24 September 2020

To: All holders of the *City of Ottawa Accessibility Design Standards*

Subject: TECHNICAL BULLETIN ISTB-2020-03

Revisions to *City of Ottawa Accessibility Design Standards, Second Edition* dated November 2015

This *Technical Bulletin* is being issued to incorporate a new Appendix 7.8 to the *City of Ottawa Accessibility Design Standards* to provide interim guidance and direction on the design and installation of accessibility measures where a cycle track or multi-use pathway approaches an intersection. This guidance applies to cycling facilities that are adjacent to, and at the same grade as, pedestrian facilities.

Please note these are interim solutions until further standards and guidelines are developed by the City.

Specifically, the criteria related to the following are presented and have been incorporated:

- Delineation between the Sidewalk and Cycle Track;
- Application of Tactile Walking Surface Indicators (TWSIs);
- Other Required Accessibility Measures;
- Straight Path of Travel;
- Consistency;
- Optional Accessibility Measures;
- Accessibility Measures at Multi-Use Pathways (MUPs) Approaching a Signalized Intersection;
- Reverse Protected Intersections;
- Sketches – Accessibility Measures at Intersections with Cycle Tracks;
- Negotiating the Right-of-Way; and
- Next Steps.

For more information, please contact Mr. Emmett Proulx, P.Eng., Engineer, Design Review and Implementation, Transportation Services at (613) 580-2400 ext. 27737 or emmett.proulx@ottawa.ca or Ms. Anna Valiant, P.Eng., Senior Engineer, Guidelines and Standards, Infrastructure Services at (613) 580-2424 ext. 16904 or anna.valliant@ottawa.ca.

Yours truly,

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24 September 2020

TECHNICAL BULLETIN ISTB-2020-03

The document entitled *City of Ottawa Accessibility Design Standards, Version 2.0 dated November 2015* is amended by the addition of the enclosed new Appendix 7.8 entitled *Interim Guidance for Accessibility Measures in the Presence of Cycling Infrastructure*.

End of Technical Bulletin ISTB-2020-03

Accessibility Measures at Intersections with Cycle Tracks

7.8

Background

Consistent with the City of Ottawa *Accessibility Design Standards* (COADS), an accessibility lens should be applied to all projects within City of Ottawa right-of-way. The application of the COADS is mandatory for all new construction and redevelopment of City-owned spaces and infrastructure, including roadways.

The purpose of this document is to clarify the COADS by providing interim guidance on the design and installation of accessibility measures where a cycle track or multi-use pathway (MUP) approaches an intersection. The guidance applies to cycling facilities that are adjacent to, and at the same grade as, pedestrian facilities. It generally does not apply to, or is not specifically intended for, on-road bicycle lanes or other designs where there is a vertical separation or curb between the cycling facility and the pedestrian facility.

The document consists of the interim guidance and the following appendices:

- Appendix 7.8A: Sketches – Accessibility Measures at Intersections with Cycle Tracks
- Appendix 7.8B: Negotiating the Right-of-Way (general information on how pedestrians with vision loss negotiate a road right-of-way)

As noted, this document is intended as interim guidance and is therefore to be used only until further “ultimate” guidance is provided from the City. Further guidance on accessibility measures where cycle tracks are adjacent to sidewalks is to be developed throughout the remainder of 2020. It is likely that accessibility guidance as it relates to cycling infrastructure will continue to evolve in subsequent years.

Delineation between the Sidewalk and Cycle Track

In recent years it has become common practice in Ottawa to build off-road cycling facilities (cycle tracks) directly adjacent to, and at the same grade as, pedestrian facilities. In this configuration, the two modes are typically separated by a tactile delineator strip made up of tactile (i.e. protruding bars) paving tiles placed in an alternating pattern, see Figure 1.

Figure 1 – Asphalt cycle track separated from a concrete sidewalk by a tactile delineator strip.

The intent of the delineator strip is to be detectable by those with vision loss such that users can determine the edge of the sidewalk and not stray into the cycle track. The delineation strip material (i.e. ribbed tactile tiles in an alternating pattern) was chosen in 2015 as part of the Main Street complete street project, with consideration for various factors including safety, accessibility, cost, maintainability, and constructability. However, during subsequent consultations with CNIB, City staff have learned that this tactile delineation is not reliably detectable or understood by those with visual impairments and therefore does not reliably keep users from straying into the cycle track.

It is recognized that improved methods of delineation between cycling and pedestrian facilities are needed. It is also recognized that additional research and consultation is required to finalize accessibility guidance. Throughout the remainder of 2020, the City will examine various delineation techniques including vertical separation, curbs, and at-grade delineation methods, as well as the use of directional or positive guidance tactile pavers. This project will include consultation with a wide array of City and accessibility stakeholders.

In the meantime, the following is recommended with regards to delineation between cycling and pedestrian facilities at the same grade:

- The current delineation practice of providing a strip of tactile paving tiles placed in an alternating pattern should continue.

- The delineator tiles (typically 20cm wide) should be applied in double (40cm) or triple (60cm) wide alternating rows to increase their effectiveness. These wider delineation widths (40cm to 60cm) are particularly encouraged where deviations in the pedestrian path of travel mean pedestrians may intersect with delineation at oblique or perpendicular angles.

- The width of the delineation should be considered as a separate cross-section element and should not be included within the minimum widths of the adjacent sidewalk and cycle track.

- The use of landscaped buffer space between the cycle track and sidewalk is potentially a lower-cost alternative to the tactile delineation strip. However, such a landscape buffer space is generally not supported by the City's Roads Services as it does not allow for

winter maintenance operations to be completed in an efficient manner. The use of a landscape buffer space between a cycle track and a sidewalk must be approved by Roads Services prior to implementation, especially if there is an expectation or a requirement that the cycling facility is to be winter maintained at any point in the future.

