DOCUMENT 1 EVALUATION OF ALTERNATIVE SOLUTIONS AND DESIGNS

1.0 EVALUATION OF ALTERNATIVE SOLUTIONS

Environmental Assessment (EA) processes recognize that there may be various alternatives or options that address a need or opportunity and require that proponents explore all reasonable solutions. Alternative planning solutions are functionally different but general ways of addressing a need or opportunity. The 2013 Transportation Master Plan (TMP) evaluated alternative solutions at the network level for Huntmar Drive and Stittsville Main Street road projects. The resulting recommended solutions are described in **Table 1-1**.

Table 1-1 Huntmar and Stittsville Main Road Projects as per 2013 TMP

Project	General Description	Rationale
Huntmar Drive	Widen from two to four lanes between Campeau Drive extension to Cyclone Taylor Boulevard. Widen from two to four lanes between Palladium Drive to Maple Grove Road.	Accommodates Kanata West Development
Stittsville Main Street Extension	New two-lane road between Palladium Drive and Maple Grove Road	Provides capacity for development in Stittsville

This chapter describes the process of validating the TMP recommended solutions for the two transportation corridors in consideration of the existing conditions in the study area, planning policy directions for growth as outlined in the City's Official Plan and the re-confirmed need and opportunity.

Planning Principles

The vision defined by the new draft TMP (2023) is that "In 2046, Ottawa's transportation network will be flexible, dependable, safe and efficient in meeting the evolving needs of residents and businesses across the city, while enabling the City to meet its climate change goals. The network will provide travel options for people regardless of their income, identity, or ability." This vision for transportation is supported by guiding principles that provide a basis for developing and evaluating alternatives as part of this EA study. The alternative solutions considered were evaluated against relevant principles presented in both the 2013 and draft TMP including:

1. Reduce automobile dependence
2. Promote active transportation and transit use
3. Integrate transportation and land use
4. Protect the environment and enhance the economy
5. Recognize and meet the diverse mobility needs of all residents, businesses and visitors
6. Promote better public health
7. Improve safety

Description of Long List of Alternative Solutions

To assist in the validation of the recommended solutions, a range of alternative solutions were developed that have some potential to address the above-noted planning principles for each of the road corridors.

Alternative Solutions for Huntmar Drive

The alternative solutions considered for Huntmar Drive include:

1. Do nothing. Provide no new transportation infrastructure in the Study Area and do not widen Huntmar Drive. Rely on other transportation infrastructure investments outlined in the TMP for transportation capacity for all modes.
2. Improve transit service within the Study Area. Leave Huntmar Drive as a two-lane road in the Study Area. Improve bus transit service through increased route options and number of trips offered. Construct a new park and ride facility in the Study Area to provide access to improved transit service.
3. Construct pedestrian and cycling facilities only. Leave Huntmar Drive as a two-lane road in the Study Area.
4. Reconstruction. Provide additional capacity by widening and reconstructing Huntmar Drive as a Complete Street accommodating all modes (walking, cycling, transit, automobiles and trucks) (*TMP Solution*).
5. Add capacity to other existing north-south facilities (such as Terry Fox Drive and Carp Road) to serve north-south travel demand and include active transportation facilities.

Alternative Solutions for Stittsville Main Street

The alternative solutions considered for Stittsville Main Street include:

1. Do nothing. Provide no new transportation infrastructure in the Study Area and do not extend Stittsville Main. Rely on other transportation infrastructure investments outlined in the TMP for transportation capacity for all modes.
2. Construct new pedestrian and cycling facilities only. Do not construct a new roadway in the Study Area. Construct contemporary pedestrian and cycling facilities only within a dedicated corridor.
3. Extend the facility as a complete street. Extend Stittsville Main from Maple Grove Road to the future Robert Grant Avenue accommodating all modes (walking, cycling, transit, automobiles and trucks). (*TMP Solution*).
4. Do not extend the street north of Maple Grove Road, but, a) construct an appropriate intersection and easterly connection to existing Maple Grove Road, and b) construct a new road segment connecting the southerly extent of Derreen Avenue to Robert Grant Avenue.

The long lists of alternative solutions were each subject to a two-step screening/evaluation process. The first step involved screening the ability of each alternative to sufficiently meet the planning principles. If the alternative passed that screening, it was carried forward for a more

holistic evaluation considering all aspects of the environment at a high-level and in consideration of the existing conditions documented as part of the study.

Screening of Long List of Alternative Solutions

The first step in the evaluation process is screening alternative solutions based on their ability (or not) to sufficiently achieve the identified planning principles. Those cells highlighted in green identify the solutions that were carried forward whereas cells highlighted in red represent those solutions that do not sufficiently satisfy the planning principles and were therefore screened out. Cells that are highlighted in yellow partially satisfy the planning principles and are also carried forward for further analysis.

The results of the screening of the long list of alternative solutions for Huntmar Drive are shown in **Table 1-2**.

Table 1-2 Results of Screening of the Long List of Alternative Solutions for Huntmar Drive

	Alternative	Description	Recommendation
1	Do nothing in the Study Area.	Does not sufficiently address the planning principles	Carried forward for comparison purposes
2	Improve transit service within the Study Area only; do not widen.	Does not sufficiently address the planning principles	Screened out
3	Construct pedestrian and cycling facilities only; do not widen.	Partially satisfies the planning principles	Carried forward for further evaluation
4	Provide additional capacity by widening and reconstructing Huntmar Drive as a Complete Street.	Satisfies the planning principles	Carried forward for further evaluation
5	Add capacity to other existing north-south facilities.	Partially satisfies the planning principles	Carried forward for further evaluation

The results of the screening of the long list of alternative solutions for Stittsville Main Street are shown in Table 1-3.

Table 1-3 Results of Screening of the Long List of Alternative Solutions for Stittsville Main Street

	Alternative	Description	Recommendation
1	Do nothing in the Study Area.	Does not sufficiently address the planning principles	Carried forward for comparison purposes
2	Construct new pedestrian/cycling facilities only.	Does not sufficiently address the planning principles	Screened out
3	Extend the facility as a complete street.	Satisfies the planning principles	Carried forward for further evaluation

	Alternative	Description	Recommendation
4	Do not extend the street northerly, but connect to Maple Grove Road, and construct a street segment between Derreen Avenue and Robert Grant Avenue.	Partially satisfies the planning principles	Carried forward for further evaluation

The Do Nothing alternative does not address the planning principles but is carried forward as an alternative solution for comparison purposes for each detailed evaluation. Alternative solutions that partially address the planning principles were also carried forward for further evaluation. Transportation Demand Management measures do not on their own address the need and planning principles and are therefore not included as an independent alternative solution. They are however, an important component and are considered part of all solutions. Similarly, new pedestrian and cycling infrastructure will be provided in any preferred solution, in keeping with the corridor's Official Plan and TMP designations and other council policies, but on their own do not satisfy the transportation demand and the Complete Street Approach.

Evaluation of Alternative Solutions for Huntmar Drive

The alternative solutions carried forward were subject to an evaluation process according to criteria that considered all aspects of the environment. The results are presented individually in Table 1-4 and Table 1-5 for each of the evaluations of Huntmar Drive and Stittsville Main Street Corridors.

Table 1-4 Evaluation of Alternative Solutions Results - Huntmar Drive

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Construct pedestrian and cycling facilities only; do not widen.	Alternative 4: Widen and reconstruct Huntmar Drive as a Complete Street.	Alternative 5: Add capacity to other existing north-south facilities (such as Terry Fox and/or Carp).
1	Supports a reduction in automobile dependency and GHG emissions.	Does not contribute to reducing automobile dependency. Could potentially result in increased GHG emissions, noise and energy consumption from added congestion (increased travel time, delay at intersections, etc.) in the Study Area.	Partially addressed. Provides additional transportation capacity within the Study Area only for active modes, which limits the ability of creating a positive modal shift or reduction in the project's contribution to climate change. Would not provide capacity for improved local bus transit to provide efficient transit connection to the future LRT station, eliminating the attraction to use LRT, a large capital investment. Instead, there would likely be an increase in bus transit travel time and a reduction in transit reliability. Could potentially result in increased GHG emissions, noise and energy consumption from added congestion in the Study Area.	Delivers a project that would provide the best opportunity/ incentive for a positive modal shift for all modes. Provides a good opportunity/incentive for supporting the integration/connection with the LRT stations which will make transit more attractive than the use of private automobiles. With additional lanes, local transit service could operate more efficiently. Active modes would be more attractive as reconstruction would provide an enhanced level of service, continuous facilities connecting existing routes. Efficient transit service and connections and more attractive pedestrian and cycling facilities supports a reduction of GHG emissions.	Partially addressed. Provides additional transportation capacity within the Study Area for all modes. Would not deliver the best opportunity/incentive for positive modal shift from automobile dependency because it doesn't provide the most direct or efficient access for all modes to future LRT service. As a result, other, more direct roads would still suffer congestion. Other roadways i.e. Terry Fox Drive are already 4+ lanes, adding more lanes is not justified and would be an overbuild. Some limited cycling and pedestrian facilities exist on parallel corridors (such as painted bike lanes, east-side sidewalk on Terry Fox), which could accommodate some active transportation demand. Would have limited opportunity to reduce

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Construct pedestrian and cycling facilities only; do not widen.	Alternative 4: Widen and reconstruct Huntmar Drive as a Complete Street.	Alternative 5: Add capacity to other existing north-south facilities (such as Terry Fox and/or Carp).
				This solution encourages a positive impact on modal shift to transit and active modes that would result in a positive impact on the project's contribution to climate change. Provides the opportunity to build in resiliency of the corridor to climate change effects.	GHG emissions as direct routes would still experience congestion.
2	Consistent with existing transportation network	Does not support the vision of the road network identified in the 2013 and draft new TMP. Does not support the large economic transit investment of LRT.	Does not support the vision of the road network identified in the 2013 and draft new TMP. Partially supports the large economic transit investment of LRT by providing safe and efficient pedestrian and cycling connections, but not the opportunity for improving local bus connections to future LRT stations. Does not provide sufficient vehicle capacity.	Fully addressed. Provides necessary additional multi-modal transportation capacity within the Study Area for all modes. Reconstructed Huntmar Drive provides a direct connection to planned growth areas. Significant transit-oriented development is anticipated at the future Palladium LRT station, for example, which would be primarily served by Huntmar Drive.	Does not address. Adding capacity to other north-south roadways in place of Huntmar Drive would not provide the most direct or efficient access for all modes to future O-Train rapid transit service. Also, there would be no upgrades to the Huntmar active transportation facilities and no additional capacity for improving connecting bus service in the corridor. Other adjacent north-south roadways have already been reconstructed (Terry Fox), or their future widening has already been accounted for in the supporting traffic analysis for this Study. Any further

