Document 3

Evaluation of Alternative Designs

This document is a summary of the overall principles and design criteria that guided the evaluation of alternative designs for realigned and widened Leitrim Road. This analysis is sensitive to the site-specific conditions within the study area and draws on the findings of existing conditions. The evaluation is specific to the Preferred Corridor as established through the previous phase of study.

1.0 ROADWAY INTERCONNECTIVITY ALTERNATIVES

The Preferred Corridor for a realigned and widened Leitrim Road remains an Arterial Road and serves as a spine route within the City's transportation network. The road will intersect with north-south arterials including: River Road, Limebank Road, Albion Road, and Bank Street. Leitrim Road will also intersect with existing collector (Bowesville Road) and future collectors to be planned in the growing communities of Riverside South and Leitrim as well as a planned southern business park on Airport lands. There are two alternative means to provide roadway inter-connectivity, including:

- Signalized intersections; and,
- Roundabouts.

Each intersection location has its own characteristics and site-specific intersection choices as appropriate. The following considerations influenced the evaluation and eventual selection of roadway inter-connectivity choices:

1. Type of existing intersection that can be re-used;
2. Road function within the network;
3. Need or not for free-flowing traffic conditions, normally associated with controlled access highways;
4. Directional balance of traffic flow;
5. Number of intersecting routes (i.e. T-intersection, or four-way intersection);
6. Adjacent land use and the need for access, or not;
7. Footprint and land required;
8. Consideration for community design plans and choice for neighbourhood connectivity; and,
9. The visual environment, intersecting with River Road and Bank Street as Scenic Entry Routes to the City.

On this basis, the preliminary recommendations for the realigned and/or widened Leitrim Road are presented on Table 1. Of note, these recommendations are not

binding and will be determined later on a case by case basis as development approvals proceed and as existing intersection modifications are studied.

Table 1: Recommendations for Roadway Interconnectivity

Intersection	Community/Area	Preliminary Control Recommendation	Rationale
Leitrim Road at River Road	Northern Limit of Riverside South	Roundabout	A roundabout would provide traffic calming and enhances River Road's Scenic Entry Route designation. Space is available.
Leitrim Road at Realigned Leitrim Road	Northern Limit of Riverside South Employment Area	Signalized Intersection	A signalized T-intersection is preferred where traffic balance is a consideration as well as is minimizing land requirements from the NCC Greenbelt. This location could be considered for a roundabout in the future should a new crossing of the Rideau River tie into this intersection.
Realigned Leitrim Road at Limebank Road	Riverside South Employment Area	Signalized Intersection	Existing Limebank Road has been designed with signalized Intersections which extend into Riverside South. Land is constrained in vicinity of an existing Stormwater Management Pond and proximity to tributaries of Mosquito Creek.
Realigned Leitrim Road at Riverside South Collector Roads	Riverside South Employment	Roundabout	As subdivision development within the employment lands has not begun, there is an opportunity to introduce a new character for the business park as land requirements can be planned for. As the location of future collector and local roads are not known at this time, building in flexibility to the EA will allow for intersection design to be evaluated during detailed design of the proposed facility

Intersection	Community/Area	Preliminary Control Recommendation	Rationale
			or collector/local road network.
Realigned Leitrim Road at Bowesville Road	NCC Greenbelt and Southern Airport Business Park	Roundabout	This would be located within a rural context and adjacent to the NCC Greenbelt. A roundabout would provide an opportunity to introduce a gateway feature to the Airport Southern Business Park.
Realigned Leitrim Road at Gilligan Road (Leitrim Park and Ride Connection)	Leitrim Employment Lands/Leitrim Park and Ride Lot	Signalized Intersection	With a realigned Leitrim Road being elevated over the Trillium Line and associated embankment and transition back to grade and the proximity of Gilligan Road, a roundabout may not be feasible to construct.
Realigned Leitrim Road at Albion Road	Leitrim Employment Lands	Signalized Intersection	Albion Road along its length is currently controlled by signalized intersections. Due to intersection spacing and existing un-signalized access to local roads north and south of the new intersection, a signalized intersection is proposed in this location to facilitate access to area local roads in the vicinity.
Realigned Leitrim Road at future collector roads	Leitrim Employment Area	Signalized or Roundabout designs	A realigned Leitrim Road within the Leitrim Employment lands will include curves that may limit the location and choice for intersection design. As the location of future collector and local roads are not known at this time, building in flexibility to the EA will allow for intersection design to be evaluated during detailed design of the proposed facility or collector/local road network.
Leitrim Road	Leitrim	Signalized	Due to land use constraints

Intersection	Community/Area	Preliminary Control Recommendation	Rationale
at Kelly Farm Drive	Community	Intersection	adjacent to the NCC Greenbelt, proposed road curvature to bring realigned Leitrim Road back into alignment with exiting Leitrim Road, and on-going design exercises by others on the intersection at Kelly Farm Drive.
Widened Leitrim Road at Bank Street	Leitrim Community	Signalized Intersection	Will tie into final design for this intersection by others, and according to the Bank Street Widening EA Study

The decision for signalization versus roundabouts is based on the current context, but can be revisited during detailed design and evaluated against updated practices, policies, and adjacent land uses in the future.

