Charlotte Department of Transportation
Engineering and Operations Division

Pavement Marking Design Guidelines
Supplemental Details for Bicycle Markings

August 2023

Purpose
The purpose of this supplement is to establish consistent use of green pavement markings and other ancillary bicycle-related pavement markings throughout the City of Charlotte. This supplement replaces and supersedes Technical Memorandum 17-01, "Green Pavement Markings for Bicycle Facilities."

Limitations/Restrictions

1. Usage
   The purpose of this supplement is to provide standards for how to lay out green pavement markings and other ancillary bicycle-related pavement markings. If green markings are used, they shall follow the standards shown herein. However, this supplement is not intended to be a usage guideline of when or if to install green markings. For usage and appropriateness guidance, please see separate guidance from the Charlotte Department of Transportation (CDOT) Bicycle Program and appropriate national guidance such as NACTO *Urban Bikeway Design Guide*, FHWA *Separated Bike Lane Planning and Design Guide*, etc. Example layouts are provided.

2. Applicability
   This supplement does not apply to high-profile shared-use trails such as the Cross-Charlotte Trail, Little Sugar Creek Greenway, and the Rail Trail. These trails have their own design guidance for street crossings. Refer to Technical Memorandum No. 17-02, *Urban Trails Crosswalk Marking Standard*, for the use of green pavement markings where these trails cross streets.

Authority/Administration
The Engineering & Operations Division (E&O) shall be responsible for administering this supplement. E&O shall consult with the Planning & Design and Strategic Mobility Divisions on any necessary changes or interpretations.

Background
The Federal Highway Administration (FHWA) has authorized the use of green pavement markings in three interim approvals to the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD), designated as IA-14, IA-18, and IA-20. Interim approval allows use of these traffic control devices, pending official rulemaking for inclusion in the MUTCD.

- IA-14: Use of green markings
- IA-18: Use of bicycle boxes
- IA-20: Use of 2-stage left-turn boxes

Several experiments were conducted in the US and other countries to determine the value of designating a specific color to indicate a portion of the roadway reserved for use by bicyclists. Based on those studies, green was selected as the preferred color.

CDOT supports using green pavement markings for bicyclists and has received approval from FHWA for its use. The National Association of City Transportation Officials (NACTO) developed the *Urban Bikeway Design Guide* which states that the green pavement marking within a bicycle lane increases the visibility of the facility, identifies potential areas of conflict, and reinforces priority to bicyclists in conflict areas. Green pavement markings can be used as a message for both motorists and bicyclists of a potential conflict in the street. NACTO and FHWA guidance were the basis for many of the sections outlined below.

Green markings are standard on NCDOT facilities per their 2024 *Roadway Standard Drawings*. While generally similar in concept to what is shown in this Supplement, there are some differences, especially with regards to the use of solid green areas and on two-way facilities. Please coordinate with the NCDOT Division 10, District 2 office in Newell during project development.

Definitions
The following are accepted definitions of bicycle facilities:

Bicycle Lane – a portion of the roadway that has been designated by striping, signage, and pavement markings for the exclusive use of bicyclists. It is separated from the adjacent travel lane by a white lane line. It is a one-way facility.

Buffered Bicycle Lane – Buffered bicycle lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. (Definition adapted from NACTO *Urban Bikeway Design Guide*)

Separated Bicycle Lane – Bicycle lanes that are physically separated from traffic and allow bicycle movement in the same direction of traffic on each side of the road. A separated bicycle lane may be combined with a parking lane or other permanent or flexible barrier between the bicycle lane and the motor vehicle travel lane. (Definition adapted from NACTO *Urban Bikeway Design Guide*)

Cycle track – Bicycle facilities that are physically separated from traffic and allow bicycle movement in both directions on one side of the road. A cycle track may be combined with a parking lane or other permanent or flexible barrier between the bicycle lane and the motor vehicle travel lane. Cycle tracks share some of the same design characteristics as separated bicycle lanes but may require additional considerations at driveways and side-street crossings. A cycle track may be configured as a street-level facility or as a raised facility that provides additional vertical separation from the adjacent motor vehicle lane. (Definition adapted from NACTO *Urban Bikeway Design Guide*)

Protected intersection – An intersection where the bicycle facilities are channelized and separated from those of motor vehicles, allowing for separation of movements in time and/or space. Most protected intersections feature raised channelizing islands that provide path deflection to bicyclists and tighter turning radii to drivers.

Shared-use path – A path, located either behind the curb or by itself in its own right-of-way, on which bicyclists and pedestrians share space.

Criteria
Bicycle facilities located in Uptown or on major or minor thoroughfares, as designated by the Comprehensive Transportation Plan are eligible for green pavement markings if at least one criterion below is satisfied. Other streets (non-thoroughfares) may be considered on a case-by-case basis.

The criteria below are divided into two primary categories – Conflict Zones and Wayfinding.

I. Conflict Zones

Conflict zones are locations where larger volumes of motor vehicles and bicyclists are expected to cross paths. Examples include:

- Interchange entrance/exit ramps
- Bicycle facilities crossing the bay or transition taper of exclusive right-turn lanes
  - Intersections
  - Driveways with exclusive right-turn lanes
  - Through lanes that drop as exclusive right-turn lanes
- Bicycle facilities crossing downstream of a channelized right-turn lane
- Cycle tracks crossing streets or driveways
- Bicycle facilities crossing a driveway/street with inadequate sight distance that may prohibit drivers from seeing any approaching bicyclist.
- Protected intersections
- Shared-lane markings, a.k.a. sharrows
- Unique conditions not identified above may be considered for green pavement markings on a case-by-case basis in consultation with the Engineering & Operations Division and the Design Section, per the process defined in Section VI.

II. Wayfinding

Wayfinding is used with signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. Green pavement markings should not be used to transition between an in-street bicycle facility and a bicycle ramp. Examples where green markings may be used include the following:

- To direct bicyclists around obstructions or through large intersections when the context or path is unclear
- To direct bicyclists at transitions between one-way and two-way bicycle facilities
- To direct bicyclists into entries to Bicycle Boxes and Two Stage Bicycle Turn Boxes

Requirements
If the bicycle facility meets at least one of the criteria listed for green pavement marking, then the markings shall follow the guideline listed below.

I. Material and Color of Pavement Marking

CDOT conducted field experiments with green marking materials ranging from paint to thermoplastic. The thermoplastic performed best with respect to skid resistance and durability. Thermoplastic shall be used inside intersections, where there is a high volume of traffic turning across the green facility, and in all cases involving a right-turn lane. Methyl methacrylate (MMA) paint may

be used at locations where durability is not the primary concern, including, but not limited to, unsignalized minor driveways and internal to separated bicycle lanes and cycle tracks.

- Daytime chromaticity and nighttime chromaticity coordinates shall meet the color requirements as prescribed in the MUTCD.
- Green colored pavement should be retroreflective.
- All green marking materials shall minimize loss of traction for bicyclists (see Paragraph 4 of Section 3A.04 of the 2009 MUTCD).
- Green pavement marking products used in the City of Charlotte shall not contain lead or hexavalent chromium. Manufacturers' certifications to this effect shall be provided upon request.

II. Pavement Marking Lengths

Green pavement markings must fill between two white lines that mark the bicycle facilities. Per IA-14, green pavement markings may only be used to supplement other pavement markings and may not be used by themselves. Green pavement markings shall extend the length of the conflict/wayfinding zone and shall have an approach distance and an equal departure distance that extends beyond the conflict/wayfinding zone. The length of the solid green pavement marking is determined by the conflict location and is as follows:

Table 1. Length of Green Pavement Marking

Conflict Location	Length of Solid Green Pavement Marking Approach & Departure Conflict Area*
Intersections	25 ft.
Interchange Ramps	50 ft.

**CDOT Project Engineer may allow minor adjustments on a case-by-case basis*

III. Intersection Markings

Intersection markings will vary with the type of bicycle facility and the type of motor vehicle facility being crossed, as shown in Table 2. This is to elevate motorist's attention of potential bicyclist crossings. Green markings are not typically needed on driveway approaches and departures, or across single-family residential driveways (Type I driveways).

Table 2. Intersection Markings

Type of Bicycle Facility	Type of Motor Vehicle Facility Being Crossed	Type of Marking	Figure Number
In-street standard bicycle lanes and buffered bicycle lanes	Any	None*	N/A
Separated Bicycle Lane (one-way)	Signalized intersection	Green skip	2
	Unsignalized intersection or driveway	None*	N/A
Cycle track (two-way)	Signalized intersection	Crossbike	3A
	Unsignalized intersection or driveway **outside** I-277 loop	Crossbike	10A
	Unsignalized intersection or driveway **inside** I-277 loop	Solid Green	10B

* No markings are inherently necessary in these situations. However, other conditions may exist that warrant the use of green markings, such as the presence of a right-turn lane, bicycle signal, or a location-specific wayfinding need.

IV. Signage

This supplement does not identify signage. It is the designer's responsibility to provide adequate and appropriate signage in conformance with the requirements of the MUTCD and engineering judgement.

Standards and guidelines that could be used in the development of signage packages include, but are not limited to, the following:

- The current version of the MUTCD and any applicable Interim Approvals
- NACTO *Urban Bikeway Design Guide*
- NACTO *Don't Give Up at the Intersection* guide
- Massachusetts DOT *Separated Bike Lane Planning & Design Guide*
- FHWA *Separated Bike Lane Planning & Design Guide*
- AASHTO *Guide for the Development of Bicycle Facilities*

V. Application of the Supplement; Design Exceptions

The details contained in this supplement are intended to cover most scenarios. However, it is acknowledged that design exceptions may be necessary to deal with site-specific conditions. If a design exception is needed, the requester of the design exception shall submit a package that includes the following information for evaluation:

- Concept marking plan, enough to illustrate the proposed design exception. If the concept plan is neat, legible, and clear, it does not have to be developed in CAD. A plan sheet marked up in PDF, an aerial photo, etc., could be acceptable.
- Documentation of why the existing details within this supplement do not address the condition in question.
- Documentation of how the proposed concept would address the condition in question.

The package shall be submitted to the following three people (or their respective designees), who will jointly evaluate the request:

- Design Section Manager
- Implementation Section Manager
- Bicycle & Micromobility Planner

Questions

For information on the technical contents of this supplement, please contact the Deputy Division Manager of the Engineering & Operations Division.

Details

Green Skip Lines and Crossbikes

Green markings at right-turn lanes

Protected intersections and cycle tracks

Bicycle boxes and sharrows

Miscellaneous

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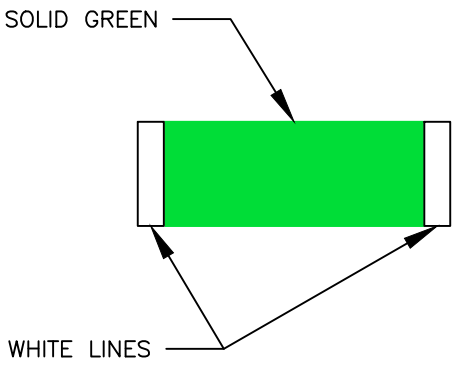
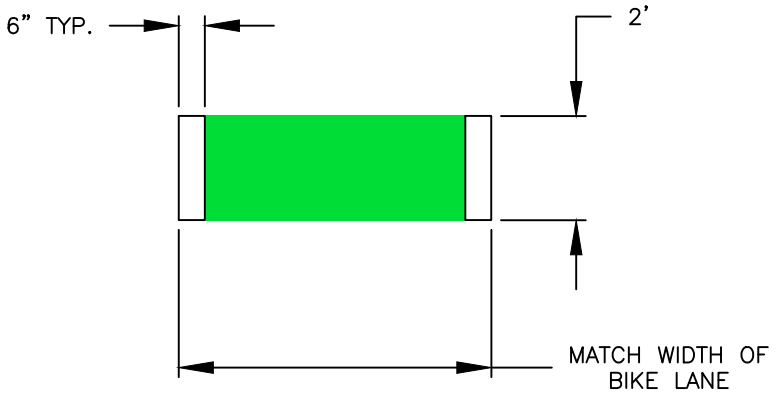
Figure 1. Green Skip Detail

COLOR ARRANGEMENT



DIMENSIONS



NOTES:
1. NOT FOR USE ON TWO-WAY CYCLE TRACKS.
2. DETAIL PROVIDES INFORMATION ON THE COMPONENTS OF A GREEN SKIP LINE ONLY. NOT TO BE USED FOR SPACING, LAYOUT, OR DESIGN. SEE APPROPRIATE FIGURES 2-19 FOR USAGE INFORMATION.

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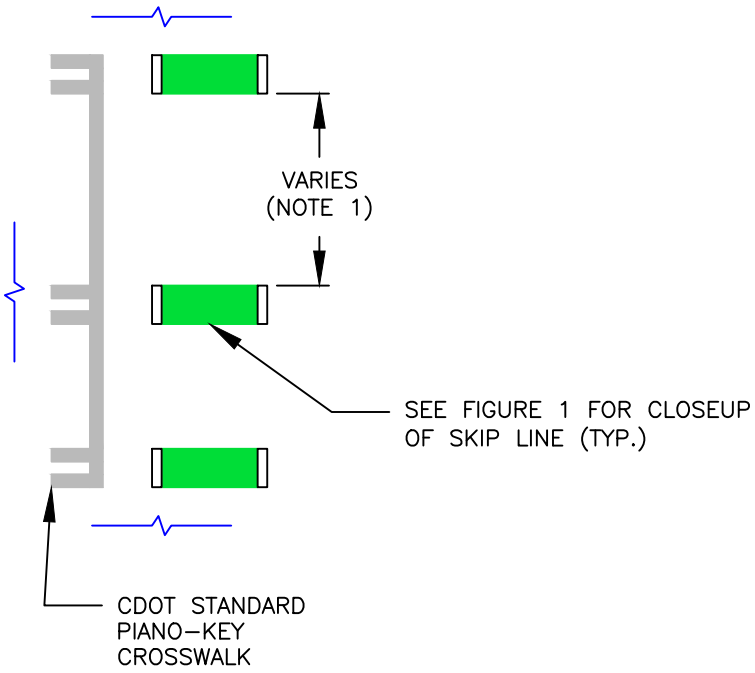
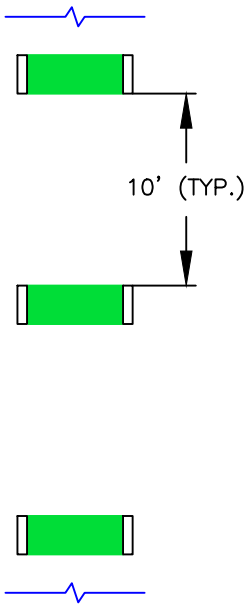
Figure 2. Series of Green Skips Detail

IN INTERSECTIONS AND DOWNSTREAM OF CHANNELIZED RIGHT–TURN LANES



ACROSS BAY TAPERS OF TURN LANES



NOTES:

1. ALIGN GREEN SKIP LINES WITH ADJACENT PIANO KEYS OF CROSSWALK. IF THERE IS NO CROSSWALK, FOLLOW CLDS DETAIL 50.14 FOR LAYOUT.
2. GREEN SKIP LINES DOWNSTREAM OF CHANNELIZED RIGHT–TURN LANES SHALL BE PERPENDICULAR TO THE BIKE FACILITY, RESULTING IN A POTENTIAL SKEW RELATIVE TO THE MOTOR VEHICLE PATH.