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Construct pedestrian and cycling facilities only; do not widen.	Alternative 4: Widen and reconstruct Huntmar Drive as a Complete Street.	Alternative 5: Add capacity to other existing north-south facilities (such as Terry Fox and/or Carp).
					widening beyond what has already been considered would become an overbuild, creating potentially unsafe roadways, which is ultimately not in line with City planning principles.
3	Support existing and planned land uses. Enhance the economy.	Does not address the planned function to accommodate growth and to support land use investment. Future developments would be limited to the capacity of the existing transportation network. Minimizes/avoids impacts to existing land uses. Congestion impacts to road users and businesses. May add additional traffic on other major roadways in the Study Area.	Does not provide sufficient transportation capacity to service the future growth and development in the Study Area. Does not support land use investment. Minimizes impacts to existing land uses. Congestion impacts to road users and vehicles. May add additional traffic on other major roadways in the Study Area.	Fully addressed. Provides the best opportunity to accommodate additional transportation demand and support adjacent planned growth areas in the Study Area as a complete street accommodating all modes. Supports the opportunity for future intensification by supporting a modal shift to transit and active modes and creating more capacity in the transportation network. Project would be planned in accordance with municipal, provincial and federal guidance where applicable.	Partially addressed. Does not provide an efficient connection from planned growth areas in the Study Area. Roads located closer to growth areas would still suffer congestion. Does not provide opportunity/support land use investment. Numerous businesses would have property impacts from road widening. Reconstruction could substantially restrict existing access to businesses and institutions. Considerable additional ROW would be required which will impact existing spaces

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Construct pedestrian and cycling facilities only; do not widen.	Alternative 4: Widen and reconstruct Huntmar Drive as a Complete Street.	Alternative 5: Add capacity to other existing north-south facilities (such as Terry Fox and/or Carp).
4	Sensitive to the natural environment.	No physical impacts. However, there would be no opportunity to improve corridor through landscaping, adapt infrastructure to be more resilient to climate change.	Partially addressed. Minimal physical impacts are anticipated from only adding pedestrian and cycling facilities. A large portion of the corridor is undeveloped. Impacts to Feedmill Creek will require additional study and mitigation. There are opportunities to avoid/minimize physical impacts to the extent feasible. Additional mitigation will be recommended where required.	Partially addressed. Minimal physical impacts are anticipated from reconstruction. A large portion of the corridor is undeveloped. Impacts to Feedmill Creek will require additional study and mitigation. There are opportunities to avoid/minimize physical impacts to the extent feasible. Additional mitigation will be recommended where required. Provides an opportunity/supports land use investment by improving movements and access within the area for all modes. Provides an opportunity to enhance the natural environment by implementing new stormwater management features and increasing the tree canopy.	Does not address. The investment to existing vegetated spaces, parks and landscaping would be lost. The loss of natural spaces within other corridors would result in significant loss of greenscape and little space to replace and re-landscape.
5	Consistent with vision for complete streets. Promote better public health	Does not deliver a complete street as this solution maintains existing travel lanes and existing very limited facilities for other modes	Partially addressed. Would improve equity with enhanced and contemporary active transportation facility design. Providing	Fully addressed. Would improve equity with access to enhanced and contemporary multi-modal facility design. Reconstruction of	Does not address. Adding capacity to other existing north-south facilities would result in an overbuild as most area roadways have

Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Construct pedestrian and cycling facilities only; do not widen.	Alternative 4: Widen and reconstruct Huntmar Drive as a Complete Street.	Alternative 5: Add capacity to other existing north-south facilities (such as Terry Fox and/or Carp).
and improve safety.	(cyclists, transit, pedestrians). There is no opportunity to increase accessibility, physical activity and improve public health. Does not deliver a system that includes contemporary safety design. Little to no facilities exist for cyclists and pedestrians today.	pedestrian and cycling facilities would complete the connection to/from high-order facilities in the area. Provides a new opportunity to increase physical activity and improve public health where previous opportunity did not exist due to lack of facilities. Improved active transportation facilities might marginally contribute to an increased active mode share falling short of the benefit of complete street implementation. Would be designed to include contemporary safety standards. Does not meaningfully improve transit amenities nor transit service. Does not improve public realm and landscaping.	Huntmar Drive would complete the connection to/from high-order facilities in the area. As a complete street, Huntmar Drive would provide a new opportunity to increase physical activity and improve public health where previous opportunity did not exist due to lack of facilities. Increased mode share toward transit, walking and cycling would improve air quality and reduce congestion and noise which improves health. Would be designed to improve public realm, landscaping and tree canopy. Would be designed to include contemporary safety standards. Facilities to accommodate all modes would be provided through reconstruction as a complete street.	already been or will be reconstructed as complete streets. Even wider roads create increased pedestrian crossing distances and higher level of stress to pedestrians and cyclists given the increase in traffic volumes. Unnecessary additional road capacity could dimmish health resulting in increased air pollution, noise and energy consumption. Wider roads increase the perceived allowable speed on roads; this would pose a safety issue to all users.

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Construct pedestrian and cycling facilities only; do not widen.	Alternative 4: Widen and reconstruct Huntmar Drive as a Complete Street.	Alternative 5: Add capacity to other existing north-south facilities (such as Terry Fox and/or Carp).
6	Compactness and affordability. Life Cycle Costs.	Does not deliver a cost-effective solution. No capital cost.	Does not deliver a cost-effective solution. Construction would be expensive relative to overall benefit to the transportation corridor. Potential that future development and associated increase in travel demand will necessitate widening, resulting in additional costs and physical impacts and disruption to the corridor again.	Provides opportunity to improve all modes in a cost-effective way and with a compact footprint. Life cycle costs are anticipated, however, will be designed in consultation with relevant City departments to minimize costs associated with operation and employ contemporary design.	Does not deliver a cost-effective solution and would result in throw away costs. Property impacts/ requirements are likely the greatest for this option. Capacity is not needed/justified and would be an overbuild. It could lead to induced demand. It could lead to increase in operating speeds and increase in level of stress for pedestrian and cyclists, highest cost of all alternatives.
	Conclusion	Not Recommended ×	Not Recommended ×	Recommended Preferred Solution ✓	Not Recommended ×

Evaluation of Alternative Solutions for the Huntmar Drive / Highway 417 Crossing

In addition to the range of alternative solutions considered for Huntmar Drive, there is also a need to consider a range of alternative solutions for the Huntmar Drive crossing of the Highway 417. The alternative solutions considered include:

1. Do nothing; leave existing bridge in place
2. Remove bridge, eliminate connection across Highway 417
3. Repurpose existing bridge for northbound or southbound vehicle travel lanes and build parallel complete street bridge to the east or west
4. Construct a single replacement complete street bridge in the same general alignment
5. Construct a replacement complete street bridge in the same general alignment with the flexibility to also construct a separate/parallel optional interim active transportation bridge.

Both Alternatives 1 and 2 are not in line with the City's planning principles, as they would fail to maintain the north-south continuity for all modes along the Huntmar Drive corridor. These alternatives would also not contribute to the positive shift to sustainable modes that are expected to result from the other improvements recommended by this Study. Community consultation identified an acute need for better and safer active transportation facilities crossing Highway 417 at this location. The existing bridge is a significant barrier for accessibility, active transportation mobility and connectivity and the removal of the bridge entirely would fail to address this need. There are limited alternative options for crossing Highway 417 in the Study Area and the closest crossing at the Palladium Drive interchange features similarly sub-standard facilities. Additionally, Alternatives 1 and 2 are not consistent with planning policies and the complete street framework for the City of Ottawa and would result in significant congestion and bottlenecks at other crossings. Alternative 2 eliminates a necessary arterial road connection for all modes north and south of Highway 417, and neither option would provide the opportunity for improved, continuous local transit connections along the corridor connecting to the future LRT service.

The possibility of constructing a new bridge structure as presented by Alternative 3 is constricted by existing and planned major infrastructure investments. A new bridge cannot be built east of the existing bridge as this is the planned location for the future Kanata LRT bridge. New crossings cannot be built west of the existing bridge as they would conflict with an existing major trunk watermain, Hydro One line and stormwater management facilities. Based on these alignment constraints, Alternative 3 is not considered viable and removed from further consideration.

The reconstruction of the Huntmar Drive bridge represents a significant opportunity to connect the north and south portions of the community for active transportation and transit users and furthermore to provide a high-quality connection to the future Palladium Hub and LRT station. Given this, the preferred solution for a new crossing of Highway 417 includes a new complete street bridge within the same general alignment (Alternatives 4 and 5). This solution avoids conflict with other major existing or planned infrastructure and maintains the needed continuous arterial road and cycling spine route connection. This complete street bridge would form the long-term solution that provides sufficient capacity and level of service for all modes. Analyses indicate that there is a potential to stage the construction of this bridge as lateral segments, thus providing continuity of the arterial road network during its construction.

Further, analyses indicate that there is sufficient space between such a complete street bridge and the Kanata LRT alignment to construct an optional interim active transportation bridge. This potential interim investment could provide the missing active transportation functionality across Highway 417 for the period prior to the construction of the Huntmar Drive complete street bridge, and prior to the construction of the Kanata LRT. It could also remain in-place for the fullness of time, being an early delivery of part of the multi-use pathway (MUP) facility that is planned along the west and north side of the Kanata LRT. On the basis of the foregoing, Alternative 5 is the recommended solution for the Huntmar Drive / Highway 417 crossing.

Regarding the interim active transportation crossing solution, it is important to note that the option to deliver the crossing as an above grade bridge crossing versus an underground tunnel were evaluated. The overhead structure is favoured as part of the recommended solution because it:

- Can be designed in a space-efficient manner that does not interfere with the Kanata LRT alignment to the east.
- Can be designed in a space-efficient manner that does not interfere with the Huntmar complete street bridge alignment to the west.
- Can best be delivered with accessible grades in a manner that ties into Cyclone Taylor Boulevard at-grade, to the south of Highway 417.
- Avoids risks associated with flooding of below-grade infrastructure.
- Avoids tunnelling or excavating under Highway 417.

