

**State of California**

**Department of Transportation**

**Office of Traffic Safety Program**

**Pedestrian Safety Branch**

**1120 N Street, Sacramento CA 95814**

**Office (916) 654-6600**

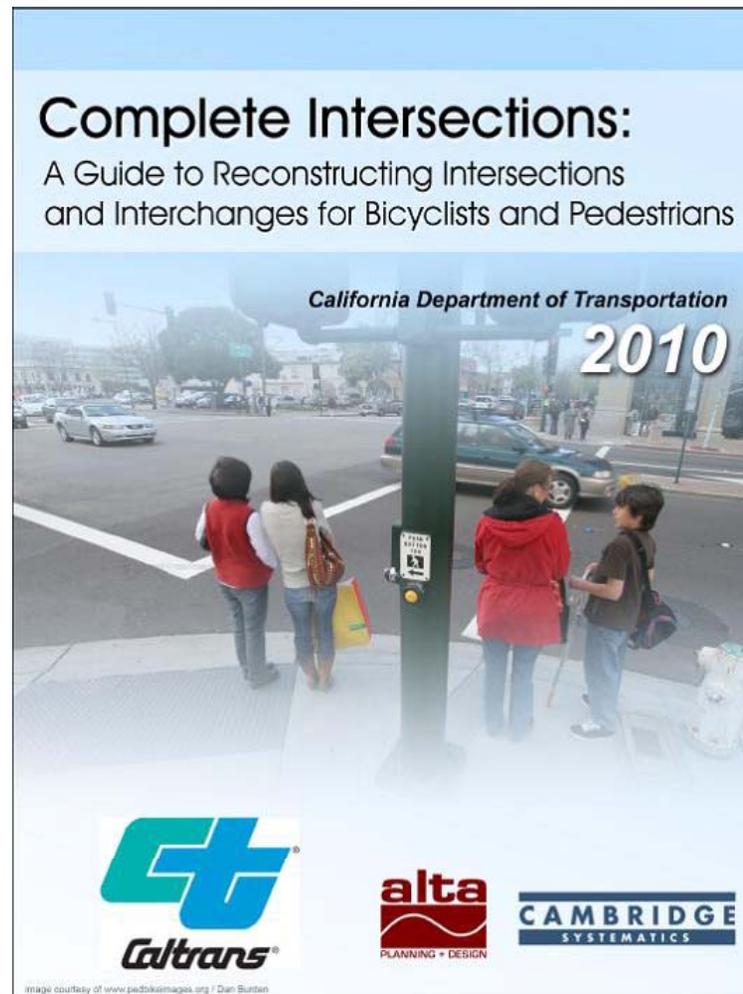
**Fax (916) 653-3053**

**brian\_alconcel@dot.ca.gov**

**BRIAN ALCONCEL, P.E.**  
**SENIOR TRANSPORTATION ENGINEER**

<http://www.dot.ca.gov/hq/traffops/survey/pedestrian/>

# The Complete Intersections Guide





## Disclaimer

This reference guide (Guide) does not constitute a standard, specification, or regulation. It is not intended to replace the existing California Department of Transportation (Caltrans) mandatory or advisory standards, nor the exercise of engineering judgment by licensed professionals. The Guide is compiled of information and concepts from various agencies and organizations faced with similar transportation issues. Caltrans acknowledges the existence of other practices and provides this Guide for those responsible for making professional engineering or other design decisions.

# Background



- Major points of conflict for road users
- Frequent site of injuries and fatalities
- 20% of pedestrian fatalities
- 25% of bicyclist fatalities
- Safety and Mobility
- Common Issues and Best Practices

# Organization

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- Section 1: Introduction
- Section 2: All Intersections Overview – Guiding Principles
- Section 3: Four-Leg Intersections
- Section 4: Three-Leg Intersections
- Section 5: Multi-leg, Offset and Skewed Intersections
- Section 6: Special Cases
- Section 7: Intersections with Transit
- Section 8: Roundabouts
- Section 9: Interchanges
- Section 10: Treatments on the Horizon
- Section 11: Background Information covering pedestrian and bicyclists' collision data, crash types, and other topics.

# How Should This Guide Be Used?

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- Review 12 Guiding Principles
- Select Intersection Type(s)
- Review Common Issues and Treatments
- Apply to Situation

# 12 Guiding Principles

All Intersections Overview

# “Observe”

Does the crosswalk placement meet the needs of this pedestrian?



# “They Will Be There”

Was this road designed with pedestrians in mind?



# “Maintain And Improve”

Keeping facilities well maintained and improving them during maintenance or road construction provides a benefit to pedestrians and bicyclists.



# “Tee It Up”

The high-speed ramp has been replaced with a 90-degree intersection.



# “One Decision At A Time”

Median Refuges allow pedestrians to consider one direction of traffic at a time.



# “Slow It Down”

Road diets can improve pedestrian and bicycle access with reducing motor vehicle crashes.



# “Shorten Crossings”

Curb Extensions shorten crossings and make pedestrians more visible to motorists.



# “Improve Visibility”

Good design makes motorists more aware that bicyclists and pedestrians are expected, thus increasing visibility.



# “Clarify The Right-Of-Way”

Bike lanes striped to the left of a right-turn only lane reduce the risk of a weaving-related collision.



