

Appendix A
Road Design Criteria Tables

Table 1 - Trillium Line Design Criteria

Criteria Description	Leitrim Road (Existing)		Gilligan Road	Leitrim Service Road (Existing)	Earl Armstrong Road (West of Bowesville Rd. to West of High Rd.) ¹	Bowesville Road (Leitrim Rd. to Rideau Rd.)
	Overhead	Guideway				
Road Classification ²	RAU		ULU / RLU ³	RLU	RAU / UAU ⁴	RCU
Posted Speed (km/hr) ⁵	50		50	50	80	80
Design Speed (km/hr)	60		60	60	90	90
Basic Lanes	2		2	2	2	2
Minimum Radius (m) ⁶	2000	Existing	130	16.5	4000 ⁷	4000
Min. K Factor Sag ⁸	18		18	18	68	39
Min. K Factor Crest	36		11	11	50	51
Max. Grade (%) ⁹	5% ¹⁰		5%	6%	3.2%	2.3%
Max. Superelevation (%) ¹¹	NC		NC	NC	NC ¹²	NC
Minimum S.S.D. (m) ¹³	As Per TAC		As Per TAC	As Per TAC	As Per TAC	As Per TAC
Minimum D.S.D. (m) ¹⁴	As Per TAC		As Per TAC	As Per TAC	As Per TAC	As Per TAC
Lane Width (m) ¹⁵	3.5		3.5	3.25	3.5 – 3.75 ¹⁶	3.5
Aux. Lane Width (m) ¹⁷	3.5		3.5	N/A	3.5	3.5
Sidewalk Width (m)	N/A		2.0 ¹⁸	N/A	4.0 ¹⁹	N/A
Boulevard Width (m)	N/A		N/A	N/A	1.75	N/A
Shoulder (m) ²⁰	2.5 ²¹		1.5 ²²	1.8 – 2.5 ²³	2.5 ²⁴	2.5
Bike Lane(m) ²⁵	N/A		N/A	N/A	N/A	N/A
Median Width (m)	N/A		N/A	N/A	N/A	N/A
Side Slope/ Back Slope	As Per TAC		As Per TAC	As Per TAC	As Per TAC	As Per TAC
Design Vehicle(s) ²⁶	WB-20, A-Bus, Maintenance & Emergency Vehicles		WB-20, A-Bus, Maintenance & Emergency Vehicles	WB-20, Maintenance & Emergency Vehicles	A-Bus, Maintenance & Emergency Vehicles	A-Bus, Maintenance & Emergency Vehicles
Two-Way AADT (vehicles/day) ²⁷	15,200 (Jan-2016)		690 (Jan-2016)	300	4330 (28-Aug-2015)	3840 (26-Apr-2016)
8 Hour Heavy Vehicle %	~4.7%		~36.7%	20%	1.9%	1.6%
Traffic Growth Rate Assumption ^{28, 29, 30}	1% ³¹		1%	0%	8.8%	4.2%

Table 1 - Trillium Line Design Criteria Cont'd

Criteria Description	Limebank Road (Intersection at Earl Armstrong Rd. to approx. 620m South) ³²				
Road Classification ²	UAD				
Posted Speed (km/hr) ⁵	80				
Design Speed (km/hr)	90				
Basic Lanes	4				
Minimum Radius (m)	N/A ³³				
Min. K Factor Sag	38				
Min. K Factor Crest	50				
Max. Grade (%)	4.1				
Max. Superelevation (%)	NC				
Minimum S.S.D. (m) ¹³	As Per TAC				
Minimum D.S.D. (m) ¹⁴	As Per TAC				
Lane Width (m) ¹⁵	3.5 – 3.75				
Aux. Lane Width (m) ¹⁷	3.5 – 4.25				
Sidewalk Width (m)	4.0 ³⁴				
Boulevard Width (m)	2.0				
Shoulder (m) ²⁰	N/A				
Bike Lane(m) ²⁵	N/A				
Median Width (m)	Varies ³⁵				
Side Slope/ Back Slope	As Per TAC				
Design Vehicle(s) ²⁶	WB-20, A-Bus, Maintenance & Emergency Vehicles				
Two-Way AADT (vehicles/day) ²⁷	6,690 (28-Aug-2015)				
8 Hour Heavy Vehicle %	4.1%				
Traffic Growth Rate Assumption ^{28, 29, 30}	1.5%				

