



MEMO

TO: Bobbi Jo Duncan, Town of Innisfil
FROM: Shawn Smith, Matt Pinder, Jordan Freedman, WSP
SUBJECT: 25th Side Road – Design Criteria V4
DATE: May 11, 2022

INTRODUCTION

This Design Criteria for the 25th Side Road functional design project summarizes the intended design approach to be taken for the project. The documents referenced in producing these criteria include:

- Town of Innisfil Engineering Design Standards and Specifications, May 2020. Section 2.0: Roadways
- Transportation Association of Canada, *Geometric Design Guide for Canadian Roads*, 2017 (TAC)
- Ontario Traffic Manual Book 18: Cycling Facilities, 2020 Draft Update (OTM Book 18)
- Town of Innisfil Speed Limits Corporate Policy (2018)

CONTEXT

The Town’s Complete Streets Guidelines (2018) provide direction for the planning and preliminary design phases for street design projects. The complete streets approach seeks to safely accommodate all road users (pedestrians, cyclists, transit, and motor vehicles) while supporting local neighbourhood context and placemaking.

The study portion of 25th Side Road contains multiple varying contexts along the corridor. Though a continuous and seamless active transportation facility and experience are desired, it is important to consider these contexts in the selection of design criteria. WSP proposes the following contexts:

- **Context 1: Low density residential**
 - Runs through Alcona from 80m north of Innisfil Beach Road to Rose Lane (2.0 km) and through Sandy Cove Acres from north of Lockhart Road to Mapleview Drive (1.4 km)
 - Characterized by frequent driveways and older, low-density, primarily residential development
- **Context 2: Green space**
 - Includes the segment north of Mapleview (1.4 km) which is adjacent to rural and key natural heritage feature areas.
 - Limited driveways/development existing and planned
- **Context 3: Downtown commercial**
 - Includes the Innis Village development (~0.7 km), the future urban area south of Mapleview (0.3 km) and the commercial area 80m south of Innisfil Beach Road (~0.1 km)
 - Undergoing active development; desired as an “urban village” in the Official Plan
 - Desire for on-street parking, streetscaping, placemaking, walkable development, and lower vehicle travel speeds
 - Urbanized cross section desired

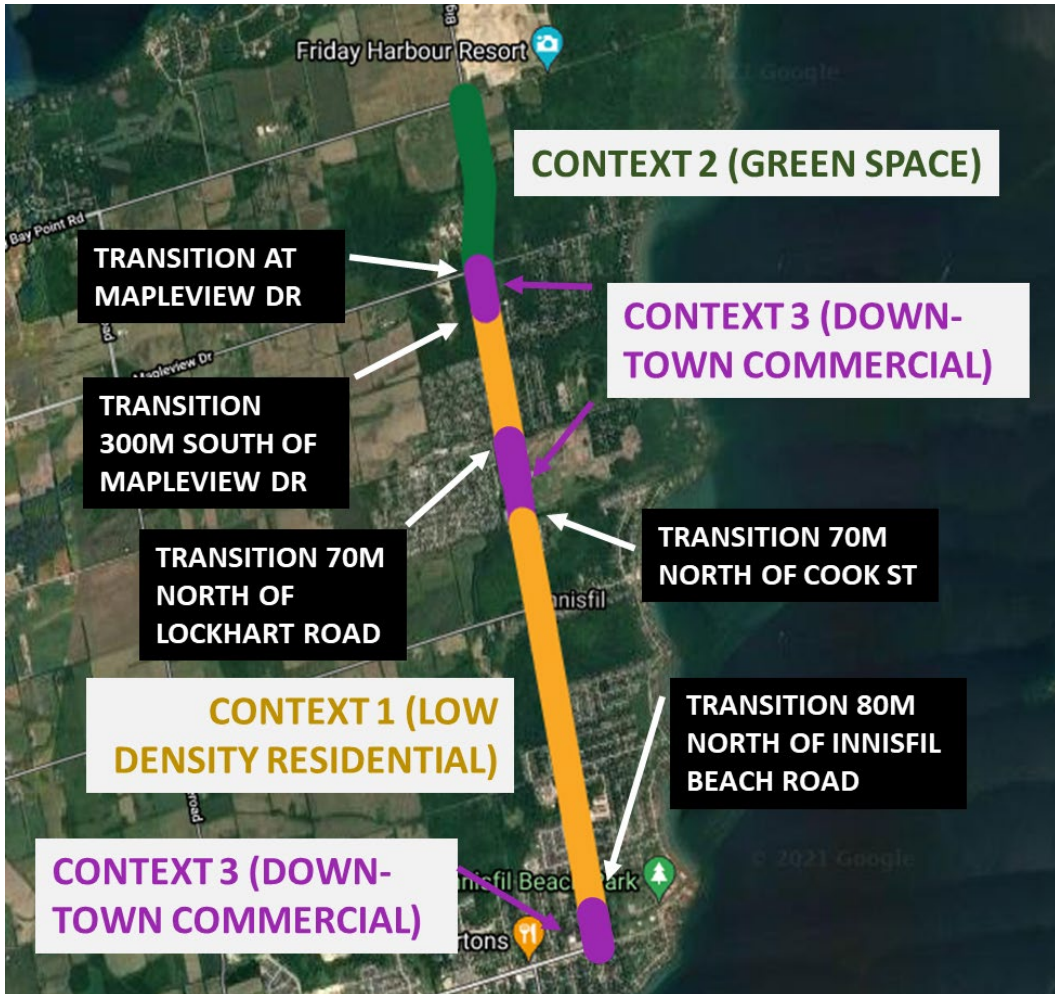


Figure 1: Three contexts for 25th Side Road, including transition points.