Note that where multi-year construction contracts are anticipated, it may be advantageous to delay delineator installation until as late as possible, at which point additional guidance on delineation methods may be available.

Tactile Walking Surface Indicators (TWSIs)

Tactile Walking Surface Indicators (TWSIs), also known as detectable warning surfaces or tactile attention indicators, are standardized walking surfaces that convey information to people impacted by vision loss through texture and, occasionally, sound (per *Clearing Our Path* by the CNIB). There are two types of TWSIs – attention TWSIs and directional TWSIs. Currently, attention TWSIs are much more commonly implemented within City right-of-way whereas directional TWSIs are rarely utilized. Attention TWSIs are used to alert those with vision loss of a hazard such as a flight of stairs, a transit platform edge, or a roadway. Per the City of Ottawa *Accessibility Design Standards* (COADS), "where a pedestrian route crosses or joins a vehicular route and the walking surfaces are not separated by curbs, railings or other elements between the pedestrian and vehicular areas, [attention] TWSIs are to be provided continuous along the full length of the crossing boundary". For additional information on attention TWSIs refer to the COADS and City of Ottawa *Standard Tender Documents for Unit Price Contracts* F-3512: Tactile Walking Surface Indicators and standard detail SC7.3: TWSI Detail.

Recently, it has been determined that guidance is required for the placement and provision of attention TWSIs at intersections with cycle tracks at the same grade as pedestrian facilities. Specifically, to address the potential for pedestrians with vision loss who have strayed into the cycle track (because of inadequate delineation) to enter the roadway without encountering an attention TWSI at the depressed curb.

The placement of TWSIs in these situations has been discussed with internal city stakeholders, orientation and mobility specialists from CNIB (Vision Loss Rehabilitation Ontario), and an external accessibility consultant (refer to Appendix 7.8B for general information provided by the consultant on how people with vision loss negotiate a road right-of-way). Guidance was also sought from Legal staff. The resulting interpretation of TWSI requirements at intersections with cycle tracks and MUPs is as follows:

1. **Provide TWSIs** at depressed curbs where a dedicated pedestrian facility such as a sidewalk meets the roadway, typically (but not always) where a crosswalk is provided. For TWSIs provided at depressed corners the TWSI should be applied along the entire length of the depressed curb (not just in front of the crosswalks), however TWSIs at depressed corners should be provided in two parts with a 300mm (+/- 50mm) space provided between the two TWSI plates per the current standard. Examination of removal of this spacing will be undertaken as part of the 2021 spec updates.

2. **Provide TWSIs** at depressed curbs where a cycling facility such as a cycle track and a pedestrian sidewalk meet the roadway at the same location and the cycling facility is

directly adjacent to and at the same grade as the pedestrian facility, typically (but not always) where a crossride is provided.

3. **TWSIs are <u>NOT</u> required** across the cycle track if…
    a. a cycling facility is directly adjacent to and at the same grade as a pedestrian facility mid-block,
    b. the cycling facility ramps-down to road-level prior to the intersection, and
    c. no depressed curb is provided between the road-level protected cycling facility and the roadway.

    It is expected that, given the design features listed above (refer to Appendix 7.8A-3 and Appendix 7.8A-5 schematic examples), various contextual and detectable features (including the full-height curb that develops between the sidewalk and road-level cycle track, the adjacent pedestrian curb ramps or depressed corner, and the full-height corner island) will be sufficient to alert pedestrians with vision loss that they are walking within the cycle track before they reach the roadway.

4. **Provide TWSIs** at depressed curbs where a MUP meets the road at an unsignalized intersection, typically where a mixed crossride is provided.

5. **Provide TWSIs** at designated pedestrian crossings of the cycle track (i.e. where crosswalks are provided to cross the cycle track). Under the *Highway Traffic Act*, cyclists are considered vehicles. As such, attention TWSIs are required to warn those with vision loss of the vehicular path of travel (cycle track).

Sketches depicting the provision of TWSIs are provided in the following scenarios:

- An unconstrained protected intersection corner with straight pedestrian path of travel (Appendix 7.8A-1),
- An unconstrained protected intersection corner with a deviation in the pedestrian path of travel (Appendix 7.8A-2), and,
- A constrained protected intersection corner (Appendix 7.8A-3).

Note that the term “unconstrained” as used in the descriptions of the Appendix A7.8-1 and Appendix 7.8A-2 scenarios above refers to a corner with sufficient space at each pedestrian crossing to provide a pedestrian waiting area that is ≥2.7m long (per current City of Ottawa practice) between the cycle track and the roadway edge. The term “unconstrained” does not literally mean the corner is completely free of all constraints.

Conversely, the term “constrained” as used in the description of Appendix 7.8A-3 above refers to a corner that does not have sufficient space to provide a pedestrian waiting area that is ≥2.7m long. The “constrained” design depicted in Appendix 7.8A-3 does not necessarily represent the maximum space constraints possible at a signalized protected intersection corner. It is up to the individual practitioner to apply the guidance provided within this document to constrained intersections and potentially consider other design alternatives (e.g. two-stage left-turn queue boxes) if space limitations prevent the implementation of a constrained protected intersection corner in an accessible manner.

Also note that these sketches only provide a diagrammatic depiction of accessibility measures and are not intended to accurately show all geometric and pavement marking requirements at the intersection.

