City of Ottawa Protected Intersection Design Guideline

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1) Why Protected Intersections?

2) Early Implementation and Policy Foundation

3) Protected Intersection Design Guide

4) Results, Refinements and Challenges

Why Protected Intersections?

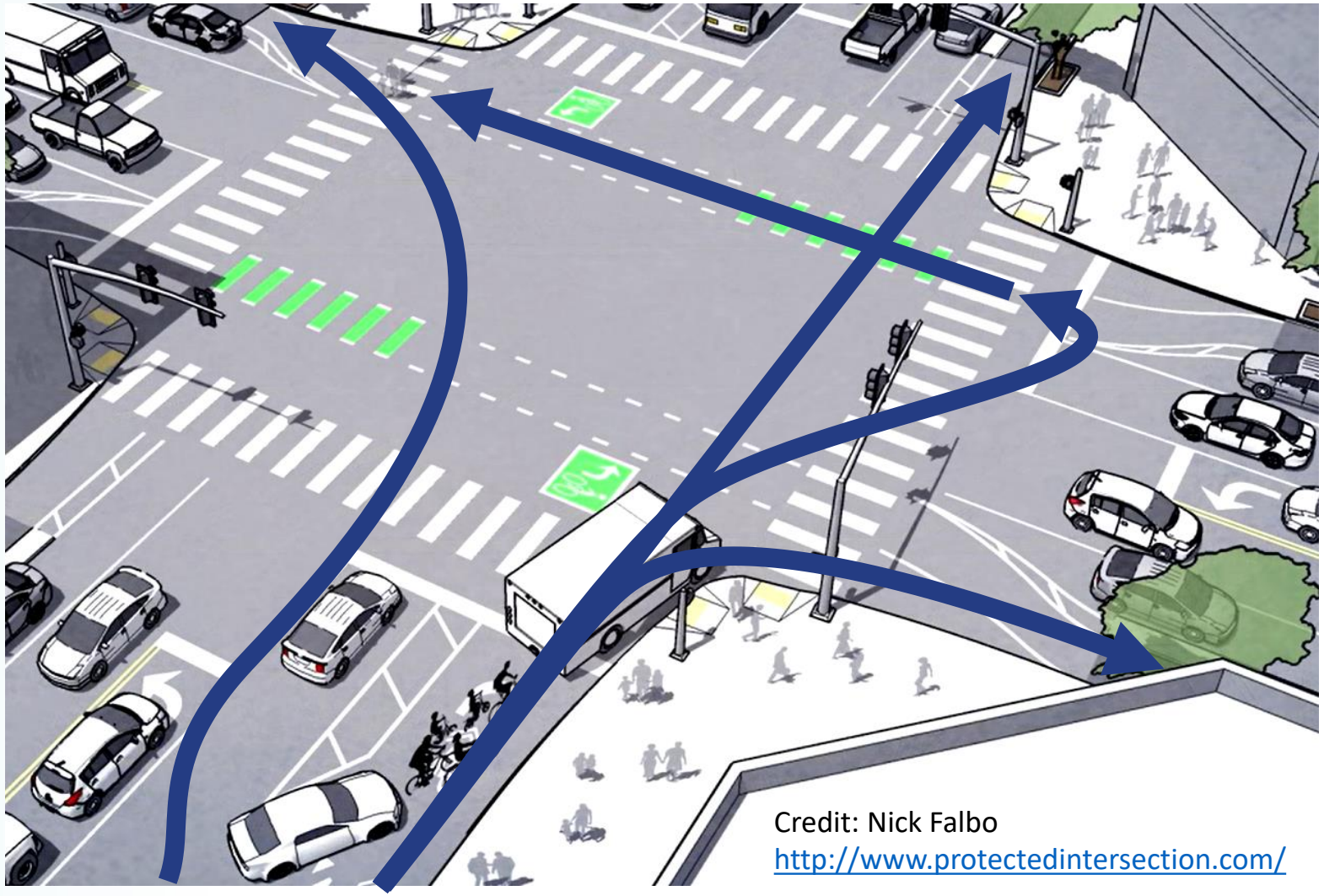
- Combines best practices from the Netherlands and North America
- **Improves safety** for vulnerable road users (pedestrians and cyclists)
- Increase cycling modal share by **attracting "interested but concerned" cyclists**
- Improves **consistency and predictability** of intersection operations for all users

Ottawa's Conceptual Development / Internal Buy-In Occurring 2013-2016

Why Protected Intersections?

Traditional Intersection:

- Confusion, multiple possible cycling movements!
- Little protection for cyclists
- Not comfortable

