

Madison Transportation Plan Complete Streets and Innovative Bicycle Facilities



Ken Ray, RLA

Toole
Design
Group









HERE ON
RED
←

STOP
HERE ON
RED
←

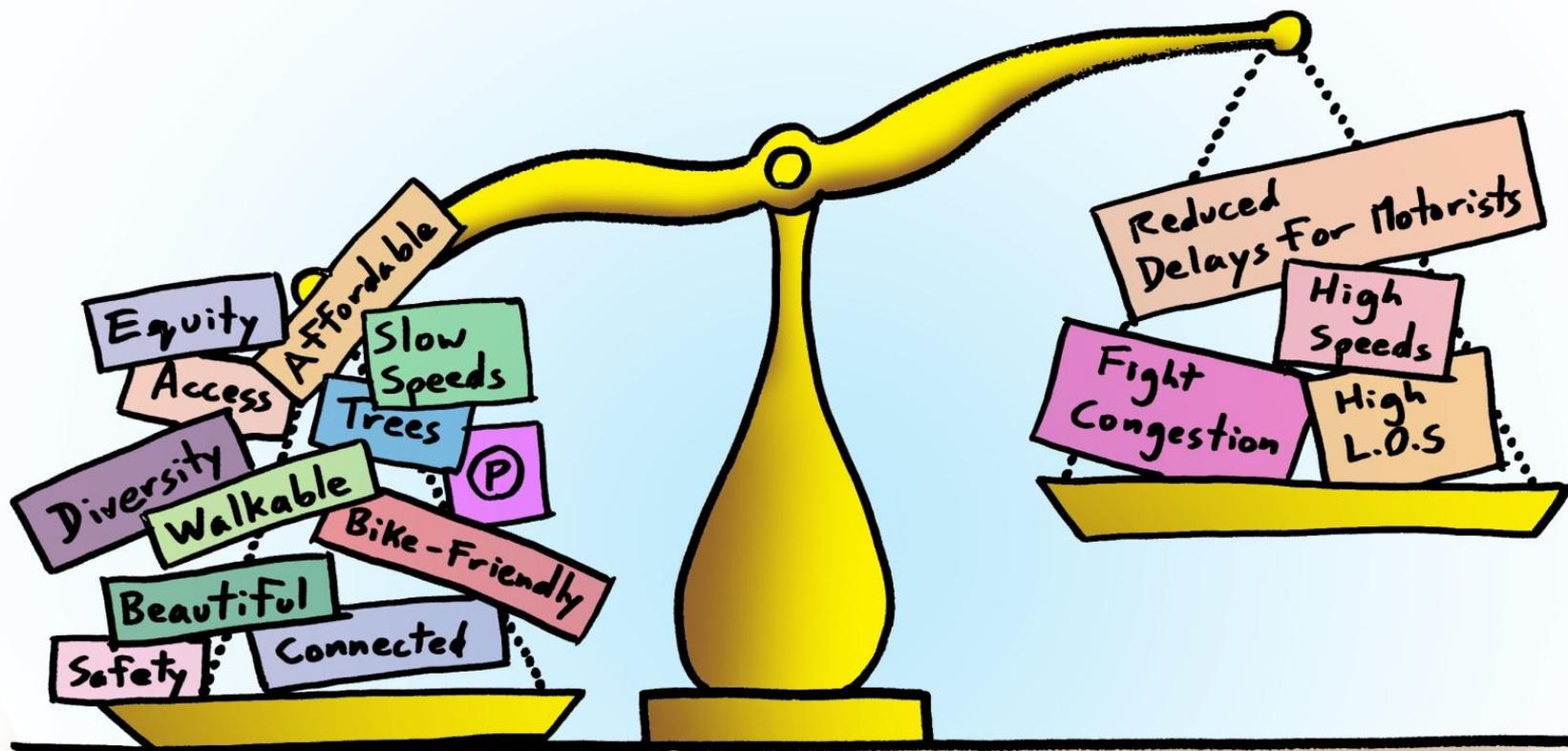
Monroe St





Streets define the character of neighborhoods and are the common ground where people travel, meet and do business on a daily basis.





"Priorities"

vs

"Balance"

Lockwood

What to plan, decide, fund...?