Other Required Accessibility Measures

This section is intended to highlight other notable, required accessibility measures as detailed in the City of Ottawa *Accessibility Design Standards* (COADS). The COADS incorporates the provincial accessibility requirements detailed in O. Reg. 191/11: Integrated Accessibility Standards Regulation (IASR) under *Accessibility for Ontarians with Disabilities Act* (AODA). This section is not a complete summary, and practitioners should refer directly to the COADS and the IASR for a more fulsome review of accessibility standards.

- The alignment of curb ramps or depressed curbs with the direction of travel (e.g., the crosswalk) and curb ramp or depressed curb on the opposite side of the roadway is required (per 80.26.1/80.27.1.2 of IASR and 3.4.1.b of COADS). This helps users orient themselves, allows someone to maintain a straight path of travel through the intersection and find the curb ramp or depressed curb on the opposing side of the roadway.

- The provision of flared sides where curb ramps are provided (as opposed to depressed corners) per 3.4.4 of COADS. Feedback received from the accessibility community indicates that flared sides help to further orient those with vision loss towards the crosswalk. Currently, the standard City approach is provision of depressed corners. Provision of two separated curb ramps at a corner where no boulevard is present is considered a deviation and subject to the associated deviation process. Creation or adaptation of the current Ontario Provincial Standard Drawing (OPSD 310.033) for two separated curb ramps at a corner without a boulevard will be evaluated as part of the 2021 spec updates.

- The provision of accessible pedestrian signals (APS) per Section 3.5 of COADS. In terms of lateral placement, COADS includes the following requirements:
    - APS assemblies must be installed within 1500mm of the edge of the curb.
        - In constrained intersections with cycle tracks, where there is insufficient space for a pedestrian staging area between the cycle track and the roadway (refer to Appendix 7.8A-2 and 7.8A-4), it is recommended that a curb be developed between the sidewalk and the cycle track and the APS assembly installed within 1500mm of the edge of this curb.
    - Where two APS assemblies are installed on the same corner, they must be installed a minimum of 3000mm apart.
    - Where two APS assemblies cannot be installed 3000 mm (minimum) apart because of site constraints or existing infrastructure, they can be installed on a single post and must include a verbal announcement clearly stating which crossing is active.

  Note that all City of Ottawa traffic signal design will be completed by the Traffic Signal Design & Coordination Unit.

Straight Path of Travel

A common and generally desirable feature of intersections with cycle tracks or MUPs are off-set crossings (i.e. where bicycle and pedestrians crossings are off-set by approximately a car-length from the vehicle lanes). Off-set crossings often require deviations in the pedestrian path of travel as the bicycle and pedestrian facilities are realigned from their mid-block position to their off-set crossing position at the intersection. Sharp or sudden deviations make it more difficult for pedestrians with vision loss to detect the delineation and follow the pedestrian path of travel (refer to Appendix 7.8B for additional general information on how those with vision loss navigate the right-of-way).

Given this understanding, the City endeavored to understand existing accessibility requirements with respect to straight path of travel and how these requirements should be applied to intersections with cycle tracks or MUPs. Guidance on the issue was once again sought from Legal staff. Interpretation of the IASR under AODA and COADS is summarized as follows:

- It is possible to infer from the provisions of the IASR and the ADS that there is an implied notion that pedestrians should be able to maintain their direction of travel. However, there is a lack of specific criteria and guidelines in both the IASR and the ADS with respect to straight path of travel. COADS and the IASR do not currently provide sufficient design guidance and specifications that clearly identify when diverting pedestrians from a straight path of travel may become a barrier to accessibility.

- Looking at the broader underlying principles and objectives of accessibility legislation, the mandate of COADS and the principles underlying the Ontario *Human Rights Code* require the City to design exterior paths of travel that can be used by all people to the greatest extent possible.

Based on the above, it is recommended that bends and tapers should be avoided or minimized on the approach to the intersection to simplify intersection navigation for those with visual impairments. If feasible, maintain the sidewalk at the edge of the right-of-way within mid-block segments so that deviations are not required to achieve off-set crossings at the intersections.

Consistency

The pedestrian experience at intersections should be designed consistently within a given corridor and the pedestrian experience at each of the intersection corners should be designed consistently within a given intersection. Consistency greatly contributes to user safety, and it enables people with vision loss and cognitive impairments to more easily anticipate the corner design, the path of travel for pedestrians and cyclists, the location of the APS signal post, the location of the TWSI, the meaning of the delineators, and where they are supposed to wait – whether they are using a long white cane or a guide dog.

However, it must be noted that this does not necessarily mean that constrained and unconstrained corners cannot be mixed within a corridor or within an intersection.

Unconstrained corners are generally preferred if space permits their accessible implementation (even if another corner within the same intersection requires a constrained design).

Optional Accessibility Measures

The following are additional accessibility measures that are recommended (or discouraged) as best practices but are not required per COADS (or AODA):

- The use of zebra stripe crossings (or ladder crossings) along crosswalks in intersections is helpful to many with low vision. The implementation of this crosswalk type is strongly encouraged from an accessibility standpoint, subject to other considerations/warrants associated with their implementation.

- Avoid the use of pavers near intersections or otherwise near TWSIs or delineators (for low vision pedestrians, particularly cane users, it is difficult to differentiate between a paver and other tactile accessibility measures).

- Avoid the use of depressed corners. For a graphic depicting a depressed corner see Figure 35 on page 78 of COADS. For more information on why depressed corners should be avoided see the note on page 75 of COADS. As previously mentioned, the standard City approach is provision of depressed corners. Provision of two separated curb ramps at a corner where no boulevard is present is considered a deviation and subject to the associated deviation process.

- Experimentation with directional TWSIs is not recommended until City completes a full review of this design element.