# “Keep It Direct”

Restricting crossing movements increases the distance a pedestrian must travel to cross a road.



# “Light At Night”

Lighting increases safety and security for pedestrians and bicyclists.



# “Access For All”

Pedestrian facilities must be reconstructed to meet or exceed ADA requirements.



# Intersection Types

Four-Leg

Three-Leg and Offset

Skewed and Multi-Leg

Midblock and Shared Use Path

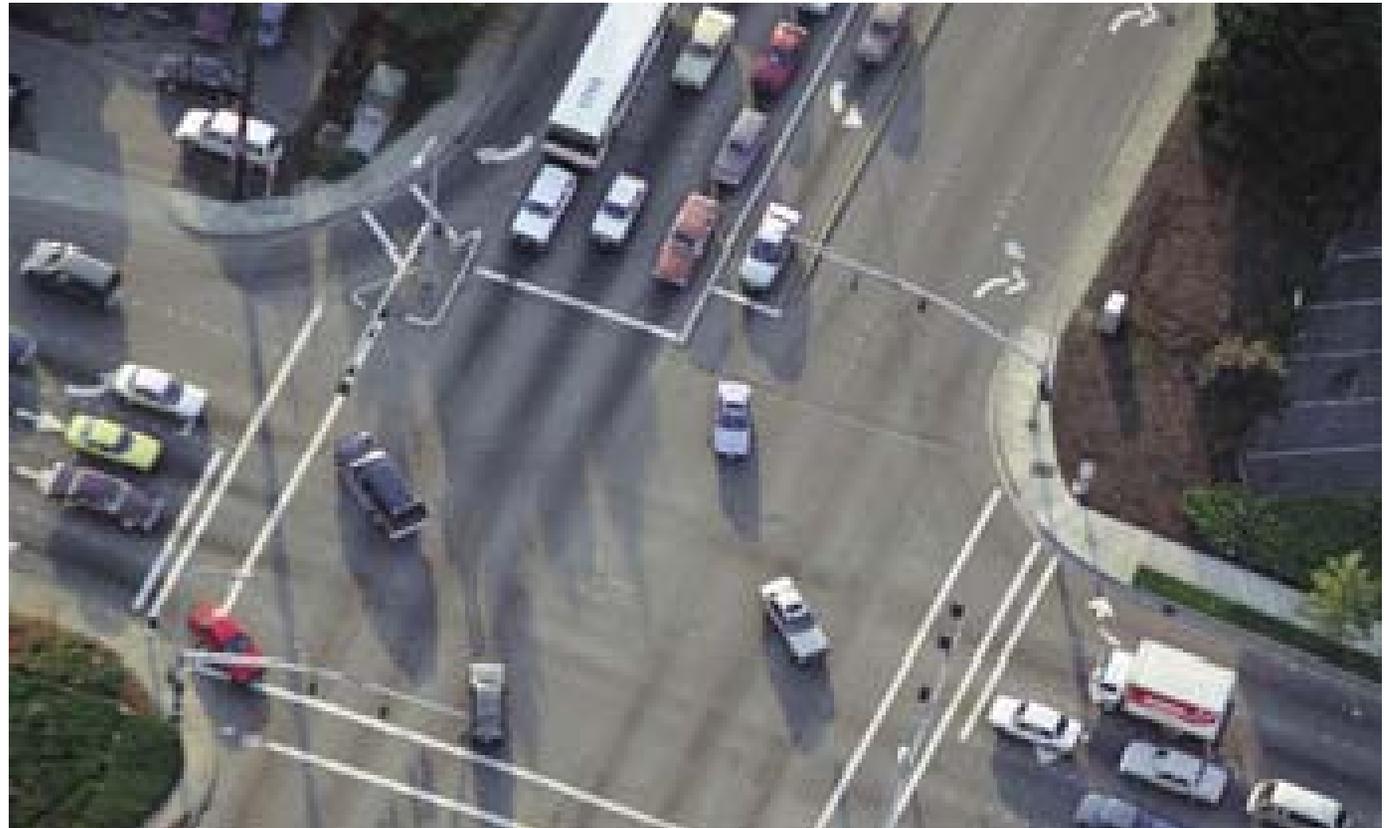
Bus Stops and Railroad

Roundabouts

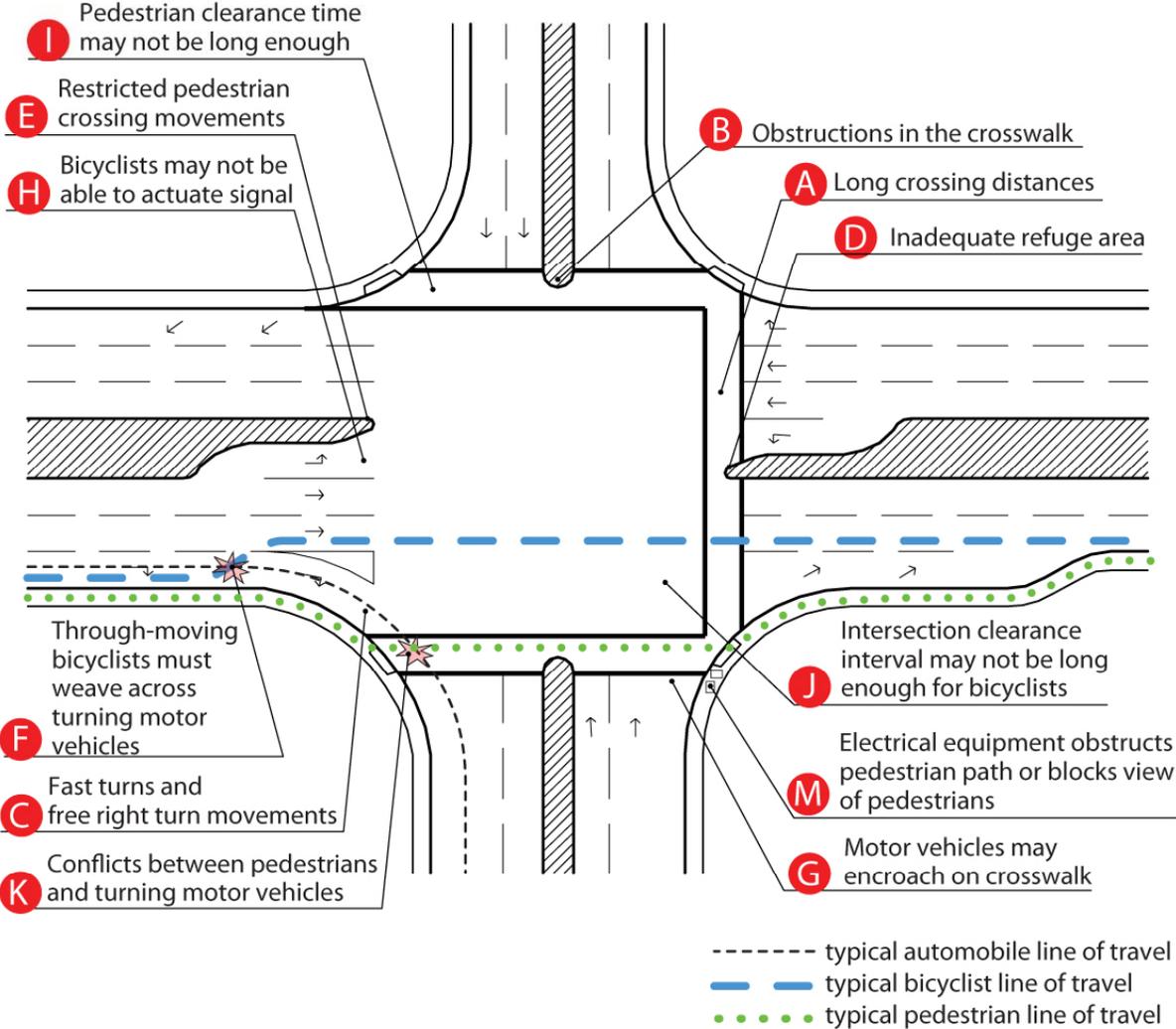
Free-Flow Ramps

# Signalized Four-Leg Intersection

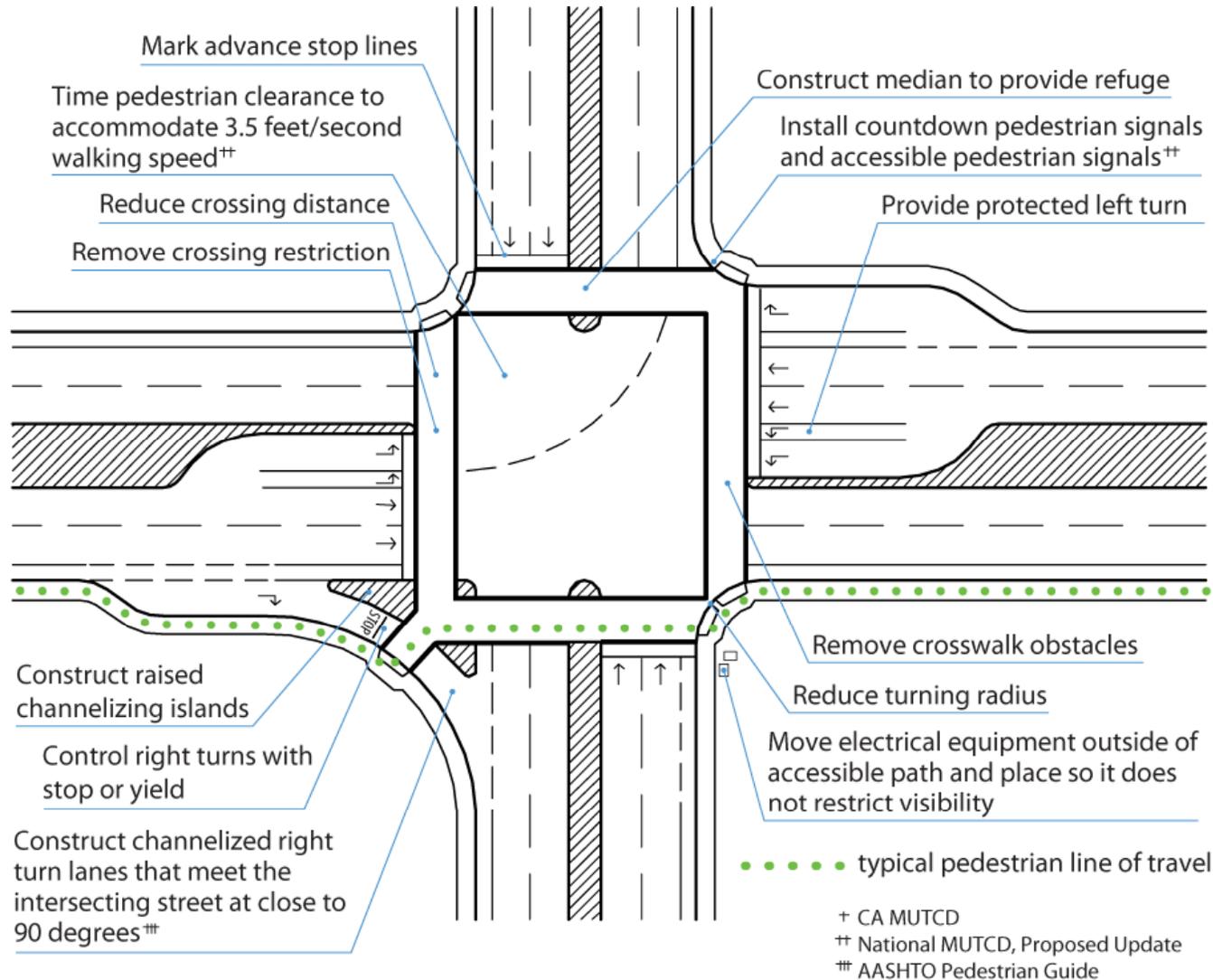
A right-turn only lane may allow high turning speeds and may reduce the likelihood that motorists will yield to pedestrians crossing the turn lane.