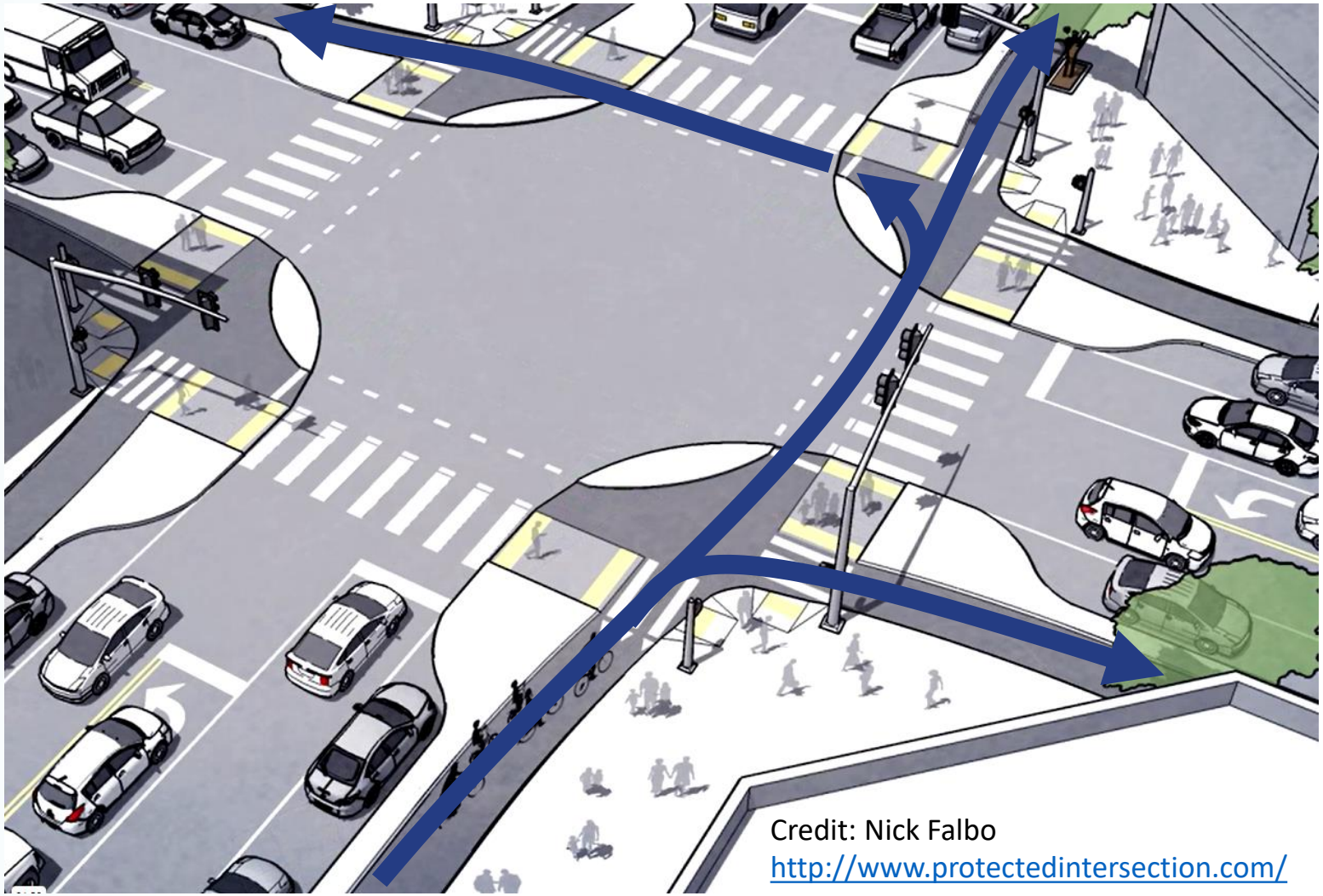


Credit: Nick Falbo
http://www.protectedintersection.com/

Why Protected Intersections?

Protected Intersection:

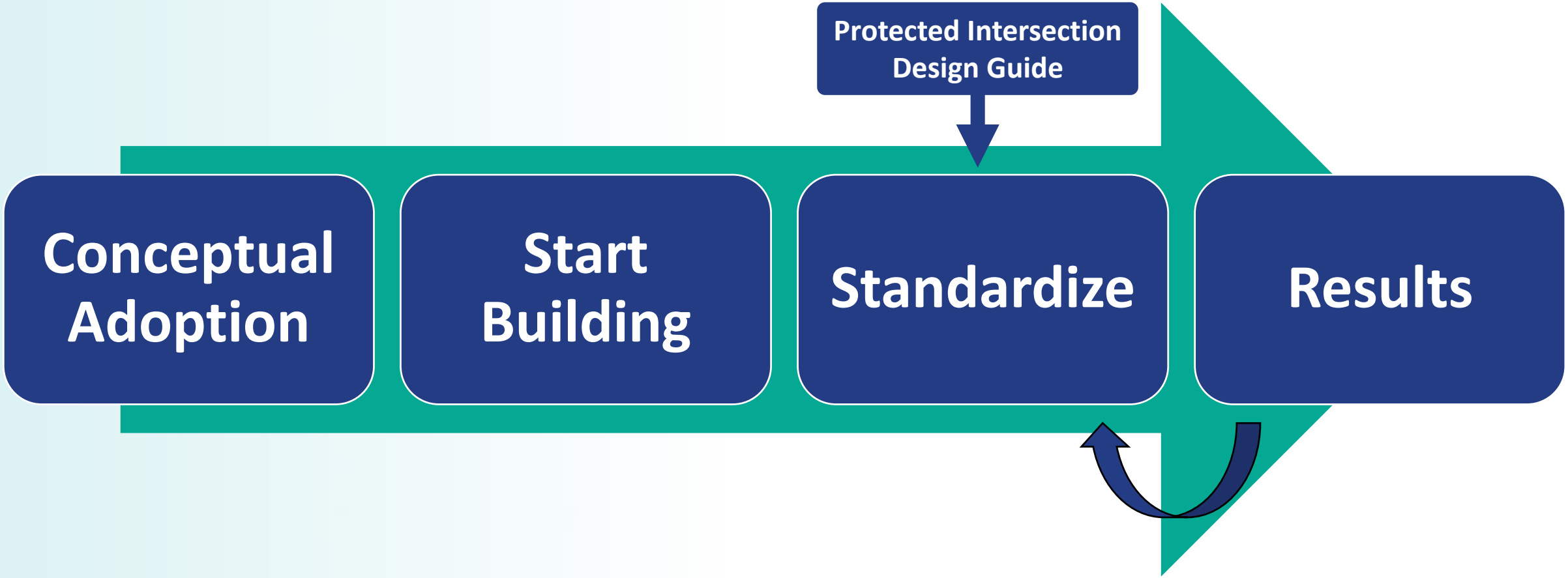
- Cycling movements consolidated
- Safety features:
  - Corner safety island
  - Forward stop bar
  - Crossride and crosswalk setback
- Comfortable
- Predictable & Consistent



Credit: Nick Falbo
http://www.protectedintersection.com/

Protected Intersections

from concept to results



Start Building!