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- ¹ The Earl Armstrong Road corridor is subject to a future widening to a 4-lane urban arterial divided cross section with a 5.0m raised median. For the purpose of Project Co's design consideration, the cross section of the future Earl Armstrong Road cross section shall be assumed as follows:

 - 2 general purposes lanes (3.50m wide) in both the eastbound and westbound directions;
 - 5.0m raised concrete median;
 - 2.5m shoulder constructed beside the Stage 2 westbound lanes will become half of the future 5.0m raised concrete median.
 - ² Roadway classifications are identified in the City of Ottawa Official Plan – Schedule E. Project Co shall confirm all roadway classifications with the City of Ottawa.
 - ³ The west side of Gilligan Road shall be urbanized between Leitrim Road and the Park and Ride, with the east side remaining rural. In addition, sidewalks shall be provided or extended along the curb radii of the southeast and southwest intersection quadrants of Leitrim Road and Gilligan Road.
 - ⁴ The north side of Earl Armstrong Road (i.e. along the westbound lanes) shall have a rural cross section (i.e. shoulder, ditches, etc...) while the south side shall have an urban cross section (i.e. curbs, boulevards, etc...).
 - ⁵ All posted speed limits and advisory speed signs shall be maintained for all design elements, unless specifically noted otherwise in Schedule 15-2, Part 2, Article 6 – Roadways, Bus Terminals, and Lay-Bys.
 - ⁶ Minimum radius corresponds to maximum superelevation values for road classification and design speed.
 - ⁷ The 4000m minimum radius requirement specified in the design criteria table shall be satisfied for the entire section of the proposed Earl Armstrong Road corridor, between west of Bowesville Road to west of High Road, under the road-over-rail scenario. Under a rail-over-road scenario, the minimum radius requirement is only applicable to and shall be satisfied for the proposed Earl Armstrong Road corridor west of the eastern Bowesville Park and Ride access. Project Co's proposed design of the Earl Armstrong Road corridor east of the eastern Bowesville Park and Ride access may include a transition back to the existing roadway corridor, as appropriate. The geometry of the roadway alignment associated with the transition between the proposed and existing Earl Armstrong Road corridor shall meet the minimum requirements as per TAC GDGCR.
 - ⁸ The minimum K factor for sag vertical curves shall meet the minimum comfort controls based on the presence of illumination.
 - ⁹ Maximum longitudinal grade assumes a rolling terrain, unless otherwise specified.
 - ¹⁰ Grades steeper than 5% are not acceptable on Leitrim Road due to necessary sight distance requirements and since the corridor is a cross-town bikeway facility according to the City of Ottawa's Cycling Plan.
 - ¹¹ Maximum roadway superelevation corresponds to road classification (L – Local, C – Collector, A – Arterial). NC denotes normal crown.
 - ¹² Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, Project Co shall provide a consistent 2% cross fall, draining the roadway surface runoff to the south side curb, on the Earl Armstrong Road Overhead Structure across both eastbound and westbound lanes.
 - ¹³ The stopping sight distance parameters provided are minimum typical values. Additional sight distance may be required under certain constrained conditions. In all cases, Project Co's design shall meet the requirements of Schedule 15-2, Part 2, Clause 6.5.
 - ¹⁴ Minimum decision sight distances shall be based on Avoidance Manoeuvre C, unless otherwise specified.
 - ¹⁵ General lane width requirements shall meet the minimum lane widths as prescribed in the TAC GDGCR based on the corresponding road classification.
 - ¹⁶ The median lane shall be 3.75m wide and the curbside lane shall be 3.5m along Earl Armstrong Road.
 - ¹⁷ Auxiliary lanes with high transit volumes shall be a minimum of 3.5m.