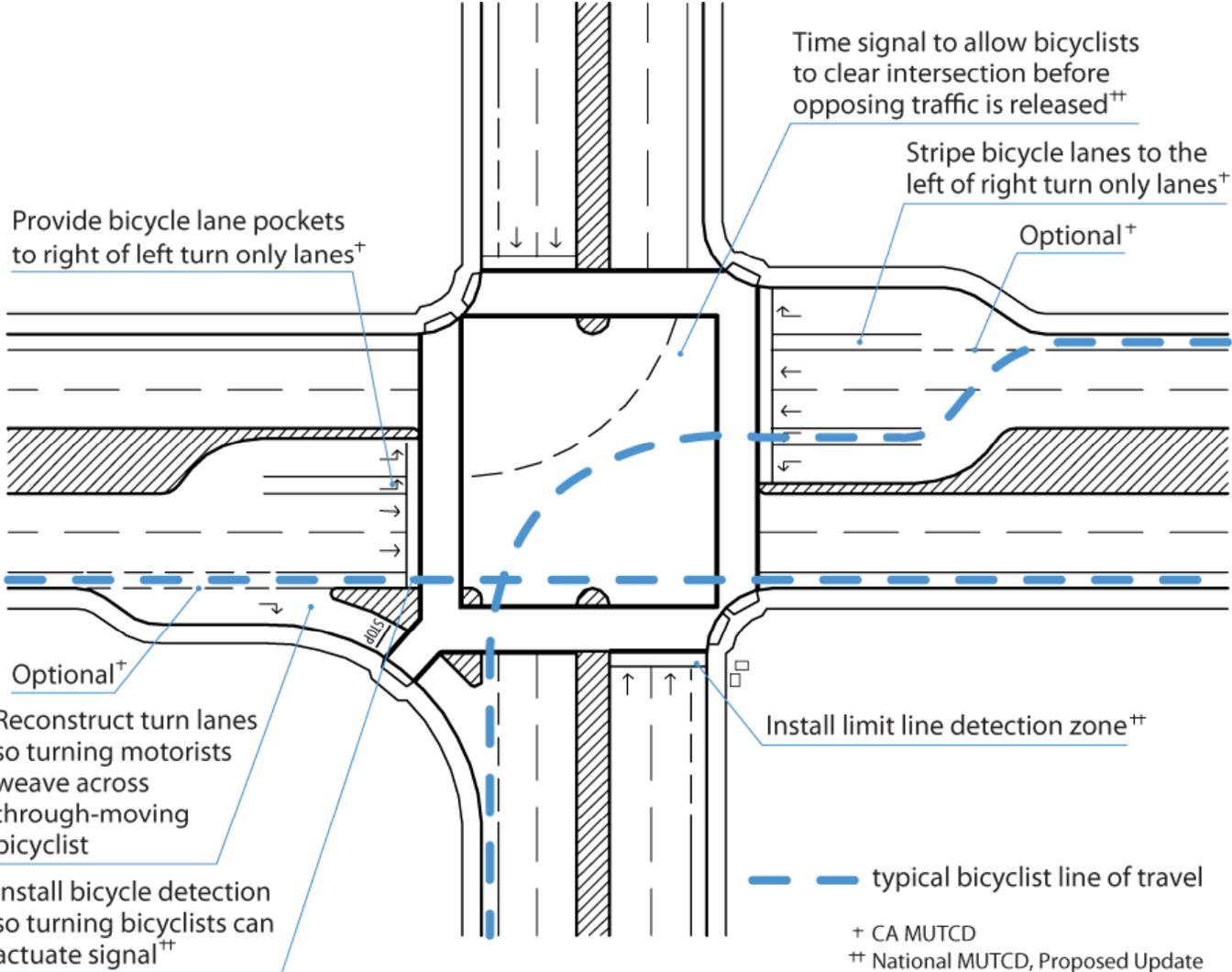
# Common Issues at Signalized Four-Leg Intersections



# Treatments for Pedestrians at Signalized Four-Leg Intersections



# Treatments for Bicyclists at Signalized Four-Leg Intersections



+ CA MUTCD  
 †† National MUTCD, Proposed Update  
 ††† Traffic Operations Policy Directive 09-06

# Problem Statement #1

1. Signalized Four-Leg intersection near elderly care facility and river access.
2. Multi-lane approaches with high ADTs.
3. Three bicycle and two pedestrian injuries within the last year.

