

Technical Memo

Project:	Bedford Highway Functional Plan
Project #:	18310
Subject:	Facility Design Criteria
To:	Mike Connors, HRM
Prepared by:	Peter Allaby, P.Eng., Crandall Engineering Ltd.
Date:	November 26, 2018

Introduction

The following outlines proposed design criteria for roadway, transit, and active transportation cross-section elements applicable to the Bedford Highway Functional Plan. The TAC 2017 Geometric Design Guide, HRM Red Book, City of Toronto Lane Width Guidelines, and NACTO Bikeway Urban Design Guide are used as reference standards.

Lane Widths

All lane width dimensions are based on a 50 km/h posted speed and design speed.

Design Element	Reference Standards (TAC 2017)		Proposed Project Standards
	TAC 2017	City of Toronto	
Through Lane	3.0 - 3.7m	Target = 3.0m Min = 3.0m Max = 3.3m	3.0 - 3.3m
Curb Lane ¹ (assumes presence of dedicated cycling facility)	3.55 - 3.95m	Target = 3.3m Min = 3.3m ² Max = 3.5m	3.3 - 3.5m
Two-Way Left Turn Lane or Dedicated Left Turn lane	3.5m	Target = 3.0m Min = 3.0m Max = 3.3m	3.0m 3.3m for TWLTL where left turning traffic is high
Dedicated Right Turn Lane ¹	---	Target = 3.0m Min = 3.0m Max = 3.3m	3.0m 3.3m for queue bypass/jump lanes

¹ Measured to face of curb or edge of cycling facility

² Minimum lane width of 3.3m reflects presence of bus routes.

Active Transportation Facilities

Sidewalks

Design Element	Reference Standards (TAC 2017)		Proposed Project Standards
	TAC 2017	HRM Red Book	
Sidewalk Width	1.5 - 2.3m	1.8m	1.8 - 2.0m (Desirable) 1.5m (Constrained Minimum)
Boulevard Width	2.0 - 3.0m	2.0m (Major Collector) 2.85m (Arterial)	2.0 - 2.85m 1.5m (Constrained)
Sidewalk Width (no boulevard)	1.5 - 2.3m	2.1m	2.1m 2.5m if Utility Poles are within sidewalk (0.6m from the face of curb to face of pole)

Multi-Use Paths

Design Element	Reference Standards (TAC 2017)		Proposed Project Standards
	TAC 2017	HRM Red Book	
Pathway Width	3.0 - 6.0m Practical Lower Limit = 2.7m	4.0m	3.5m (Desirable) 2.7m (Constrained Minimum over short distances)
Buffer Separation to Travel Lane	Clear Zone (4.5 - 6.5m)	2.0m (Major Collector) 2.85m (Arterial)	2.5m (Desirable) 1.0 - 1.5m (Constrained Minimum) ¹
Lateral Separation to Hazards	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m	----	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m

¹ May require barrier separation.

Conventional Bike Lanes

Design Element	Reference Standards		Proposed Project Standards
	TAC 2017	NACTO	
Bike Lane Width	1.8 - 2.1m ¹ Practical Lower Limit = 1.5m ¹	1.5m to curb face (1.2m of clear riding space next to joint)	1.8m to curb face (Desirable) 1.5m to curb face as a constrained minimum over short distances
Lateral Separation to Hazards	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m	0.6m to physical barrier	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m

¹ Excluding gutter area

Buffered Bike Lanes

Design Element	Reference Standards		Proposed Project Standards
	TAC 2017	NACTO	
Bike Lane Width	1.8 - 2.1m ¹ Practical Lower Limit = 1.5m ¹	1.5m to curb face (1.2m of clear riding space next to joint)	1.5m - 1.8m to curb face
Buffer Width	0.3 - 0.9m	0.45m Min	0.5m
Lateral Separation to Hazards	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m	0.6m to physical barrier	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m

¹ Excluding gutter area

Protected Bike Lanes/Cycle Tracks

Design Element	Reference Standards		Proposed Project Standards
	TAC 2017	NACTO	
Unidirectional Bike Lane Width	1.8 - 2.5m Practical Lower Limit = 1.5m	1.5 - 2.0m	1.8m (Desirable) 1.5m (Constrained Minimum)
Bidirectional Bike Lane Width	3.0 - 3.6m Practical Lower Limit = 2.4m	3.65m desirable 2.4m constrained	3.0m (Desirable) 2.4m (Constrained Minimum)
Delineator/Buffer Width	0.3 - 1.0m	0.9m for painted buffers 0.3m minimum for raised cycle tracks	0.5m with physical separation or raised cycle tracks 0.3m in constrained areas
Lateral Separation to Hazards	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m	0.6m to physical barrier	0.2m to hazards lower than 0.75m 0.5m to hazards higher than 0.75m