Table 1-5 Evaluation of Alternative Solutions Results - Stittsville Main Street

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Extend Stittsville Main Street as a complete street.	Alternative 4: Do not extend the street northerly, connect to Maple Grove Road, and construct a street segment between Derreen Avenue and Robert Grant Avenue.
1	Supports a reduction in automobile dependency and GHG emissions.	Does not contribute to reducing automobile dependency. Could potentially result in increased GHG emissions, noise and energy consumption from added congestion in the Study Area.	Fully addressed. Provides necessary additional transportation capacity within the Study Area for all modes. Constructing the road as a complete street would link the surrounding communities to future LRT service with high quality active transportation facilities, as well as enabling bus service to connect neighbourhoods. Providing sufficient capacity to meet travel demand offers the opportunity to reduce congestion, noise and energy consumption and therefore GHG emissions.	Partially addressed. Provides some additional transportation capacity within the Study Area for all modes. Addresses the need for direct, efficient access to future LRT service from portions of the surrounding neighbourhoods. Does not provide the opportunity for local bus service to connect these neighbourhoods. May result in added congestion and travel distance which will increase GHG emissions.
2	Consistent with existing transportation network	Does not support the vision of the road network identified in the 2013 and draft TMP.	Fully addressed. Provides necessary additional transportation capacity and missing link within the Study Area for all modes.	Does not address. The absence of an extended Stittsville Main Street would fail to meet the long-term multi-modal transportation requirement for connecting the growing communities surrounding the Study Area to the existing transportation network. The Study Area transportation network would operate less efficiently in the absence of a needed major collector. Could result in additional traffic diverting on to Maple Grove Road, which does not support the intended purpose of that road as a minor collector.

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Extend Stittsville Main Street as a complete street.	Alternative 4: Do not extend the street northerly, connect to Maple Grove Road, and construct a street segment between Derreen Avenue and Robert Grant Avenue.
3	Support existing and planned land uses. Enhance the economy.	Does not address the planned function to accommodate growth. Would fail to connect adjacent planned growth areas in the Study Area to the existing transportation network. Minimizes/avoids impacts to existing land uses. Does not provide opportunity and does not support for land use investment or further economic development.	Fully addressed. Provides the best opportunity to accommodate additional transportation demand and connect adjacent planned growth areas in the Study Area to the existing transportation network. Supports the opportunity for future intensification by creating more capacity in the transportation network and supports a shift towards sustainable modes which are more conducive to dense land use patterns. Extending Stittsville Main Street would complete the connection of the surrounding communities to /from high order transportation facilities.	Does not address the planned function to accommodate growth. Would fail to connect adjacent planned growth areas in the Study Area to the existing transportation network. Property impacts and impacts on existing land uses still anticipated.
4	Sensitive to the natural environment.	No physical impacts. However, existing Study Area environment is already substantially disturbed as a result of ongoing development in planned growth areas.	Partially addressed. Some physical impacts are anticipated from constructing the road. A significant portion of the Study Area environment has already been substantially disturbed as a result of ongoing development in planned growth areas. Will result in impacts to a significant woodland north of Maple Grove Road, however this woodland is subject to planned future development so construction of the road will not have any additional impacts. There are opportunities to avoid/minimize physical impacts to the extent feasible. Additional mitigation will be recommended where required.	Partially addressed. Would result in nearly the same impacts to the natural environment as Alternative 3. Same with Alternative 3, impacts are anticipated to be minimized or eliminated through mitigation measures.

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Extend Stittsville Main Street as a complete street.	Alternative 4: Do not extend the street northerly, connect to Maple Grove Road, and construct a street segment between Derreen Avenue and Robert Grant Avenue.
			Provides an opportunity/supports land use investment by improving movements and access within the area for all modes. This solution encourages a positive impact on modal shift to transit and active modes that would result in a positive impact on the project's contribution to climate change. Provides the opportunity to build in climate change resiliency to corridor infrastructure.	
5	Consistent with vision for complete streets. Promote better public health and improve safety.	Does not deliver a complete street that would provide the needed multi-modal travel capacity. Does not deliver a system, or opportunity to increase physical activity and improve public health. Does not deliver a system that includes contemporary safety design. Little to no facilities exist for cyclists and pedestrians today.	Fully addressed. Extending the road would provide the opportunity for a complete street vision to be built. Constructing the road as a complete street would meet the needs of a diverse range of users. Would improve equity with access to enhanced and contemporary facility design. As a complete street, the Stittsville Main Street extension would provide a new opportunity to increase physical activity and improve public health where previous opportunity did not exist because of a lack of facilities. An increased mode share of transit, walking and cycling would improve air quality and reduce congestion and noise. Would be designed to contemporary safety standards.	Partially addressed. The portion of roadway constructed would be designed as a complete street. However, a continuous complete streets connection would not be provided. Discontinuous facilities do not provide the best opportunity for improving public health. Would avoid creating a direct traffic link between Stittsville Main Street and the Palladium highway interchange, possibly reducing cut-through traffic and improving overall traffic safety. However, has the potential to direct additional traffic to Maple Grove or Derreen.

	Criteria	Alternative 1: Do Nothing in the Study Area (for comparison purposes)	Alternative 3: Extend Stittsville Main Street as a complete street.	Alternative 4: Do not extend the street northerly, connect to Maple Grove Road, and construct a street segment between Derreen Avenue and Robert Grant Avenue.
6	Compactness and affordability. Life Cycle Costs.	Does not deliver a cost-effective system. No capital cost.	Delivers a cost-effective solution for all modes based on projected capacity needs within the corridor. Life cycle costs are the most of all options but will be designed in consultation with relevant City departments to minimize costs associated with operation and will utlize contemporary design.	Does not address the need for added capacity and continuous facilities for all modes within the corridor. May result in a slightly lesser capital cost. May result in higher life cycle costs if it is determined that the missing connection is needed in the future.
Conclusion		Not Recommended ×	Recommended Preferred Solution ✓	Not Recommended ×

2.0 EVALUATION OF ALTERNATIVE DESIGNS

This section provides a summary of the overall principles, design and evaluation criteria that guide the evaluation and design of the recommended infrastructure solutions. These criteria are sensitive to the site-specific conditions within the Study Area**.**

The evaluation process chosen to determine the alternative designs for the transportation solutions is a stepwise process and considers the varied opportunities, constraints, policies, geometric design requirements and environmental effects. The first step was to establish the design criteria for each of the roadways; then, upon further dissection of those design criteria, establish the best outcome following stakeholder discussion. The next step was to evaluate alternative cross sections, then alignments and intersection options. Preliminary preferred designs were confirmed for each of the corridors following broad stakeholder consultation.

The extension of Stittsville Main Street as a Major Collector Road will provide increased north-south and west-east connectivity to the existing and planned communities on either side of the corridor, creating a multi-modal link between Hazeldean Road and Robert Grant Avenue. The Huntmar Drive widening will emphasize the road's role as a multi-modal north-south Arterial travel link, serving the residential communities in Kanata and Stittsville, and the institutional and commercial destinations within and near the Study Area. The renewed Huntmar Drive crossing over Highway 417 as a complete street, together with the flexibility for a potential interim active transportation crossing, will provide continuous path of travel for all road users, providing a multi-modal connection between the communities on either side of the highway. Design Criteria were developed to respond to these intended functions, to the requirements of policy and site-specific conditions, as well as to study priorities and needs of varying road users.

Huntmar Drive Widening

Design Criteria

Design Criteria for the Huntmar Drive widening are as follows:

- Arterial Road and Cycling Spine Route designation;
- Accessible in accordance with all municipal and provincial guidelines and standards;
- Protected intersections where signalized;
- Local Street intersections as 30 km/h streets;
- Undivided travel lanes (no mid-block medians) as per 2018 Council approved arterial road cross sections;
- Transit route;
- Potential for Truck Route;
- 37.5m right-of-way, as per Official Plan policy (additional space at intersections, and grading easements as required);
- Posted Speed of 50km/h or 60km/h (design speed 70km/h);
- Lane widths as per council policy;
    - 3.5m outside travel lanes (ensures sufficient space for bus transit operations)

    - 3.25 interior travel lanes
- 2.0m minimum sidewalks on both sides;
- 1.8 to 2.0m uni-directional cycle tracks on both sides;
- 4.0m bus pads/stops following City guidelines for interactions with active transportation facilities;
- Tree planting as per City requirements;
- Four travel lanes (two in each direction);
- Snow storage along curb line;
- High-voltage overhead hydro line retained in place where possible;
- No on-street parking; and
- Left turn and right turn lanes where needed.

Note that, as per the directive of the Fall 2018 City of Ottawa Council report advising against medians for urban arterials with posted speeds less than 70km/h, design alternatives featuring continuous medians were not considered. Medians provide no benefit for street tree planting, are more costly to construct and can result in less compact infrastructure and they also unnecessarily lengthen pedestrian crossing distances. For these reasons, options including mid-block medians do not align with the study's planning objectives and are not considered further. Where left-turn lanes and traffic signals are required, narrow 1.5m medians may be needed for signal plants, and narrow medians may also be employed to prohibit undesired/unsafe turning movements at private approaches.

Rural versus Urban Cross Section

An urban road cross-section is recommended. The road edge design of urban roads is influenced by adjacent land uses, buildings, pedestrian activity, and public space functions, whereas in the rural area the road edge design is more influenced by its integration with the drainage patterns, landscapes, and natural processes. An urban cross-section is favoured for Huntmar Drive due to the planning context provided by the New Official Plan, the road's designation as Minor Corridor, the presence of the planned Palladium development "hub" and rapid transit station, and the adjacent development lands on both sides of the corridor. It is expected that over time, in response to these policies, significant development will take place along the corridor, creating an "urban" setting, where today the setting of the corridor might be considered "rural". The OP's Corridor designation applies to bands of land along specified streets whose planned function combines a higher density of development, a greater degree of mixed uses and a higher level of street transit service than abutting Neighbourhoods, but lower density than nearby Hubs. Hubs are identified as Protected Major Transit Station Areas (PMTSAs) for the purposes of the Provincial Policy Statement. At the Palladium Hub, the OP allows for mid-high density development centred on the future LRT station, which could result in particular transit-oriented development and urbanization along this segment of Huntmar. The redevelopment vision for the section of Huntmar bordering the Palladium Hub involves a highly active street-front, appropriate of an urban roadway cross-section.