Accessibility Measures at Multi-Use Pathways (MUPs) Approaching a Signalized Intersection

Where MUPs approach signalized intersections, the path is split into separate sidewalks and cycle tracks. Where a MUP splits into a separate cycle track and sidewalk the consistent and appropriate application of accessibility measures is important. Special attention should be paid to minimizing deviations in the pedestrian path of travel, and, when lateral shifts of the pedestrian path of travel are necessary, providing a gradual shift is preferred to abrupt transitions.

Where a MUP splits into a separate cycle track and sidewalk, the MUP and sidewalk should have a consistent alignment (i.e. straight path of travel for the pedestrian) and the cycle track should deviate from that alignment. Provide delineation between the cycle track and the MUP as soon as the cycle track begins to deviate away from the alignment of the MUP/sidewalk. An asphalt surface and a dashed yellow centreline is recommended at the split.

Sketches depicting the provision of accessibility measures at MUPs approaching a signalized intersection are provided in the following scenarios:

- An unconstrained scenario (Appendix 7.8A-4), and,
- a constrained scenario (Appendix 7.8A-5).

As previously mentioned, the term “unconstrained” is meant to refer to a corner with enough space at each pedestrian crossing to provide a pedestrian waiting area that is ≥2.7m long between the cycle track and the roadway edge. While the term “constrained” is used to refer to a corner that does not have enough space to provide a pedestrian waiting area that is ≥2.7m long.

Note that these sketches only provide a diagrammatic depiction of accessibility measures and are not intended to accurately show all geometric and pavement marking requirements at the intersection.

Reverse Protected Intersections

In developing the design at the intersection, the context of the surrounding area should be considered and if conflicts preclude the accessible design of a conventional protected intersection, implementing a reverse design whereby the pedestrian crossing is in advance of the cycling facility could be considered.

Next steps

The annual update to the *Standard Tender Documents for Unit Price Contracts* kicks off in the fall of 2020 with a call for volunteers and issues and culminates in March of 2021. As noted, the spec update will examine creation of a standard showing curb ramps at corners with no boulevards, review of separation between TWSI plates at corners, and potential incorporation of delineator standards.

In developing further guidance on accessibility measures, staff will be examining various delineation techniques including vertical separation, curbs, at-grade delineation methods, and the use of directional or positive guidance tactile pavers. This undertaking is anticipated to be part of a project to further develop design guidance on the functional design of protected intersections under a variety of different contexts. The project will include consultation with a wide array of City and accessibility stakeholders.

For questions and inquiries regarding the application of the guidance provided herein to projects or initiatives managed by the Transportation Services Department, please contact Mr. Emmett Proulx, P.Eng., Engineer, Design Review and Implementation, Transportation Engineering Services at (613) 580-2400 ext. 27737 or emmett.proulx@ottawa.ca

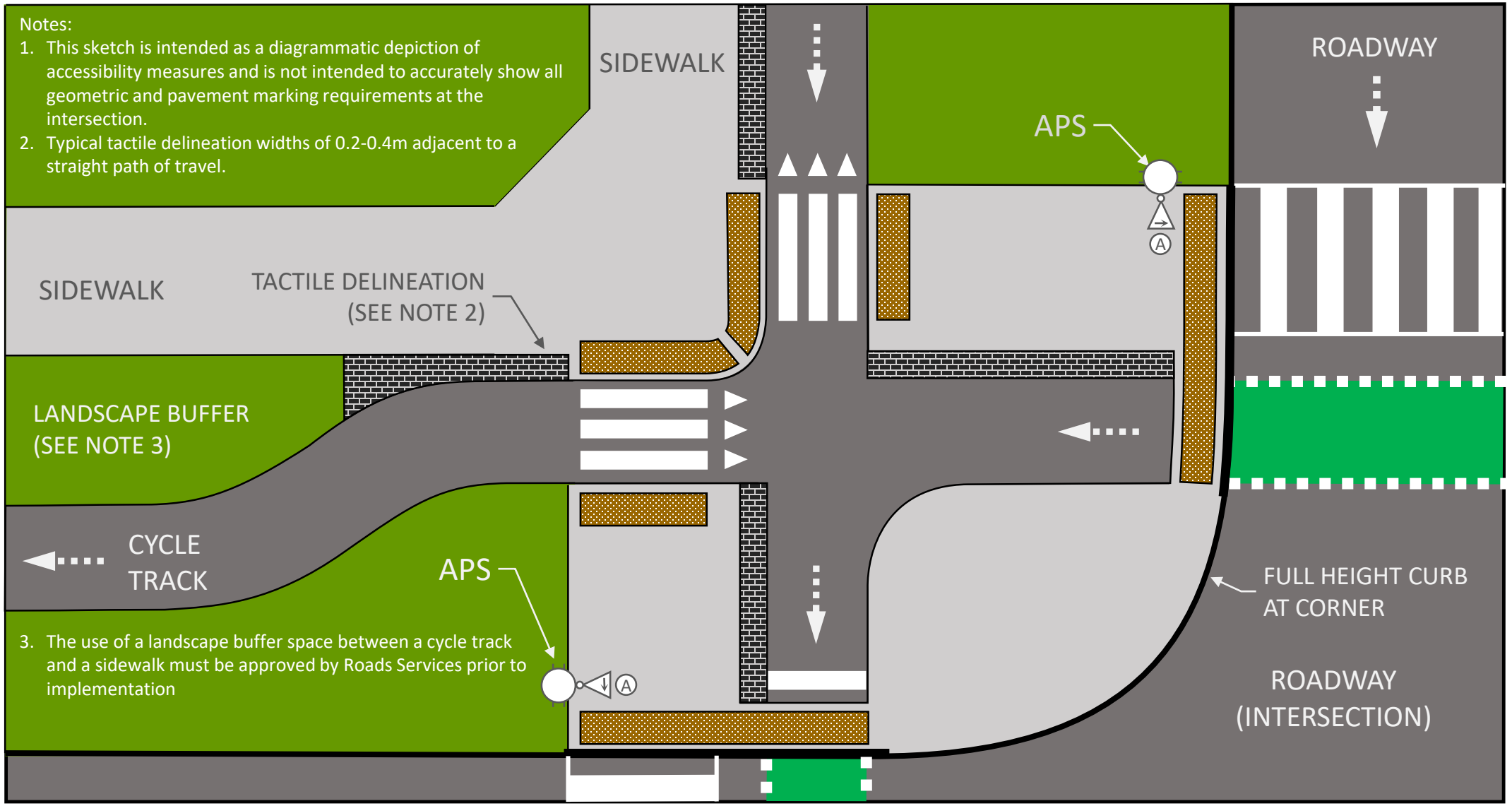
For questions or inquiries regarding the application of the guidance provided herein to projects or initiatives managed by the Planning, Infrastructure & Economic Development Department, please contact Ms. Anna Valiant, P.Eng., Senior Engineer, Guidelines and Standards at (613) 580-2424 ext. 16904 or anna.valliant@ottawa.ca