A more thorough overview and discussion of these contexts is provided in Appendix A.



ROADWAY, PEDESTRIAN, AND CYCLING DESIGN CRITERIA

	STANDARDS	PROPOSED DESIGN
Classification	Major Collector – Rural Cross-Section (a) with limited short stretches of urbanized cross sections	Major Collector – Rural Cross-Section
Average Annual Daily Traffic	South of 9 th Line: ~7,000 9 th Line to Cook Ave: ~4,000 North of Cook Ave: ~2,000	Stable AADT south of Cook, with some growth north of Cook due to new developments
Design Speed	70km/h (Major Collector – Urban) (a)	Context 1 (Low-Density Residential): 50km/h, with traffic calming at key locations (such as schools) to reinforce target speed Context 2 (Greenspace and Rural): match existing conditions Context 3 (Downtown Sandy Cove Acres): use geometric measures to reduce speeds to a target of 50km/h
Posted Speed	Collector (urban): 50km/h (e) Collector (rural): 80km/h or less if geometric characteristics are unsuitable (d) Existing: 50km/h south of Mapleview, 60km/h north of Mapleview	Context 1: 40 km/h* Context 2: 50 km/h Context 3: 40 km/h**
Vehicle Lane Widths	High truck volumes: 3.5 m (3.4m min) (e) Other conditions: 3.2 m (3.0 m min in constrained locations) (e) Existing: 3.5 m	Contexts 1 & 3: 3.2 m target Context 2: 3.5 m target
Min/Max Grade	0.5%/6%	0.5%/6%
Min. Horizontal C/L Curvature	190 m	190 m
Vertical Curvature Min. ‘K’ Value (Crest/Sag)	25/25	25/25
Min. Tangent between horizontal curves	80 m	80 m
Min. Crossfall	2%	2%

Curb Radii / Daylighting Collector-Arterial Collector-Collector Collector-Local	15/10 m 12/10 m 9/5 m	Per Town standards. At sensitive locations such as near schools, consider reduced radii, validated using turning simulation software. Collector-Arterial: WB-20 control vehicle Collector-Collector: HSU control vehicle Collector-Local: MSU control vehicle
Road Pavement Structure	As per Town Standards Section 2.2.2 Major Collector	As per Town Standards Section 2.2.2 Major Collector (to be confirmed by geotechnical investigation)
Max. Driveway Grade	7%	7%
Cycle track (One-way)	2.0–2.5 m (min 1.5 m) (b)	Preferred: 2.0 m Minimum: 1.5 m
Cycle track (Two-way)	3.5–4.0 m (min 3.0 m, min at constraints 2.4m) (b)	Preferred: 3.5 m Minimum: 3.0m, 2.4 m (at constraints only)
Multi-use Path	3.5m (b) (minimum 3.0m) (b)	Preferred: 3.5 m Minimum: 3.0 m, 2.4 m (at constraints only for short segments)
Street Buffer Between Cycling Facility & Adjacent Travel Lanes	0.8–1.2 m (b) (minimum 0.4 m) For on-street physically separated bike lanes: 1.0m desired, 0.3m minimum (c) For raised cycle track and MUP: Posted speed ≤50 km/h: 0.6-1.0 m desired, 0.3m minimum (c) Posted speed 60 km/h: 1.5-2.5 m desired, 0.6 m minimum (c)	Per design guidelines. For cycle track and MUP, preference is to locate facility behind the ditch where possible.
Buffer Between Cycling Facility & Adjacent Sidewalk	Landscaping strip, 600mm tactile buffer, or 50mm curb (c) (buffer may be omitted in highly constrained areas) (c)	Landscaping strip preferred where feasible. Otherwise, use 600mm tactile strip, reduced to 300mm for straight segments and 0mm at constraints.
Offset from Property Line	Town’s standard: 0.9 m desired 0 m constrained	Per Town’s standards

Lateral offset to obstructions (Cycle Track)	0.2m for obstructions between 200-750mm high (ex. a curb) 0.5m (0.3m min.) for obstructions greater than 750mm high (ex. a pole) (c)	0.2m for obstructions between 200-750mm high (ex. a curb) 0.5m (0.3m min.) for obstructions greater than 750mm high (ex. a pole)
Sidewalk Width	1.8–2.0 m (b)	Preferred: 2.0 m (2.1m+ to be considered in Context 3) Minimum: 1.5m (existing 1.5 m sidewalk may be retained in constrained locations; any segment narrower than 1.5m will be proposed to be upgraded to meet criteria)
Vertical Clearance	2.7–3.6 m 2.5min, 3.0m default (a)	Preferred: 3.0 m Minimum: 2.5 m
Maximum Running Slope of Facility	<4 % pref. (a) No steeper than 1:20 (5%), unless roadway slope is steeper. Up to 1:12 (6.67%) can be accommodated if landings are provided at intervals of no more than 9.0 m (b)	Preferred: up to 1:25 (4%) Maximum: 1:20 (5%)
Cross Slope of Facility	2% preferred, 5% max and up to 8% may be considered at driveways. (b)	Per design guidelines

**Subject to Council Approval; Town of Innisfil Speed Limits policy allows reduced speed limits of 40 km/h in proximity to schools. However, it is recognized that schools do not actually front onto 25th Side Road*

*** Subject to Council Approval; As Downtown Sandy Cove Acres is imagined as a “walkable village environment”, it is proposed this segment be treated the same as a Heritage Conservation District, for which a 40 km/h speed limit may be proposed*



INTERSECTIONS

Collector-Arterial: WB-20 control vehicle

Collector-Collector: HSU control vehicle (Major or Minor Collector)