BETWEEN FACILITY TRANSITIONS IN INTERSECTIONS (FIGURE 11 ONLY)

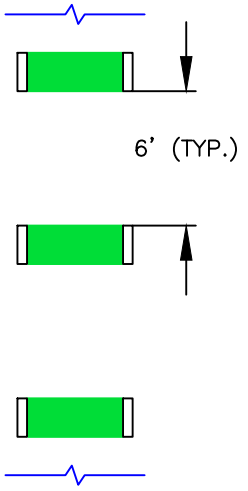


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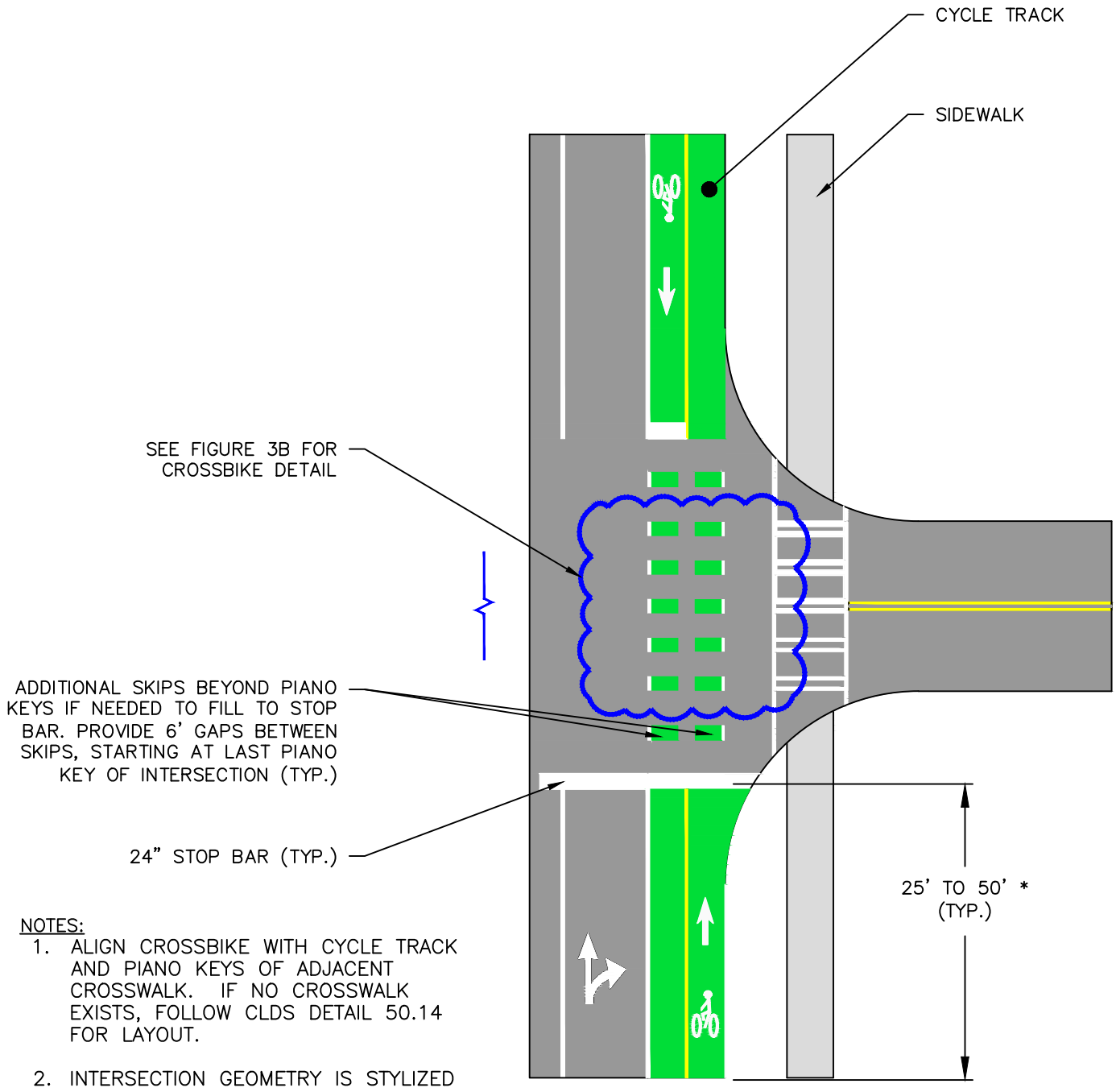
Figure 3A. Crossbike Markings at Intersections/Driveways



NOTES:

1. ALIGN CROSSBIKE WITH CYCLE TRACK AND PIANO KEYS OF ADJACENT CROSSWALK. IF NO CROSSWALK EXISTS, FOLLOW CLDS DETAIL 50.14 FOR LAYOUT.

2. INTERSECTION GEOMETRY IS STYLIZED AND OTHER PAVEMENT MARKINGS SHOWN FOR REFERENCE ONLY. FOLLOW CDOT PAVEMENT MARKING STANDARDS FOR APPROPRIATE MARKING LAYOUTS.

* REFERENCE TABLE 1 ON SHEET 4 FOR LENGTH

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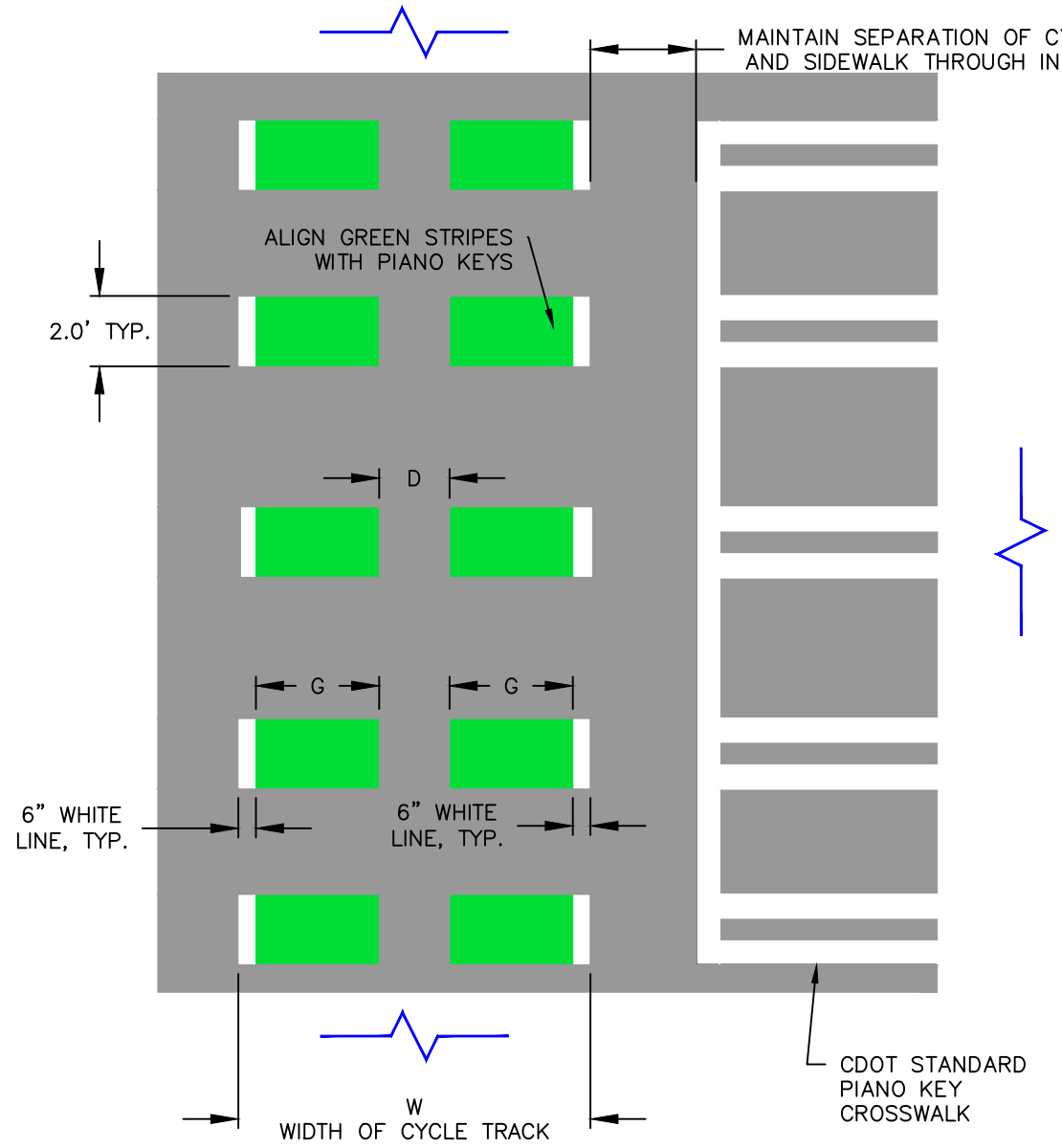
Figure 3B. Crossbike Marking Detail



NOTES:

1. IF W < 10', D = 1'
2. IF W ≥ 10', D = 2'
3. G = (W−D−1)/2
4. W INCLUDES THE WHITE EDGELINE (1 FT. TOTAL)
5. ALIGN CROSSBIKE WITH CYCLETRACK AND PIANO KEYS OF ADJACENT CROSSWALK. IF NO CROSSWALK EXISTS, FOLLOW CLDS DETAIL 50.14 FOR LAYOUT.
6. FOR USE ONLY ON TWO−WAY CYCLE TRACKS.

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Figure 4A. Exclusive Right Turn Lane Example Layout

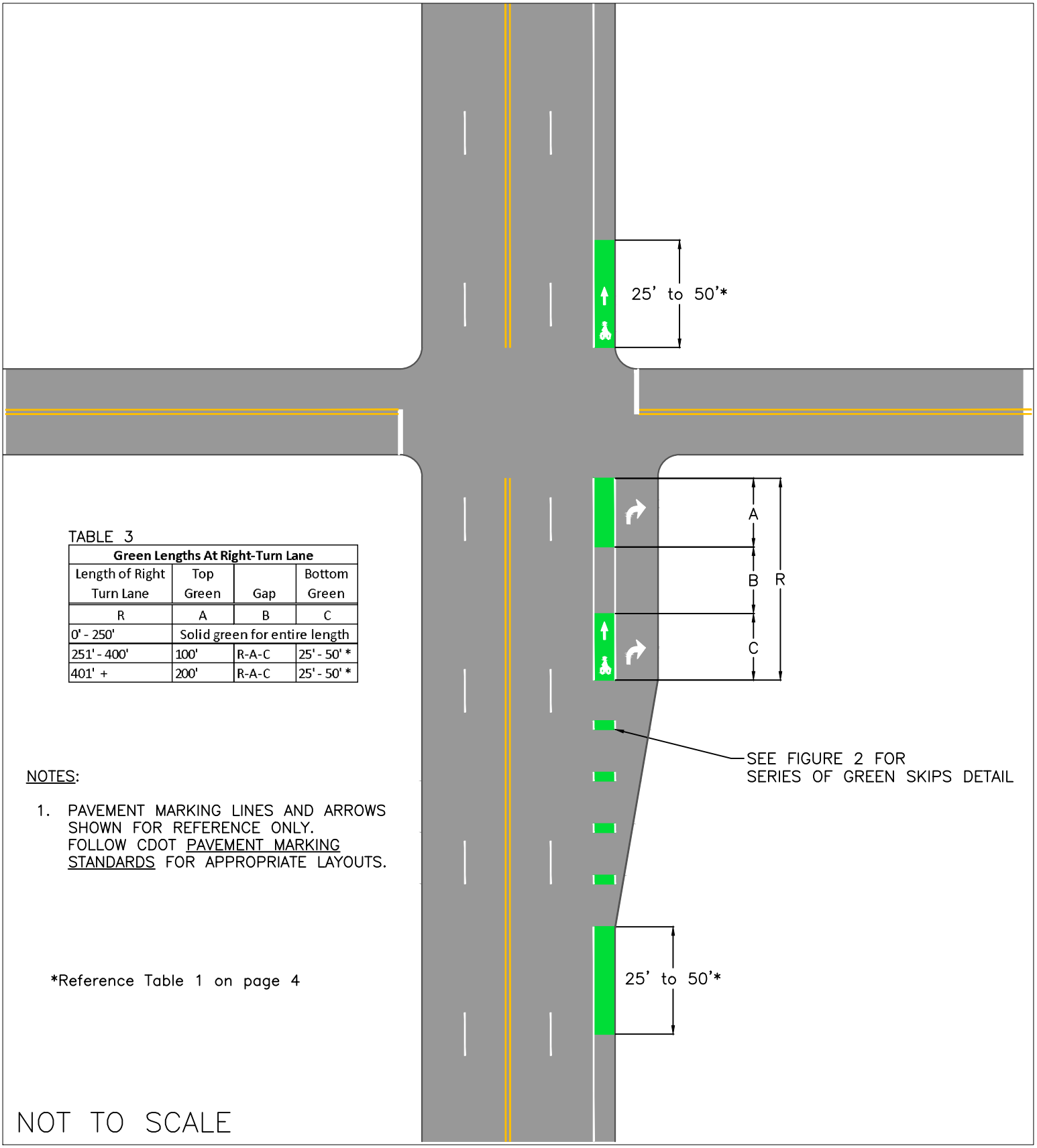

TABLE 3

Green Lengths At Right-Turn Lane			
Length of Right Turn Lane	Top Green	Gap	Bottom Green
R	A	B	C
0' - 250'	Solid green for entire length		
251' - 400'	100'	R-A-C	25' - 50' *
401' +	200'	R-A-C	25' - 50' *

NOTES:

1. PAVEMENT MARKING LINES AND ARROWS SHOWN FOR REFERENCE ONLY. FOLLOW CDOT PAVEMENT MARKING STANDARDS FOR APPROPRIATE LAYOUTS.

*Reference Table 1 on page 4

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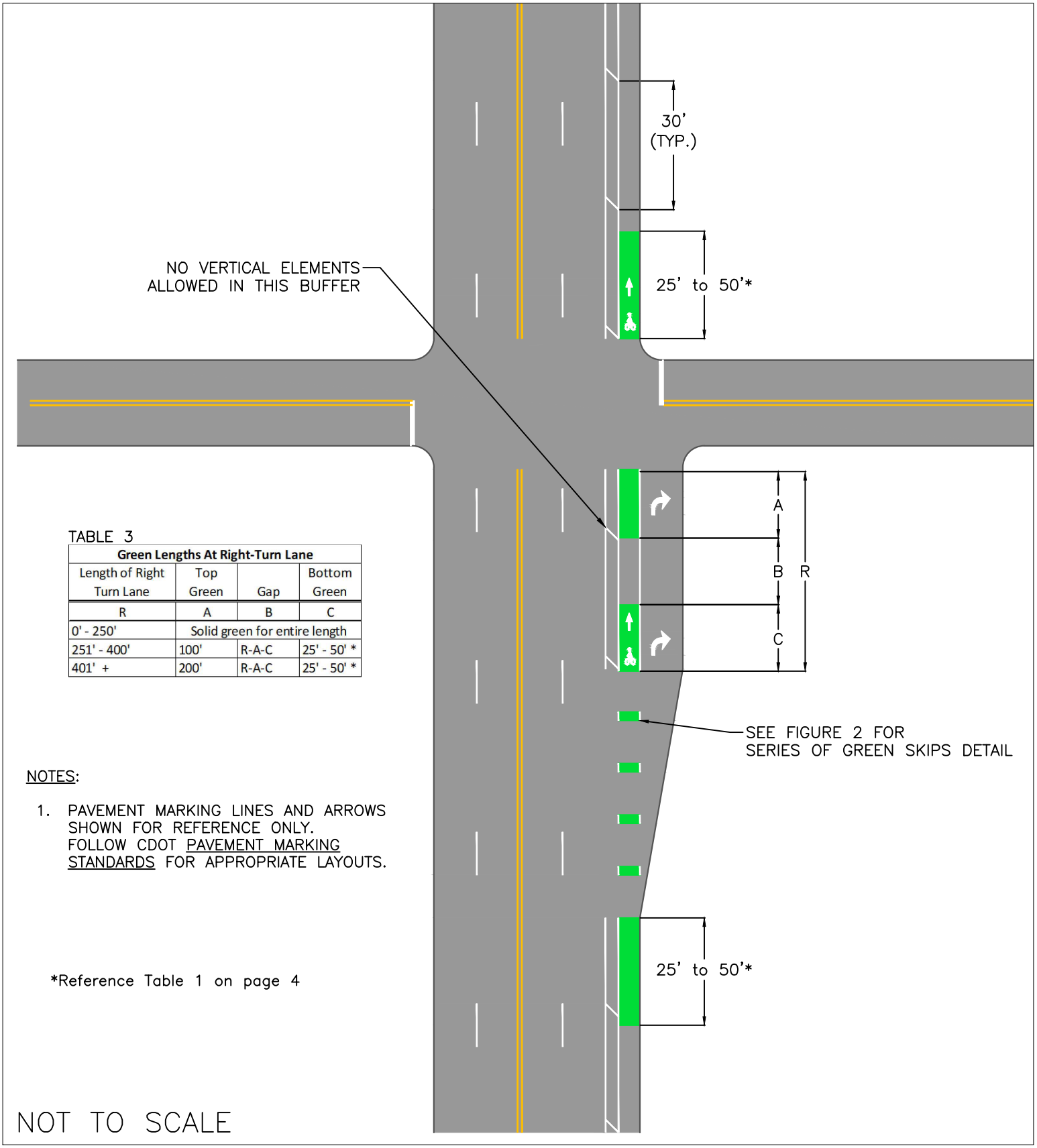
Figure 4B. Exclusive Right Turn Lane With Buffered Bicycle Lane Example Layout



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Green Lengths At Right-Turn Lane			
Length of Right Turn Lane	Top Green	Gap	Bottom Green
R	A	B	C
0' - 250'	Solid green for entire length		
251' - 400'	100'	R-A-C	25' - 50' *
401' +	200'	R-A-C	25' - 50' *

NOTES:

1. PAVEMENT MARKING LINES AND ARROWS SHOWN FOR REFERENCE ONLY. FOLLOW CDOT PAVEMENT MARKING STANDARDS FOR APPROPRIATE LAYOUTS.