Design Speeds and Posted Speed Limit

A design speed of 70km/h was selected to reflect Huntmar Road's arterial function. A design speed of 70km/h leaves the flexibility to select either a 50km/h or 60km/h posted speed at some point in the future, depending on the emergent priorities for the corridor which will evolve with the ongoing development of the area. The road is in the Urban Area and will feature active transportation facilities, and is designated a Minor Corridor, so lower vehicular operating speeds are desirable. The role of Huntmar in the wider transportation network as a high-volume arterial is also acknowledged, which creates the need for sufficiently high traffic speeds to maintain roadway function and traffic flow. Pedestrian and cyclist safety can be addressed with fully separated facilities and a wide buffer to vehicle travel lanes, minimizing the interaction between active road users and higher speed traffic.

Alternative Cross-Section Arrangements

The City of Ottawa's *Arterial Road Cross-Sections,* which were approved by Council in 2018 as supplemental guidance for the City's *Regional Road Corridor Design Guidelines (2000),* were used as a starting point for the evaluation of alternative cross-section arrangements for Huntmar Drive. These cross-sections assumed a narrower ROW than what is protected in the Official Plan for Huntmar Drive but could still be used to compare options for generalized cross-section arrangements. Of the Council endorsed cross-sections, two were determined to most closely meet the design criteria for Huntmar Road. **Option A**, shown in Figure 2-1 shows a 4-lane cross-section with 3.5m outside vehicle travel lanes; 3.25m interior travel lanes; and unidirectional cycle tracks on both sides separated from 2.0m sidewalks by a 2.0m planting strip. **Option B**, shown in Figure 2-2, is largely the same but with side-by-side cycle tracks and sidewalks, separated by an unspecified delineation strip.

Figure 2-1: Huntmar Drive (Option A) - separated cycle tracks/sidewalks

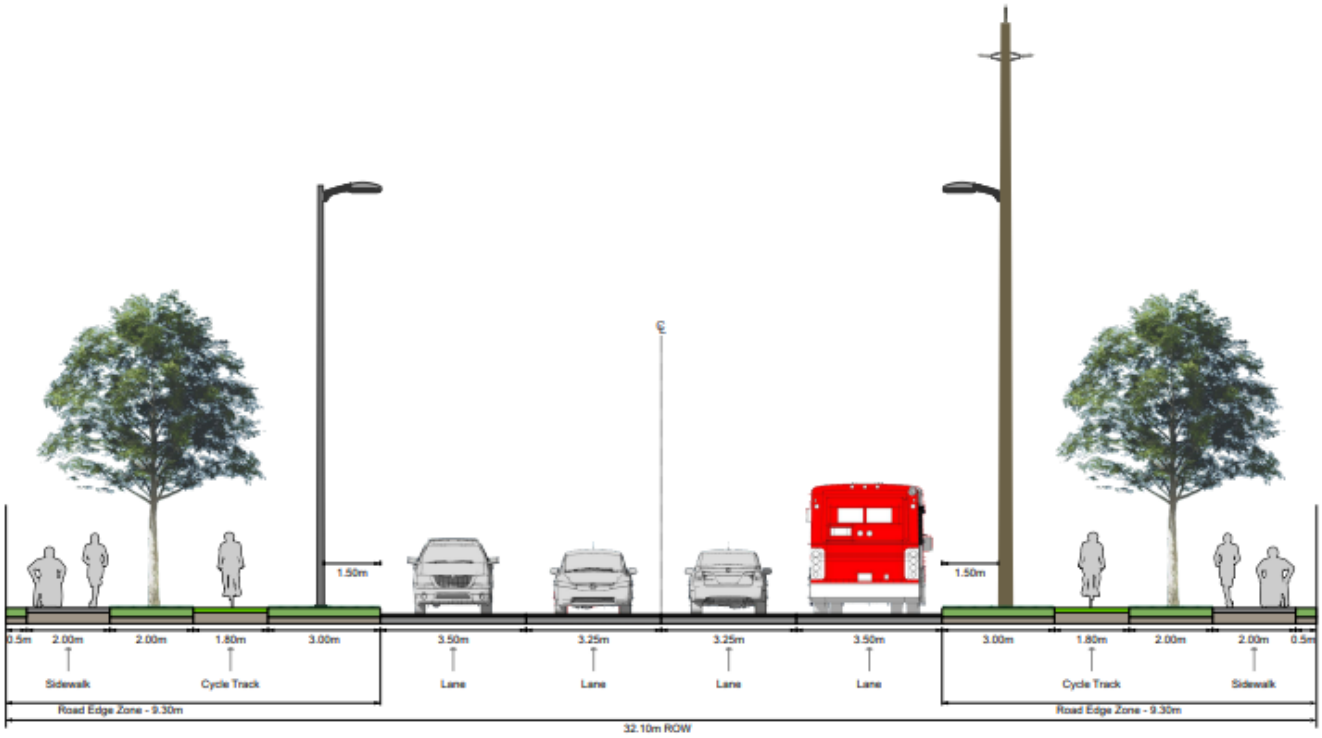
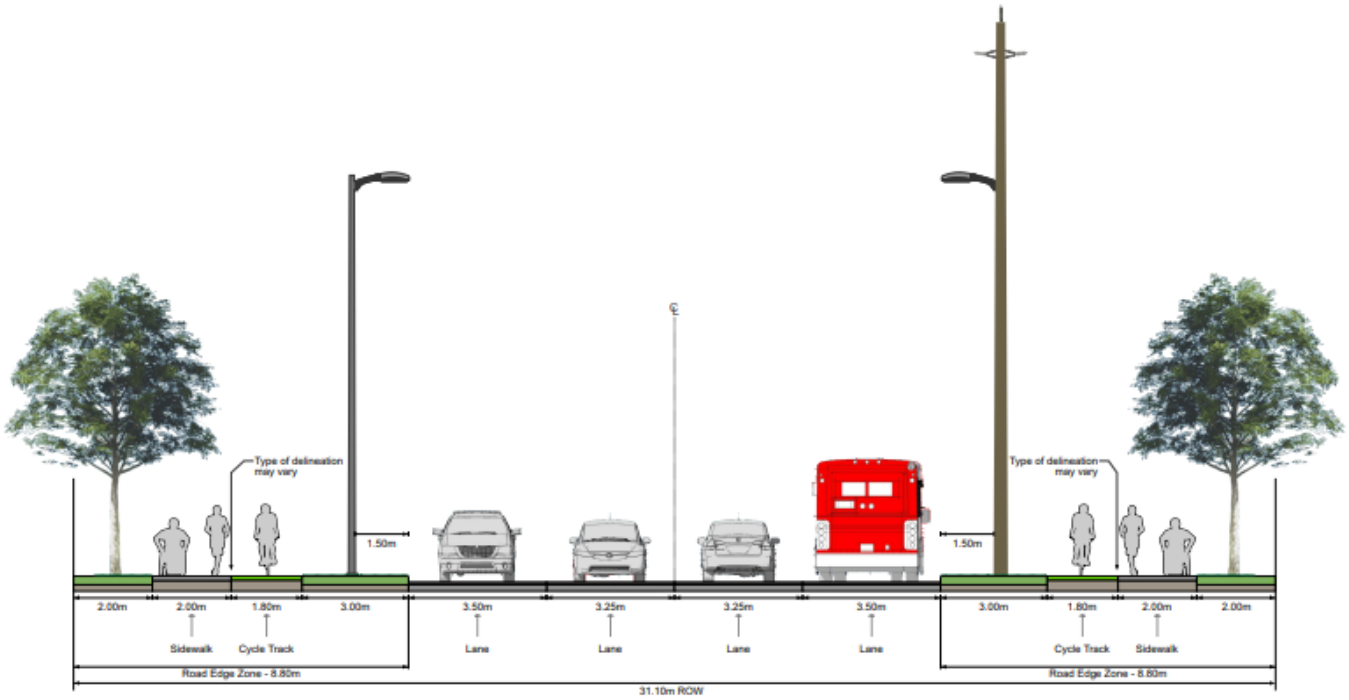


Figure 2-2: Huntmar Drive (Option B) - combined cycle tracks/sidewalks

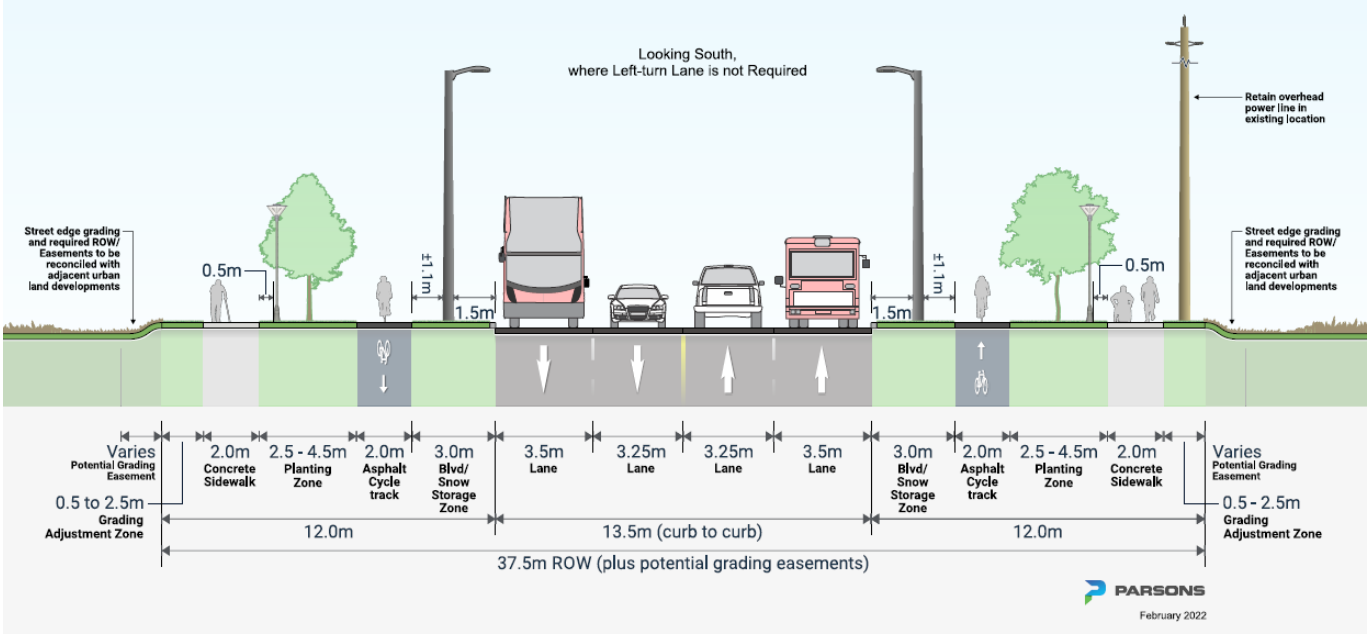


Preferred Cross-Section

The preferred cross-section – shown in Figure 2-3 – is a version of Option A but updated for a 37.5m ROW that does not include 5m grassy medians, chosen through consultation with the Study's Agency, Business, and Public consultation groups, as well as through analysis of the environmental, planning and engineering context for the roadway. Both alternatives largely meet the design criteria outlined earlier. However, consultation group feedback indicated a preference for fully separated active transportation facilities, which is provided in Option A by a wide planting zone, over bundled facilities as shown by Option B. Some concern was voiced over the potential for unsafe interactions between cyclists and pedestrians created by placing sidewalks and cycle tracks directly adjacent to each-other.