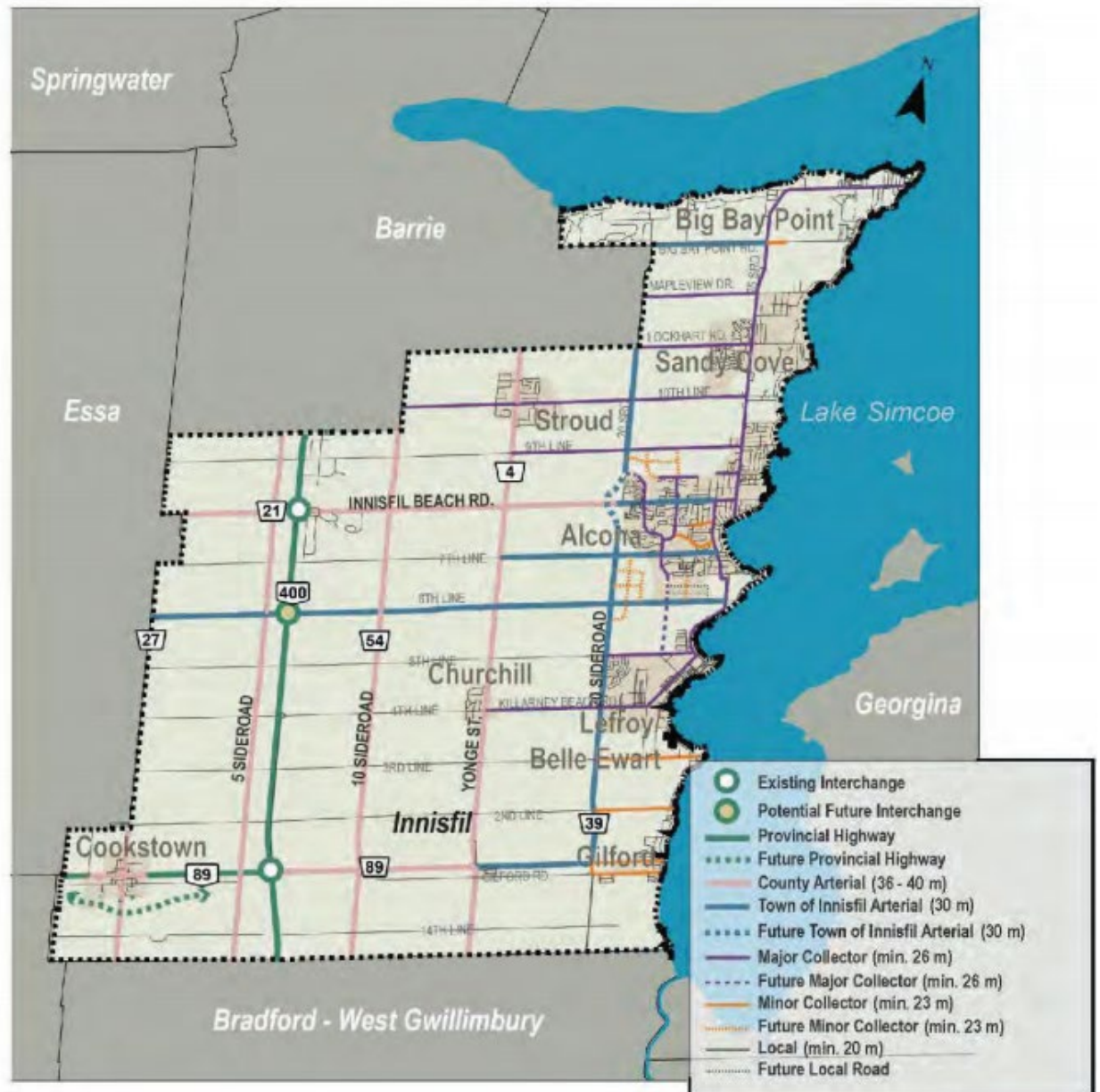
Collector-Local: MSU control vehicle

LOCATION	ROAD CLASSIFICATION:	CONTROL VEHICLE	SIGNALS
Innisfil Beach Road	(tie in only) West: Major Collector-Major Collector East: Major Collector-Local	Existing Conditions	Y
Raynor Ct	Major Collector-Local	MSU	N
Lebanon Dr	Major Collector-Local	MSU	N (future pedestrian crossing)
Park Rd	Major Collector-Local	MSU	N
Leslie Dr / Roberts Rd	West: Major Collector- Major Collector: East: Major Collector-Local	West: HSU East: MSU	Y
Happy Vale Dr	Major Collector-Local	MSU	N
Willow Ave	Major Collector-Local	MSU	N
Jack Cres	Major Collector-Local	MSU	N
Joseph St	Major Collector-Local	MSU	N
William St	Major Collector-Local	MSU	N
9 th Line	West: Major Collector- Major Collector East: Major Collector-Local	West: HSU East: MSU	N (future roundabout – currently not in scope)
James St	Major Collector-Local	MSU	N
Trinity St	Major Collector-Local	MSU	N
Candaras St	Major Collector-Local	MSU	N
Rose Lane	Major Collector-Local	MSU	N
Chestnut St	Major Collector-Local	MSU	N
10 th Line	West: Major Collector- Major Collector East: Major Collector-Local	West: HSU East: MSU	N
Carniola Dr	Major Collector-Local	MSU	N
Cook St	Major Collector-Local	MSU	N
Lockhart Rd	West: Major Collector- Major Collector East: Major Collector-Local	West: HSU East: MSU	Y (future improvements)
Main St	Major Collector-Local	MSU	N