7.8A

Sketches – Accessibility Measures at Intersections with Cycle Tracks

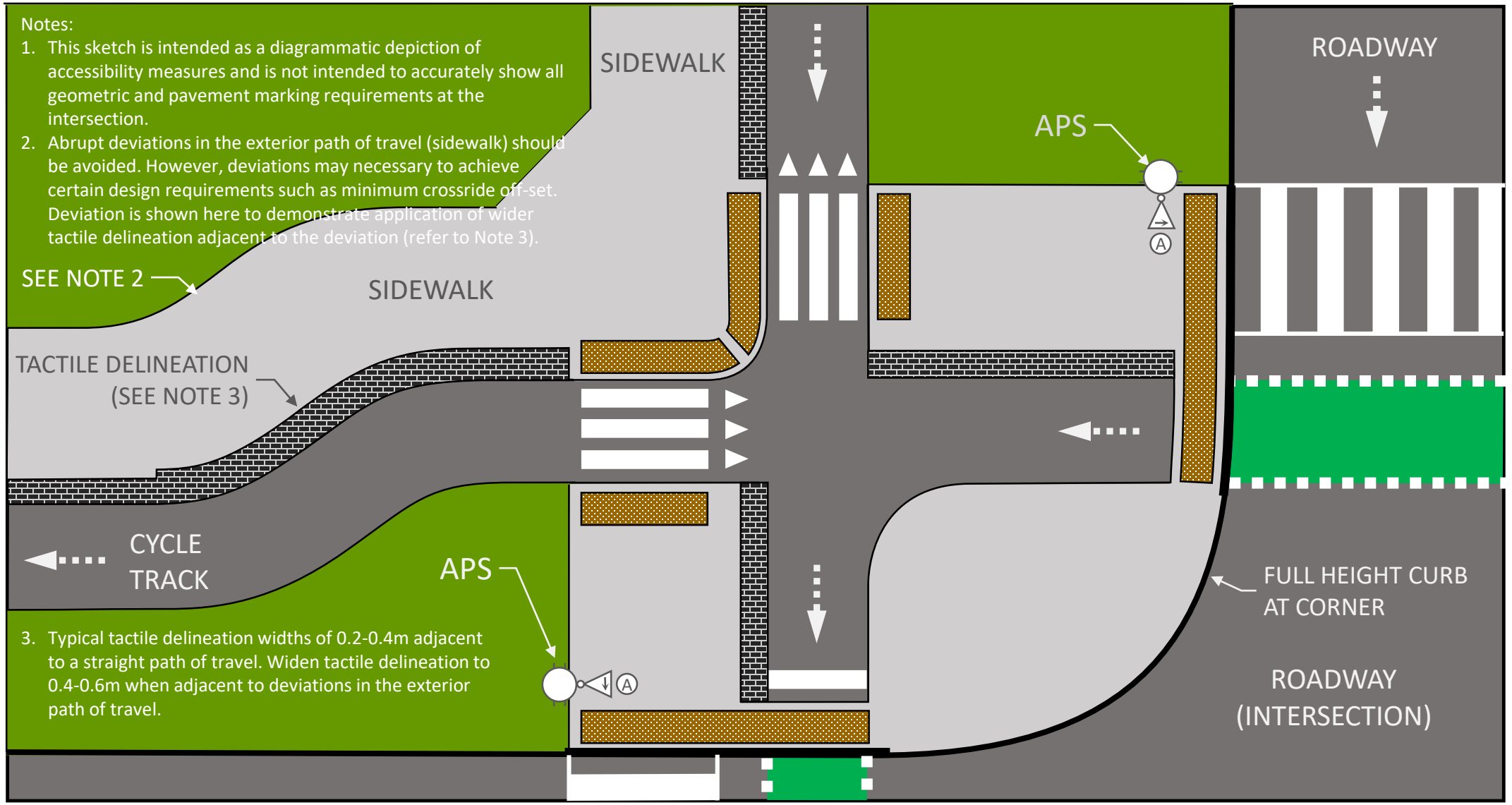
Appendix 7.8A-1: Unconstrained* (Option 1)

* Unconstrained refers to a corner with enough space at each pedestrian crossing to provide a pedestrian waiting area that is ≥2.7m long between the cycle track and the roadway edge.