1.1 Rural Versus Urban Cross Sections

In general terms, 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, road edge design is more influenced by its integration with the landscape and natural processes. In the future, as the communities of Riverside South, Leitrim, and the Airport Southern Business Park, continue to develop, and due to its interaction with the Greenbelt along its length, Leitrim Road will include both urban and rural cross-sections depending on the context. The two main options for road cross-sections that were evaluated include:

1. Urban cross-section, consisting of asphalt travel lanes, barrier curbs, catch basins, with stormwater outletting to existing piped municipal drainage systems, or to new road-edge facilities; and,
2. Rural cross-section, consisting of asphalt travel lanes, narrow paved shoulder, gravel rounding, vegetated gently-sloping fore slope, vegetated, flat-bottomed drainage channel, and vegetated back slope, with stormwater primarily managed within the right-of-way and outletting to watercourses subsequent to in-corridor treatment.

On this basis, the context sensitive and environmental benefits of these cross-sections have been evaluated with the results provided in Table 2.

Table 2: Urban versus Rural Cross-Section Considerations

	Road Edge Design	
Criteria	**Urban Cross-Section**	**Rural Cross-Section - Enhanced Grass Swales**
Land Implications	More compact design and less width of land required to construct. End of pipe solution may be associated with additional land requirements however can be located where land exists, if required	Considerable width of land required to construct ditch drainage due to safety considerations. Can be partially mitigated by barrier solutions to allow for steeper side slopes
Community Interface and Access	Provides for direct and at-grade mid-block access to sidewalks, cycle tracks or multi-use pathways, and the roadway	Can cut off mid-block access to sidewalks, cycle tracks and multi-use pathways, and the roadway (users need to traverse grassy slopes and cross swale)
Road and Pathway Lighting	In-corridor pathways and sidewalks can be located near the roadway, and roadway lighting can illuminate all facilities	In-corridor pathways and sidewalks are typically located behind the road-edge drainage system, and ability to illuminate with the roadway lighting can be challenging
Stormwater Management	Stormwater to be managed within the ROW (such as filter, storage systems) and at urban drainage outlets (where available) including measures for water quality and quantity. Roadway-edge treatment/retention facilities may be required in some circumstances	Stormwater can be managed within the system including quality and quantity controls. Roadway-edge treatment/retention facilities may be required in some circumstances
Natural Heritage	With a more compact design, impact on surrounding natural heritage features could be minimized or avoided	Drainage features can be incorporated into surrounding natural heritage systems and could enhance adjacent features
Visual Environment	Can be designed to include landscape elements to soften the edge treatment however requires additional land	A more natural design feature which can be complementary in an open space environment
Lifecycle Cost	More expensive to construct and maintain due to piped/below-grade infrastructure and end of line facility/outlet	Less expensive to construct and maintain due to open/surface ditch solutions and use of low maintenance vegetation

With context-specific benefits related to both road edge treatments, the Recommended Plan has incorporated a mixture of urban and rural cross-sections keeping to the planned use for these lands in the long term.

1.2 DIVIDED VERSUS UNDIVIDED ROADWAY OPTIONS

The realignment of Leitrim Road will bring the arterial roadway closer to the growing communities of Riverside South and Leitrim. Existing and proposed land uses within proximity and served by Leitrim Road will include the National Capital Greenbelt, Employment Lands, and General Urban Area Lands (accommodating residential, institutional, and commercial/service uses).

Following directions of the Building Better Suburbs Report (approved in May 2017), City staff set up an Ottawa Arterial Roads Cross-Section working group to review existing arterial road cross-sections. The objective of the review was to recommend options to modify urban arterial roads in a way that is economical, practical, functional, and effective while corresponding with contemporary design best practices. The review by the working group had regard for the Regional Road Corridor Design Guidelines (2000). Furthermore, the working group was cognizant of the impact of any changes to the Arterial Road Cross-Sections on the City's long-term operation and maintenance cost. As it relates to the provision of medians, the report recommends the following.