Henderson Dr	Major Collector-Local	MSU	N
Mapleview Dr	West: Major Collector-Major Collector East: Major Collector-Local	West: HSU East: MSU	N (future urbanization)
Martin Cres (south)	Major Collector-Local	MSU	N
Martin Cres (north)	Major Collector-Local	MSU	N
Big Bay Point Rd / 13 th Line	(tie in only) West: Major Collector-Arterial East: Major Collector-Minor Collector	Existing Conditions	N Future Roundabout

Schedule C: Transportation Network - Roads Innisfil Official Plan



REFERENCES:

- a) Town of Innisfil Engineering Design Standards and Specifications, May 2020. Section 2.0: Roadways
- b) Transportation Association of Canada, *Geometric Design Guide for Canadian Roads*, 2017 (TAC)
- c) Ontario Traffic Manual Book 18: Cycling Facilities, 2020 Draft Update (OTM Book 18)
- d) Town of Innisfil Speed Limits Corporate Policy (2018)
- e) Town of Innisfil Complete Streets Guidelines (2018)

Other references to incorporate as needed:

TOISD 208 – Rural Industrial Road 26m ROW 8m Pavement width (updated April 2018)

TOISD 204 – Urban Major Collector 26m ROW 14m Pavement width (updated May 2019)

ROUNDBABOUT DESIGN CRITERIA

As per TAC Canadian Roundabout Design Guide (2017)

CRITERIA	STANDARDS	PROPOSED DESIGN	SECTION
Inscribed Circle Diameter (ICD) -Single Lane (Alt 1)	28 - 46	28	6.3.1 ICD
Inscribed Circle Diameter (ICD) – Mini Roundabout (Alt 2)	14 - 27	20	6.3.1 ICD
Control Vehicle (Alt 1)	B-12	HSU (per roadway design criteria)	6.3.1 ICD
Control Vehicle (Alt 2)	MSU	HSU (per roadway design criteria)	6.3.1 ICD
Entry width (m)	4.2 – 6.0	4.2 (3.0 lane plus edge lines)	6.2.5 Entry Width
Circulatory Roadway	1.0 – 1.2 times smallest entry width	1.0 times	6.3.2 Circulatory Roadway
Clearance from vehicle to outer circle (m)	1.0 minus 0.3 encroachment	0.7 MIN	6.3.3 Central Island
Splitter Island Width (m)	2.4 MIN	2.4 MIN	6.2.9 Crosswalk Location and Alignment
Splitter Island Length (m) – Collector Roads	8 – 10	8 – 10 (8 MIN at constraint)	6.3.4 Splitter Islands
Crosswalk setback from roundabout (m)	6.0 MIN	6.0 MIN	6.2.9 Crosswalk Location and Alignment

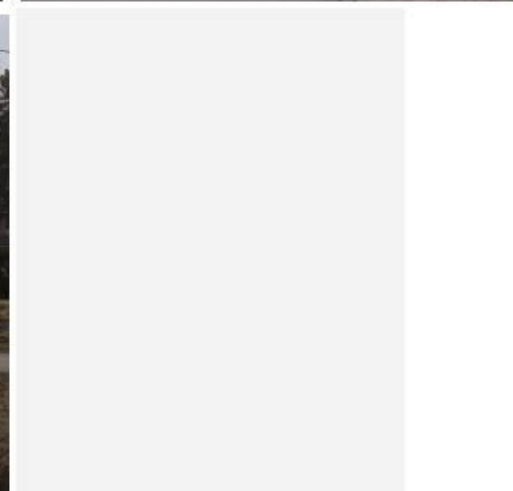
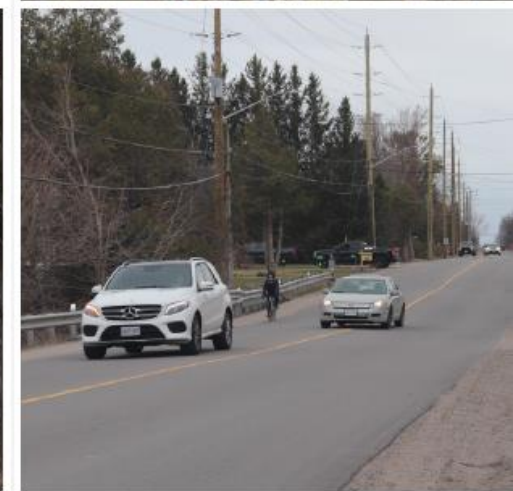
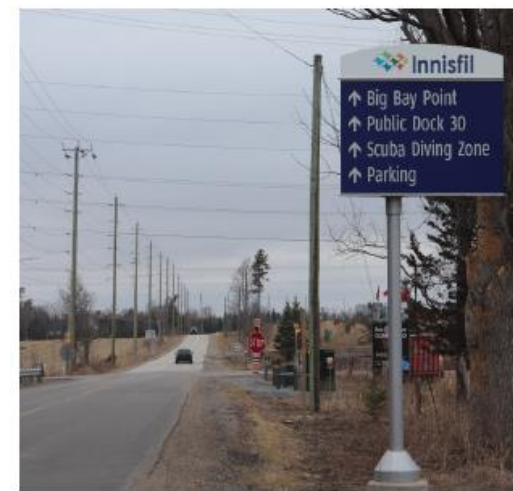
Crosswalk alignment	Perpendicular to entry width OR Flat (straight)	Flat	6.2.9 Crosswalk Location and Alignment
Crosswalk ramp width (m) and tactile plates to be full width of dropped curb	1.2 MIN	1.5 (for peds) 3 (1.5 each way for cyclists) 0.5 buffer 5 (total)	6.2.9 Crosswalk Location and Alignment
Alignment of Entry Lanes	Arc Tangential to Central Island	Tangential (Alt 1) Radial (Alt 2)	6.3.8 Alignment of Entry Lanes
Entry Flaring			6.3.10 Entry Flaring
Entry Angle	20 – 60 degrees		6.3.11 Entry Angle
Entry/Exit Curb Radius (m)	10 MIN (small urban roundabout) 20 MIN		
Exit Width (m)	7 – 7.5 at throat, taper to 6 MIN	7 at throat, taper to 6 MIN	6.3.13 Exit Width