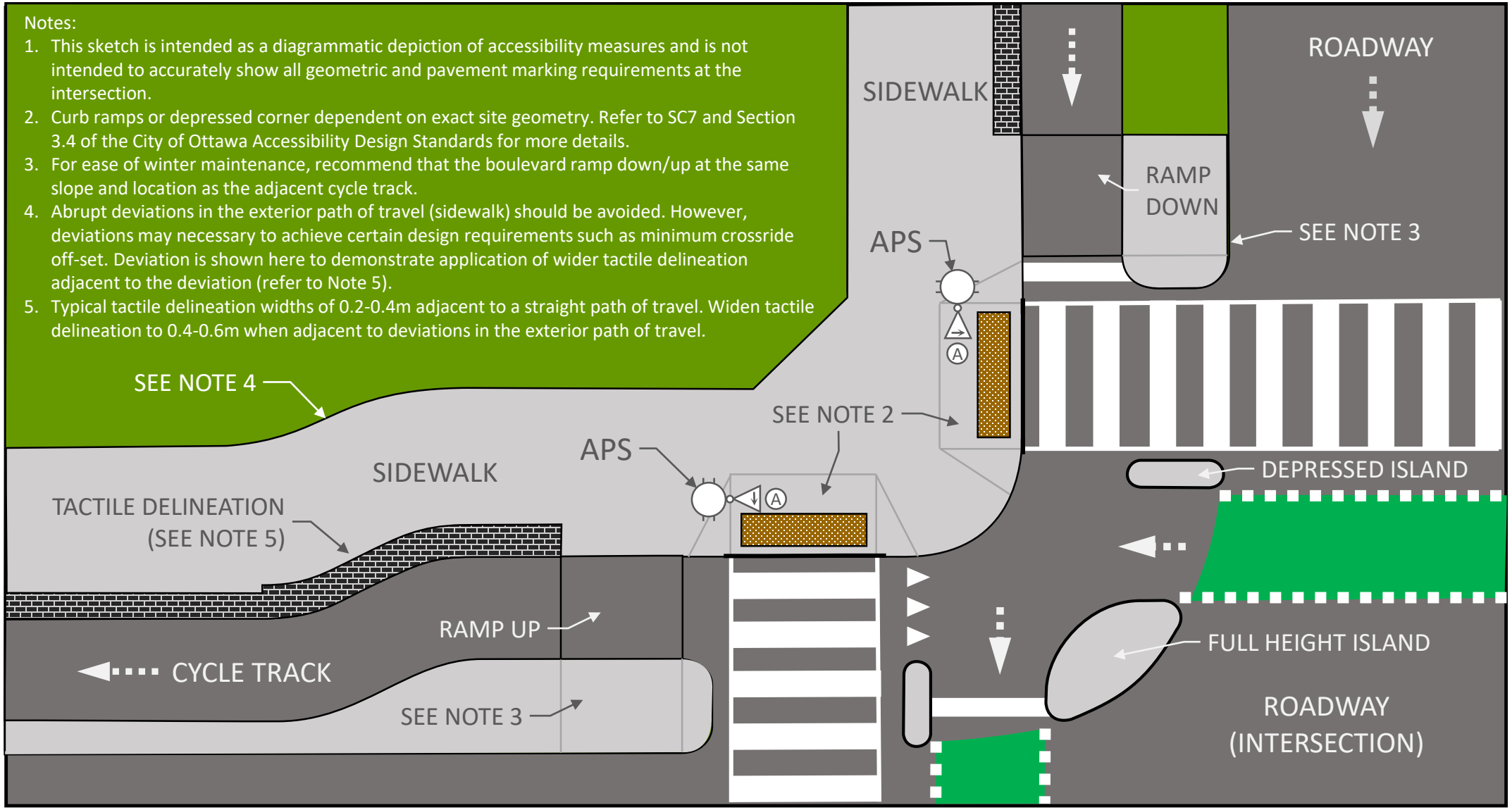
Appendix 7.8A-2: Unconstrained* (Option 2)

* Unconstrained refers to a corner with enough space at each pedestrian crossing to provide a pedestrian waiting area that is ≥2.7m long between the cycle track and the roadway edge.