2011: Laurier Avenue

2014: Churchill Avenue

Start Building!

2017: Main Street & Riverdale

BEFORE

AFTER

Start Building!

2019: Dynes and Fisher

BEFORE

AFTER

Start Building!

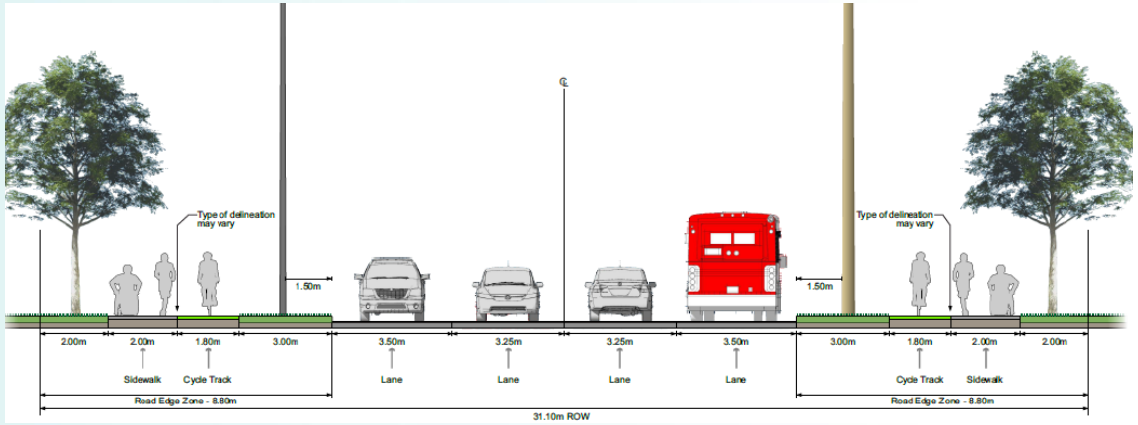
2019: St. Laurent & Donald

BEFORE

AFTER

Policy Foundation

- **2017: Arterial Road Cross-Sections**
- **2019: Designing Neighbourhood Collector Streets**
  - Page 27 notes that *"Regardless of intersection type, **protected features must be provided** for active transportation users."*



Need for a Protected Intersection Design Guide

With many protected intersections in design, Ottawa needed a design guide that was…

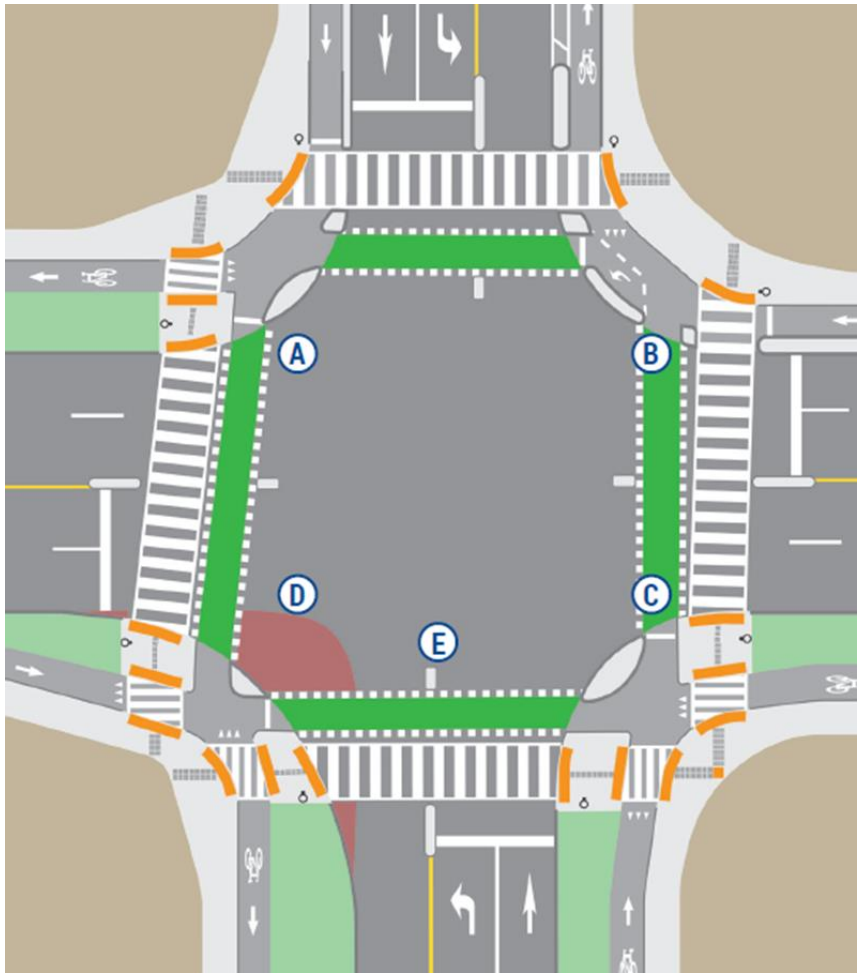
- ✓ **Detailed**
- ✓ Specific to **Ottawa context** and experience
- ✓ **Transparent** for external engineers/designers and public
- ✓ **Consistent** for designers and users
- ✓ Incorporated **Universal Accessibility**