*Reference Table 1 on page 4

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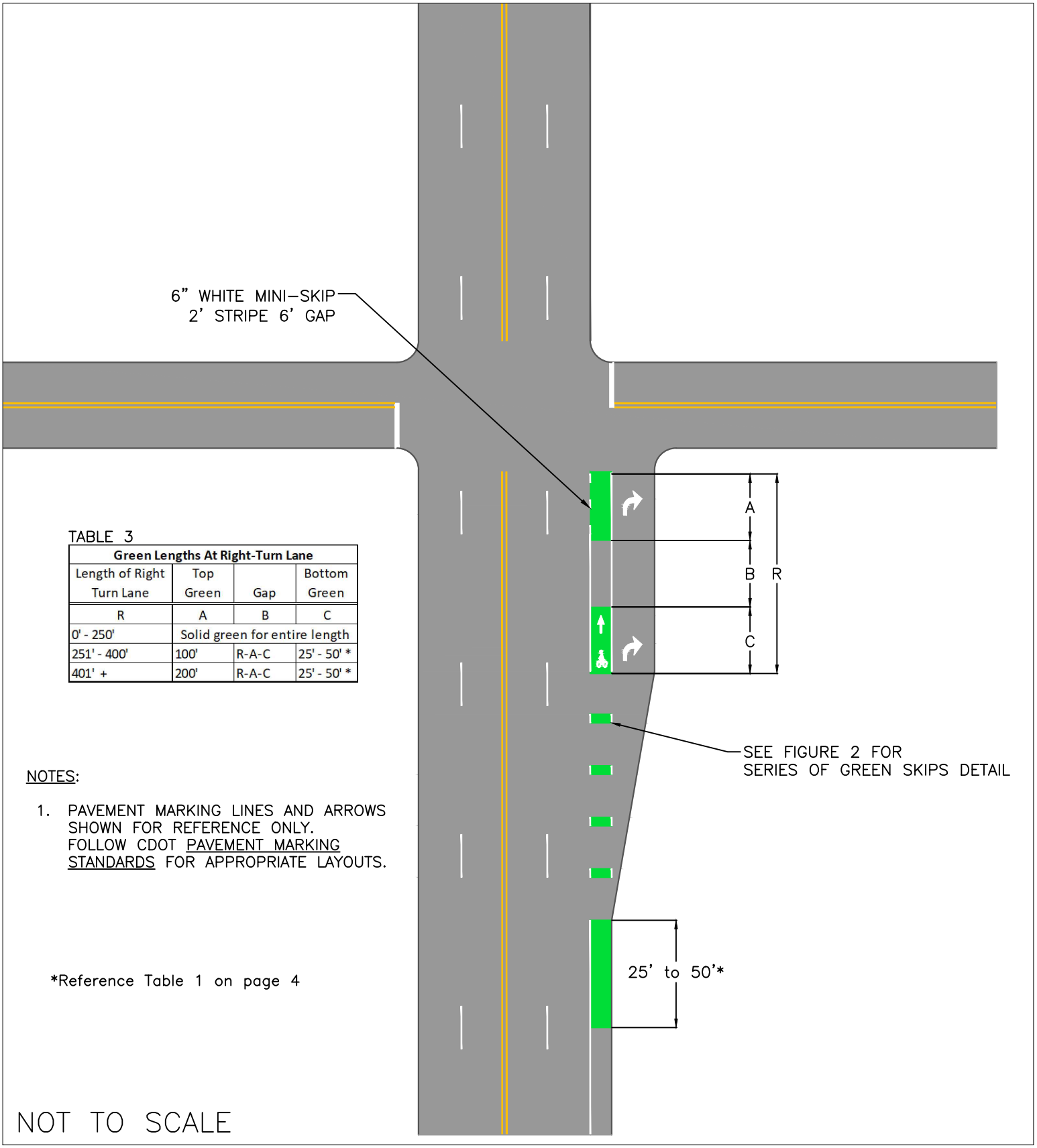
Figure 4C. Exclusive Right Turn Lane (No Receiving Lane) Example Layout



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Green Lengths At Right-Turn Lane			
Length of Right Turn Lane	Top Green	Gap	Bottom Green
R	A	B	C
0' - 250'	Solid green for entire length		
251' - 400'	100'	R-A-C	25' - 50' *
401' +	200'	R-A-C	25' - 50' *

NOTES:

1. PAVEMENT MARKING LINES AND ARROWS SHOWN FOR REFERENCE ONLY. FOLLOW CDOT PAVEMENT MARKING STANDARDS FOR APPROPRIATE LAYOUTS.

*Reference Table 1 on page 4

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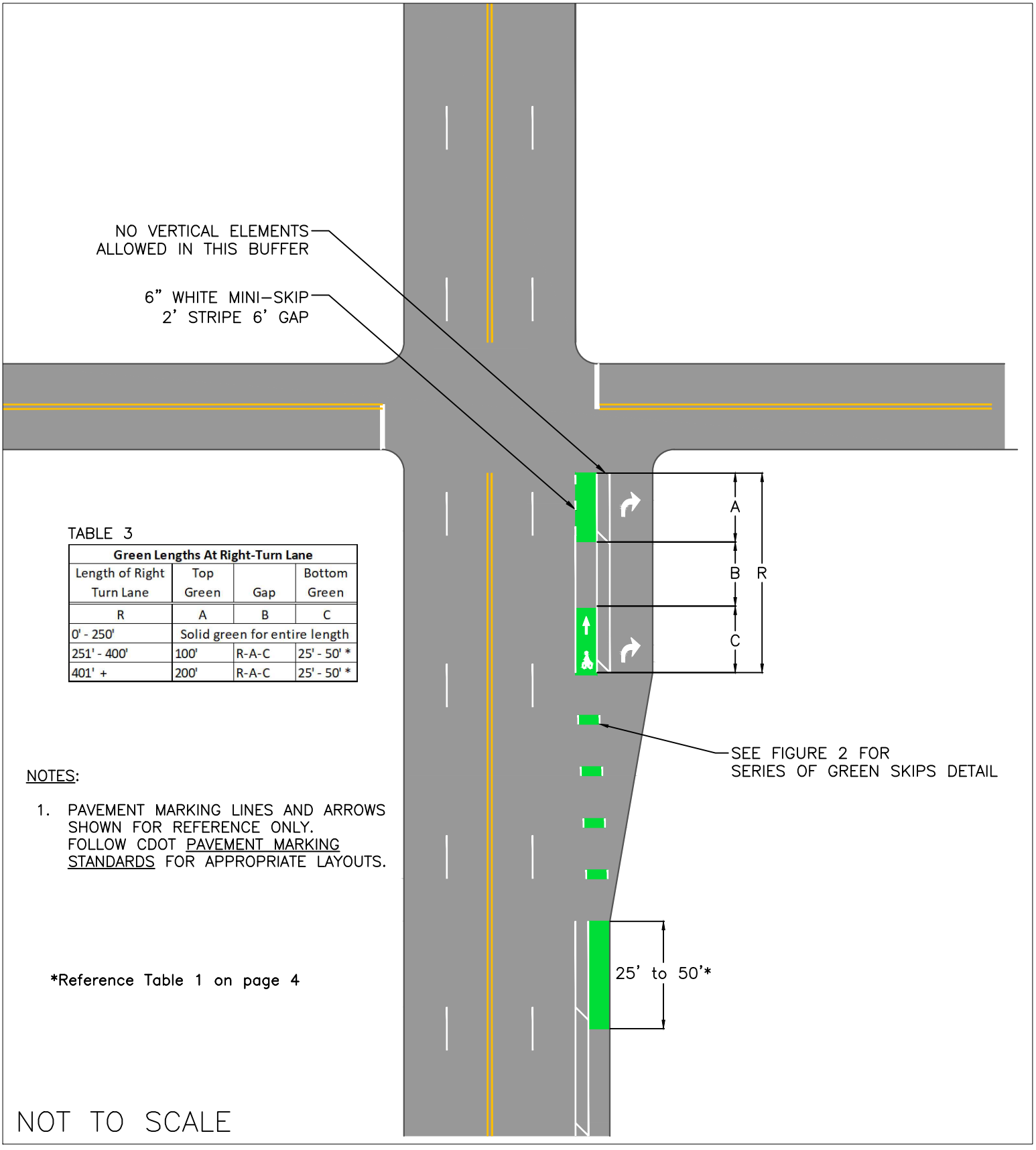
Figure 4D. Right Turn Lane With Buffered Bicycle Lane (No Receiving Lane) Example Layout



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Green Lengths At Right-Turn Lane			
Length of Right Turn Lane	Top Green	Gap	Bottom Green
R	A	B	C
0' - 250'	Solid green for entire length		
251' - 400'	100'	R-A-C	25' - 50' *
401' +	200'	R-A-C	25' - 50' *

NOTES:

1. PAVEMENT MARKING LINES AND ARROWS SHOWN FOR REFERENCE ONLY. FOLLOW CDOT PAVEMENT MARKING STANDARDS FOR APPROPRIATE LAYOUTS.

*Reference Table 1 on page 4

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Figure 5. RESERVED FOR FUTURE USE

RESERVED

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Figure 6A. Signalized Through Lane w/ Standard Bicycle Lane Green Skips Through Intersection Example Layout

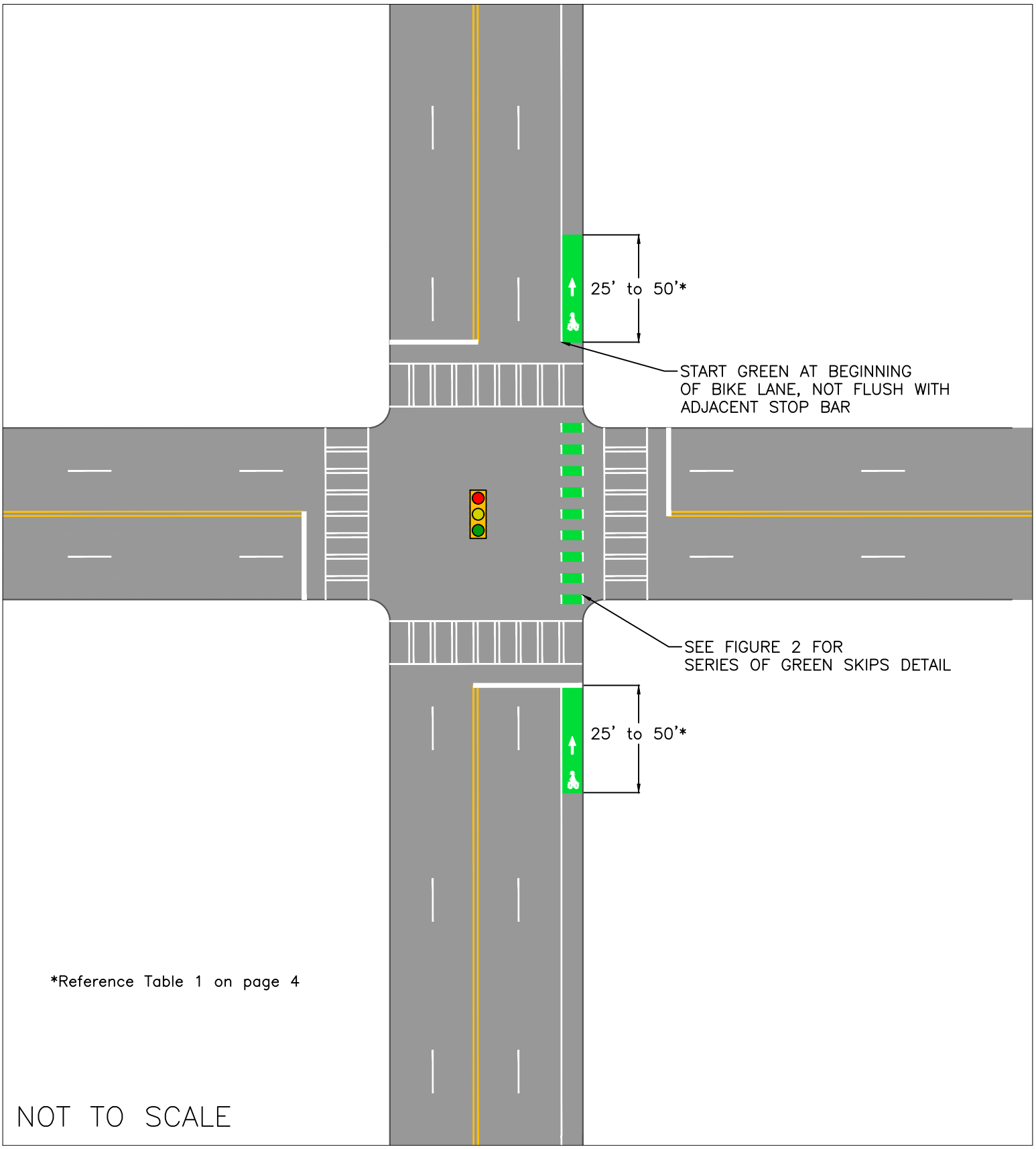

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Figure 6B. Signalized Through Lane w/ Buffered/Separated Bicycle Lane & Green Skips Through Intersection Example Layout