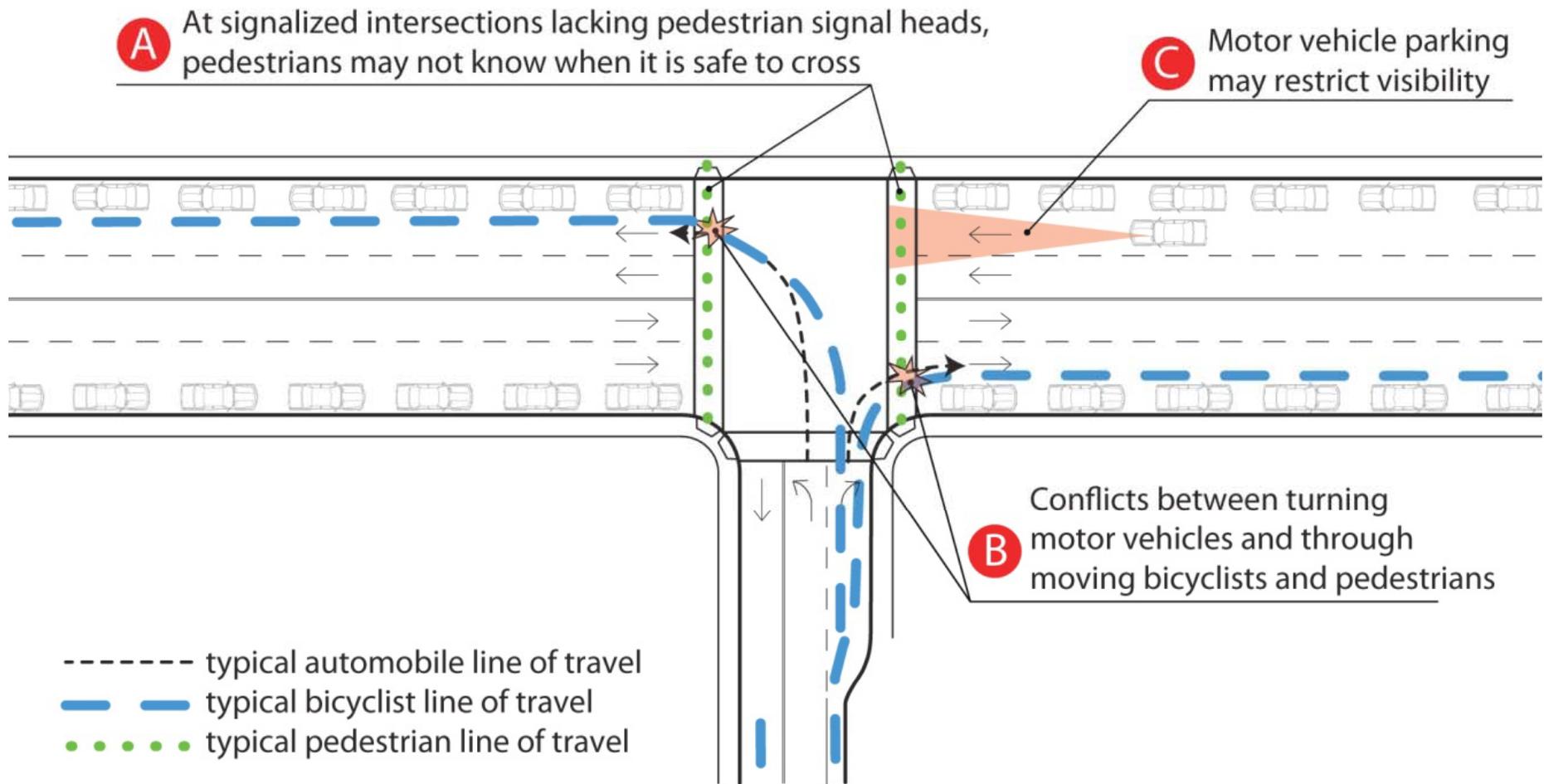


# Three-Leg (T) Intersections

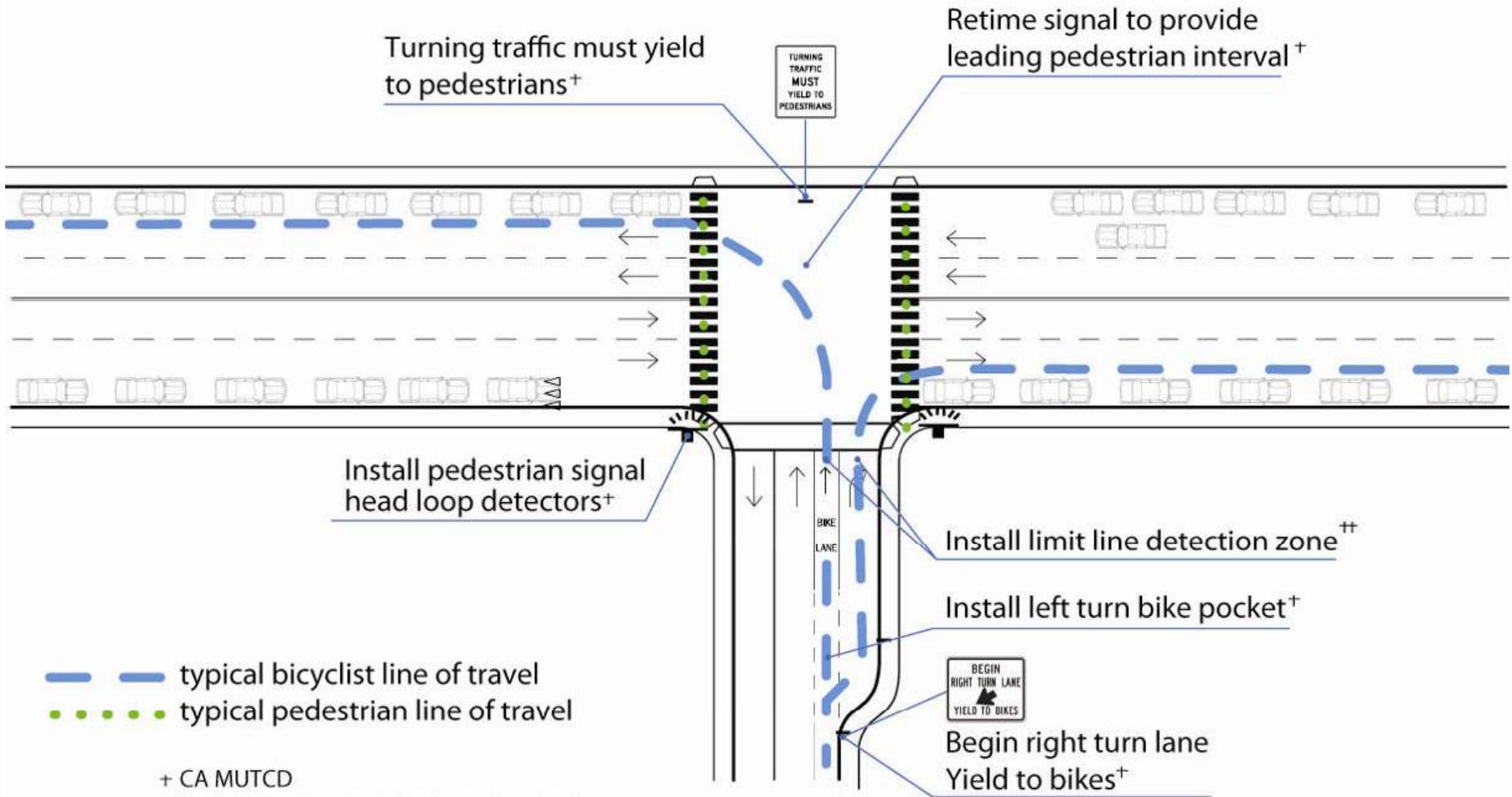
*Crosswalks at uncontrolled locations on high volume arterials should be paired with enhancements such as a raised median or pedestrian-actuated beacon.*