APPENDIX A: OVERVIEW OF DESIGN CONTEXTS

Innisfil 25th Side Road Overview of Contexts

June 29, 2021

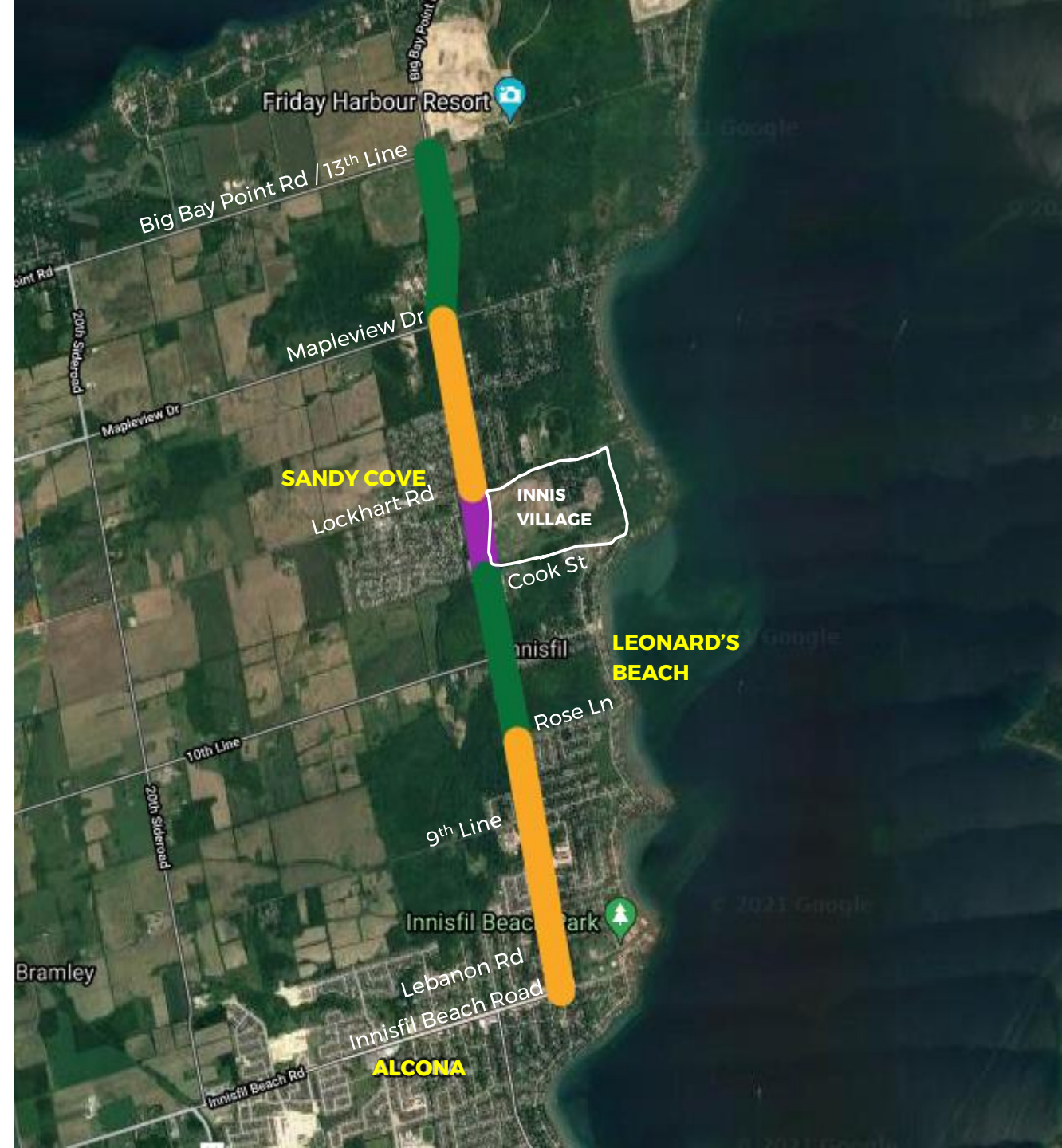


Overview of Contexts

Context 1 (Low-Density Residential): 3.4km

Context 2 (Greenspace and Rural): 2.7km

Context 3 (Downtown Sandy Cove Acres): 0.7km



Context 1 (Low-Density Residential)



Context 1 (Low-Density Residential)



Development Context	<ul style="list-style-type: none"> Existing low-density residential Planned “future urban” area south of Mapleview (300m) Mostly driveways accessing 25th sideroad (mostly spaced at 20-30m)
Primary Street Purposes	<ul style="list-style-type: none"> Access to/from neighbourhoods, schools, and local beaches Significant recreational cycling route Minimal through traffic expected Moderate pedestrian volumes expected
Existing Condition	<ul style="list-style-type: none"> 50km/h speed limit ~1.3m sidewalk on one side, behind ditch (Alcona portion only) Rural cross section with ditch on one/both sides 20m ROW (noted from Road Needs Study) 7m pavement width, 2.0m granular shoulders Driveway spacing 10-30m Intersection spacing 100-300m

Context 1 (Low-Density Residential)