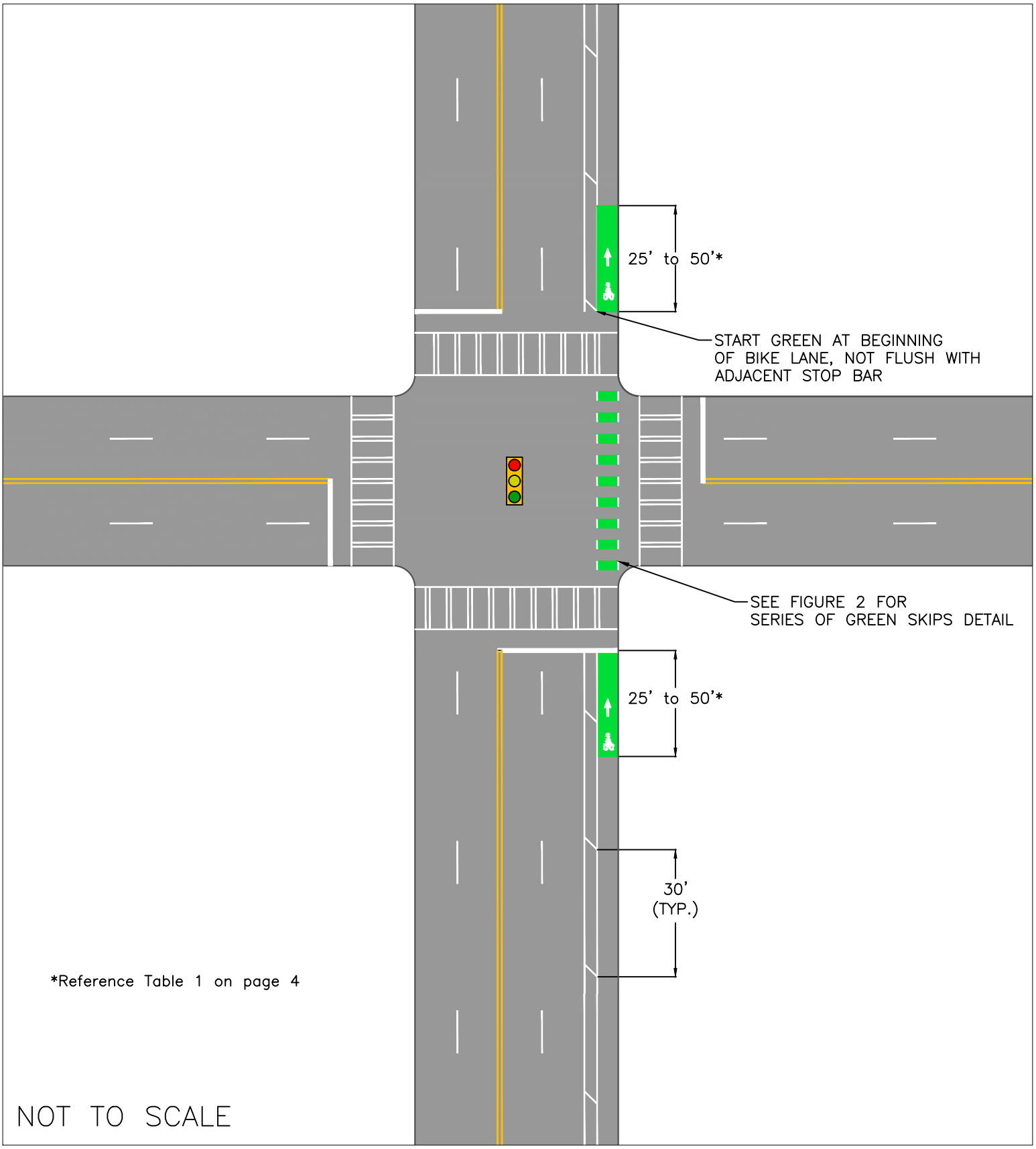

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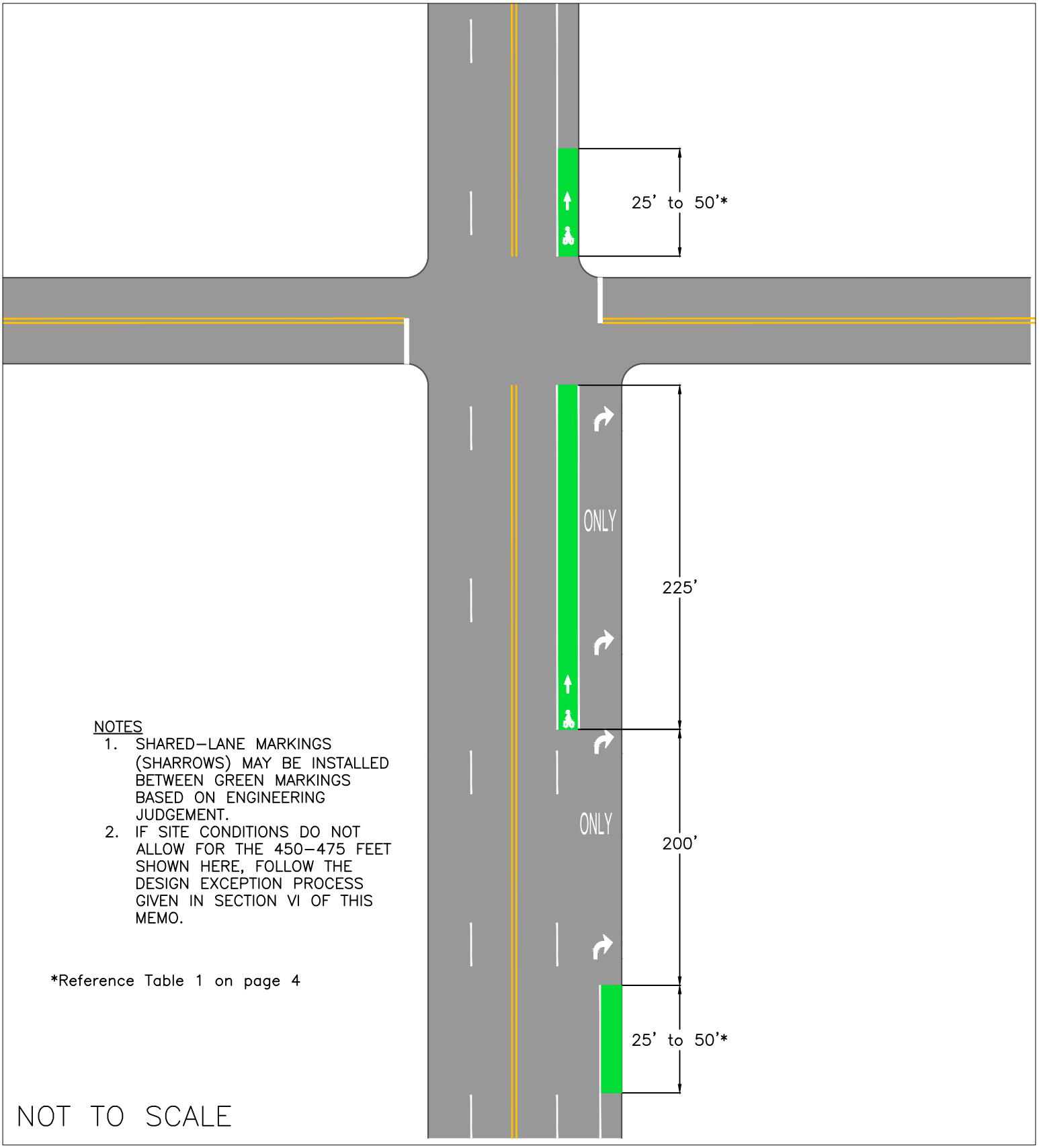
Figure 7A. Through Lane Drops as an Exclusive Right Turn Lane (Unsignalized) Example Layout



NOTES
1. SHARED–LANE MARKINGS (SHARROWS) MAY BE INSTALLED BETWEEN GREEN MARKINGS BASED ON ENGINEERING JUDGEMENT.
2. IF SITE CONDITIONS DO NOT ALLOW FOR THE 450–475 FEET SHOWN HERE, FOLLOW THE DESIGN EXCEPTION PROCESS GIVEN IN SECTION VI OF THIS MEMO.

*Reference Table 1 on page 4

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Figure 7B. Through Lane Drops as Exclusive Right Turn Lane w/ Buffered Bicycle Lane (Unsig.) Example Layout

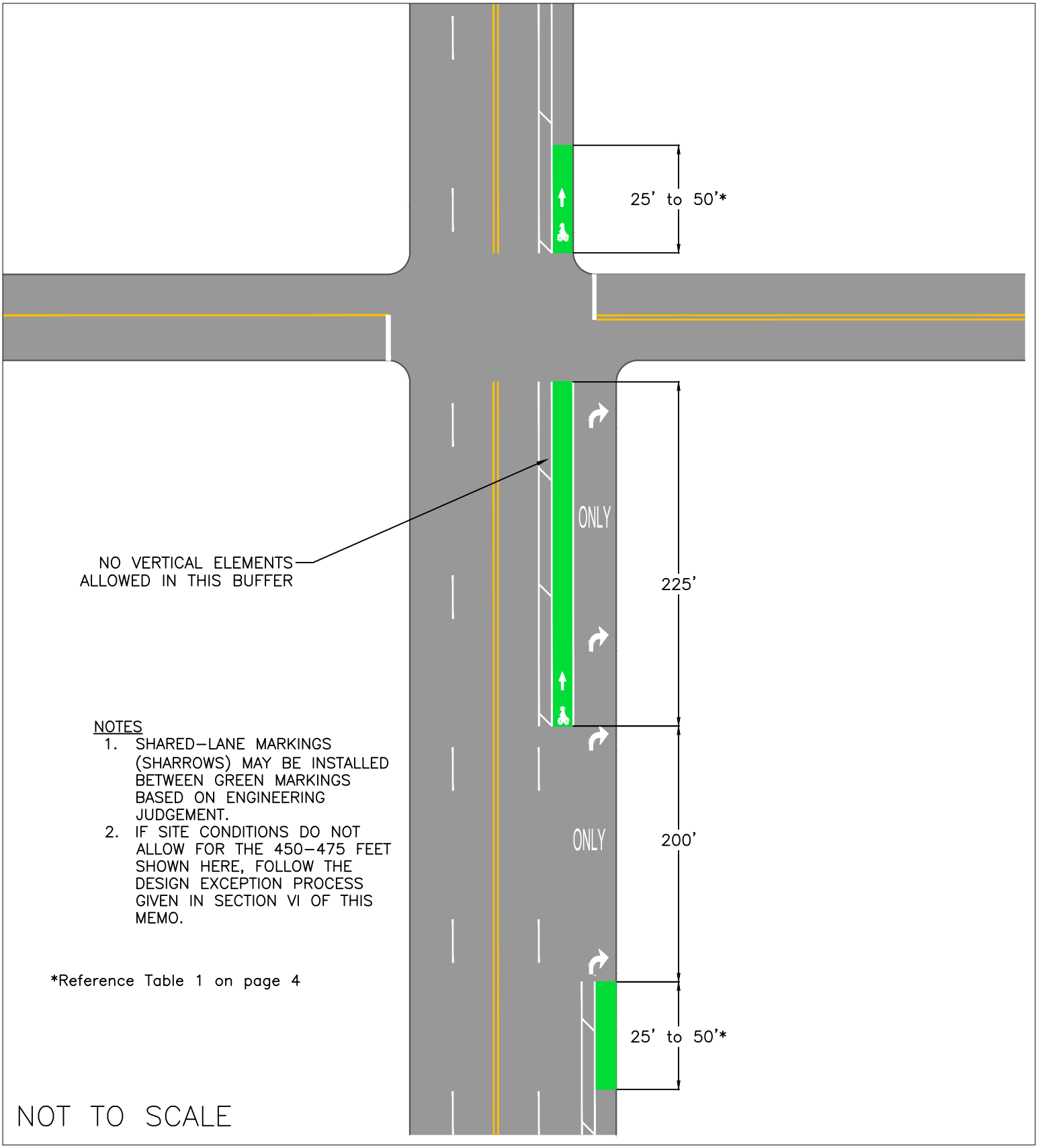

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Figure 8A. Through Lane Drops as an Exclusive Right Turn Lane (Signal) Example Layout

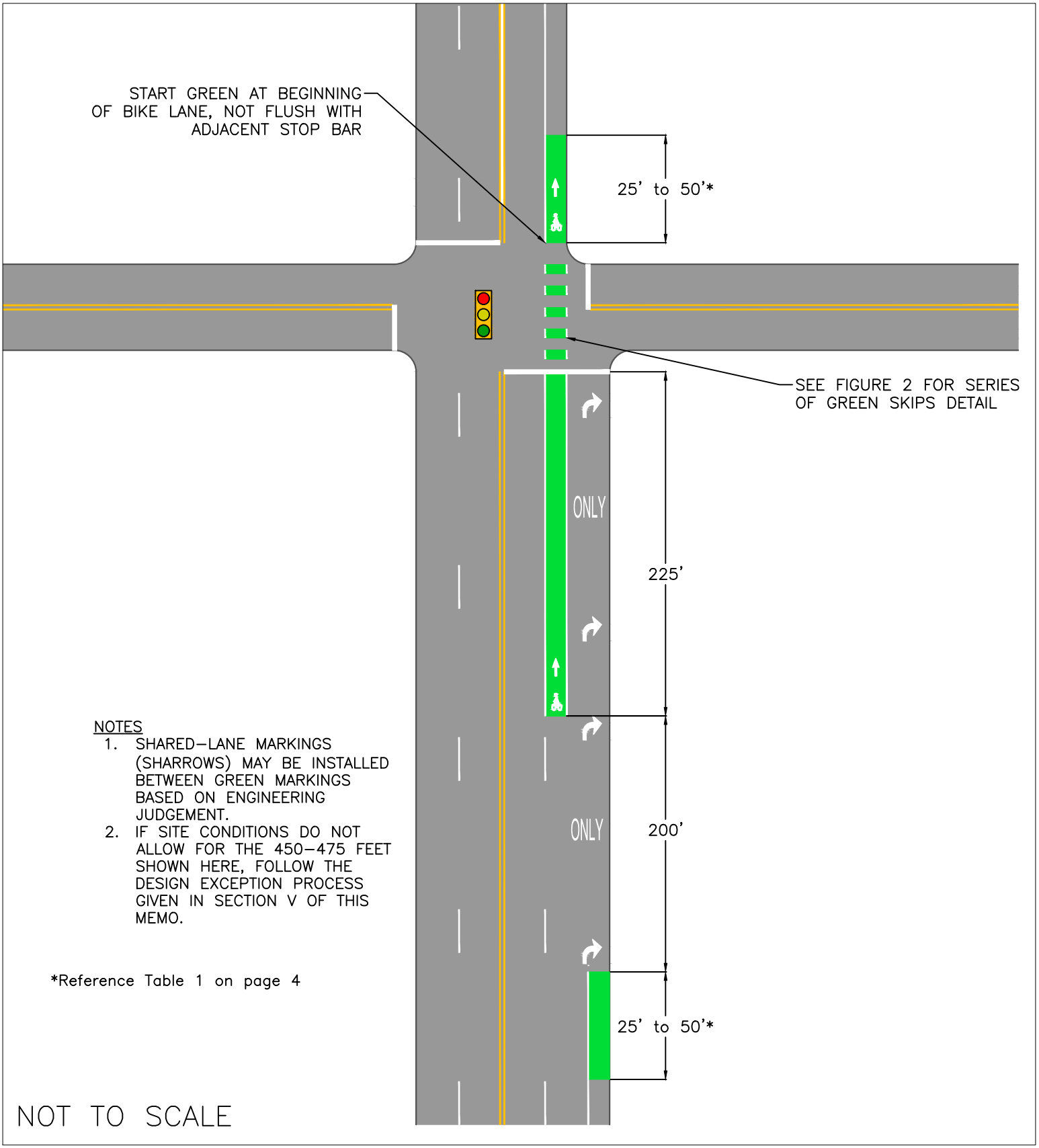

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Figure 8B. Through Lane Drops as Exclusive Right Turn Lane w/ Buffered Bicycle Lane (Signal) Example Layout