- Guide development with Alta Planning + Design **(2020-2021)**

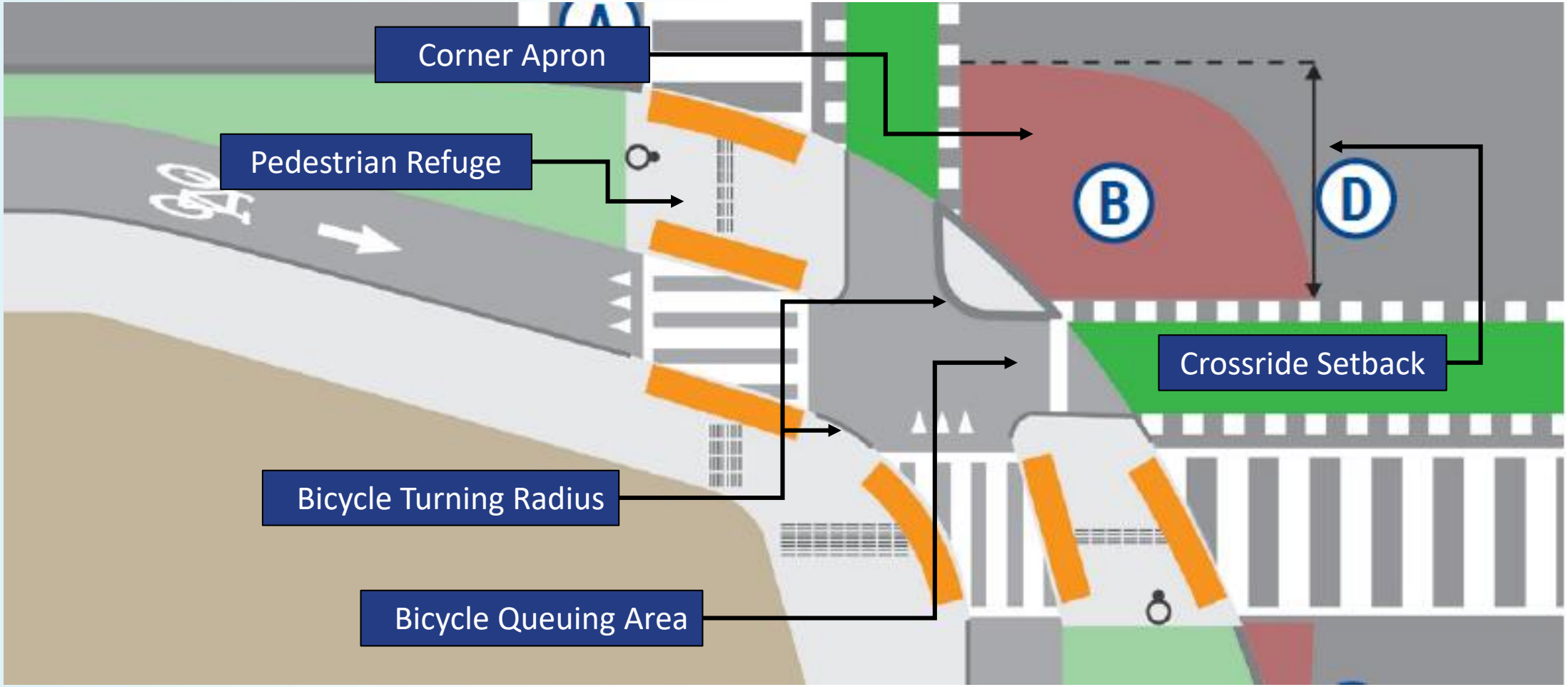
Protected Intersection Design Guide

Guide is a framework for developing protected intersections and is therefore organized into steps of the design process.