> *Medians are implemented in a roadway corridor with a wide range of varied functions including separating opposing traffic, creating space for the left-turn movements and providing refuge to pedestrians. For the application of medians along arterial roads, the working group recommended that medians are not necessarily required for all arterial roads in developing community contexts. For new roads posted 70km/h or less, medians are not necessary unless there are area specific traffic safety considerations, regardless of the number of travel lanes. Where there will be a high frequency of adjacent private approach served by the arterial road, medians may be required to intercept left-turn movements. However, for multi-lane arterials with a posted speed limit at or above 80km/h a median is recommended, and in locations where there is a regular occurrence of left turn lanes, a 1.5-metre-wide raised median is recommended. In cases where the arterial right-of way is narrowed as a result of removing a median, the right-of-way would be widened at intersections to accommodate additional space requirements such as separated left and or right turn movements. The right-of way would also be widened at roundabouts identified in planning and transportation studies.*

As such, the design direction from the EA study is to implement the recommendations of the working group in urban sections such that medians are generally not proposed. Despite the general direction to not include medians, in locations where higher operating speeds may be experienced (such as in rural contexts) and around curves,

the cross-section width provides sufficient right-of-way width for a 1.5m raised concrete median should that be recommended during the detailed design process or should road design guidelines or best practices change in the future.

1.3 ACCESSIBILITY, PEDESTRIAN AND CYCLIST OPTIONS

The renewal of transportation infrastructure provides an opportunity to accommodate pedestrians and cyclists of all abilities and to pursue the City's Official Plan and TMP objectives in supporting a universally accessible City with active transportation alternatives.

For pedestrians, options that were evaluated include the provision of:

- No pedestrian facility;
- 2m accessible sidewalks along one or both sides of each corridor; and
- 3m accessible multi-use pathways along one or both sides of each corridor.

For cyclists, options that were evaluated include:

- No cycling facility;
- Wide paved shoulders along the outer edges of rural cross-sections, in each direction;
- On-road painted bike lanes along the outer edges of urban cross-sections, in each direction;
- Uni-directional cycle tracks along the edge of urban cross-sections;
- Bi-directional bike-only facilities along one or both sides of the corridor; and,
- Multi-use pathways along one or both sides of the corridor.

The requirement for universal accessibility was built into all options considered. The following considerations influenced the evaluation of alternative designs for pedestrians and cyclists:

1. Traffic speed and volume;
2. Anticipated pedestrian and cyclist demand;
3. Presence of existing facilities within the corridor that can fulfill the need;
4. Abutting land use and pedestrian and cycling demand;
5. Access for pedestrians and cyclists to the lands along the road edge;
6. Opportunities for route illumination;
7. Opportunities to provide safe crossings; and,
8. Efficiency and cost of infrastructure.

On the basis of this evaluation, and in consideration of the surrounding existing and planned land use context, it is recommended that multi-use pathways be included in

areas where there are land requirement constraints or where the corridor is within a rural context and where cycling and pedestrian demand is low, or when integrating into similar networks such as at the future Leitrim Station along the Trillium Line. A breakdown of the proposed pedestrian and cycling facilities by segment is included in Table 3.

Table 3: Analysis for Pedestrian and Cycling Facilities

Segment	Community/Area	Proposed Pedestrian and Cycling Facility	Rationale
Existing Leitrim Road between River Road and Limebank Road	Riverside South	3.0 m multi-use pathway on the south side of a reconstructed Leitrim Road	The NCC Greenbelt is located on the north side of Leitrim Road with no plans for a future recreational pathway within this portion of the Greenbelt. As such, a multi-use pathway (MUP) is recommended on the south side of Leitrim Road to serve the future urban employment uses on that side. The MUP would connect to existing paved shoulders on River Road and bike lanes, sidewalks and a MUP on Limebank Road.
Realigned Leitrim Road within Riverside South Planned Employment Area	Riverside South Employment Area	Separate 2.0 m sidewalk and 1.8 m cycle track on both side of the roadway	The intended uses within the future employment area anticipate the need for separated facilities.