Trends in bicycle-friendly communities

- Providing “stress-free” bikeways
 - ✓ High quality trails and greenways
 - ✓ Separated and buffered bike lanes
- “Neighborways” - Bike boulevards
- Encouraging a “bike culture”

Cities are innovating

- New York City
- Portland, OR
- Boston, MA
- Chicago, IL
- Washington, DC
- Baltimore, MD



Top Innovation: the “Road Diet”



Green Pavement in Bike Lanes



New York City



Portland, OR

Huntington Avenue - Boston

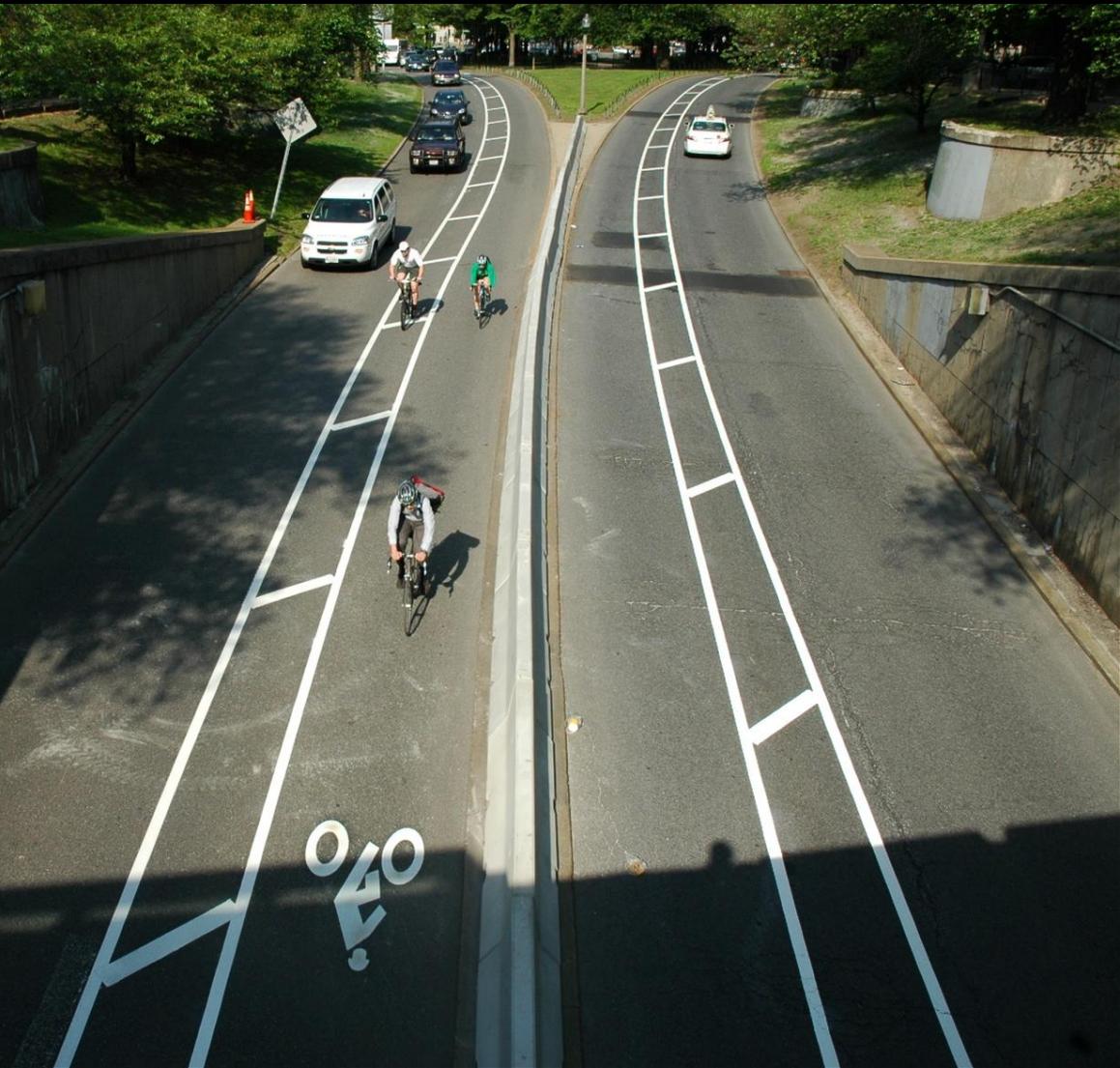


Head-Out Angled Parking



Washington, DC

Buffered Bike Lanes



Boston, MA

Separated Bike Lanes



Minneapolis, MN

- Plenty of wide roads
- Population 382,000







7'