Additionally, providing a planting zone between the sidewalk and cycle track allows street trees to be positioned in such a way as to provide shade to both facilities simultaneously while also providing a space for snow storage. The wide protected ROW of Huntmar Drive allows the planting zone provided in this space to be of a sufficient width to encourage healthy tree growth. Under the bundled arrangement shown by Option B, street trees would be planted in the outer boulevard, potentially placing the cycle tracks outside of the area of shade coverage.

Figure 2-3: Preferred cross-section for the Huntmar Drive widening



The preferred design fulfills the Complete Street vision for Huntmar Drive, providing safe and comfortable facilities for all users. The design features 2.0m unidirectional cycle tracks and sidewalks on both sides. The variable-width planting zone provided is a sufficient minimum width for healthy tree growth and will also contain pedestrian-scale lighting to supplement the main overhead fixtures. Two travel lanes are provided undivided in both directions, with ample snow storage space in the boulevards and ROW space for left-turn lanes at intersections where needed. The existing hydro line on the west side of the corridor will be maintained in place in the

outer boulevard. Street edge grading on both sides will vary with the form of future development, some of which is expected to be street fronting.

It is also important to note that the width of the planting zone will need to vary along the project length, such as in instances where turning lanes are required at intersections which in turn reduce the amount of space available for snow storage. Decisions on whether the grassy spaces are to be re-allocated to remove space from roadside snow storage to wider planting zones can be made at the detailed design stage. Similarly, there will be segments where there is insufficient space to provide a planting zone between the sidewalk and cycle track. In these segments, the sidewalk and cycle track will abut each other and the implementation of half height curbs vis a vis other methods to provide tactile delineation will be determined at the detailed design stage.

Intersection Considerations

The Huntmar Drive Widening includes the design of three major intersections – at Cyclone Taylor Boulevard, Palladium Boulevard, and Robert Grant Avenue – as well as several existing and planned minor and private approaches from developments adjacent to the corridor. The design for the widened Huntmar Drive will tie into the existing Campeau Drive roundabout at the north end of the corridor, and into the proposed signalized protected intersection at Maple Grove in the south, which is being designed by others and is approved by the City as part of an ongoing intersection modification project.

For the three major signalized intersections, the following options were evaluated:

- Roundabout; and
- Signal Controlled Protected Intersection.

All intersection options would include accessibility measures following all relevant City of Ottawa standards. Other design considerations for this intersection type analysis and evaluation were:

- Route consistency;
- ROW requirements;
- Accessibility;
- Pedestrian and cycling safety; and
- Traffic volumes and traffic flow balance.

At the Cyclone Taylor and Palladium intersections, the option of a roundabout was ruled out due to insufficient space. Widening out the intersections to provide space for a roundabout would have notable impacts on existing land uses. As such, the preferred alternative for these intersections is that they be designed as full signalized protected intersections.

At the future Robert Grant intersection, the implementation of a roundabout would require notable acquisition of property from developments (such as at 173 Huntmar and 130 Huntmar) that have been undergoing land use studies and pre-consultations on the basis of signalized intersections. Rather, designing the Robert Grant intersection as a signalized intersection would both avoid the need for development planning disruption and property acquisition and would

maintain continuity for road users on Huntmar Drive as a north-south route served by signalized intersections.

Further, the use of signalized intersections is an opportunity to showcase and implement the City's new design guidelines for protected intersections. A protected intersection provides cyclists with a continuous, protected north-south cycling route, without the requirement to dismount to cross any intersecting roadways, and can be designed as state of the art from an accessibility perspective. On the other hand, roundabouts in Ontario come with the requirement for cyclists to dismount and walk at crosswalks, and have some performance limitations for those with accessibility challenges. For these reasons, the preferred alternative for the above-noted intersections is that they be designed as full signalized protected intersections.

Huntmar Drive / Highway 417 Crossings

Design Criteria

Design criteria for the Huntmar Drive complete street bridge crossing of Highway 417 are as follows:

- Posted Speed of 50km/h or 60km/h (design speed 70km/h);
- Five (5) lane cross-section (two travel lanes in each direction, and single southbound left-turn lane);
- Lane widths as per Council policy and MTO guidance;
- 3.5m outside travel lanes for transit;
- 3.3m interior travel lanes;
- 2.0m minimum sidewalks on both sides;
- 1.8 to 2.0m uni-directional cycle tracks on both sides;
- Half-height curbs as the method to separate sidewalks and cycle tracks;
- Pedestrian railing (1.37m height);
- Curbside safety barriers;
- Overhead clearance to Highway 417 travel lanes below in accordance with MTO requirements; and
- Potential to be constructed in lateral phases in order to maintain roadway connectivity during construction.

Lane and Active Transportation Requirements

Substantial traffic analysis was undertaken to determine that, as a result of the bridge's role in serving event traffic at the adjacent Canadian Tire Centre, a southbound left-turn lane extending onto the bridge is needed to accommodate lengthy queues for this movement. Accordingly, the cross-section options evaluated for the Huntmar / Highway 417 complete street bridge crossing will feature five lanes: two through lanes in both directions and a single southbound left-turn lane. This arrangement, with 3.5m curb lanes, will also accommodate bus transit as required.

Also of importance is the provision of high-quality active transportation facilities spanning the bridge, as outlined in the criteria in the preceding section. This will connect the facilities on the

north and south sides of the highway, which would otherwise be inaccessible and result in a fragmented active transportation network. The evaluated alternative designs centre around variations of these design criteria and corresponding arrangements.

Cross-Section Options

Option A, shown in Figure 2-4, features 2.0m sidewalks and 2.0m unidirectional cycle tracks on both sides delineated by half-height curbs and separated by traffic lanes by a curbside concrete barrier. Wide, 1.5m roadside buffers on both sides contribute to an overall wider bridge width of 30.15m. **Option B** (Figure 2-5) is a variation of Option A featuring reduced roadside buffers, which results in an overall bridge width which is 2m narrower. For **Option C** (Figure 2-6) the concrete barrier is shifted to be between the sidewalks and cycle tracks, so that the cycle track is adjacent to the travel lanes and separated only by a 0.25m offset. **Option D** (Figure 2-7) does not feature a concrete AT barrier, and as a result features the narrowest total bridge width possible while still meeting the minimum design criteria. All options feature a 1.37m pedestrian railing on the outside bridge edge.

Figure 2-4: Option A (Roadside Barrier with Wide Buffer, Half-height Curb Delineation)

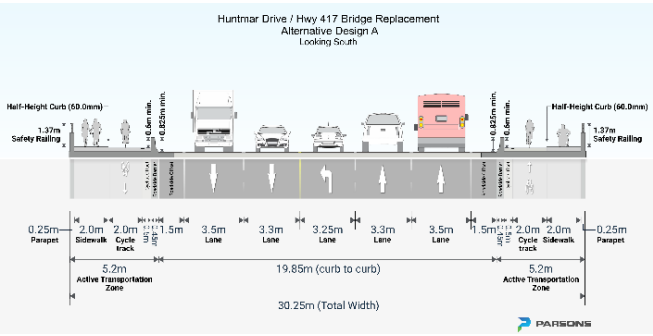


Figure 2-5: Option B (Roadside Barrier with Narrow Offset, Half-height Curb Delineation)

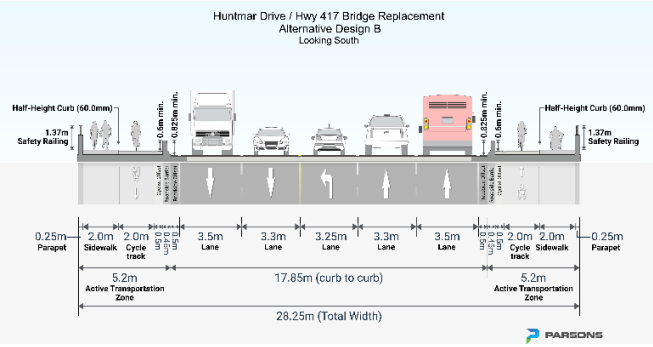


Figure 2-6: Option C (Barrier-Separated Sidewalk/Cycle Track Narrow Roadside Offset)

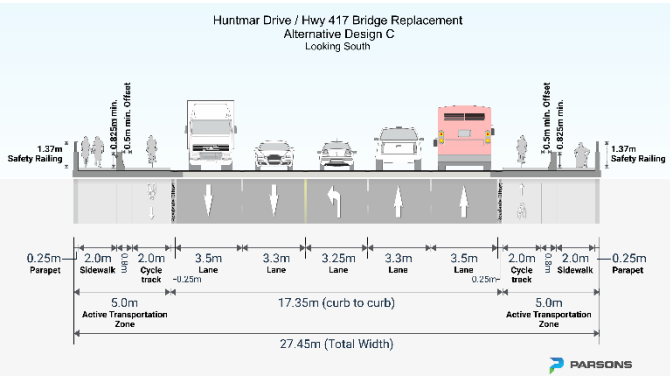
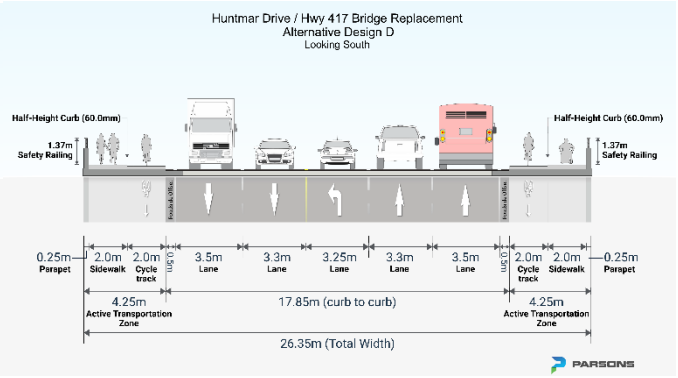


Figure 2-7: Option D (No Roadside Barrier)



Preferred Cross-Section

Through consultation group feedback, the preferred Huntmar/Hwy. 417 bridge cross-section was determined to be **Option A**. This option provides the highest level of active transportation comfort and safety, a priority of the project, while still meeting traffic requirements. Option C does not provide sufficient separation between cyclists and vehicle traffic; Option D does not provide sufficient separation for cyclists or pedestrians. The wide curbside buffer provided in Option A creates very good separation between motor vehicles and cyclists and also provides ample space for snow storage compared to Option B. Option A best addresses concerns over the possibility that snow could accumulate against the roadside barrier and impede the outside travel lanes, and other than cost, there is no impediment in this case to providing the greater width in favour of roadside safety.