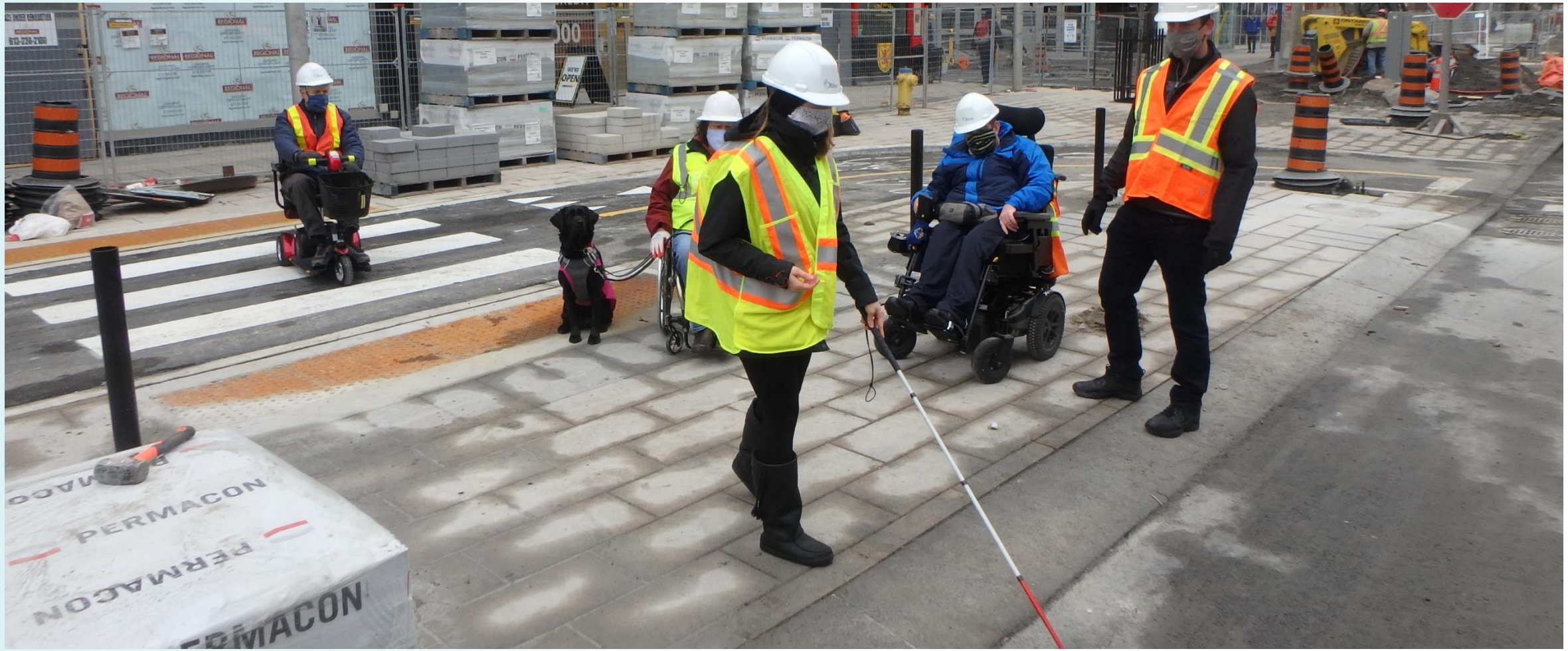
- **Chapter 2: Guiding Principles**
- **Chapter 3: Functional Planning** – context, constraints, and corner radius
- **Chapter 4: Protected Corner Selection** – types and selection process – 7 different corner types in Guide