Design Objectives

- Create a design that complements the existing residential built form
- Use design features to mitigate speeding concerns
- Consider trade-offs between urbanized and rural cross sections
- Work within the existing 20m ROW (future acquisition unlikely)
- Provide enhanced walking and cycling facilities suitable for all ages and abilities

Context 1 (Low-Density Residential) POTENTIAL COMPLETE STREETS OPTIONS

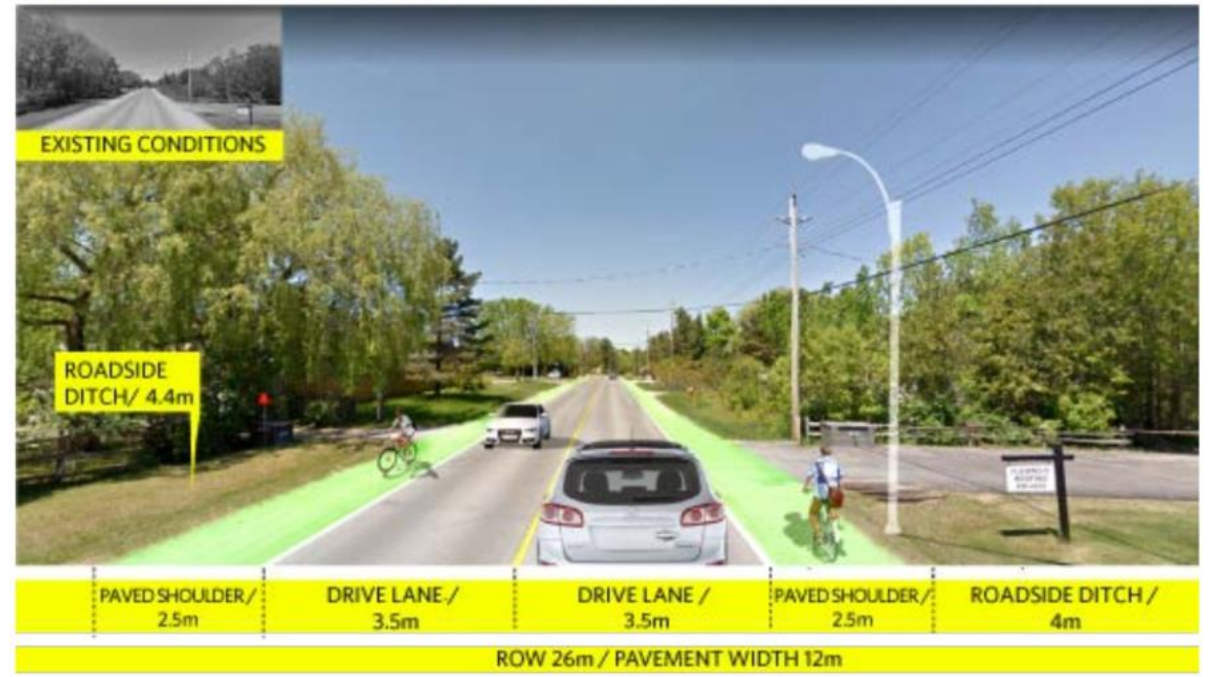
NEIGHBOURHOOD CONNECTOR

NEIGHBOURHOOD COLLECTOR – RURAL CROSS SECTION

CONCEPTUAL APPLICATION A – WEBSTER BOULEVARD RETROFIT, ALCONA



CONCEPTUAL APPLICATION A – SAINT JOHNS ROAD RETROFIT, ALCONA



Context 1 (Low-Density Residential)



Example from Essex County, ON



Example from Tofino, BC

Context 1 (Low-Density Residential)

Anticipated Challenges	<ul style="list-style-type: none">• Fitting desired elements into constrained right-of-way• Cost impacts of urbanization versus space impacts of maintaining rural cross section
Areas Requiring Special Attention	<ul style="list-style-type: none">• Box culvert south of Pinegrove constraining pavement width to 10.25m• Proposed controlled pedestrian crossing at Lebanon• Tie-ins to existing AT facilities at Innisfil Beach Road

Context 2 (Greenspace and Rural)



Context 2 (Greenspace and Rural)



Development Context	<ul style="list-style-type: none"> No new development expected or planned Contains Natural Heritage Features Some existing single-family homes with driveways facing the street (between Sandy Cove Acres and Alcona)
Primary Street Purposes	<ul style="list-style-type: none"> Some through traffic between Sandy Cove Acres, Alcona, and Big Bay Point Significant recreational cycling route Low pedestrian traffic expected
Existing Condition	<ul style="list-style-type: none"> 50 km/h speed limit (60km/h north of Maplevue) No sidewalks Rural cross section with ditch on both sides 20m ROW (noted from Road Needs Study) 7m pavement width, 2.0m shoulders Driveway spacing 30-50m (where provided) Intersection spacing 400-700m

Context 2 (Greenspace and Rural)