7'

5'

FREEWHEEL BIKE

MIDTOWN BIKE CENTER

SPRINKLES
CASSIS
SUNDAY AUG 14th
- SLURP -

FREE
ICE
WATER
midtown
bike



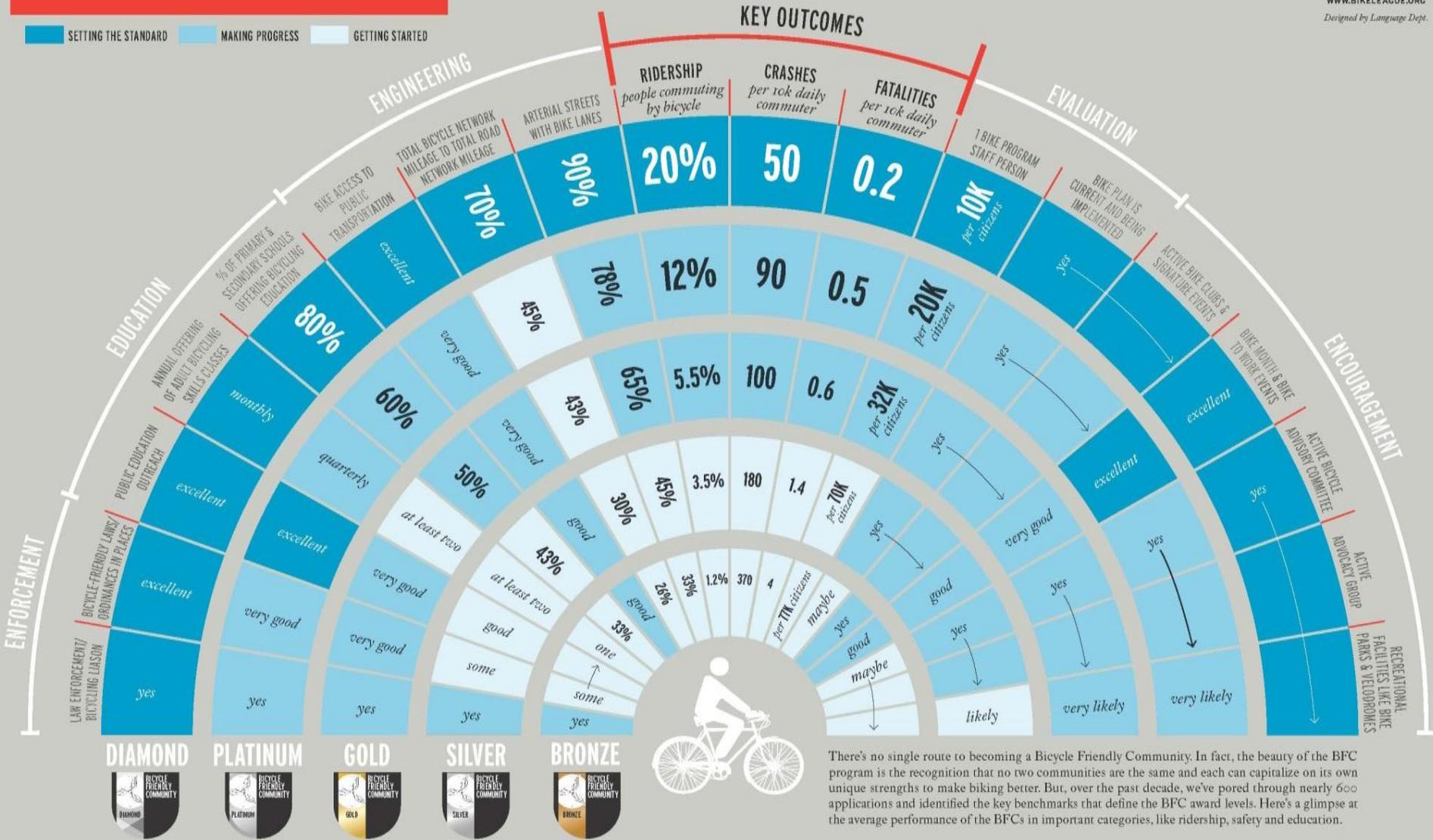




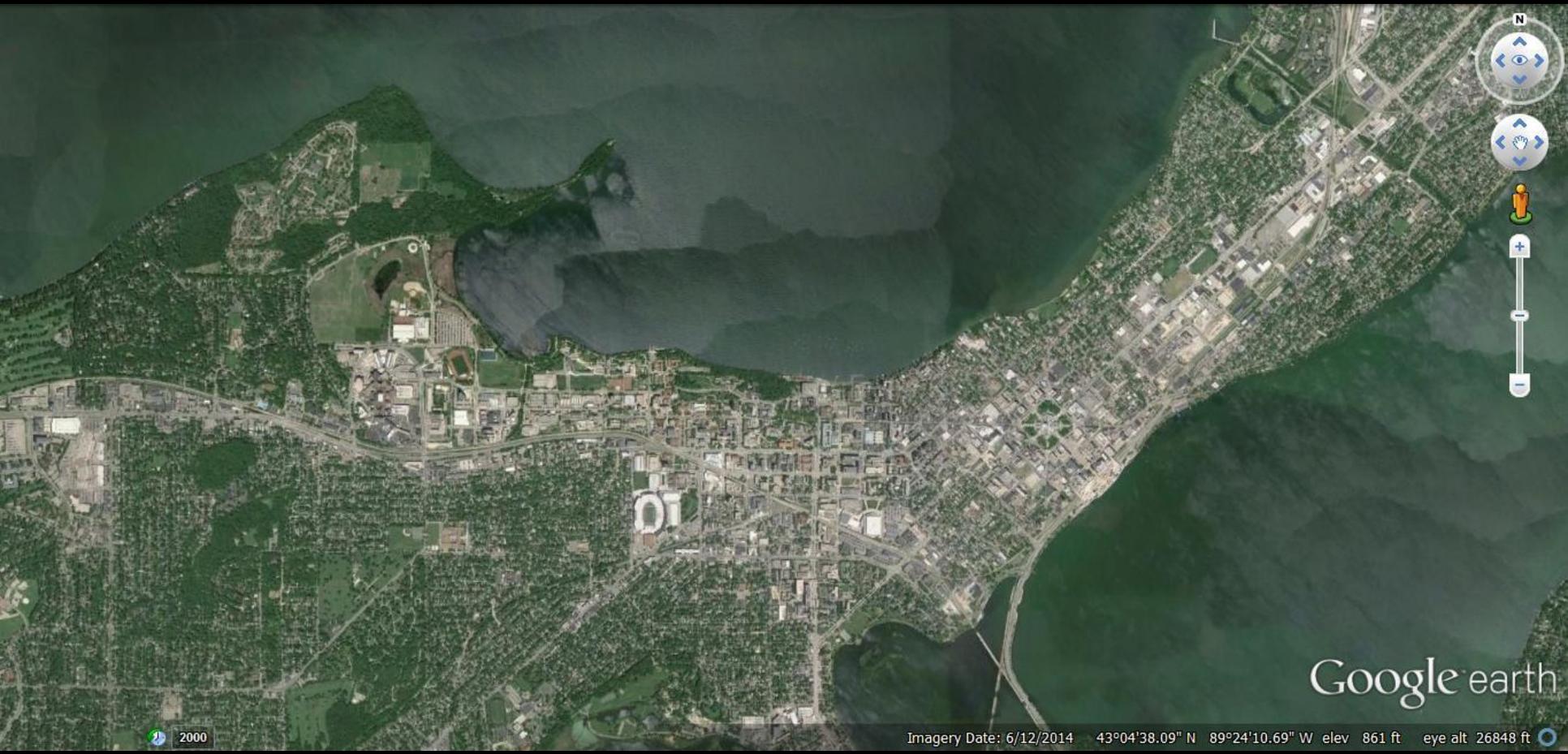
THE BUILDING BLOCKS OF A BICYCLE FRIENDLY COMMUNITY

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 WWW.BIKELEAGUE.ORG
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SETTING THE STANDARD MAKING PROGRESS GETTING STARTED