Chapter 5: Functional Design – Corner Elements

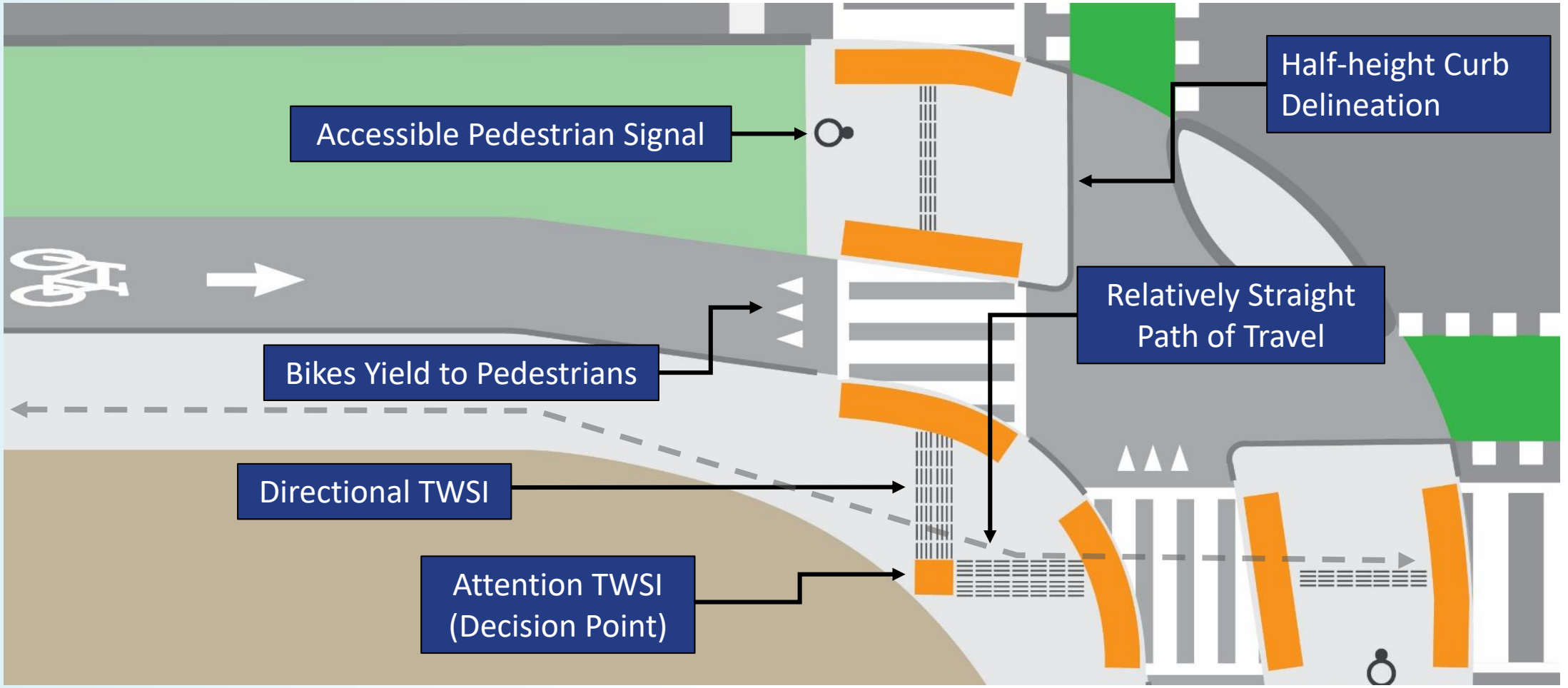


Chapter 5: Functional Design – Accessibility



Angled curb testing on Rideau Street during Nov. 30th on-site workshop

Chapter 5: Functional Design – Accessibility

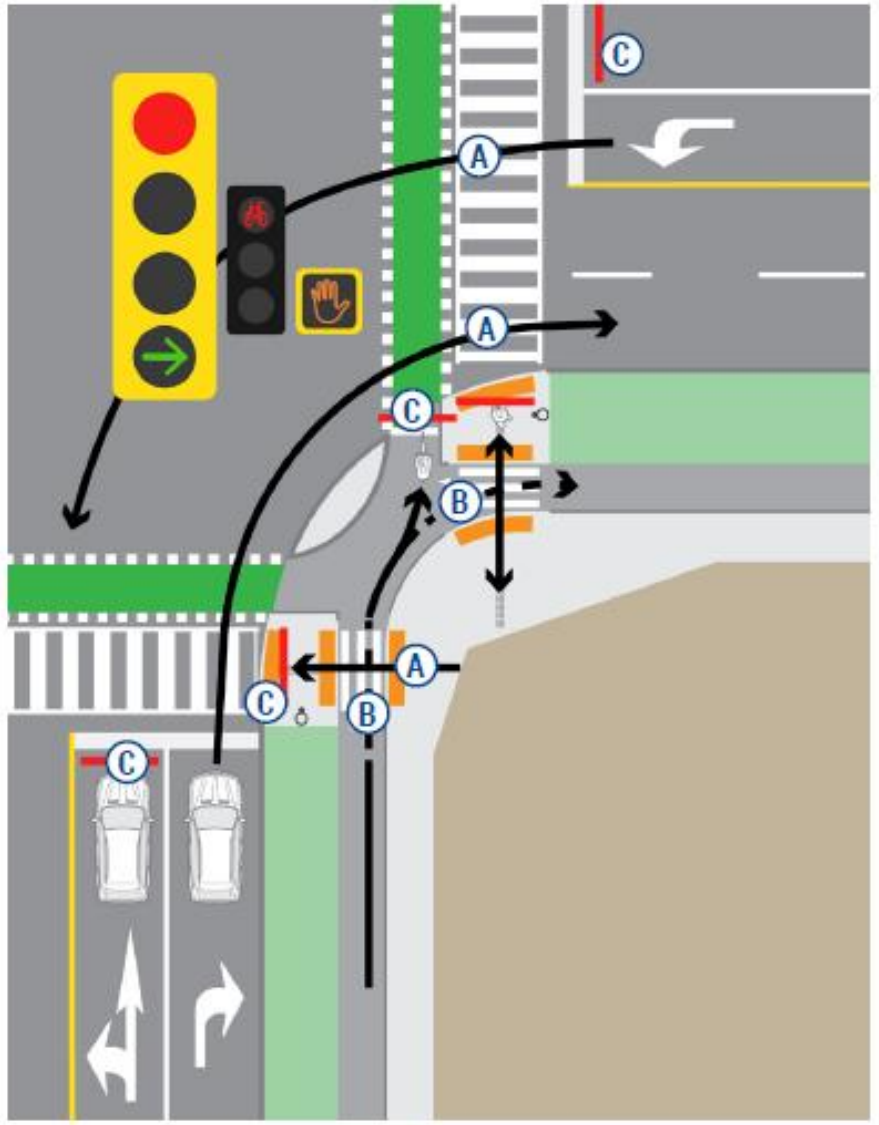


Chapter 6: Detailed Design

- Pedestrian Guidance
- Delineation
- Directional guidance
- Elevations and Drainage
- Seasonal Maintenance
- Materials and Construction

Chapter 7: Signalization Measures

- Leading pedestrian/bicycle interval
- No right turn on red
- Permissive Right Turn and Right Turn Overlap Phase
- Fully protected left and right turn phases
  - Requirement for protected turning phases stricter with bidirectional cycling facilities (including MUPs)
  - Protected right turn phases typically considered at >150 right turning vehicles per hour