Segment	Community/Area	Proposed Pedestrian and Cycling Facility	Rationale
West Airport Natural Link and Airport Southern Business Park	NCC Greenbelt and Airport Southern Business Park	3.0 m multi-use pathway on both sides of the roadway	With urban business park uses planned for the north side of the roadway within the Airport Southern Business Park, and the adjacent Greenbelt lands and planned capital pathway on the south side, multi-use pathways will provide for bi-directional travel. This will satisfy routes to and from the Riverside South Employment Area in the west and the Trillium Line LRT Station in the east. In these locations, cyclist and pedestrian movements are expected to be lower due to the surrounding Greenbelt context.
East Airport Natural Link to Albion Road including a connection to the future Leitrim Station of the Trillium Line	NCC Greenbelt and Albion Road Industrial Park	3.0 m multi-use pathway on both sides of the roadway	Within a rural context and provides connections to existing recreational pathway network as well as connections to the multi-use pathway network to be constructed on the east side of the Trillium Line.
Realigned Leitrim Road between Albion Road to Existing Leitrim Road	Leitrim Community	Separate 2.0 m sidewalk and 1.8 m cycle track on both side of the roadway	The intended uses within the future employment area and residential uses anticipate the need for separated facilities.

Segment	Community/Area	Proposed Pedestrian and Cycling Facility	Rationale
Existing Leitrim Road between the realigned Leitrim Road and Bank Street	Leitrim Community	3.0 m multi-use pathway on the south side of a reconstructed Leitrim Road	The NCC Greenbelt is located on the north side of Leitrim Road with no plans for a future recreational pathway within this portion of the Greenbelt. As such, a multi-use pathway is recommended on the southern side of Leitrim Road only to serve the future residential uses on that side, and to provide for bi-directional connectivity.

1.4 CORRIDOR LIGHTING OPTIONS

A realigned Leitrim Road is an Arterial Road within the City's road network and lighting is to be provided in accordance with the City's Right-of-Way Lighting Policy. Existing Leitrim Road is not illuminated within its existing corridor. Providing illumination for proposed pedestrian and cycling facilities is also a consideration. Options to provide roadway and pathway lighting that were evaluated include:

- Utilize existing lighting systems in-place for one side of the roadway (by widening to the opposite side as the case may be) and install new lighting on the other side of the roadway;
- Re-use components of the lighting systems if displaced by widening (where applicable);
- Install new road edge lighting that can illuminate both sides of the roadway and pedestrian and cycling facilities;
- Install new median-mounted lighting that can illuminate both sides of the roadway; and,
- Install independent pathway lighting system in addition to roadway lighting.

The following considerations influenced the selection of corridor treatments:

1. Locations and offsets of lighting poles, having regard for roadside safety;
2. Opportunities for corridor lighting to be dual-purpose, serving the needs of the roadway as well as illuminating adjacent sidewalks and/or multi-use pathways;
3. Symmetry of the lighting solution;
4. The visual environment;
5. Nighttime environment for wildlife; and,
6. Efficiency and cost of infrastructure.

On the basis of this evaluation, the following are recommended to be part of the recommended plan:

Reconstructed Portion of Leitrim Road between River Road and Limebank Road:

- Install a new road-edge roadway lighting system on the southside of the roadway (on the urban side of the corridor); and
- During the detailed design phase, evaluate the “back lighting” effect of the existing roadway lighting and determine if an appropriate level of illumination is provided on the south-side multi-use pathway as required to meet City standards.

Realigned Leitrim Road through the project limits, and Existing Leitrim Road within Leitrim community to Bank Street:

- Install a new road-edge roadway lighting system on both sides of the roadway;
- Design the new road-edge roadway lighting system on the north side of the roadway to have sufficient “back-lighting” to illuminate cycle track or multi-use pathway, and if not possible, install a new pathway lighting system; and,
- In areas where adjacent to the NCC Greenbelt, determine at detailed design, in consultation with the NCC if the pathway would be illuminated, and ensure the use of sharp cut-off lighting to reduce the potential for lighting spillover onto Greenbelt lands.

1.5 NOISE ATTENUATION

Leitrim Road is an Arterial Road within the City road network. As an Arterial Road, it is designated to accommodate the highest volumes of traffic travelling over the highest distances, and a relatively high speed. The corridor will be a source of noise and it is important to consider the impacts on adjacent noise sensitive receivers including the outdoor living spaces of residential uses and institutional uses. A preliminary noise and vibration impact assessment has been completed. The assessment aligns with the municipal and provincial guidelines that apply to transportation projects.

Future vibrations associated with the long-term operation of the roadway are expected to fall below perceptible levels for existing sensitive receivers by the project area.

For noise, key criteria include:

- Noise sensitive receivers are identified as the rear or exposed side yard amenity areas of residential dwellings and other sensitive land uses; and,
- For residential dwellings, the noise sensitive location of concern is the outdoor amenity area located 3.0 m behind the rear wall of the dwelling, and 1.5 m above the ground.