# Common Issues at T-Intersections

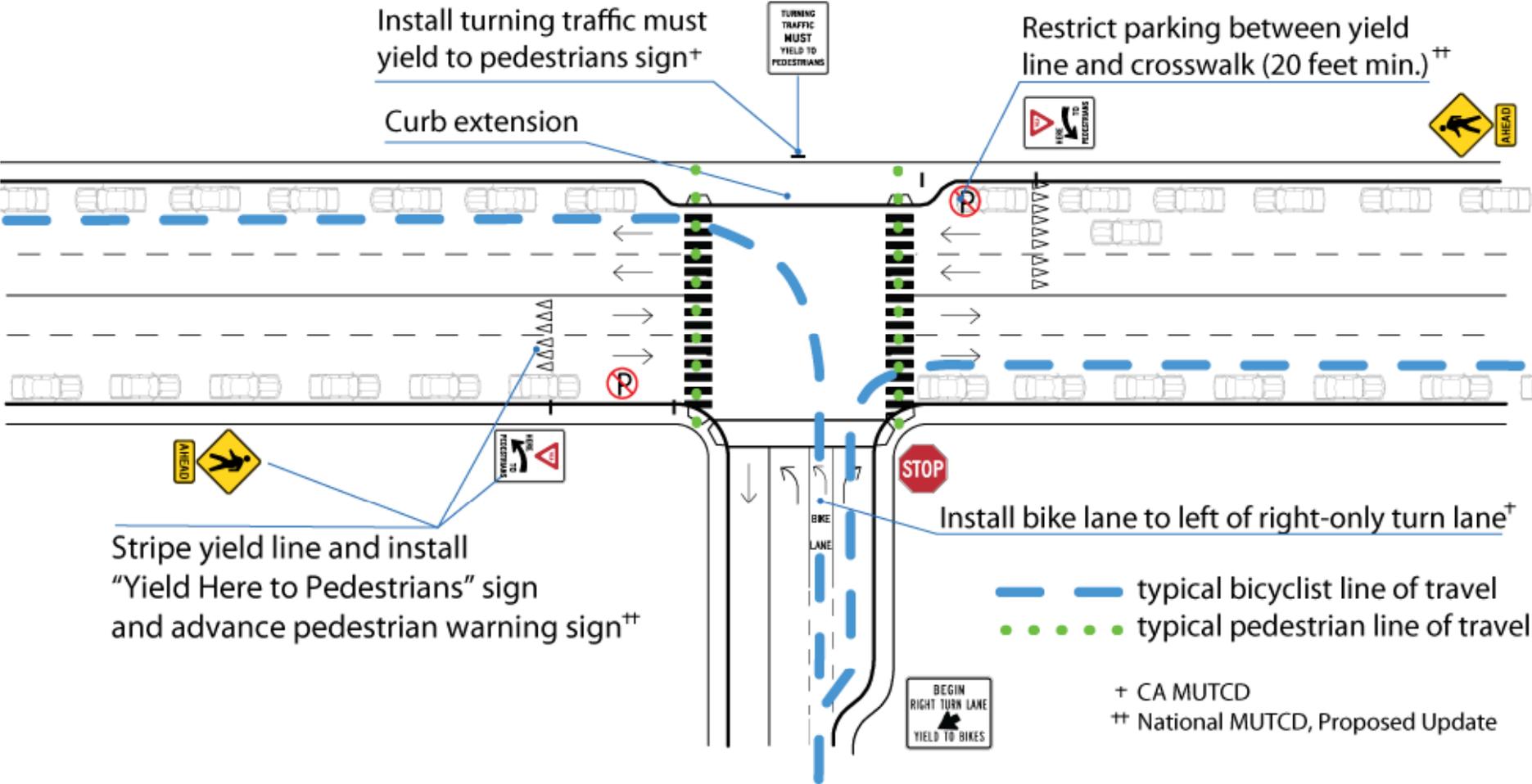


# Treatments at Signalized T-Intersections



<sup>+</sup> CA MUTCD  
<sup>++</sup> Traffic Operations Policy Directive 09-06

# Treatments at T-Intersections Where Mainline is Uncontrolled



# Problem Statement #2

1. Signalized Three-Leg intersection on rural mainstreet.
2. Collisions occurring between the 8 pm and 12 am.
3. Two pedestrian fatalities within the last year.