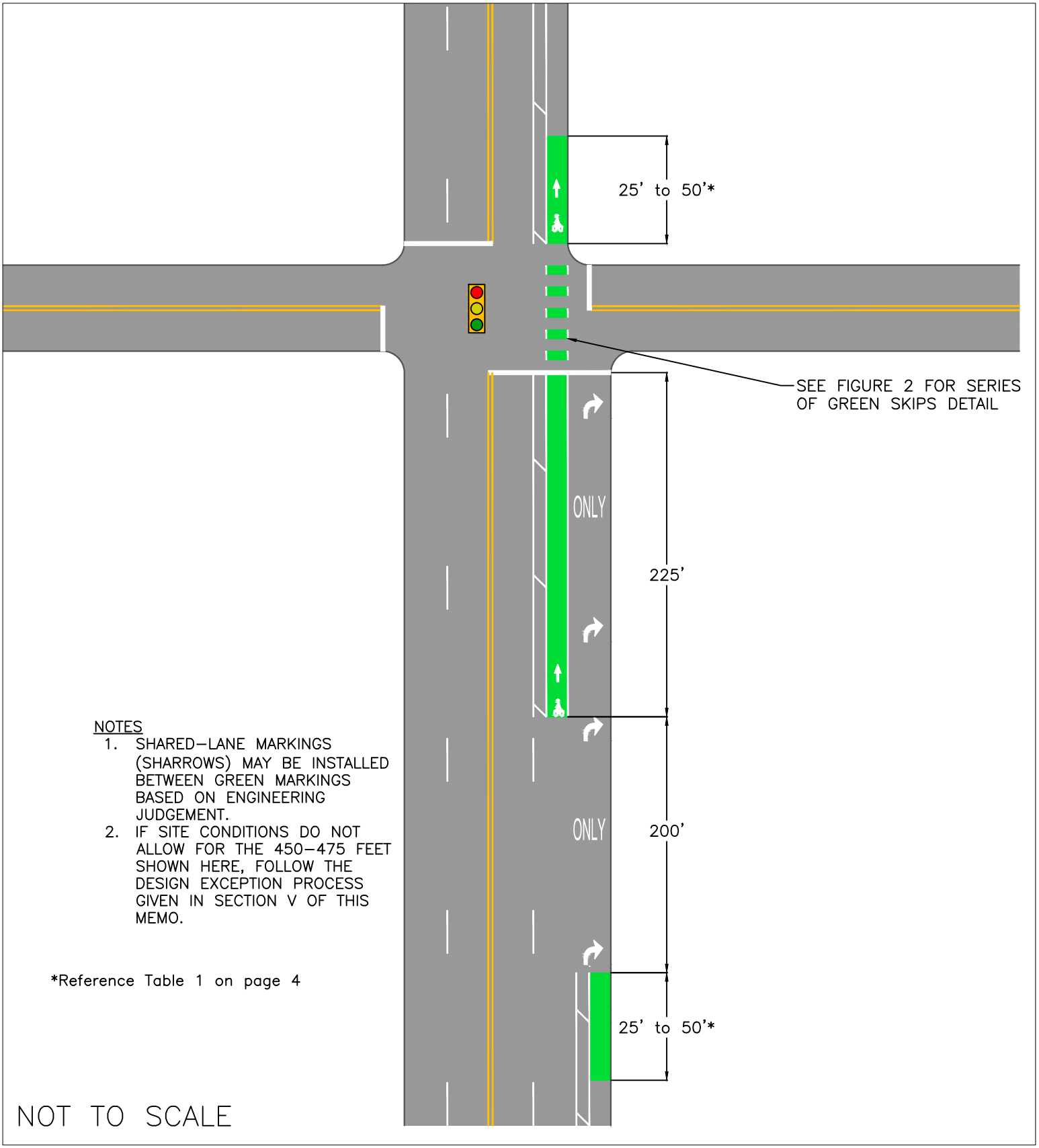

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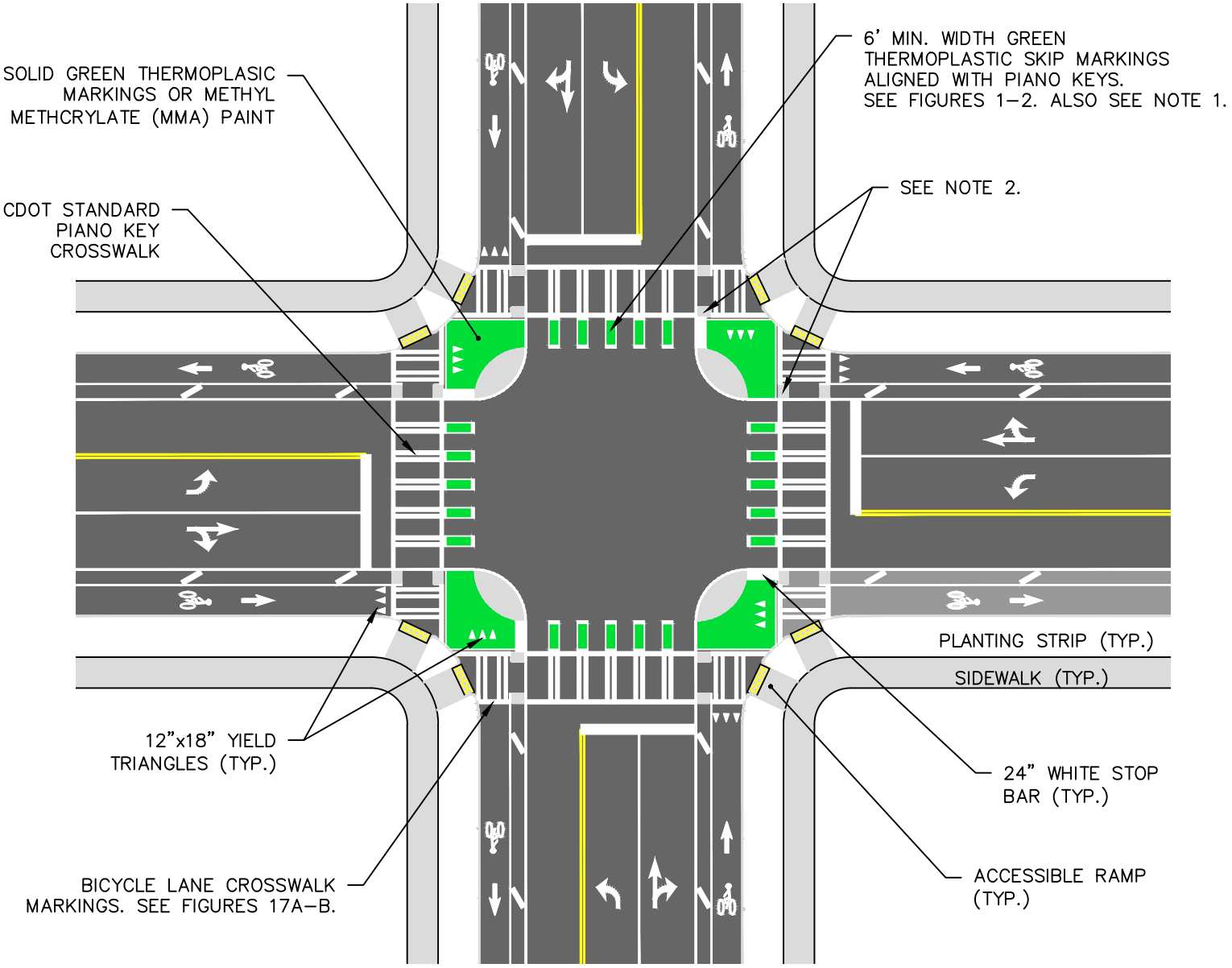
Figure 9. Protected Intersection Pavement Marking Concept



NOTES:

1. USE CROSSBIKE DETAIL FOR TWO–WAY CYCLE TRACK. SEE FIGURE 3.
2. VERTICAL CURB AND/OR TACTILE GUIDE STRIP SHALL SEPARATE ACCESSIBLE RAMP FROM BICYCLE PATH WITHIN INTERSECTION AREA.
3. THIS DETAIL IS SCHEMATIC IN NATURE AND INTENDED TO SHOW BICYCLE/GREEN PAVEMENT MARKINGS ONLY. REFERENCE APPROPRIATE DESIGN GUIDANCE FOR PROTECTED INTERSECTION GEOMETRIC LAYOUT CONSIDERATIONS AND ALL OTHER PAVEMENT MARKINGS.

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Figure 10A. Two-Way Cycle Tracks Crossing Unsignalized Street/Driveway Example Layout

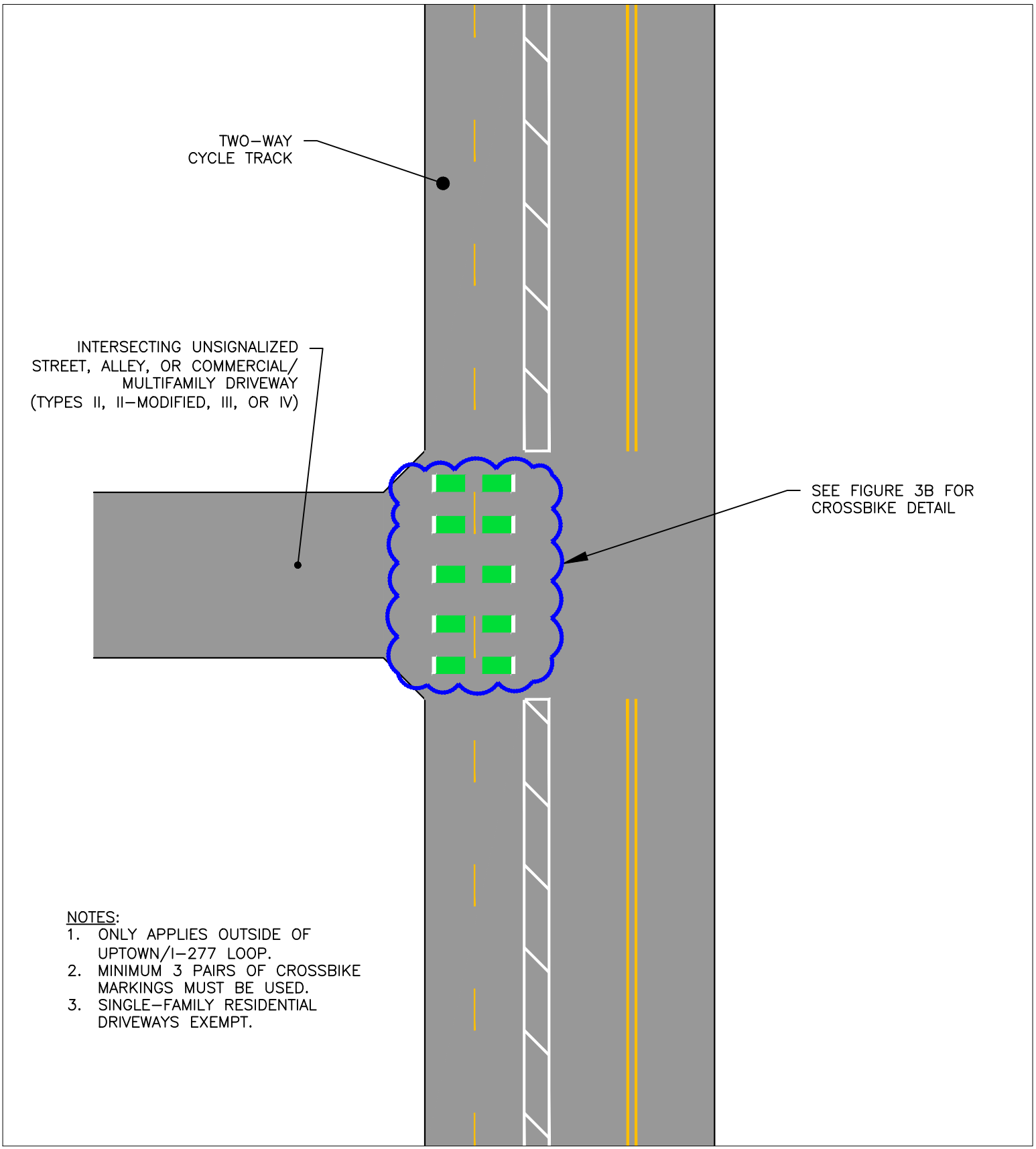

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Figure 10B. Uptown: Two-Way Cycle Tracks Crossing Unsignalized Street/Driveway Example Layout

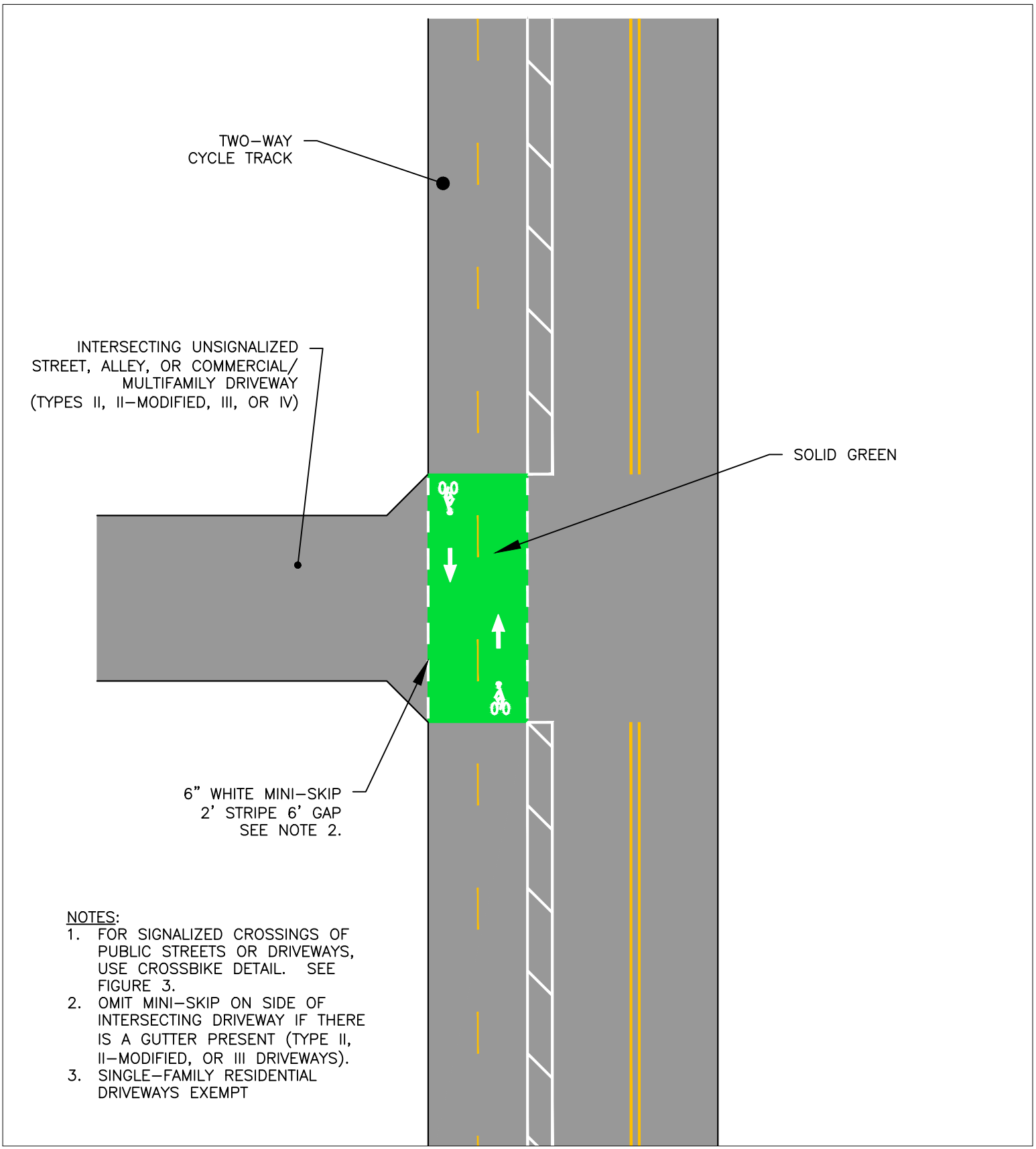

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Figure 11. Transitions Between One-Way And Two-Way Bicycle Facilities Example Layout

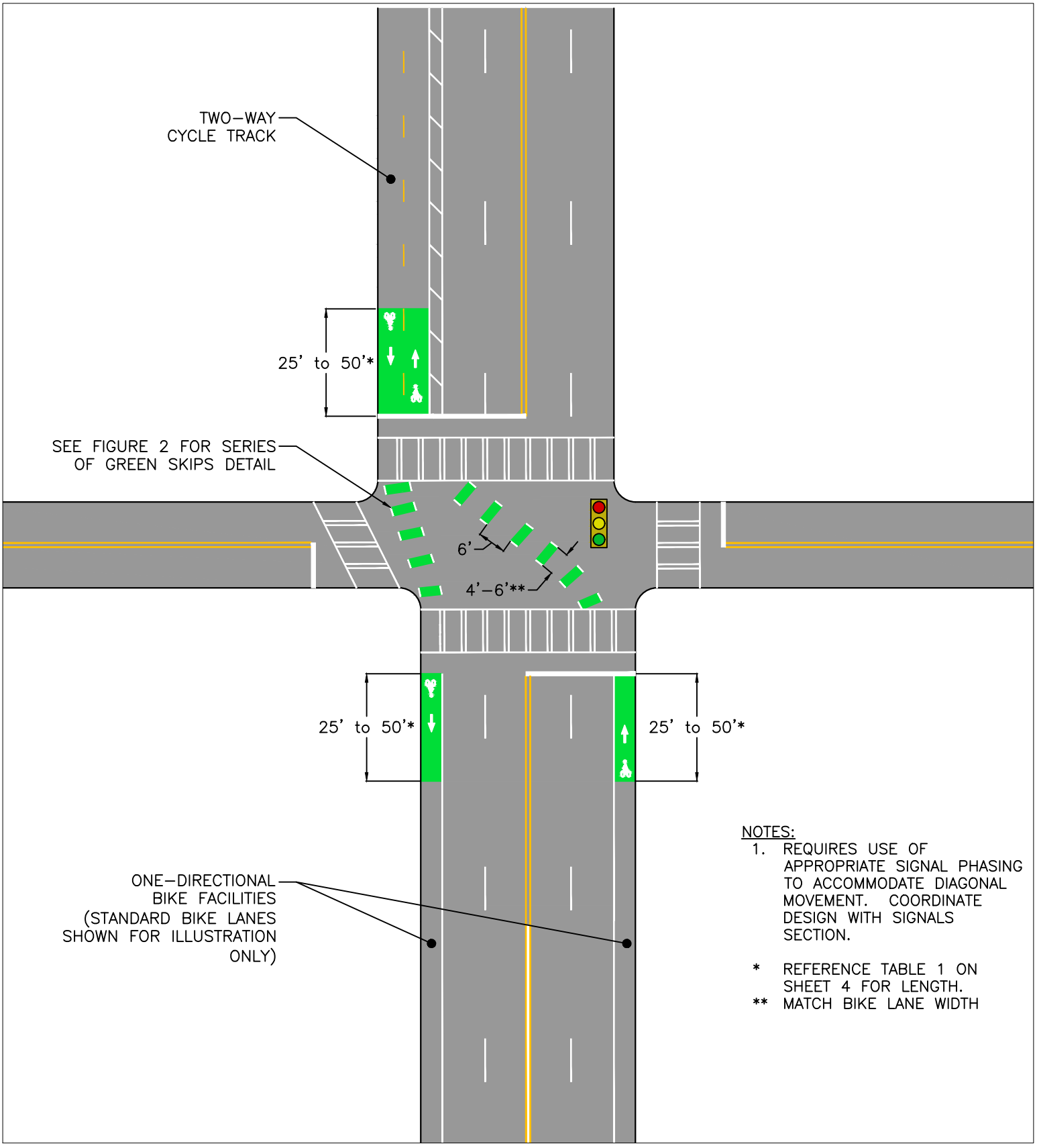

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Figure 12. Bicycle Box With Exclusive Right Turn Lane Example Layout (*Use requires prior approval*)