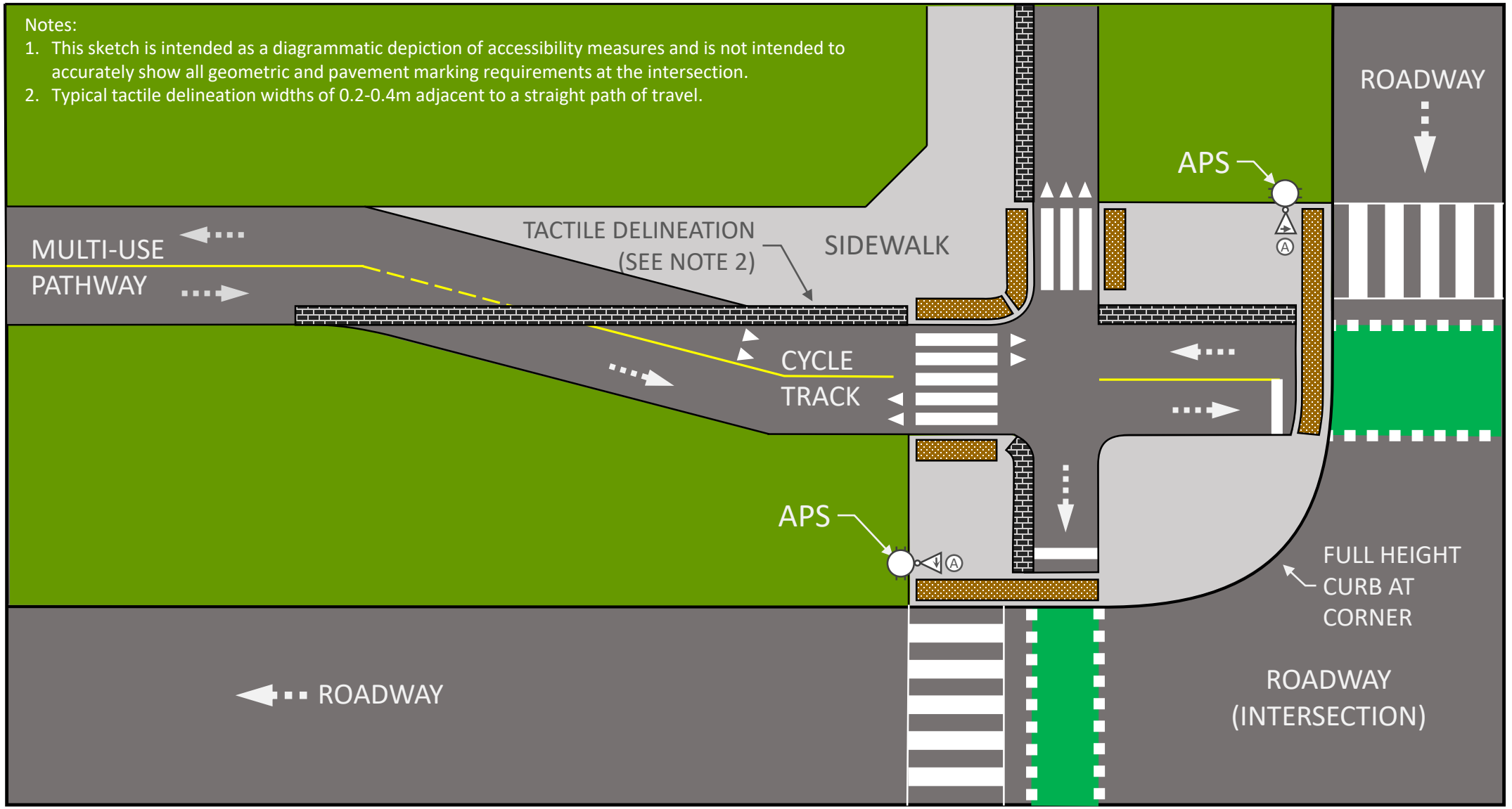
Appendix 7.8A-3: Constrained*

* Constrained refers to a corner that does not have enough space to provide a pedestrian waiting area that is ≥ 2.7m long between the cycle track and the roadway edge.



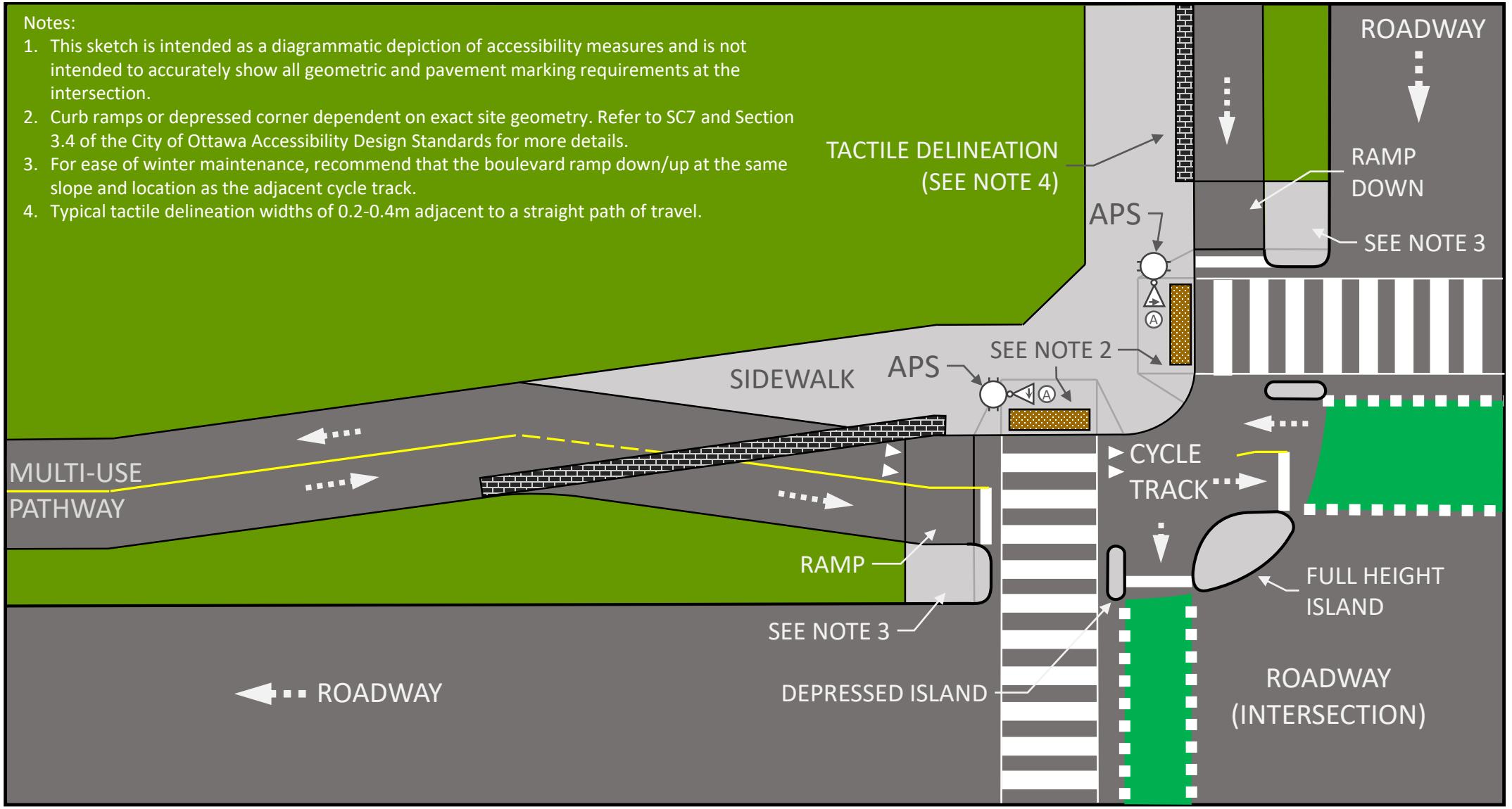
Appendix 7.8A-4: MUP Transition, Unconstrained*