Where the forecasted noise levels at sensitive receivers are higher than 60 dBA from the resulting ultimate build-out condition for the project, noise attenuation is to be investigated. Where technically, administratively, and economically feasible, noise attenuation is to be provided where warranted. However, this 60 dBA threshold is not met for this project and as such, noise attenuation measures are not warranted and are not recommended. The threshold is not met primarily due to the long distance separation between existing noise sensitive receivers (including existing residences) and the future roadway.

Notwithstanding, where future residential development is being proposed, the requirement for noise attenuation measures will be evaluated at that time as part of the development approval processes.

1.6 DESIGN PARAMETERS FOR LEITRIM ROAD

Considering the preceding analyses of functional options, the following geometric design parameters (Table 4) are recommended for the detailed design of the realignment and widening and/or reconstruction of Leitrim Road as a Complete Street. The application of guidelines has regard for the forecasted volumes for Leitrim Road as presented on Table 5.

Table 4: Detailed Design Parameters for the Leitrim Road Realignment and Widening

Design Parameter	Proposed Standard	Technical Reference
Classification	Arterial	City Transportation Master Plan (TMP)
No. Lanes	2 (River Road to Limebank Road) 4 (all other segments)	City Transportation Master Plan (TMP), Environmental Study Report
Requirement for Median Division	No	Building Better Smarter Suburbs design direction with additional space reserved should median separation be considered during detailed design
Design Speed	70km/h in urban areas 80 km/h through the Greenbelt	Selected by owner, consistent with TAC Section 2.3.6.3 given selected posted speed and desire to achieve a low-speed arterial

Design Parameter	Proposed Standard	Technical Reference
Posted Speed	60 km/h in urban areas 70 km/h through the Greenbelt	Selected by owner
Driving Lane Width - Urban	3.50m outer lane/single lane 3.25m inner lane	TAC Table 4.2.3
Driving Lane Width - Rural	3.50m outer lane/single lane 3.25m inner lane	Match urban lane widths to respect the principles of TAC Section 2.7.2
Shoulder Width	2.5m (plus 1.0m gravel rounding)	MTO GDSOH Table D5-1
Clear Zone	6.0-6.5m (urban) 7.5-8.5m (rural)	TAC Table 7.3.1
Rural Ditch Fore Slope	4:1	TAC Table 7.4.1.1 – provide a recoverable foreslope while minimizing ROW requirements
Rural Ditch Back Slope	3:1	TAC Table 7.4.1.1 – provide a non-critical backslope while minimizing ROW requirements
Multi-Use Pathway Width	3.0m min, asphalt	OTM Book 18, Table 4.7
Sidewalk width (if applicable)	2.0m (1.8m min.)	City of Ottawa Accessible Design Standards Section 3.3.2
Cycle Track	1.8m (1.5m min.)	OTM Book 18, Table 4.6 City of Ottawa policy
Minimum Horizontal Radius	200m (at 4.0% superelevation) 290m (reverse crown)	TAC Table 3.2.4
Maximum Superelevation	4%	TAC Section 3.2.2.4, considering likely future intersections
Minimum Vertical Curve – Crest “K” (stopping	17	TAC Table 3.3.2

Design Parameter	Proposed Standard	Technical Reference
sight distance)		
Minimum Vertical Curve – Sag “K” (stopping sight distance)	23 (non-illuminated) 10-12 (illuminated)	TAC Table 3.3.4 and 3.3.5
Minimum Gradient	0.5 %	TAC Section 3.3.2.5
Maximum Gradient	5%	TAC Table 3.3.1
Surface Type	Hot Mix Asphalt	Design choice, standard City of Ottawa practice
Traffic volumes	See table 6-4	Environmental Study Report
% Commercial Vehicles	6%	Environmental Study Report
Roundabout Diameter	45m - 55m	U.S. D.O.T.

Table 5: Traffic Volumes for the Leitrim Road Realignment and Widening

Segment	2017		2031*	
	Directional PHV	Two-way AADT	Directional PHV	Two-way AADT**
River Road to Limebank Road	290	3,900	380	7,400
Limebank Road to Bowesville Road	560	13,200	860	15,900
Bowesville Road to Albion Road	1020	15,800	1830	24,100
Albion Road to Bank Street	810	12,800	1170	15,400

**The population and business growth in this area in the TRANS model is substantially less than that expected based upon full buildout of the relevant Community Design Plans. Population was adjusted for this scenario to match the anticipated full buildout.*