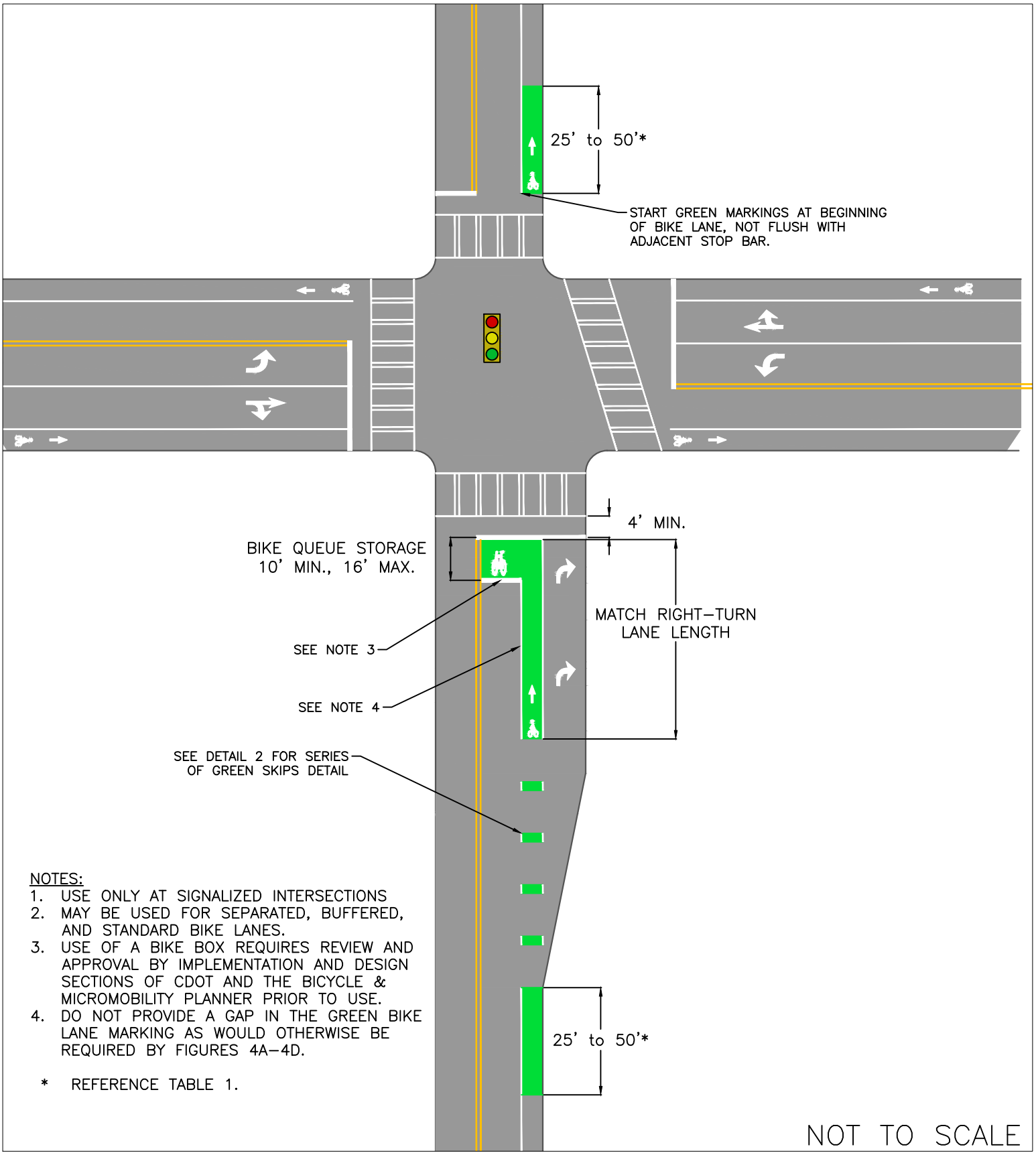

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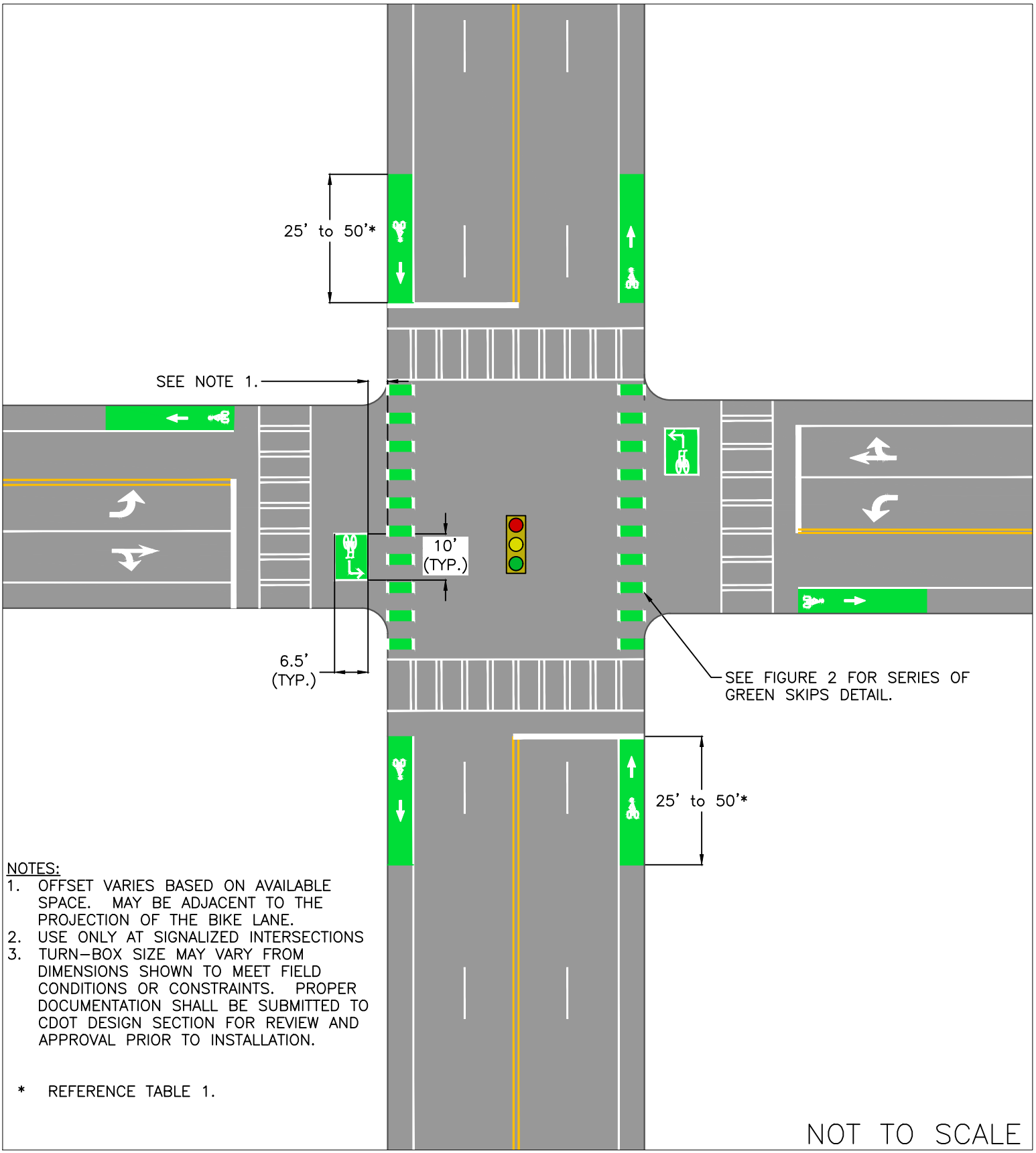
Figure 13A. Two Stage Bicycle Turn Box Example Layout



NOTES:
1. OFFSET VARIES BASED ON AVAILABLE SPACE. MAY BE ADJACENT TO THE PROJECTION OF THE BIKE LANE.
2. USE ONLY AT SIGNALIZED INTERSECTIONS
3. TURN–BOX SIZE MAY VARY FROM DIMENSIONS SHOWN TO MEET FIELD CONDITIONS OR CONSTRAINTS. PROPER DOCUMENTATION SHALL BE SUBMITTED TO CDOT DESIGN SECTION FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

* REFERENCE TABLE 1.

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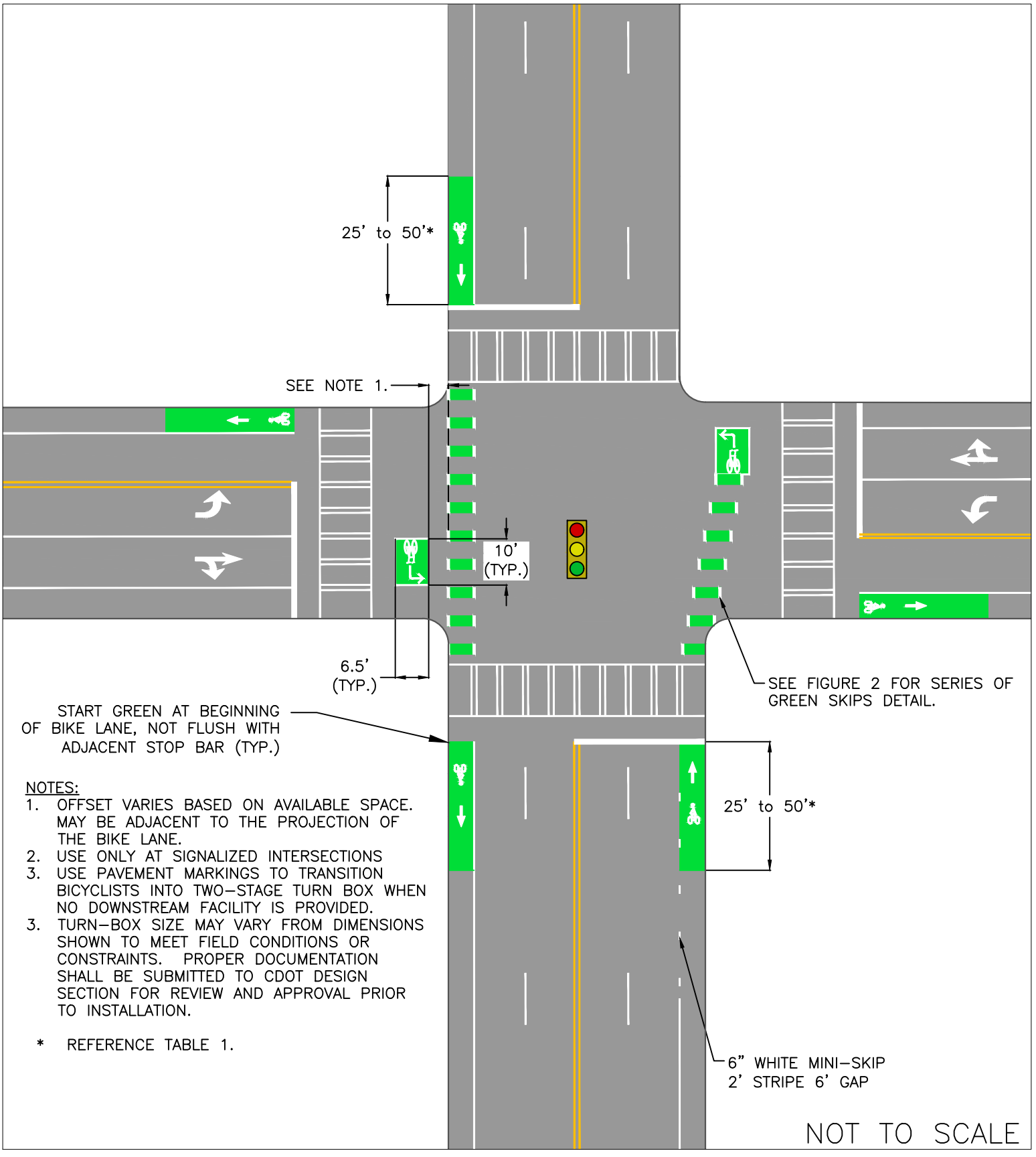
Figure 13B. Two Stage Turn Box As Termination of a Bicycle Lane



NOTES:
1. OFFSET VARIES BASED ON AVAILABLE SPACE. MAY BE ADJACENT TO THE PROJECTION OF THE BIKE LANE.
2. USE ONLY AT SIGNALIZED INTERSECTIONS
3. USE PAVEMENT MARKINGS TO TRANSITION BICYCLISTS INTO TWO-STAGE TURN BOX WHEN NO DOWNSTREAM FACILITY IS PROVIDED.
3. TURN-BOX SIZE MAY VARY FROM DIMENSIONS SHOWN TO MEET FIELD CONDITIONS OR CONSTRAINTS. PROPER DOCUMENTATION SHALL BE SUBMITTED TO CDOT DESIGN SECTION FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

* REFERENCE TABLE 1.