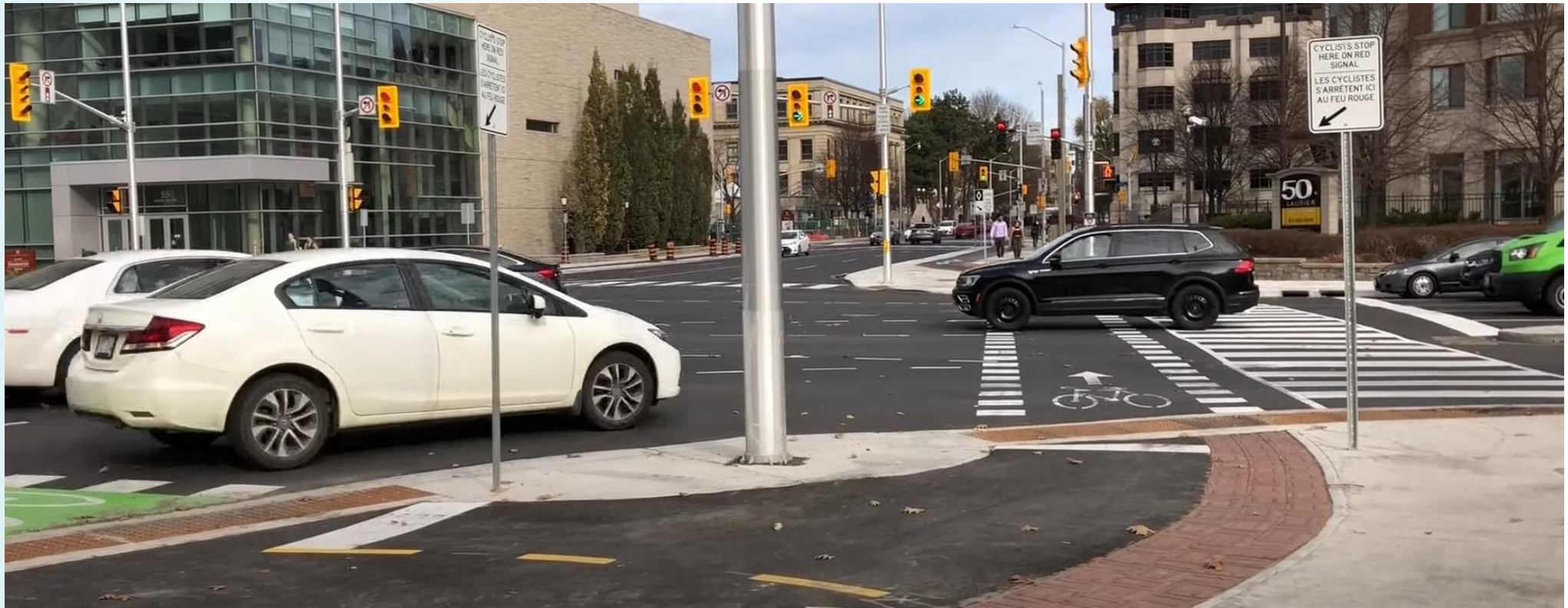


BEFORE

Results!

2022: Nicholas & Laurier

AFTER



Results!

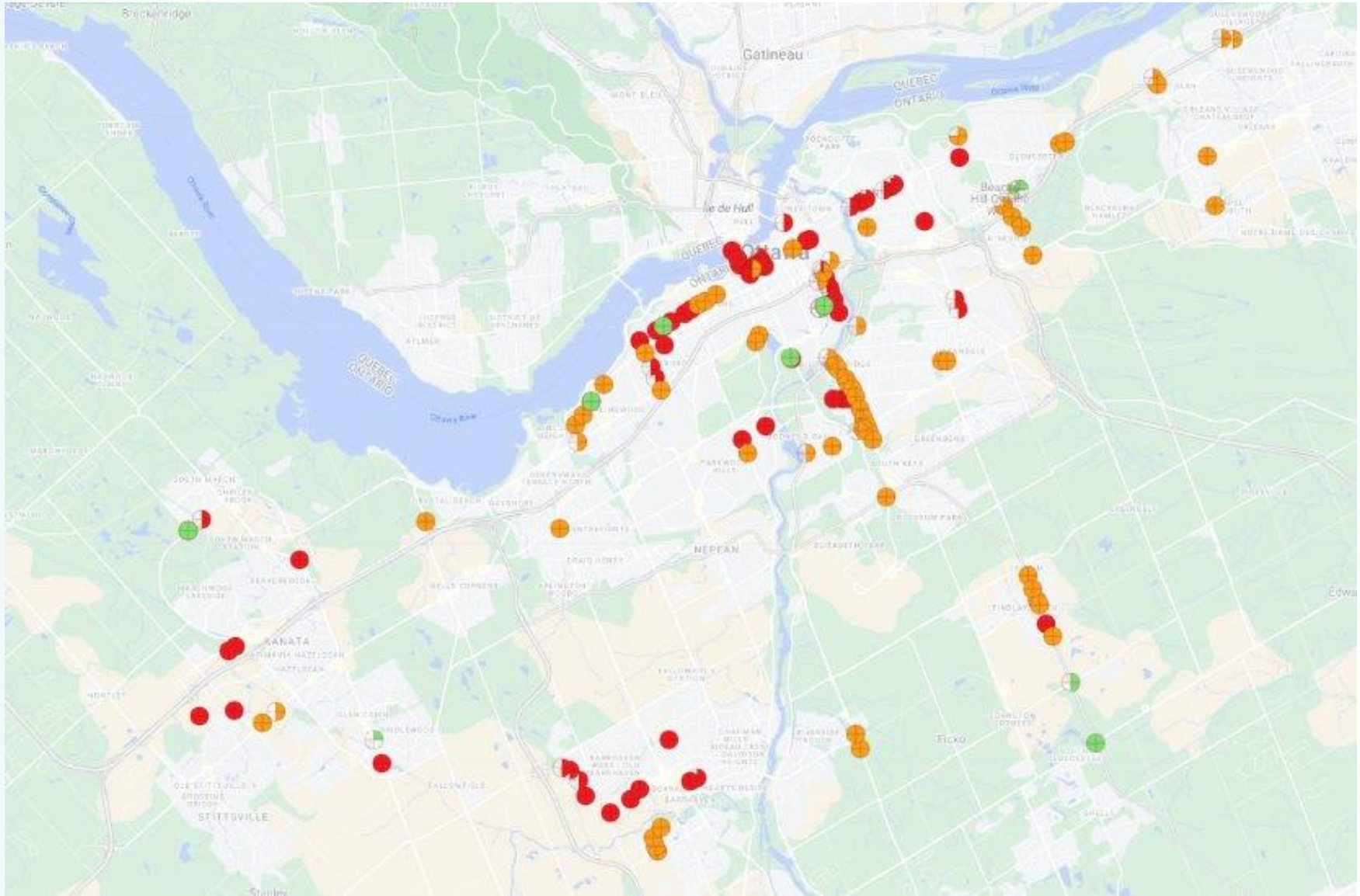
2023: Longfields & Highbury Park

BEFORE

AFTER

Results!