* Unconstrained refers to a corner with enough space at each pedestrian crossing to provide a pedestrian waiting area that is ≥2.7m long between the cycle track and the roadway edge.



Appendix 7.8A-5: MUP Transition, Constrained*

* Constrained refers to a corner that does not have enough space to provide a pedestrian waiting area that is ≥ 2.7m long between the cycle track and the roadway edge.



7.8B

Negotiating the Right-of-Way

NEGOTIATING THE RIGHT-OF-WAY

General information on how pedestrians with vision loss negotiate a road right-of-way. This guidance was provided to the City of Ottawa by Marnie Peters, accessibility consultant and President of Accessibility Simplified.

GENERAL INFO about TWSI

- The **primary** purpose of an Attention TWSI (truncated domes), is to indicate a hazard, – that the pedestrian is to proceed with caution. Attention TWSIs do not serve to indicate where to cross, the TWSI **can** help with orientation, but as a **secondary** purpose.
- Only people with at least some visual acuity can see a TWSI.
- People with no vision at all rely on its tactile features to be able to detect using a long white cane and/or underfoot.
- People use TWSI as one of many cues about where they are located within the built environment, and people using a long white cane are more likely to detect it sufficiently because of the tapping or sweeping of the cane in a full arc motion in front of them. People with total or substantial vision loss who are using a guide dog will only find the TWSI if they walk on it and are able to detect it underfoot.

GENERAL INFO about DELINEATORS

- The delineator that is currently being used by the City of Ottawa does not provide sufficient colour contrast to be visually detectable by most people with vision loss, even people with some vision.
- The effectiveness of colour contrast depends on there being sufficient light for users to be able to perceive the difference in colour, and the term “luminance contrast” is increasingly being used in international standards for accessibility. ISO 23599 - Assistive products for blind and vision-impaired persons — Tactile walking surface indicators, requires a 70% contrast between adjacent surfaces to be considered an appropriate contrast for people with low vision. This will be examined as part of the creation of the Protected Intersection Design Guide.
- A 0.20 m delineator of the current product design is not sufficiently wide to be of use to a person with vision loss, it needs to be wider, first to detect and secondly, then determine that it has meaning. This will be examined as part of the creation of the Protected Intersection Design Guide.
- The current delineator is to be applied in the interim.
- A delineator of 0.40 m or 0.60 m provides a greater opportunity for a person to recognized using a long white cane and/or underfoot that they are detecting/walking on a different surface from the traditional smooth path of travel, (whether it is concrete or asphalt).

USING A GUIDE DOG

- TWSIs have little to no meaning to dogs - all it means it is a different walking surface.
- A 0.20 m delineator has no meaning to a dog, it is not a trip hazard, and it will not indicate to them that they need to change direction.
- Guide dogs are very smart, but they are trained based on repeating tasks over and over again, based on a consistent approach to specific tasks. They have the approximate intelligence of a 2 to 3-year-old child.
- For example, a guide dog will find the post with the APS, because that's what dogs are trained to do, even if it means walking straight across a cycle path.
- Dogs cannot rationalize a design as they approach it (as a sighted person would); they are not capable of rational and reasonable thought processes. They cannot figure out what to do when they approach an intersection and it has a different design than the last one. They can only do what they are trained to do, over and over again, which is why consistency in design is so important.

USING A LONG WHITE CANE

- People with vision loss try to find the edge of the surface that they are supposed to be walking on, so that they can be walking on the right side of the path of travel. They do this by swing their long white cane from side to side, shoulder width apart, in an arc motion as they proceed forward. Some people always have the tip of their cane on the ground, and some people only tap intermittently, such as in a pattern of Left- Centre –Right – Centre – Left, etc. in an arc motion.
- A 0.20 m wide delineator is not sufficiently wide for a person using a long white cane to consistently recognize that they have tapped on the alternating ribbed delineators currently being used.
- A person using a long white cane, without a dog, will anticipate that the APS is located near a TWSI that is nearby the road. Deviation from this design makes it harder for them to find it, and they do not have a dog to rely on. If it is not there, they have to tap around, maybe back track over the cycle path again, and find the correct post (choosing between the light standard, the bike signal post, the telephone post, the street lamp, the APS signal post if it’s not on one of the other posts) - and that is a wasted time in their life they will never get back, because they spent it looking for a post.
- As bicycles are considered vehicles under the *Highway Traffic Act* (HTA), pedestrians require a warning when crossing a cycle track that they are crossing a vehicular route and/or a contrary path of travel that could pose a hazardous situation. The TWSI (on each side of the cycle track) serves as the warning.