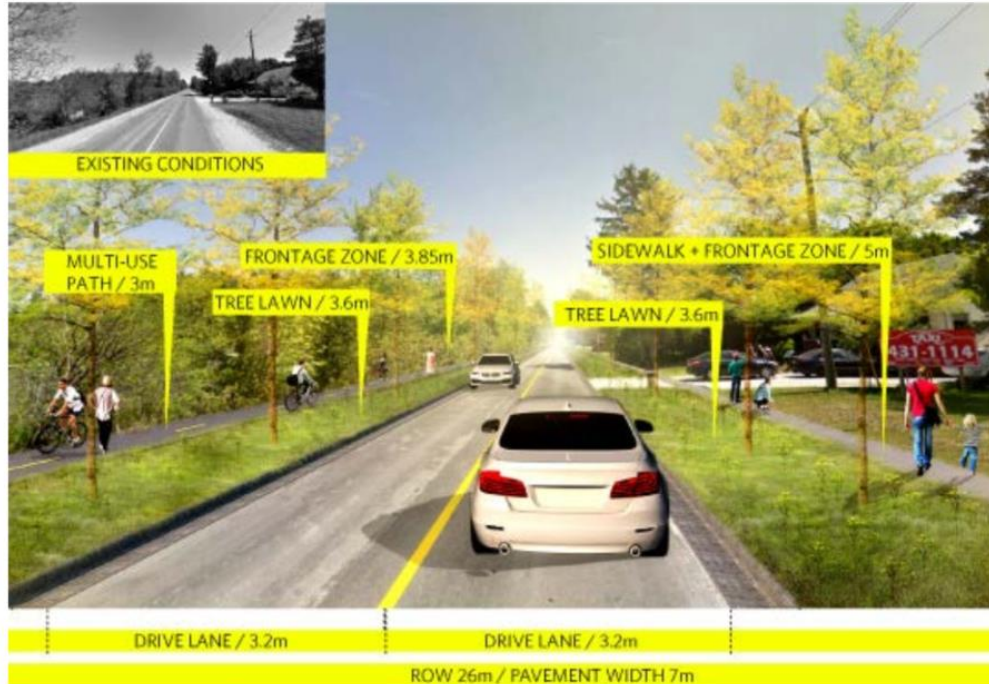
Design Objectives

- Highlight the natural heritage features and prioritize stormwater management techniques that minimize impacts on adjacent lands
- Use design features to mitigate speeding concerns
- Maintain existing rural cross sections
- Work within the existing 20m ROW (future acquisition unlikely)
- Provide suitable AT facility for non-local utility and recreational trips, with a focus on cycling

Context 2 (Greenspace and Rural) POTENTIAL COMPLETE STREETS OPTIONS

URBAN THOROUGHFARE

CONCEPTUAL APPLICATION A – RETROFIT



NEIGHBOURHOOD COLLECTOR – RURAL CROSS SECTION

CONCEPTUAL APPLICATION A – SAINT JOHNS ROAD RETROFIT, ALCONA



Context 2 (Greenspace and Rural)



Example from Aurora, Ontario

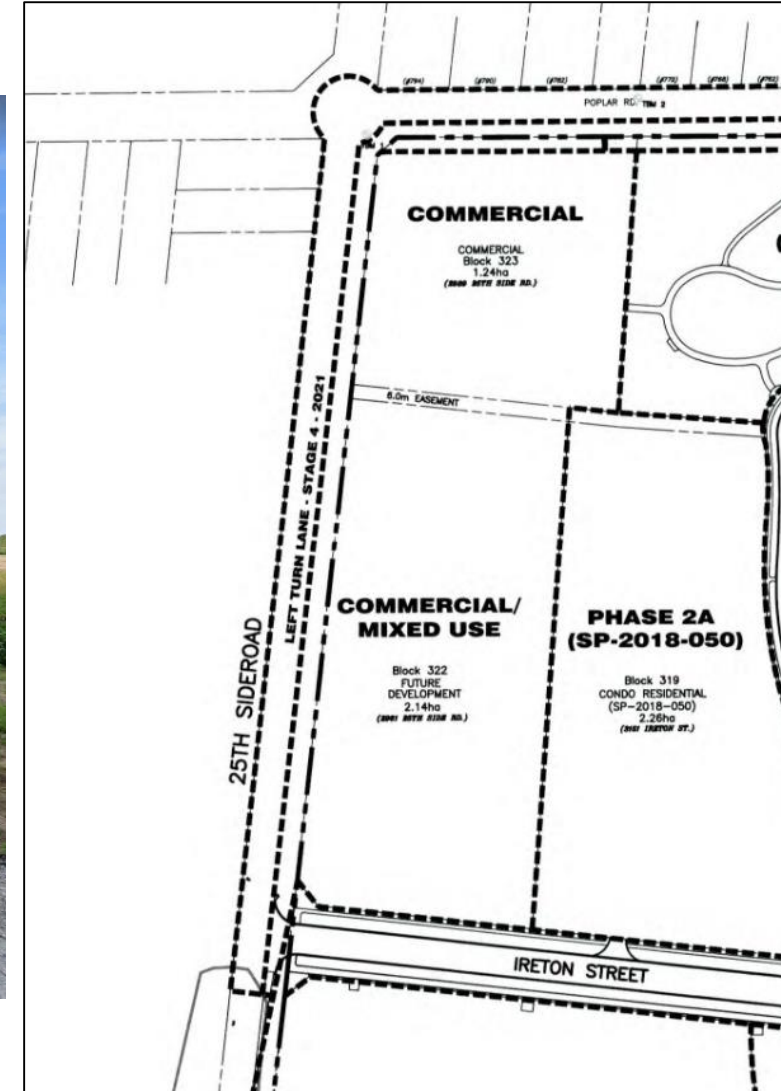


Example from Gatineau, Quebec

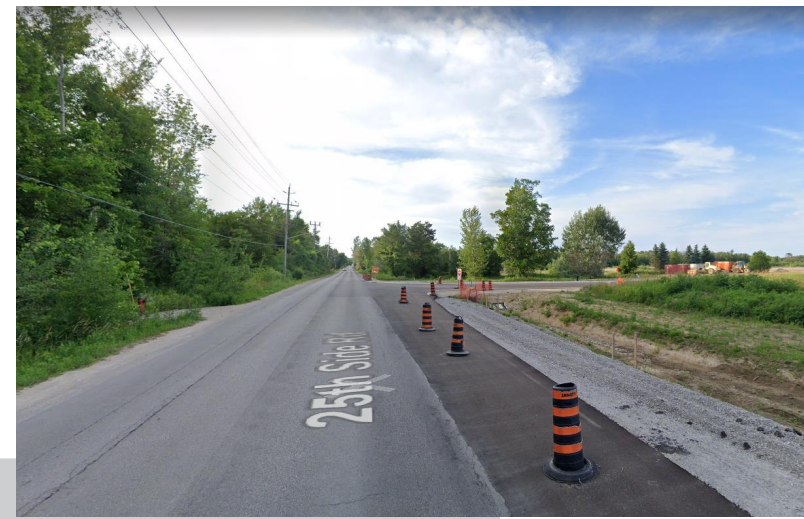
Context 2 (Greenspace and Rural)