- ¹⁸ A 2.0m wide sidewalk shall only be provided on the west side of Gilligan Road.
- ¹⁹ Project Co shall provide a 4.0m wide multi-use pathway on the south side of Earl Armstrong Road.
- Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, Project Co shall widen the multi-use pathway to be 4.5m and be separated from the travelled lanes by a concrete barrier per the applicable bridge codes as per Article 4 – Structural Design Criteria and Requirements of this Part 2.
- ²⁰ All shoulders shall be paved to meet the City's Standard Tender Package Standard Detail Drawings and Specifications.
- ²¹ According to the City of Ottawa Cycling Plan, Leitrim is identified as a cross-town bikeway facility. Therefore, Leitrim geometry and cross-section shall accommodate the requirement of a standard shoulder bikeway in both eastbound and westbound directions. Appropriate design domain for shoulder bikeways shall meet the requirements of TAC GDGCR Table 3.4.6.2.
- ²² The 1.5m proposed shoulder is only required on the east side of Gilligan Road, south of the intersection with Leitrim Road.
- ²³ The shoulder along the westbound lane shall be a minimum of 1.8m and the shoulder on the eastbound lanes shall be 2.5m.
- ²⁴ A 2.5m shoulder is only required on the north side of Earl Armstrong Road beside the westbound lane.
- ²⁵ Cycling facilities shall be a minimum of 1.5m. The type of bike lane facility (on-road, shared, raised cycle track, paved shoulder) are to be confirmed by Project Co with the City of Ottawa.
- ²⁶ All A-Bus and B12 design transit vehicles shall meet the dimensions and specifications per OC Transpo's transit vehicle fleet as per the requirements of Schedule 15-2, Part 2, Clause 6.9(c)(vi).
- ²⁷ Traffic information (AADT and Heavy Truck %) based on 8-hour turning movement counts provided by the City of Ottawa.
- ²⁸ Traffic growth rates are based on 'EMME' model outputs comparing 2011 and 2031 volumes provided by the City of Ottawa.
- ²⁹ Traffic projection horizon shall be year 2031 for all transportation impact assessments and traffic and transit analysis studies, unless otherwise noted.
- ³⁰ For the purpose of determining projected traffic volumes in traffic and transit analysis, Project Co shall reference the traffic growth rates specified in the design criteria, accordingly. Where the growth rates are used for the purpose of calculating pavement design requirements, Project Co shall use a minimum of 1.0% or the traffic growth rates specified in the design criteria, whichever is greater.
- ³¹ Due to changes in the road network in the immediate vicinity of the subject roadway, this has resulted in higher projected traffic demand patterns.
- ³² Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, Project Co shall design and construct an Overhead Structure to include the following cross sectional elements, in both the northbound and southbound direction as follows:
- 2 general purpose lanes (3.75m wide median lane and 3.5m wide outside lane);
 - 5.0m raised concrete median;
 - 2.5m shy line offset between the general traffic lanes and appropriate concrete barrier wall to separate the adjacent multi-use pathway (The shy line offset on the Overhead Structure shall transition to introduce the proposed boulevard on the approaches to the Overhead Structure.);
 - 4.0m multi-use pathway between the concrete barrier and appropriate TL-4 parapet wall and railing on the outside of the Structure.
- ³³ Project Co shall maintain the existing lane configuration and layout within the limit of the Works on Limebank Road.
- ³⁴ Project Co shall provide a 4.0m wide multi-use pathway on both sides of Limebank Road.

- Under a scenario in which Project Co's proposed grade separation facility involves a road over rail grade separation configuration, the multi-use pathway shall be separated from the travelled lanes by a concrete barrier, per the applicable bridge codes as per Article 4 – Structural Design Criteria and Requirements of this Part 2.

³⁵ Typical 5.0m wide raised concrete median is required. Where the concrete median is adjacent to auxiliary storage lanes, the minimum width of the concrete median is 1.5m.