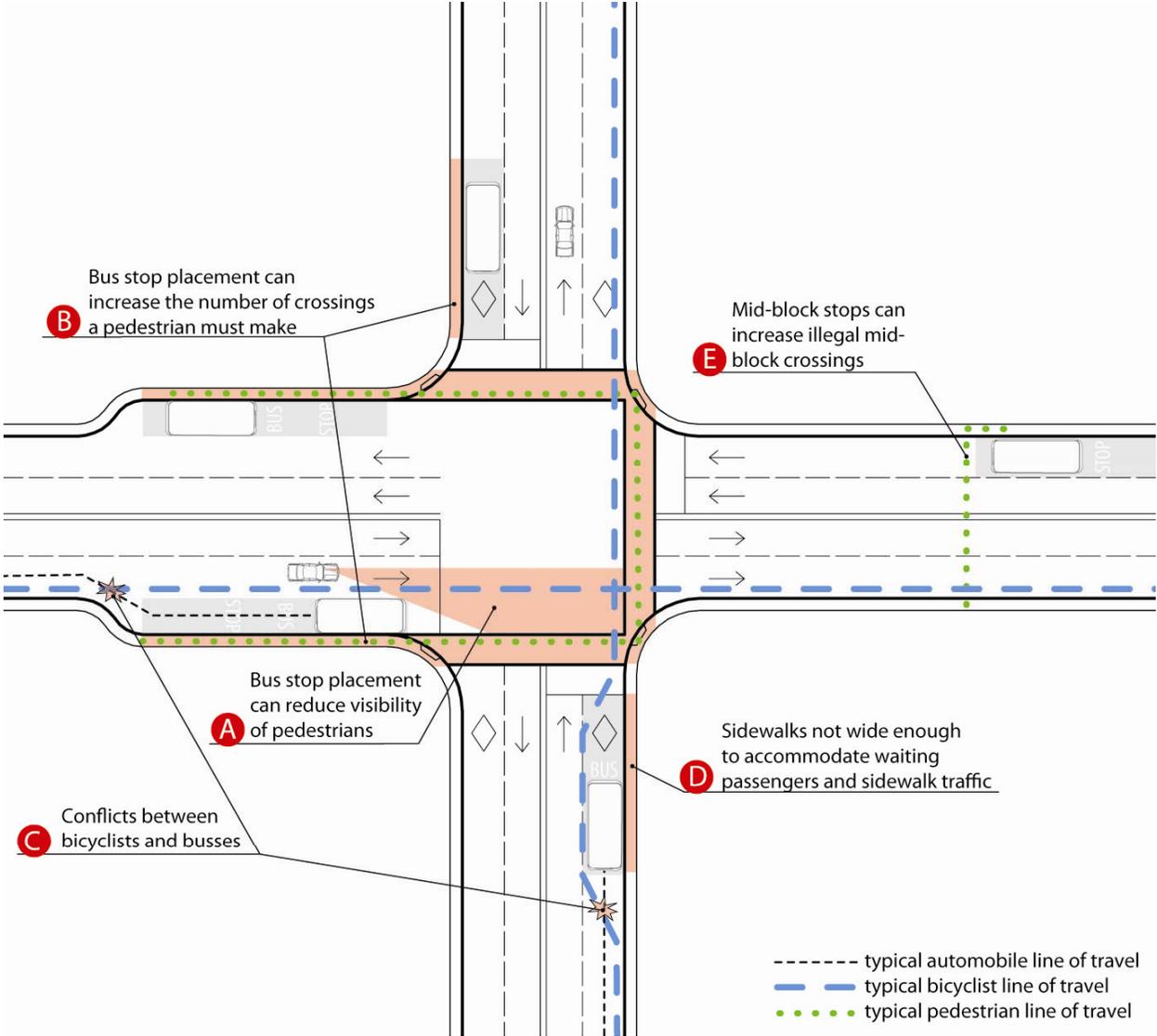


# Bus Stops at Intersections

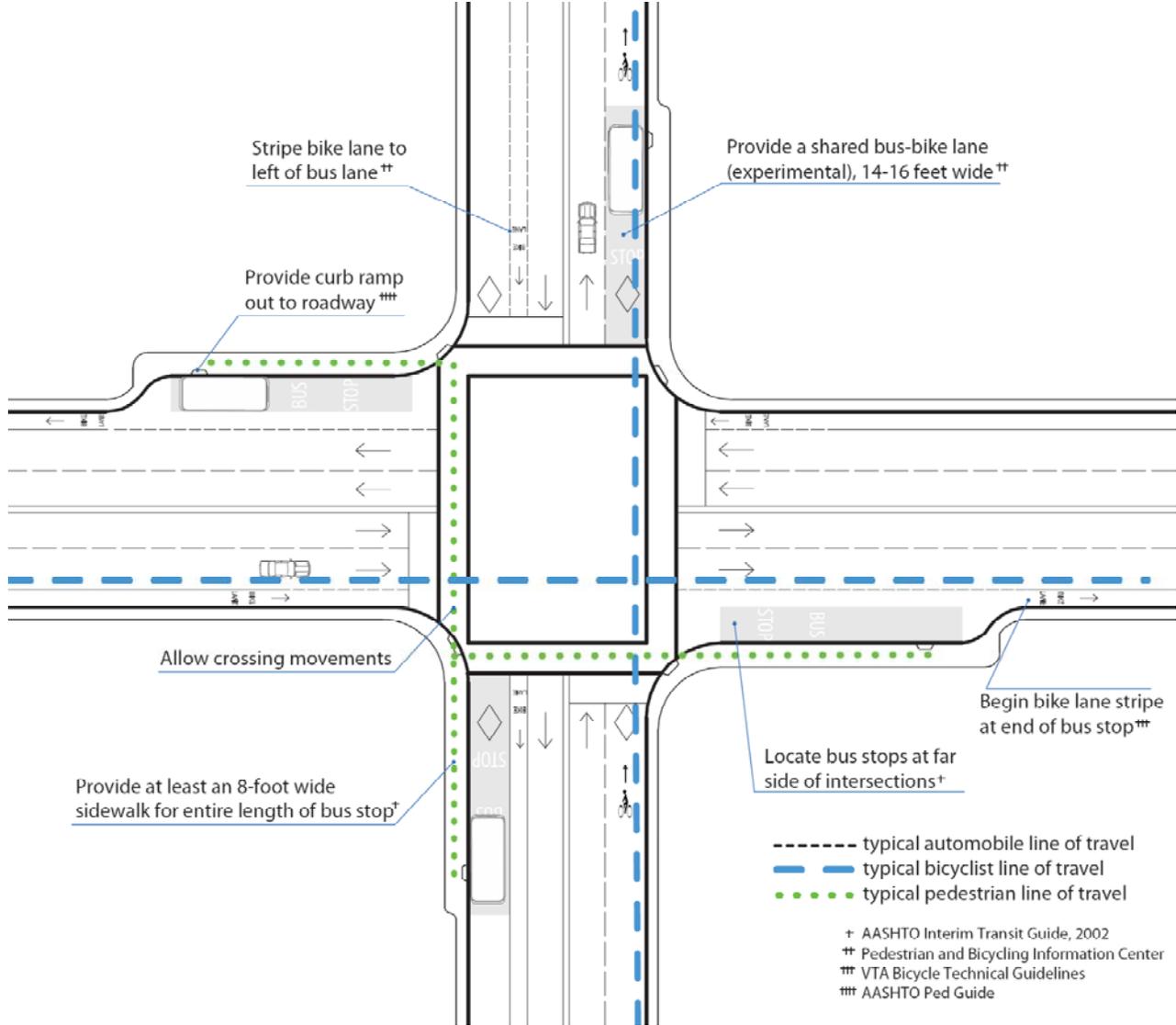
A wide landing pad and bus shelter can provide additional comfort to pedestrians and transit users.



# Common Issues at Bus Stops



# Treatments at Bus Stops



# Recap



- Review 12 Guiding Principles
- Select Intersection Type(s)
- Review Common Issues and Treatments
- Apply to Situation

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