Bundled Active Transportation Facility Delineation

For options A, B, and D, options for the delineation between the cycle tracks and sidewalks were evaluated. The preliminary preferred option, based on feedback from City staff and external accessibility stakeholders, is a half-height curb delineator, as illustrated in the cross-section diagrams above. This provides a strong level of demarcation between the bundled active transportation facilities, preventing cyclists from encroaching on the pedestrian space on

the bridge span. Half-height curbs also have minimal lateral space requirements, which would allow them to be implemented without adding to the overall bridge width; a tactile delineation strip was ruled out for this reason.

However, the viability of implementing half-height curbs over the bridge span will need to be re-evaluated at detailed design. It is anticipated that there may be engineering challenges related to 'stepping' the active transportation facilities, and the more viable option may be to provide the sidewalk and cycle track as a single level surface. In this case a painted delineator should be the preferred option because of its minimal lateral space requirements. This EA provides the approval for these options, and other options that may emerge in the future, all to be explored during detailed design and corresponding to the best practices, design guidelines, and codes of the day.

Bridge Alignment Considerations

Options were evaluated for the alignment of the replacement Huntmar / Highway 417 complete street bridge, which are shown in the figures below. The options included: 1. maintain the current bridge location and construct the new bridge over the alignment of the existing bridge; 2. shift the bridge alignment to the east of the existing bridge location; and 3. shift the bridge alignment to the west of the existing bridge location. The preferred design is **Option 1**, maintaining the existing bridge alignment. Option 2 is not feasible because it would interfere with the future LRT bridge to be constructed as part of the Kanata O-Train extension and it would also negate the opportunity for an interim optional active transportation bridge in that location. Option 3 creates conflicts with the high-voltage Hydro One line to the west of the Huntmar corridor, as well as trunk watermain and stormwater management facilities. For these reasons, Option 3 was also screened out.

Figure 2-8: Huntmar / Hwy. 417 Crossing Alignment Option 1 (Current Bridge Location) – Preferred

Figure 2-9: Huntmar / Hwy. 417 Crossing Alignment Option 2 (East of Current Bridge Location)

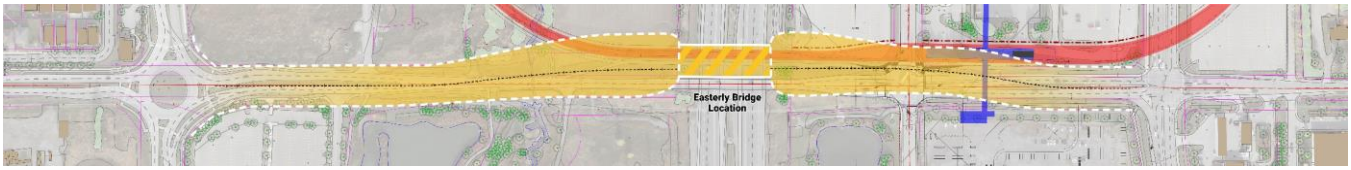


Figure 2-10: Huntmar / Hwy. 417 Crossing Alignment Option 3 (West of Current Bridge Location)

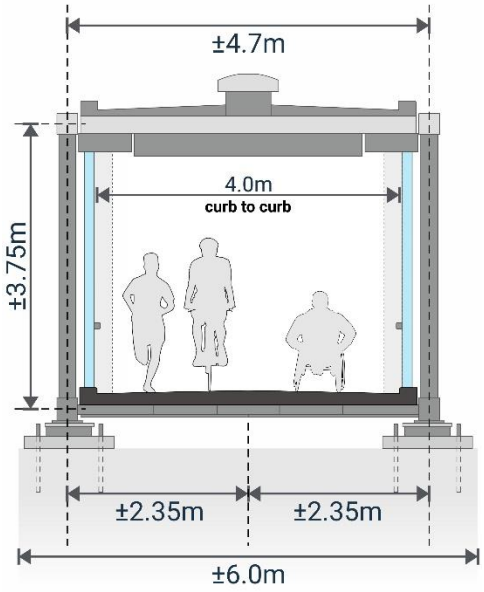
Potential Parallel Active Transportation Bridge

Responding to the need and opportunity established in the recommended solution, flexibility is built into this EA for the delivery of an optional interim active transportation (AT) bridge crossing over Highway 417. Key planning and design criteria include:

- Overhead bridge structure for the reasons outlined in the evaluation of alternative solutions;
- Enclosed and weather protected other than at the ends which will be open;
- Accessible and with a smooth rolling surface;
- Illuminated to City standards;
- Wide enough to accommodate both pedestrians and cyclists in a multi-use pathway format;
- Sufficient interior headroom for users including maintenance activities;
- Aligned to the east of the future Huntmar complete street bridge;
- Aligned to the west of the Kanata LRT alignment and as an early delivery of the Highway 417 crossing that was identified as part of that project (but not EA approved);
- Designed to be constructable in advance of either the Huntmar complete street bridge, or in advance of the Kanata LRT, or in advance of both;
- Designed in a manner to not infringe on the ability to construct the adjacent structures to the east or west; and
- Overhead clearance to Highway 417 travel lanes below in accordance with MTO requirements.

Responding to these criteria, the preferred design is shown in below.

Figure 2-11 Cross Section Design for the Optional Active Transportation Bridge



In addition to the dimensions shown on this design, the project will make best efforts to provide for exterior seating on each end of the bridge structure. The provision of seating will acknowledge that the bridge crossing over Highway 417 is relatively long, and that there is insufficient lateral space within the interior of the bridge to provide seating without encumbering movement along it.

Multi-use pathway (MUP) connections to the AT bridge ends would be made to and from the active transportation infrastructure on both sides of Highway 417 on the east side of Huntmar Drive (toward Campeau Drive to the north, and Cyclone Taylor Boulevard to the south).

Stittsville Main Street Extension

Design Criteria

Design criteria for the Stittsville Main Street extension are as follows:

- Major Collector Road;
- 26m right-of-way, as per Official Plan policy (additional grading easements possible);
- Accessible in accordance with all municipal and provincial guidelines and standards;
- Protected style Stop-controlled intersection at Maple Grove;
- Local Street intersections as 30 km/h streets;
- Two travel lanes (one in each direction);
- Provision of on-street parking;
- Posted Speed of 40km/h (design speed 50km/h);
- 3.5m minimum travel lane width (accommodates transit);
- 9.0m minimum curb-to-curb width to accommodate snow clearance vehicles;
- Sufficient width for emergency vehicles;

- Periodic “bulb-outs” to organize on-street parking and provide minimum 9m curb-to-curb width;
- Snow storage along curb line;
- Below-grade utilities;
- Undivided;
- Traffic calming / speed reduction elements to dissuade through traffic;
- Left turn lanes where needed;
- Bus pads/stops following City guidelines for interactions with active transportation facilities;
- Tree plantings as per City requirements.

An urban cross-section is favoured for the Stittsville Main Street extension because of the existing and future urban development immediately adjacent to it. It is anticipated that the ongoing and planned development of the subdivisions directly adjacent to the corridor will create an urban (or semi-urban/suburban) context rather than a rural setting which implies open ditches. Some of the developments are not anticipated to front directly on to Stittsville Main Street, based on a review of draft plans of subdivision that are in-process. However, they ideally can be designed while having regard to the City’s OP and Urban Design Guidelines for Greenfield Neighbourhoods to contribute to successful public realm along this Major Collector.

Design Speeds and Posted Speed Limit

For Stittsville Main Street, a design speed of 50 km/h and a posted speed of 40 km/h were selected following consultation with a broad range of stakeholders. This road segment is a major collector serving several developing communities in Stittsville and West Kanata, and so is expected to be well used. However, a higher speed limit might encourage through traffic between Stittsville and Highway 417, which is not desirable. As well, the lower posted speed reflects the road’s intended role as a community-oriented corridor, meant to equitably accommodate a range of modes and road users. The preferred design has regard for the City of Ottawa Designing Neighbourhood Collector Streets Guidelines, Traffic Calming Guidelines and the 30 km/h Street Design Toolbox. Interventions that are built into the preferred design specifically to help reduce vehicle speed are:

- Curvalinear centreline to result in a mild chicane effect;
- In-lane bus stops;
- Use of on-street parking;
- Alternating on-street parking;
- Relatively narrow asphalt roadway;
- Bulb-outs;
- Street tree planting;
- Roundabout “gateway” intersection at Derreen; and
- Stop-controlled intersection at Maple Grove with protected intersection design features.

Furthermore, all intersecting side-streets are to be designed to implement the City's 30 km/h Street Design toolbox. Design features include neckdowns (reduced width of the roadway throat at the Major Collector Road intersection), and the potential for continuous active transportation crossings which can be evaluated at the detailed design of these intersections.