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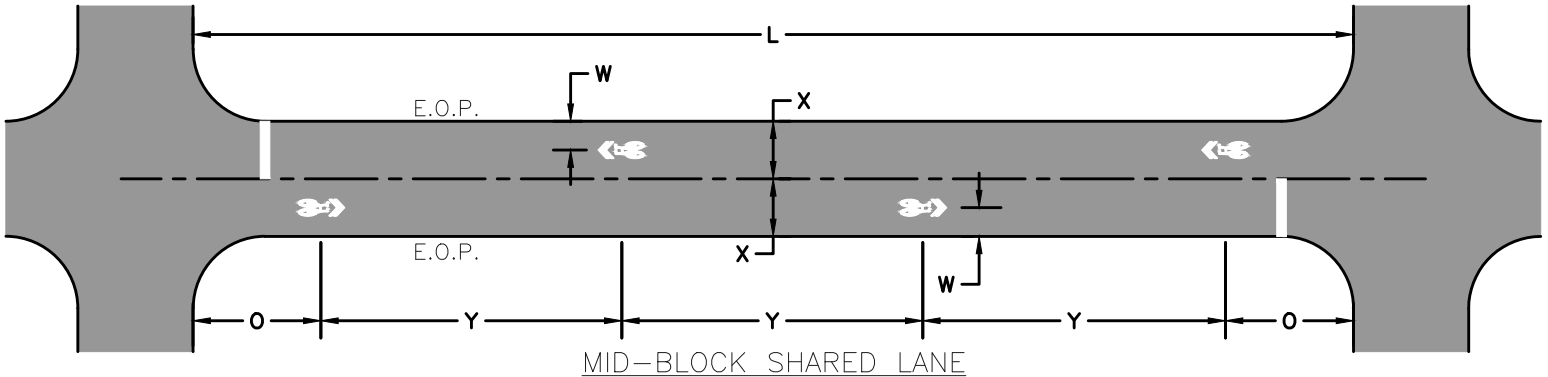
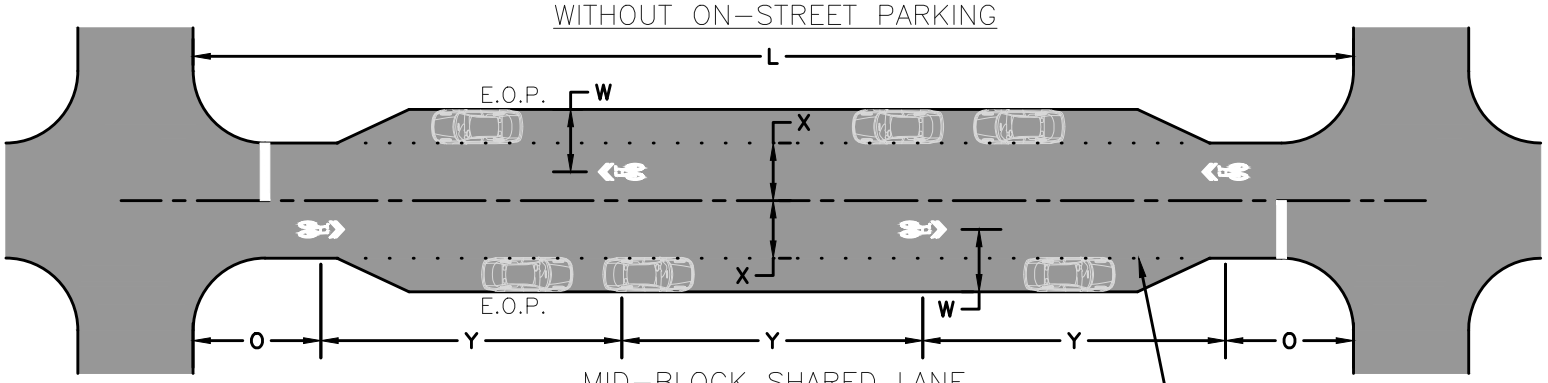
Supplemental Details for Bicycle Markings
Figure 14A. Shared Lane Marking (Sharrow) Placement Details



MID–BLOCK SHARED LANE MARKING (SLM) LAYOUT WITHOUT ON–STREET PARKING



MID–BLOCK SHARED LANE MARKING (SLM) LAYOUT WITH ON–STREET PARKING

E.O.P.: EDGE OF PAVEMENT

DOTS SHOWN FOR REFERENCE ONLY (TYP.)

LATERAL SPACING		
	NO ON-STREET PARKING	WITH ON-STREET PARKING
LANE WIDTH (FT)	SLM PLACEMENT FROM E.O.P (FT)	SLM PLACEMENT FROM E.O.P. (FT)
X	W	W
9.0	4.5	11.5
9.5	4.8	11.8
10.0	5.0	12.0
10.5	5.3	12.3
11.0	5.5	12.5
11.5	5.8	12.8
12.0	6.0	13.0
12.5	6.3	13.3
13.0	6.5	13.5
13.5	6.8	13.8
14.0	7.0	14.0
14.5	7.3	14.3
15.0	7.5	14.5

* Typical on-street parking width is 7'. This needs to be field-verified, and adjustments made prior to installation.

** Consider SLM on roadway centerlines for narrow neighborhood streets with on-street parking on both sides.

LONGITUDINAL (BLOCK) SPACING				
BLOCK/SEGMENT LENGTH (FT)	NUMBER OF SLM (EA)	BLOCK OFFSET (FT)*	SPACING (FT)	
L	N	O	Y	
			MIN	MAX
0 - 450	2	50	N/A	350
451 - 700	4	50	117	200
701 - 950	6	50	120	170
951 - 1300	8	50	122	171
1,301 - 1,650	10	50	133	172
1,651 - 2,000	12	50	141	173
2,001 - 2,350	14	50	146	173

* Typical offset from intersection is 50'. Adjust as necessary.

NOTES:

1. OFFSETS "W" ARE MEASURED FROM FACE OF CURB TO CENTERLINE OF SLM.
2. SPACINGS "Y" ARE MEASURED ALONG THE BLOCK, FROM CENTER OF SLM TO CENTER OF SLM.
3. "N" REPRESENTS THE TOTAL NUMBER OF SLM NEEDED FOR THE SEGMENT.
4. ADJUST SPACING AS NECESSARY TO AVOID SLM PLACEMENT WITHIN INTERSECTIONS OR IN FRONT OF DRIVEWAYS.
5. "O" SHALL BE LARGE ENOUGH SO THAT THE ENTIRE FIRST SLM LIES BEYOND THE SIDEWALK CORIDOR OF THE CROSS STREET.

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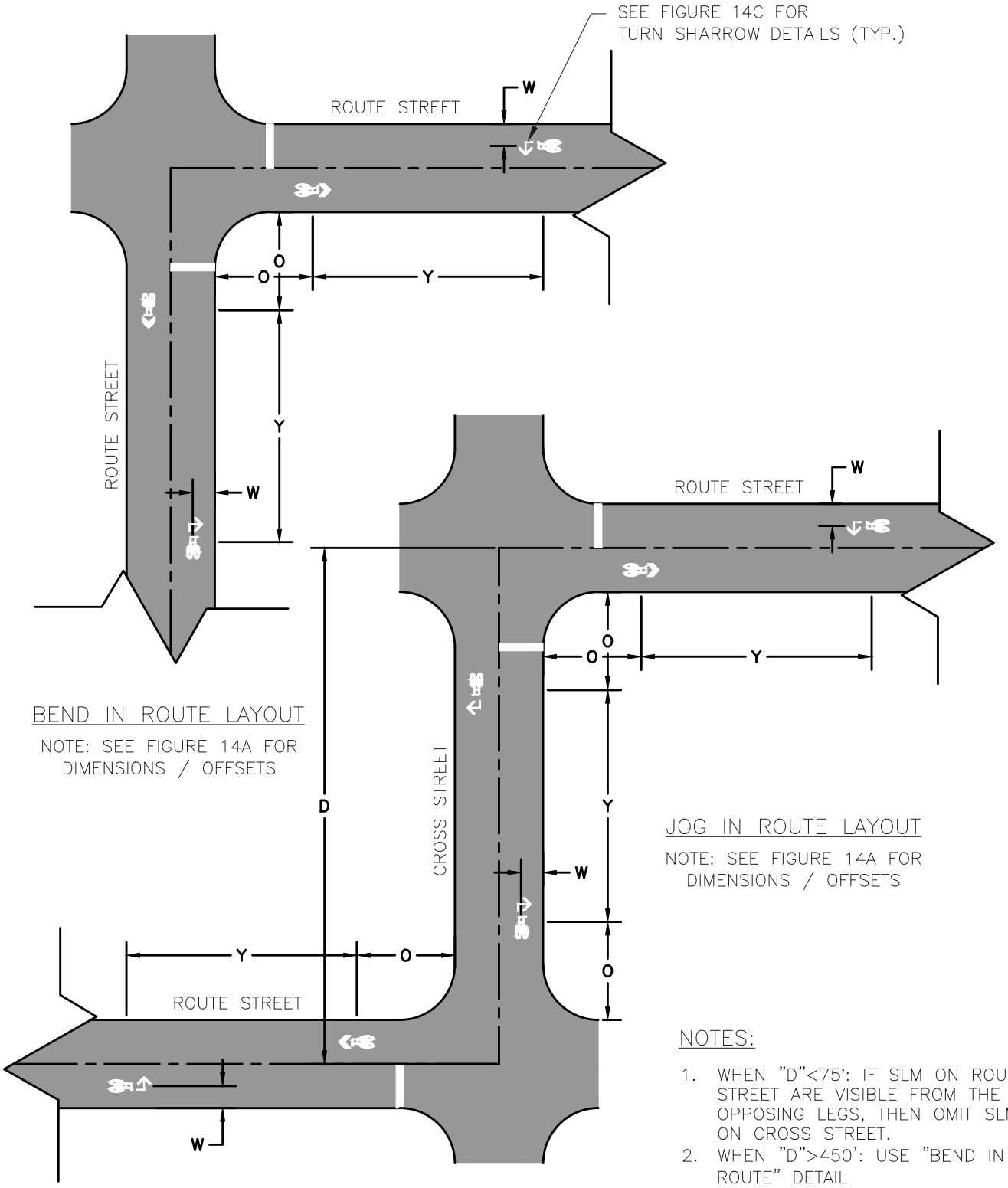
Figure 14B. Shared Lane Marking (Sharrow) Placement Details



NOTES:

1. WHEN "D"<75': IF SLM ON ROUTE STREET ARE VISIBLE FROM THE OPPOSING LEGS, THEN OMIT SLM ON CROSS STREET.
2. WHEN "D">450': USE "BEND IN ROUTE" DETAIL

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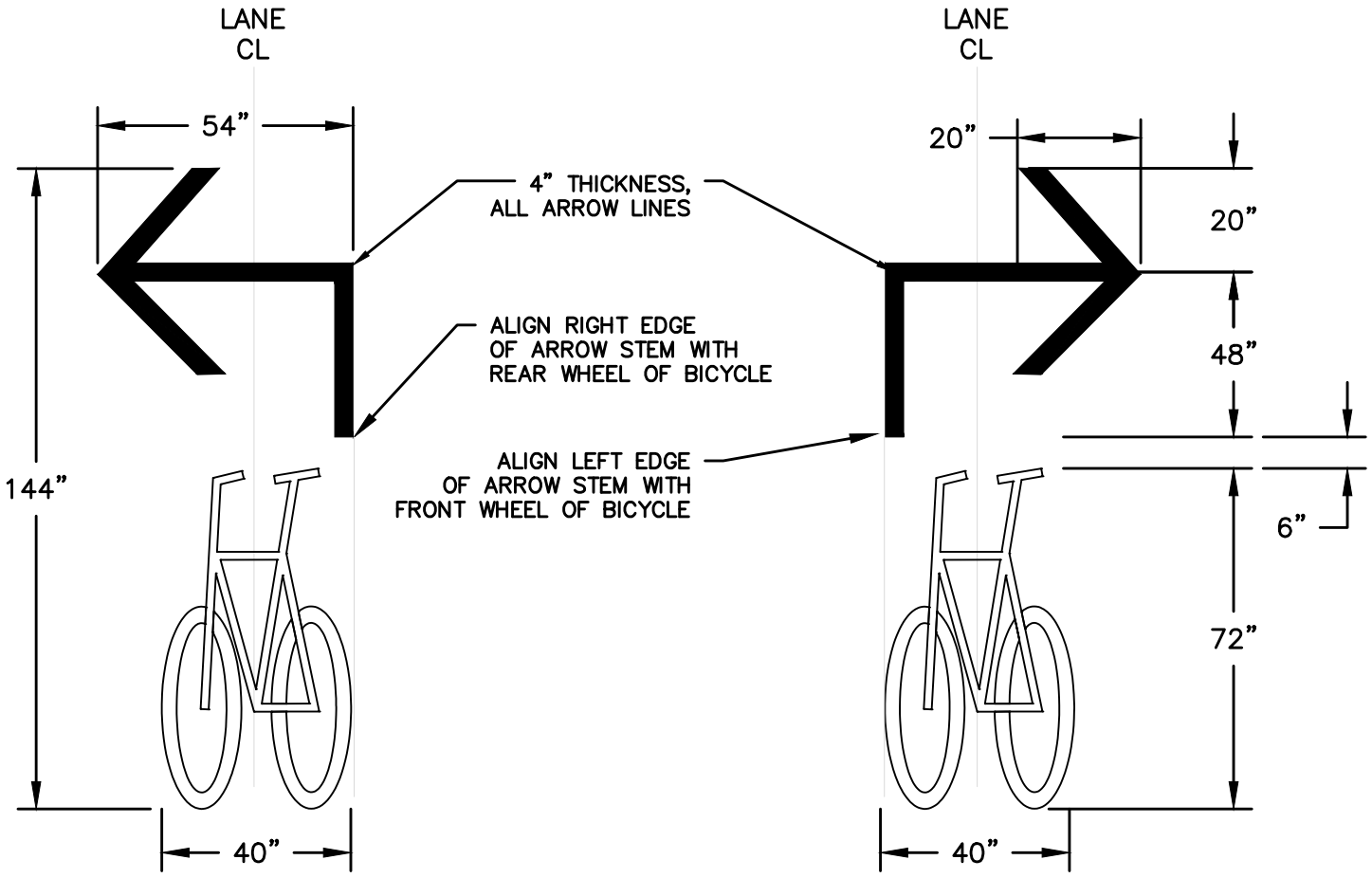
Figure 14C. Turn Sharrow Markings



LEFT–TURN SHARROW

RIGHT–TURN SHARROW

LEFT/RIGHT SHARROW NOTES:

1. PLACE CENTERED IN VEHICLE LANE
2. CENTERLINES AND REFERENCE LINES SHOWN ARE FOR REFERENCE ONLY.

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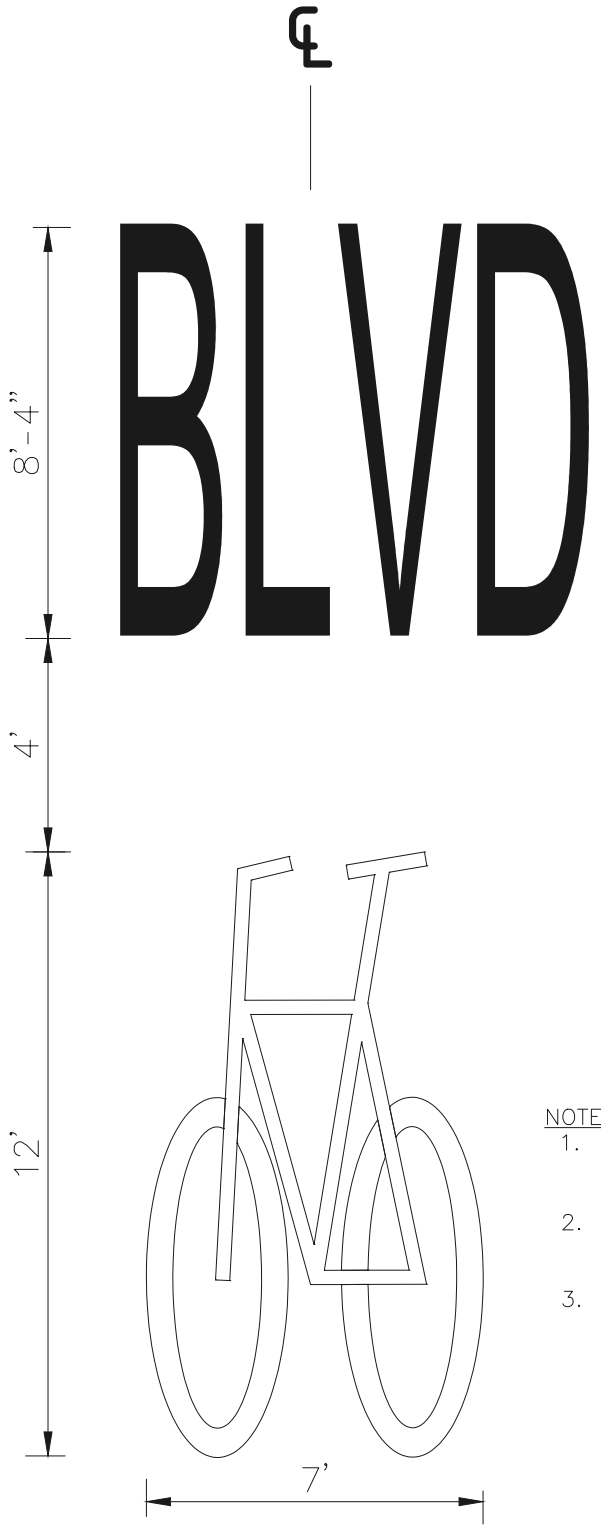
Figure 15. Bicycle Boulevard Symbol Detail