- Completed (44+)
- Including ~7 “reverse”
- In construction/design (70+)



Recognition:

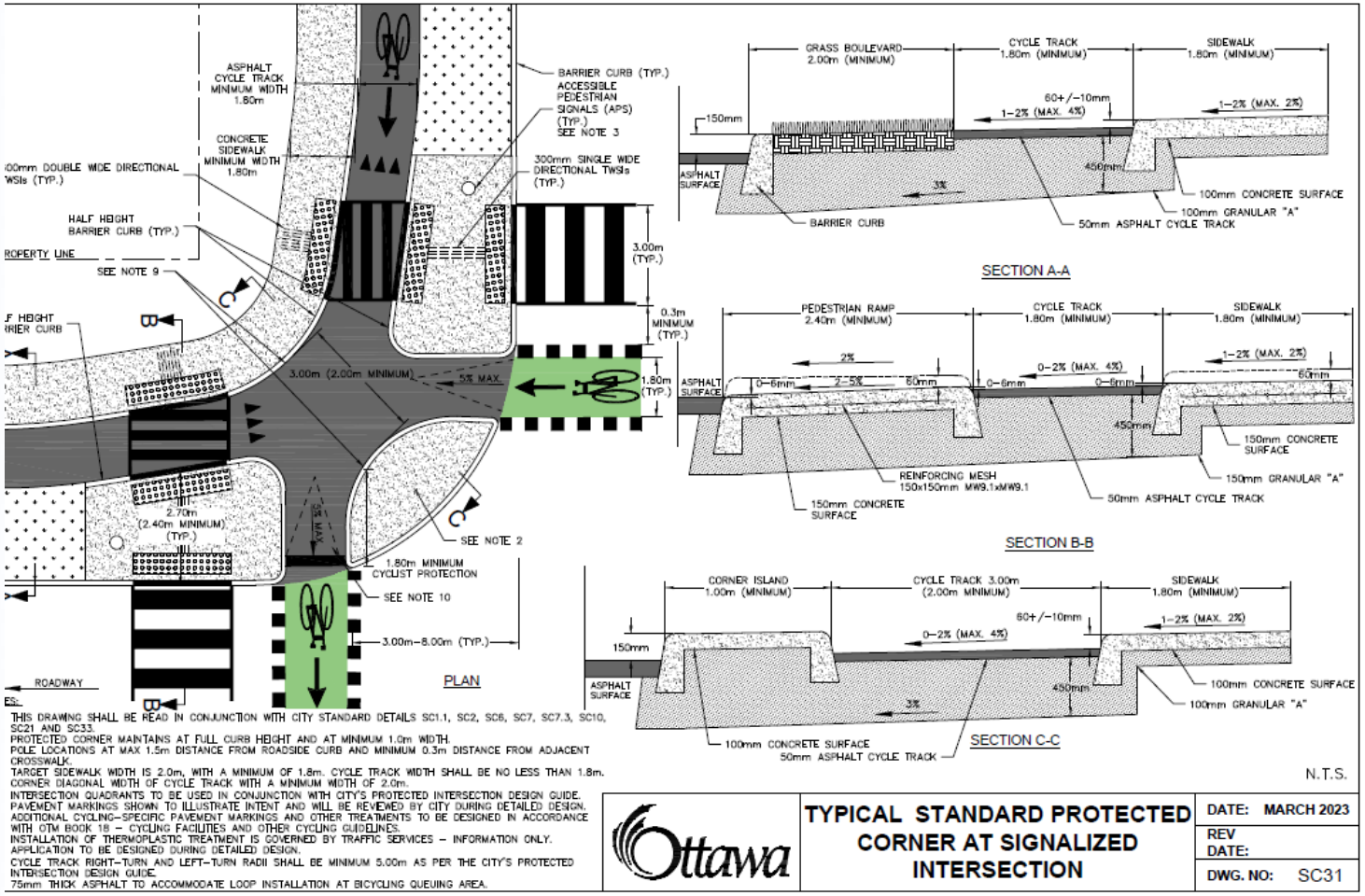
- 2022 TAC Mobility Achievement Award
- 2022 OTC Project of the Year Award

Feedback Loop – Refine Standards:

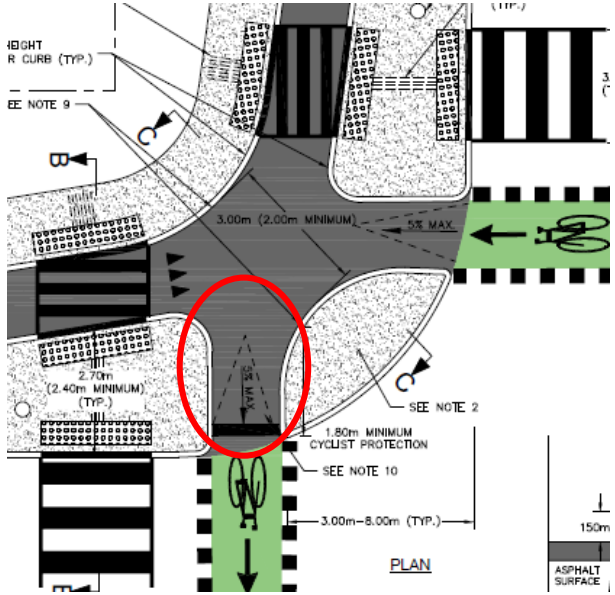
(2022-2024)

- Standard detail drawings
- Ontario Traffic Council's Protected Intersection Guide – **now available**!

  (https://otc.org)



Challenges Remain...



- $$$ Cost for…
  - standalone cycling projects
  - projects in constrained right-of-way
  - property requirements
- Capacity limits for cycling volumes
- Adaptation/capacity building associated with design, operations, and eventually renewal
- Viability of projects where protected signal phasing and 95th percentile queue storage is required

Thank You!