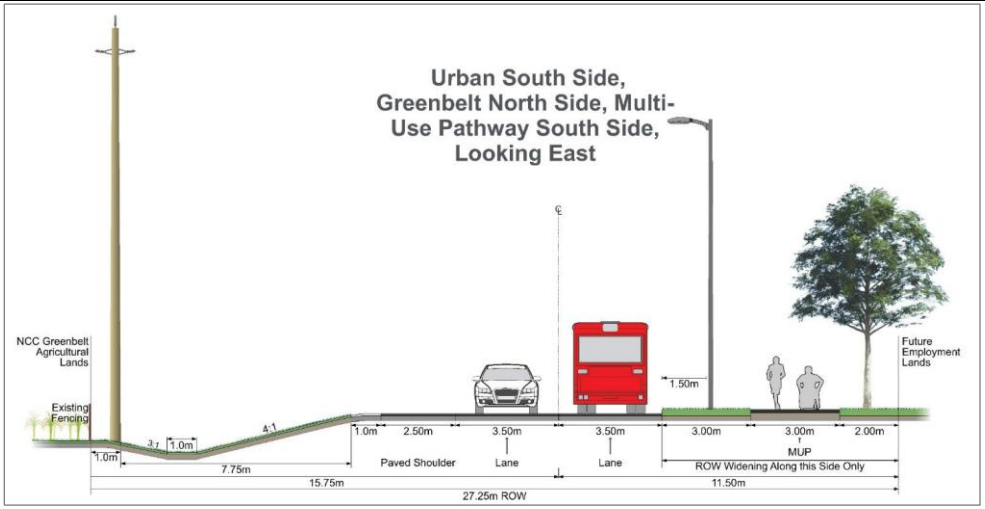
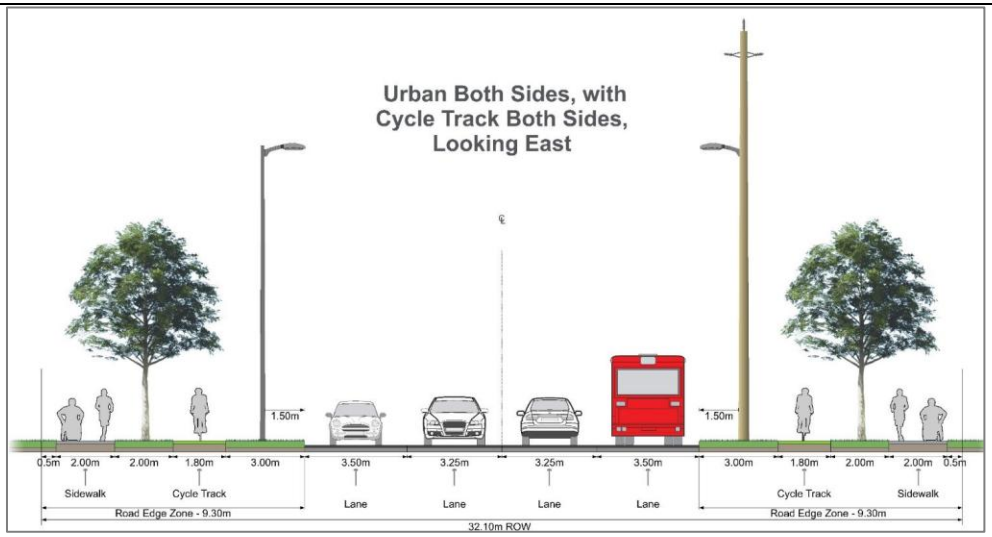
***estimated from PHVs using 10% rule as validated for the study area using existing volumes*