Cross-Section Options

Figure 2-13: Stittsville Main Street Alternative A1 (MUP on one side, periodic parking on both sides)

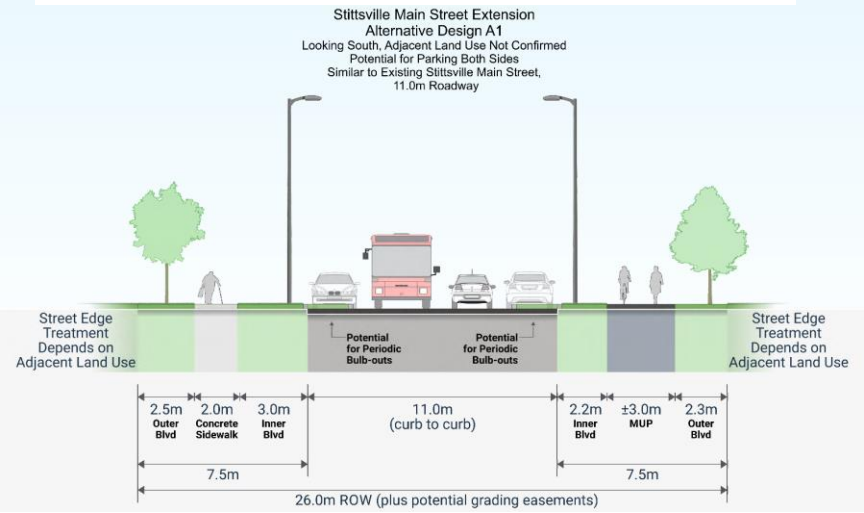


Figure 2-12: Stittsville Main Street Alternative A2 (MUP on one side, periodic parking on both sides, painted centreline)

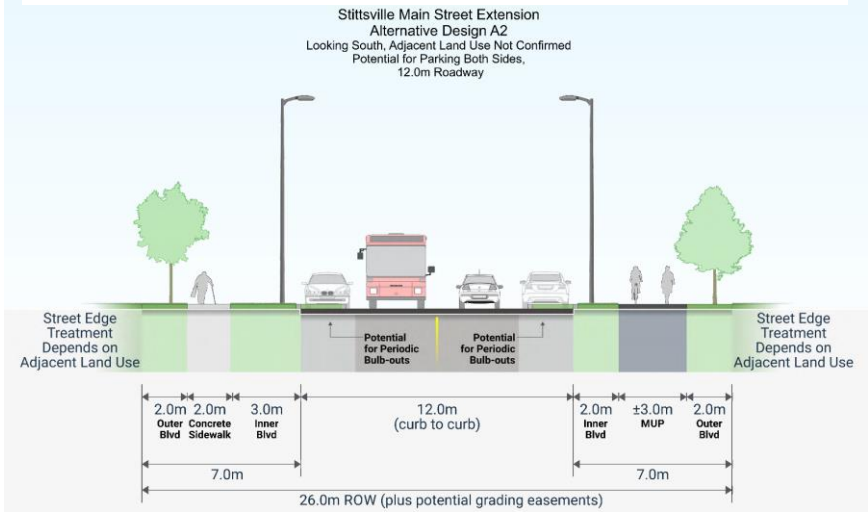


Figure 2-15: Stittsville Main Street Alternative B (MUP on one side, parking alternates sides)

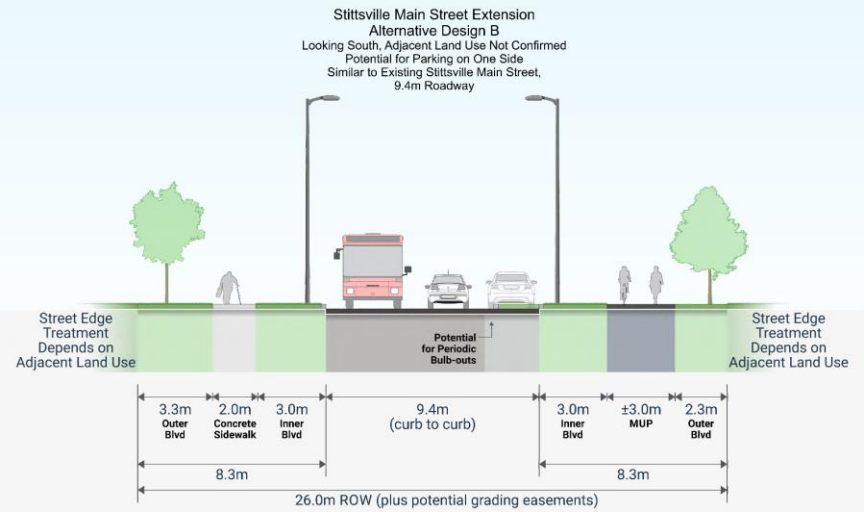


Figure 2-14: Stittsville Main Street Alternative C1 (half-height curb delineated sidewalk/cycle track, undivided, periodic parking on both sides)

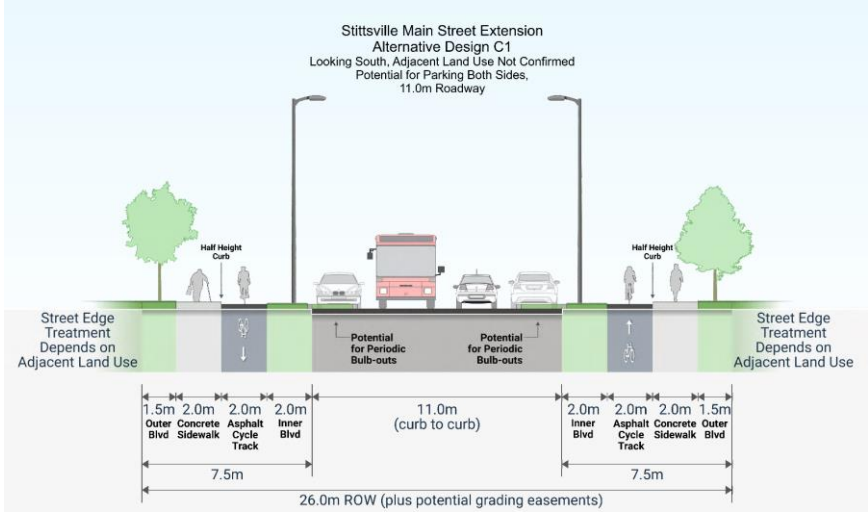


Figure 2-16: Stittsville Main Street Alternative C2 (half-height curb delineated sidewalk/cycle track, painted centre line, periodic parking on both sides)

Figure 2-17: Stittsville Main Street Alternative D (half-height curb delineated sidewalk/cycle track, undivided, parking alternates sides)

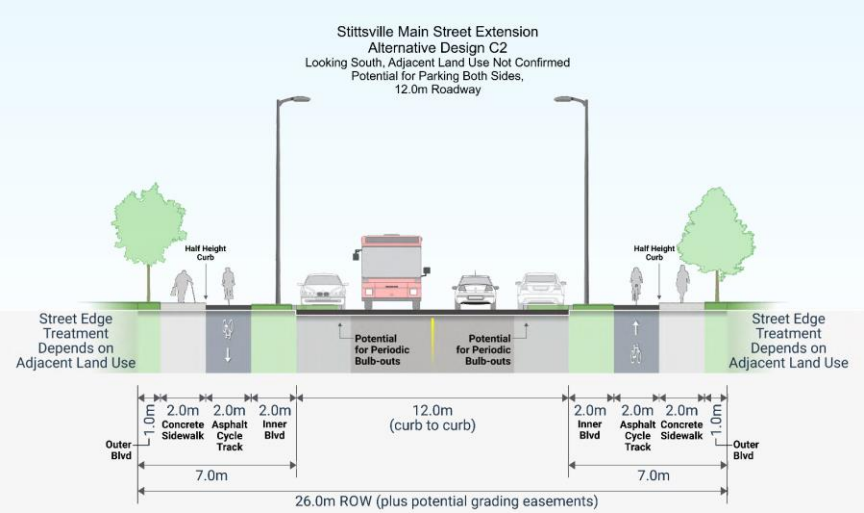


Figure 2-20: Stittsville Main Street Alternative E (buffer-separated sidewalk/cycle track, undivided, parking alternates sides)

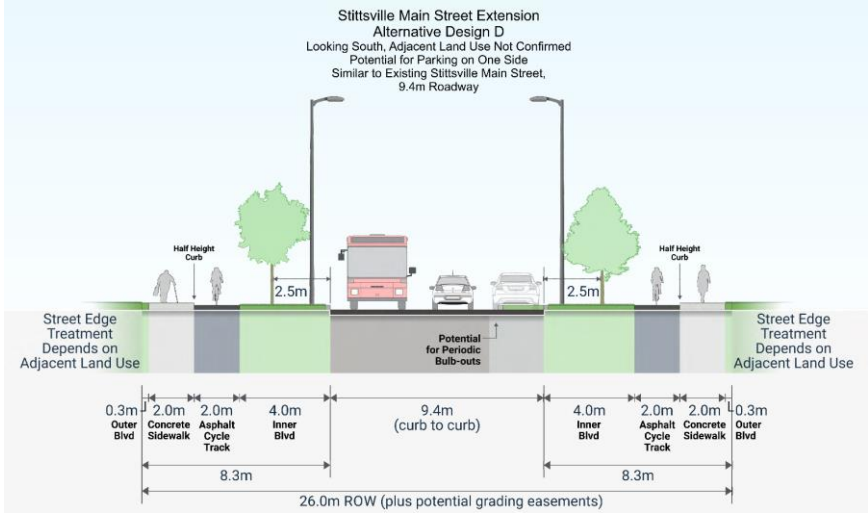


Figure 2-19: Stittsville Main Street Alternative F (modified Option D with 3.0m setbacks to fronting residential uses)