Anticipated Challenges	<ul style="list-style-type: none">• Minimizing disturbance to natural environment• Fitting desired elements into constrained right-of-way
Areas Requiring Special Attention	<ul style="list-style-type: none">• Tie-ins to roundabout at Big Bay Point Road

Context 3 (Downtown Sandy Cove Acres)



Context 3 (Downtown Sandy Cove Acres)



Development Context	<ul style="list-style-type: none"> • Mostly large parcels • Mixed-use / commercial development either underway or proposed • OP expresses desire for a “walkable village environment”
Primary Street Purposes	<ul style="list-style-type: none"> • Provide access to local businesses for people walking, cycling, and driving • Serve as a gathering place for the community • Provide a pleasant walking experience
Existing Condition	<ul style="list-style-type: none"> • 50 km/h speed limit • No sidewalks • Rural cross section with ditch on both sides • 20m ROW (expanding to 23-24m with current development) • 7m pavement width, 2.0m shoulders (centre left turn lane scheduled to be added 2021) • Intersection spacing 300m

Context 3 (Downtown Sandy Cove Acres)

Design Objectives

- Urbanize the roadway
- Provide a generous pedestrian realm and pedestrian-supportive amenities (street trees, benches, etc.)
- Design for a slower speed of travel for motor vehicles
- Provide a dedicated cycling facility (not mixed with pedestrians)



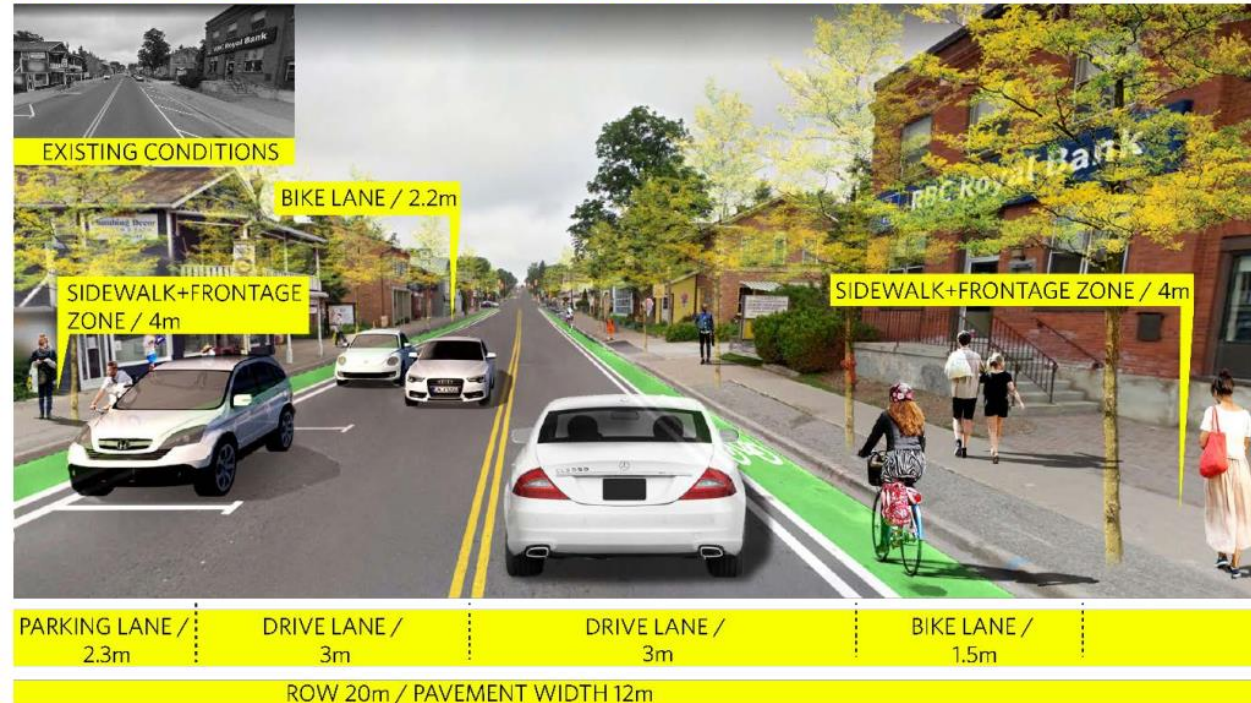
Conceptual images of commercial / mixed use development



Context 3 (Downtown Sandy Cove Acres) POTENTIAL COMPLETE STREETS OPTIONS

DOWNTOWN COMMERCIAL

CONCEPTUAL APPLICATION A – QUEEN STREET RETROFIT, COOKSTOWN



Context 3 (Downtown Sandy Cove Acres)



Example from Ottawa, Ontario

Context 3 (Downtown Sandy Cove Acres)

Anticipated Challenges	<ul style="list-style-type: none">• Coordinating with active development underway• Creating a high-quality pedestrian realm
Areas Requiring Special Attention	<ul style="list-style-type: none">• Ireton Street intersection



Thank you



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