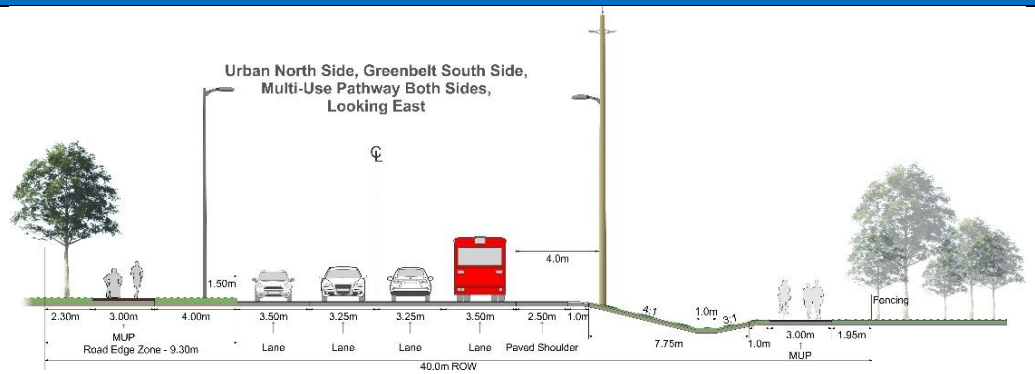
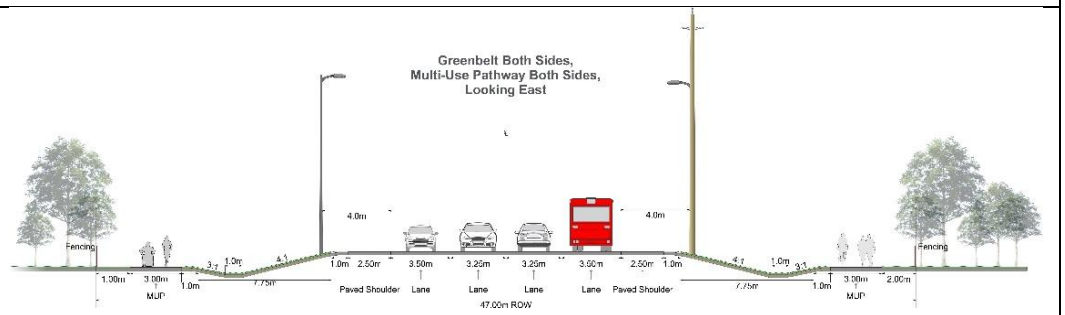
1.7 CROSS-SECTION DESIGN ALTERNATIVES

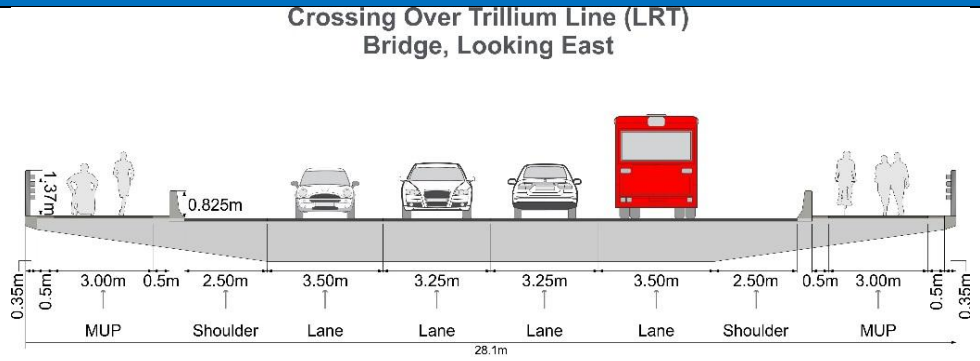
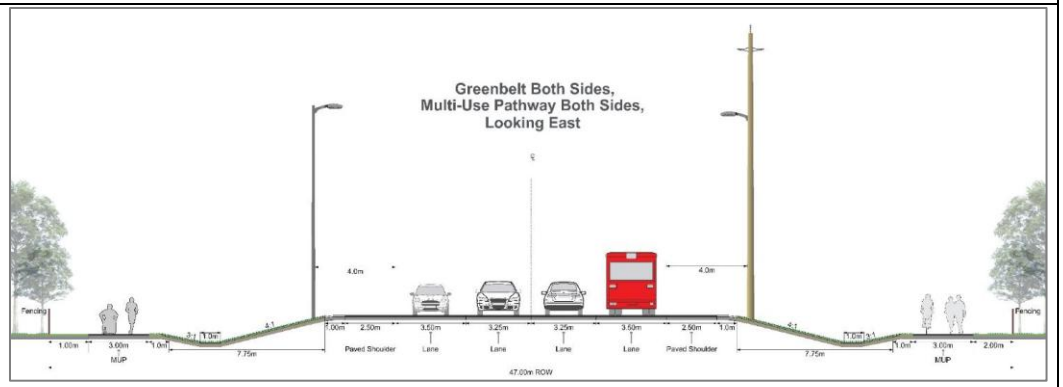
Giving consideration to the above geometric design parameters and anticipated traffic volumes, a number of cross-sections were developed. A variety of cross-sections is required due to the variance in the urban and rural land uses along the corridor, the nature of adjacent land uses, the need to provide adequate drainage systems, and the need to provide appropriate infrastructure for pedestrians and cyclists.