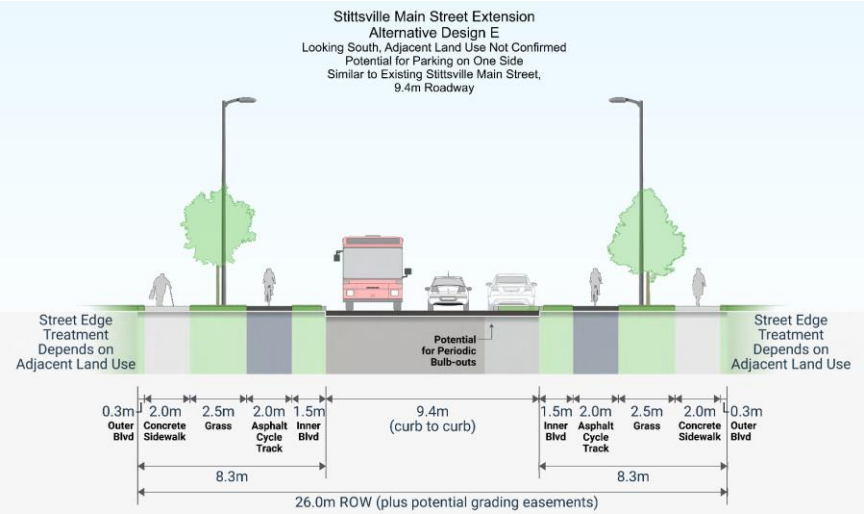
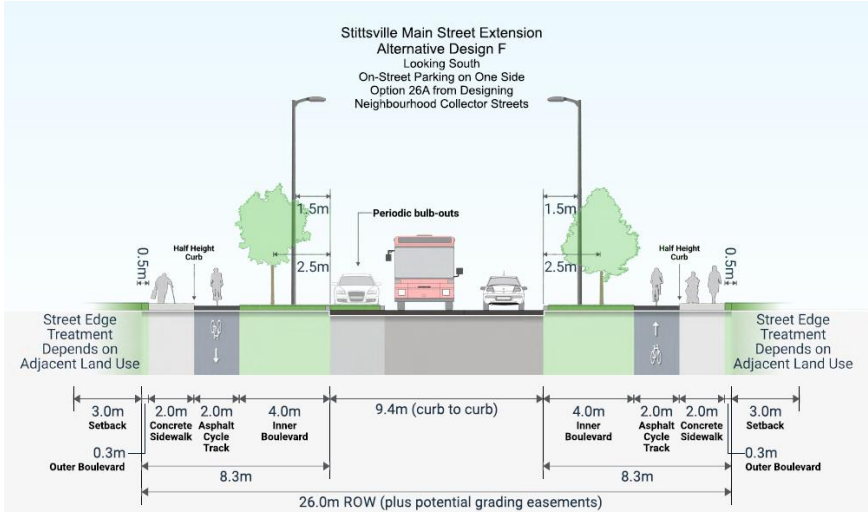
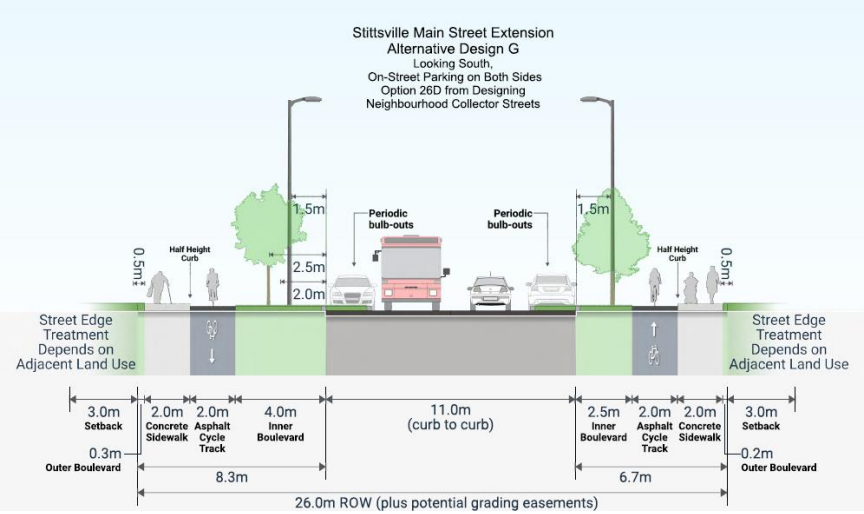


Figure 2-18: Stittsville Main Street Alternative G (modified Option C1 with 3.0m setbacks to fronting residential uses)




Stittsville Main Street Extension
Alternative Design G
Looking South,
On-Street Parking on Both Sides
Option 26D from Designing
Neighbourhood Collector Streets
1.5m
Periodic bulb-outs
Periodic bulb-outs
1.5m
0.5m
Half Height Curb
2.5m
2.0m
Half Height Curb
0.5m
Street Edge Treatment Depends on Adjacent Land Use
Street Edge Treatment Depends on Adjacent Land Use
3.0m Setback
2.0m Concrete Sidewalk
2.0m Asphalt Cycle Track
4.0m Inner Boulevard
11.0m (curb to curb)
2.5m Inner Boulevard
2.0m Asphalt Cycle Track
2.0m Concrete Sidewalk
3.0m Setback
0.3m Outer Boulevard
0.2m Outer Boulevard
8.3m
6.7m
26.0m ROW (plus potential grading easements)

Option A1 features two undivided 3.5m travel lanes, with 2.4m parking bays on both sides of the road. Cycling facilities are provided through a MUP on one side of the road, with a separate 2.0m sidewalk provided on the opposite side. **Option A2** is a modification of A1 which features a painted centreline divider, slightly increasing the overall pavement width. Parking in both options would be provided using periodic “bulb-out” parking bays, situated opposite from one-another on both sides of the road. This would create a pattern of alternating roadway widening and narrowing, or a “bottlenecking” effect intended to provide traffic calming friction.

Option B is a modification of alternative A1 which limits parking to only one side of the road at a time, allowing for a narrower overall pavement width. Parking bays under this arrangement would alternate from side-to-side moving down the corridor, creating a gentle “chicaning” effect, again intended to provide traffic calming friction.

Option C1 is a modification of A1 which replaces the MUP with a 2.0m sidewalk and 2.0m cycle track on both sides of the road. The form of delineation between the active transportation facilities could be decided at future detailed design, however as per the preference expressed by members of the City’s accessibility advisory committee, a half-height curb delineator is depicted here. **Option C2** uses the same general arrangement, but with a painted centreline divider.

Option D combines the separated active transportation arrangement of Options C1 and C2 with the alternating-side parking provision depicted in Option B. 4.0m inner boulevards are provided to allow ample space for healthy street tree growth and snow storage.

Option E uses the same roadway and parking arrangement as Option D, but instead of bundling the sidewalk and cycle track using a half-heigh delineator, the active transportation facilities are separated by a 2.5m planting strip, which meets the minimum recommended width for healthy street tree growth (however, at this width, reduced tree growth and reduced tree survival is expected). This option potentially provides a more comfortable experience to active road users by placing them on completely separate paths of travel. A 1.5m inner boulevard is also provided for snow storage.

Option F is a combination of Option D with recommended Option 26A from the City of Ottawa’s *Designing Neighbourhood Collector Streets* guidelines. **Option G** is a modification of Option 26D from the same guidelines.

Preferred Cross-Section

Following input from various stakeholders, including City staff involved in road design and maintenance, the preferred cross-section design for the Stittsville Main Street extension is **alternative Option F**. This option best responds to the City’s Designing Neighbourhood Collector Streets guidelines and provides a full complete streets treatment for the road. The design includes fully separated 2.0m wide sidewalks and cycle tracks and a wide planting zone that can accommodate large trees, in accordance with the above-noted guidelines. This design features a single 3.5m travel lane in both directions, wide enough

for transit vehicles, as well as periodic 2.4m parking “bulb-outs” which would bring the total pavement width to 9.4m, satisfying the requirements of the city’s road maintenance emergency services teams as well as OC Transpo. The on-street parking, as well as the two-lane undivided design with no painted centre line, would combine to have a traffic calming effect and dissuade through traffic as discussed in a preceding section.

Alternative Alignments

Two alternative alignments were considered for the “elbow” of the extended Stittsville Main Street, at the transition between the north-south and east-west segments of the road; these are summarized by Figure 2-21**.**

Alternative A shows Stittsville Main intersecting with Derreen at a “T” intersection. This alternative maintains the option to add a future fourth leg to the intersection, allowing the east-west segment of Stittsville Main to be extended into the development lands to the west towards Carp Road. Alternative A would also create continuity between Derreen Avenue and the north-south segment of Stittsville Main, contributing to a stronger grid pattern in the overall road network.

Alternative B provides a cross-cutting alignment which would prevent through traffic on Stittsville Main from having to slow/stop at an intersection with Derreen, improving the road’s functionality as a Major Collector. Alternative B would require significant additional property acquisition and would interfere with the ongoing development plans for the subdivision at 1981 Maple Grove. As well, the traffic calming effect of providing an intersection at Derreen (as in Alternative A) is desirable in the context of the surrounding communities, reducing vehicle speeds and through-traffic demand.

For these reasons, **Alternative A** is the preferred alignment.

Figure 2-21: Alternative alignments for Stittsville Main Street

Intersection Considerations

The extension of Stittsville Main Street includes the design of two intersections, at Maple Grove Road and Derreen Avenue. Construction of the Maple Grove intersection is dependent on the extension of Maple Grove itself from its current terminus at Alon Street to meet the Stittsville Main Street alignment. Construction of the Derreen intersection is subject to the confirmation of alternative Alignment A as the preferred option for Stittsville Main, as outlined above. Additionally, the Stittsville Main Street design will tie into the planned roundabout at Robert Grant Avenue, which has been designed externally as part of ongoing area development activities.

For the two intersections listed above, the following options were evaluated: stop controlled, signalized, and roundabout. All intersection options would include accessibility measures following all relevant City of Ottawa standards. Other design considerations for this intersection type analysis and evaluation were:

- Route consistency;

- ROW requirements;
- Accessibility;
- Pedestrian and cyclist safety;
- Traffic volumes and traffic flow balance; and
- Community context.

For the Maple Grove intersection, the recommended intersection type is stop-controlled. The warrants for signalization in terms of vehicular traffic volume were not met, so this option was ruled out. A roundabout would require a large footprint, impacting the stormwater management pond to the south-west of the intersection and the existing residential properties to the south-east; as well, a roundabout was not considered compatible with the proposed multi-use path crossing. A stop-controlled intersection would effectively provide for active transportation users crossing at this location and continuing on the multi-use pathway on the Maple Grove Road corridor and would limit the need for additional property acquisitions.

The recommended intersection method for Derreen Avenue is a roundabout. As with Maple Grove, the warrants for signalization were not met. However, in this case there are no existing properties which would be impacted by the additional space requirements. A roundabout can also act as an effective community gateway and traffic calming measure, featuring some additional landscaping elements in the central island. It would additionally tie in well to the proposed roundabout at Robert Grant Avenue, providing some east-west route consistency.

The east-west portion of Stittsville Main will also feature a number of minor intersections with local access roads. The preferred design for these intersections is stop-controlled on the minor approach and uncontrolled on Stittsville Main, as the volume of traffic using these local roads is expected to be very small. The option exists to apply an emerging design practice for the cyclist and pedestrian crossings at these minor intersections, the *Continuous Footways/Bikeways*. These would provide active users with a continuous, raised path of travel as they cross the minor approach, improving safety by introducing vertical deflection for vehicles and reducing their speed. The option of applying this design alternative will be evaluated at detailed design; see Section 4.8.4 of the City of Ottawa's *Local Residential Streets 30km/h Street Design Toolbox* for additional details.