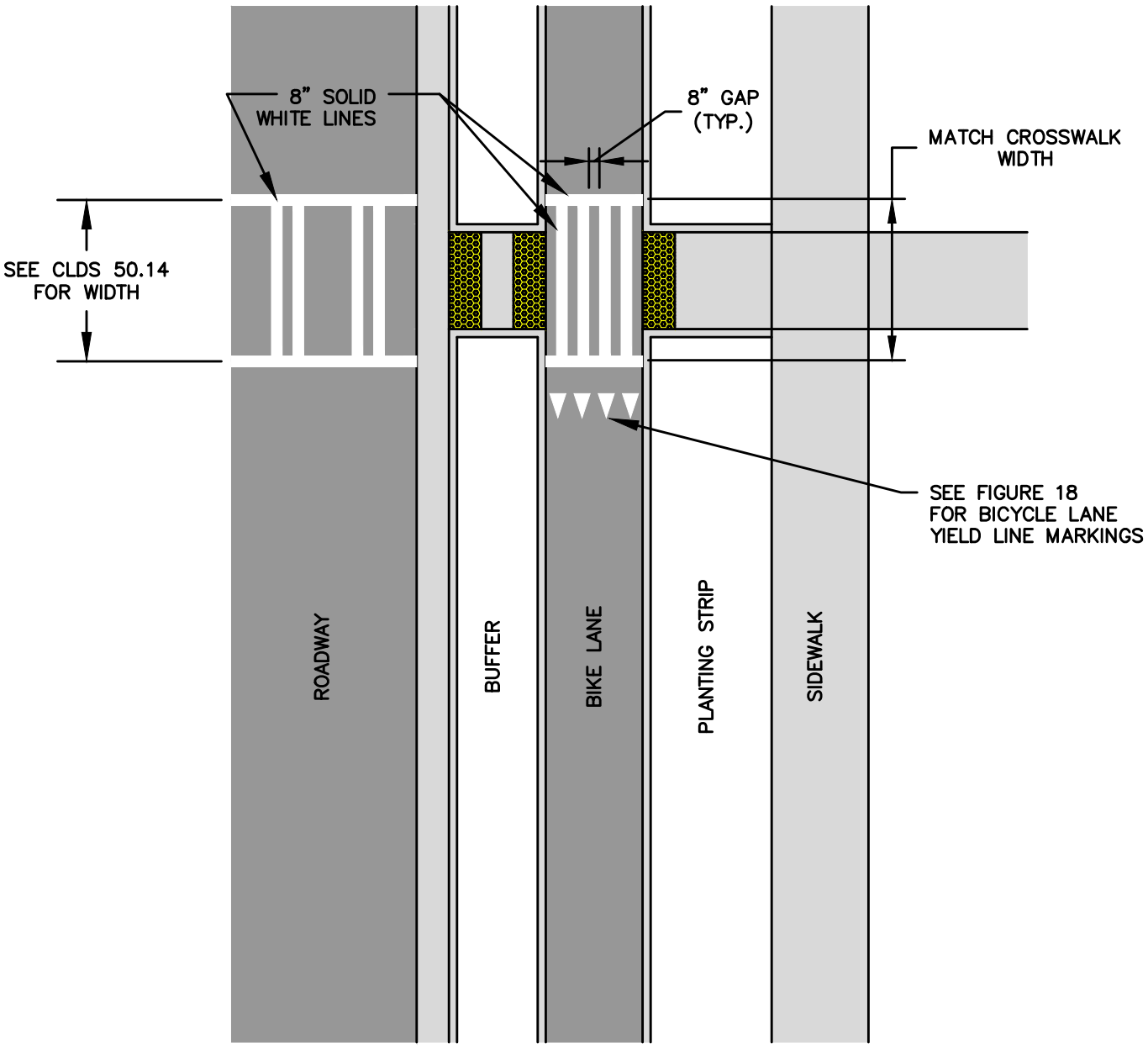


NOTES:
1. BICYCLE SYMBOL AND WORDS SHALL BE PLACED AT THE CENTER OF THE TRAVEL LANE.
2. "CL" SYMBOL AND LINE SHOWN FOR REFERENCE ONLY. NOT TO BE MARKED IN THE FIELD.
3. REFER TO NCDOT 1205.08 FOR TEXT FONT AND SPACING DIMENSIONS.

Figure 16. RESERVED FOR FUTURE USE

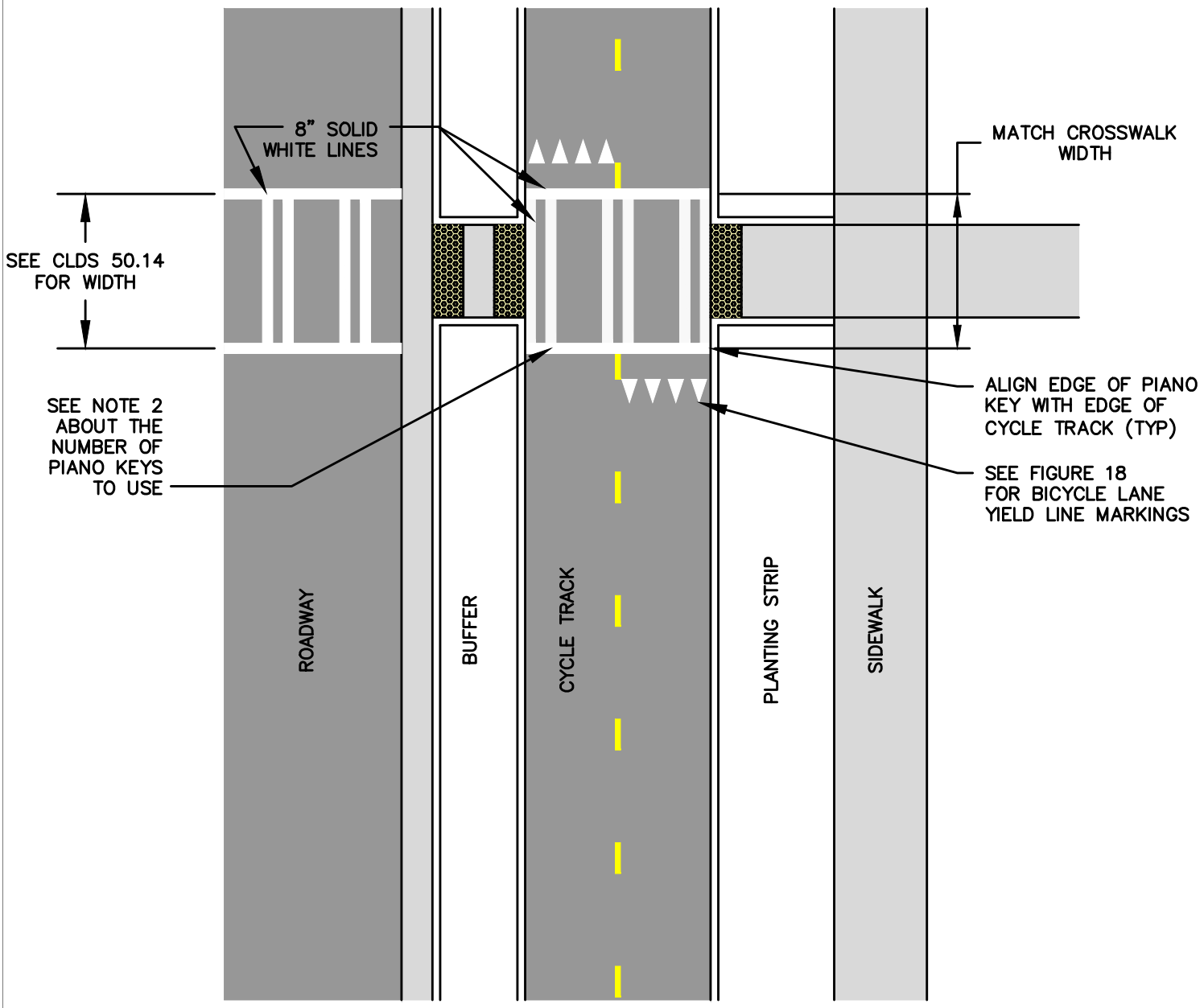
RESERVED

Pavement Marking Design Guidelines
Supplemental Details for Bicycle Markings
Figure 17A. Bicycle Lane Crosswalk, Piano Keys Markings



NOTES:
1. CENTER ALL MARKINGS IN BIKE LANE.
2. TRUNCATED DOMES SHOWN FOR REFERENCE ONLY. REFER TO PROWAG AND CLDS DETAILS FOR MORE INFORMATION REGARDING PLACEMENT.

Pavement Marking Design Guidelines
Supplemental Details for Bicycle Markings
Figure 17B. Cycle Track Crosswalk, Piano Keys Markings



NOTES:

1. CENTER ALL MARKINGS IN CYCLE TRACK. FOLLOW CLDS DETAIL 50.14 FOR LAYOUT.
2. FOR CYCLE TRACKS UP TO 12 FEET IN WIDTH, PLACE 3 SETS OF PIANO KEYS. FOR WIDTHS 12.1 FEET AND GREATER, PLACE 5 SETS INSTEAD.
3. TRUNCATED DOMES AND YELLOW MINI-SKIP CENTERLINE MARKING SHOWN FOR REFERENCE ONLY. CONSULT APPROPRIATE DESIGN GUIDANCE FOR PLACEMENT OF THESE ITEMS.

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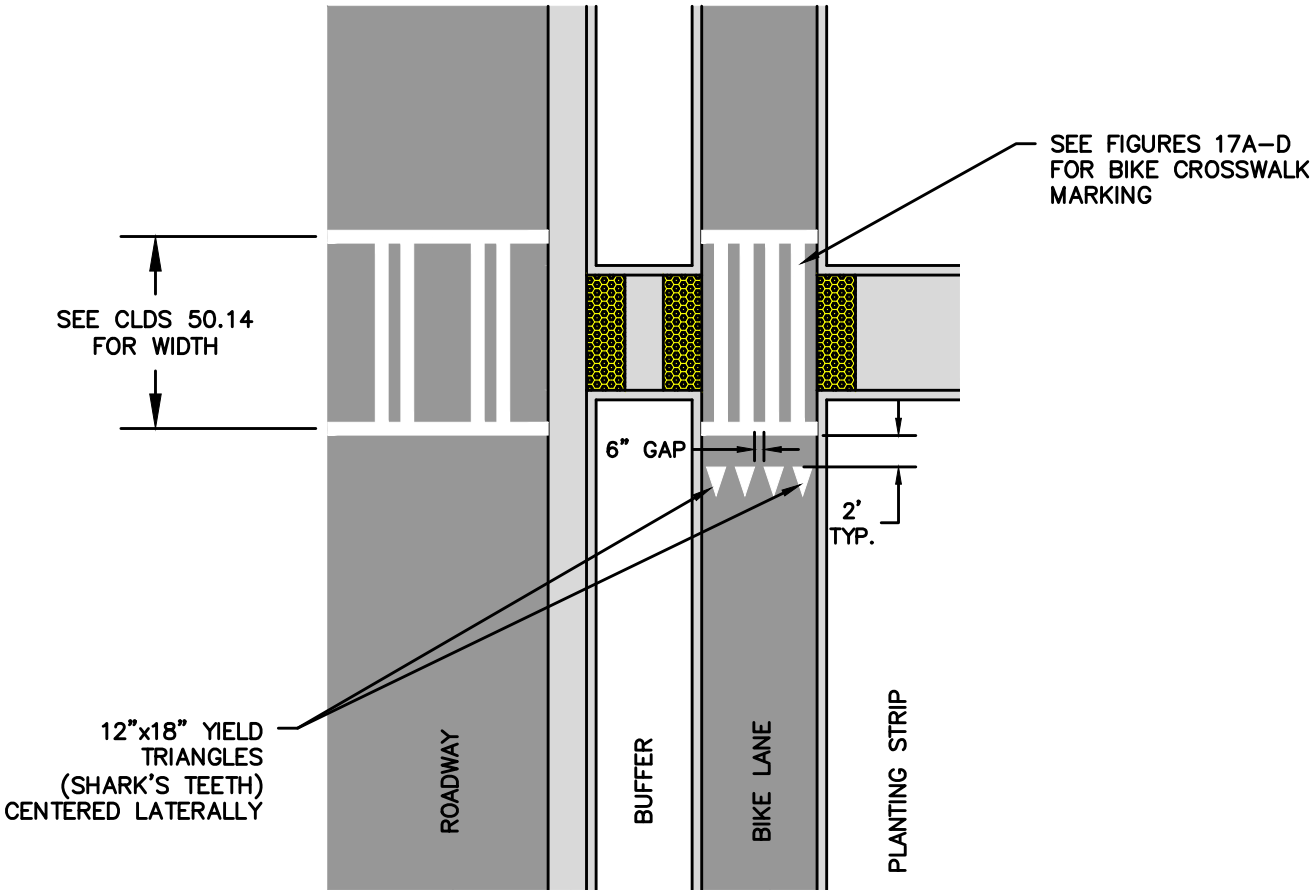
Figure 18. Bicycle Lane Yield Line Markings



SPACING CHART

WIDTH OF BIKE LANE (BY DIRECTION)	NUMBER OF YIELD MARKINGS
4'	2
5'	3
6'	4
7'	4
8'	5

NOTE:
A ONE–WAY BICYCLE FACILITY IS SHOWN FOR SIMPLICITY. FOR TWO–WAY FACILITIES, PROVIDE A MIRRORING SET OF TRIANGLES IN THE SECOND LANE.

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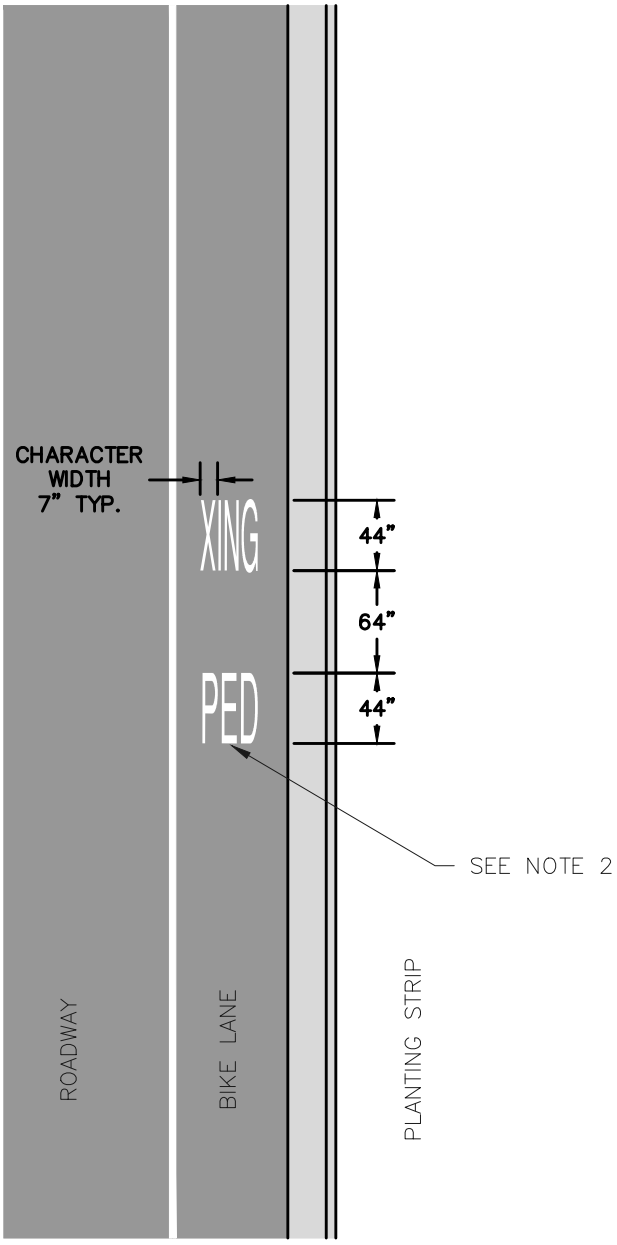
Figure 19. Bicycle Lane Text



NOTES:

1. EXAMPLES OF BIKE LANE TEXT ARE AS FOLLOWS. OTHER TEXT MAY BE CONSIDERED ON A CASE–BY–CASE BASIS, BASED ON ENGINEERING JUDGEMENT AND SUBJECT TO REVIEW AND APPROVAL BY THE CDOT ENGINEERING & OPERATIONS DIVISION:
   1.1. BIKE LANE ENDS
   1.2. PED XING
   1.3. STOP
   1.4. YIELD

2. CHARACTERS SHALL BE CENTERED LATERALLY. CHARACTER FONT SHALL BE PER NCDOT STD. 1205.08.