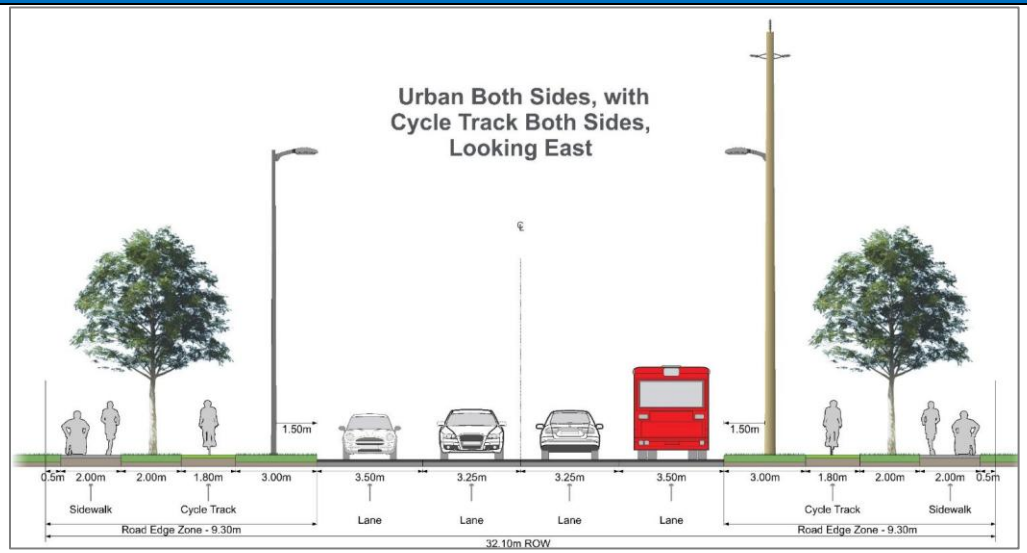
The cross-sections recommended for each section are shown and described in Table 6.

Table 6: Cross-Section Design Alternatives by Section

Segment	Recommended Cross-Section
Existing Leitrim Road between River Road and Limebank Road. *NCC Greenbelt along northern edge, future urban employment along southern edge* This rural cross-section provides rural ditch drainage along the northern edge with the use of enhanced grass swales to provide a high level of quality and quantity control. A multi-use pathway (MUP) is provided on the southern edge for pedestrians and cyclists, and two general lanes of traffic are provided. There is space in the ROW for tree planting to the south.	
West of Limebank to Western Greenbelt Edge *Future urban employment area along both edges* This urban cross-section serves the future employment lands planned along the realigned Leitrim Road, with the use of concrete sidewalks and grade-separated uni-directional cycle tracks on both sides of the road. Four general traffic lanes are provided. There is space in the ROW for tree planting on both sides.	

Segment	Recommended Cross-Section
Greenbelt and South Airport Business Park *Future urban Employment Area along northern edge and NCC Greenbelt along southern edge* The rural cross-section along the southern edge provides rural ditch drainage with the use of enhanced grass swales for high level of quality and quantity control. The urban cross-section along the northern edge serves the future employment lands. MUPs are provided on both sides. Four general lanes of traffic are provided. There is space in the ROW for tree planting to the north.	
East of Airport South Business Park *NCC Greenbelt along both edges* This rural cross-section provides rural ditch drainage along both sides with the use of enhanced grass swales for a high level of quality and quantity control. MUPs are provided on both sides to connect into the National Capital Pathway network. Four general lanes of traffic are provided.	

Segment	Recommended Cross-Section
Trillium Line Crossing This bridge overpass overtop the Trillium Line provides MUPs on both sides of the structure. Four general lanes of traffic are provided. Pedestrians and cyclists are separated from general traffic through a physical barrier.	
Trillium Line Crossing to Albion Road *Vacant natural land along northern edge and industrial land uses along southern edge.* This rural cross-section provides rural ditch drainage along both sides with the use of enhanced grass swales to provide a high level of quality and quantity control. MUPs are provided on both sides. Four general lanes of traffic are provided.	

Segment	Recommended Cross-Section
Realigned Leitrim Road between Albion Road to Existing Leitrim Road *Mixed urban employment and residential uses along both edges* This urban cross-section serves the future employment lands planned along the realigned Leitrim Road, with the use of concrete sidewalks and grade-separated unidirectional cycle tracks on both sides of the road. Four general traffic lanes are provided. There is space in the ROW for tree planting on both sides.	
Existing Leitrim Road between the realigned Leitrim Road and Bank Street *NCC Greenbelt along northern edge and residential uses along southern edge* This cross-section provides rural ditch drainage along the northern edge with the use of enhanced grass swales for a high level of quality and quantity control. A MUP is provided on the south side for pedestrians and cyclists to serve the future residential uses and to provide bi-directional connectivity. Four general lanes of traffic are provided. There is space in the ROW for tree planting to the south.