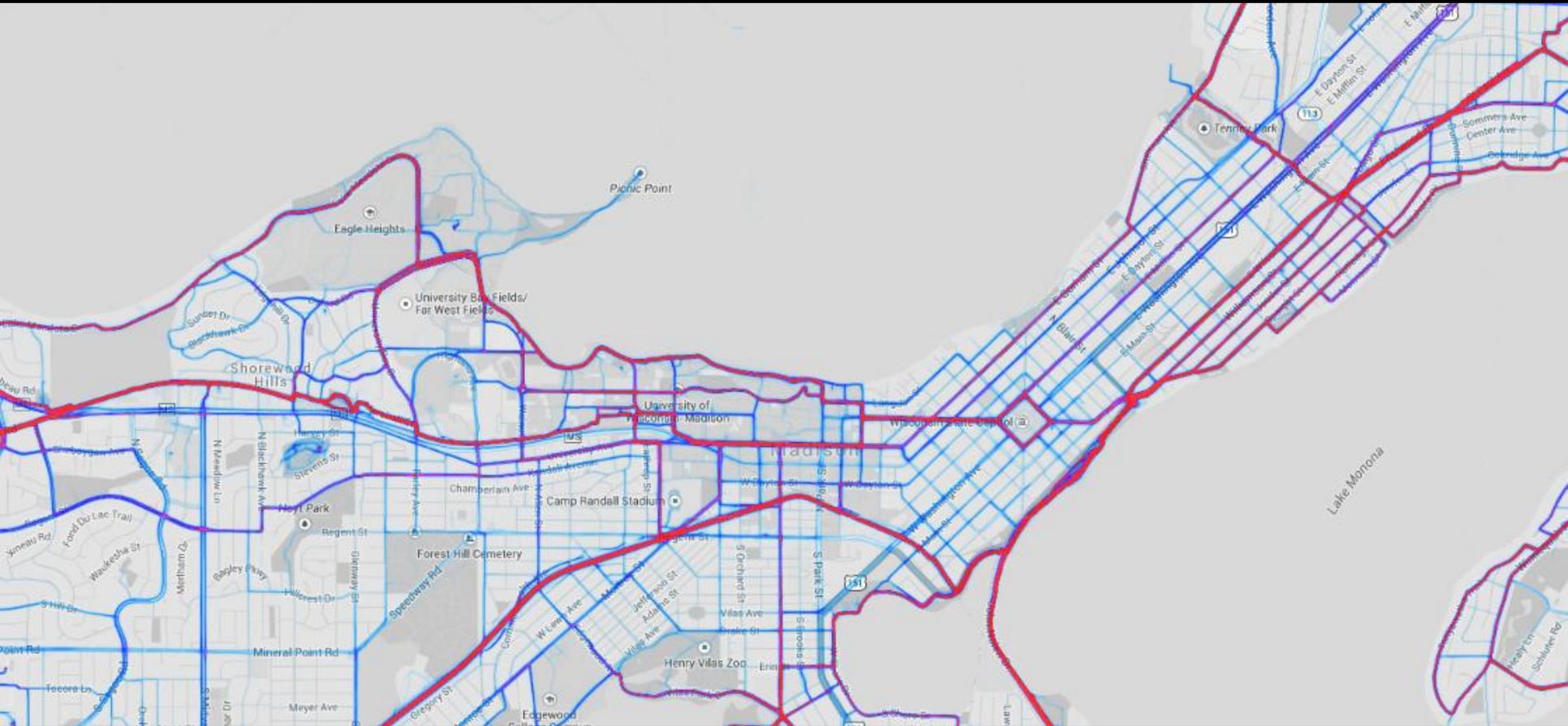
There's no single route to becoming a Bicycle Friendly Community. In fact, the beauty of the BFC program is the recognition that no two communities are the same and each can capitalize on its own unique strengths to make biking better. But, over the past decade, we've pored through nearly 600 applications and identified the key benchmarks that define the BFC award levels. Here's a glimpse at the average performance of the BFCs in important categories, like ridership, safety and education.

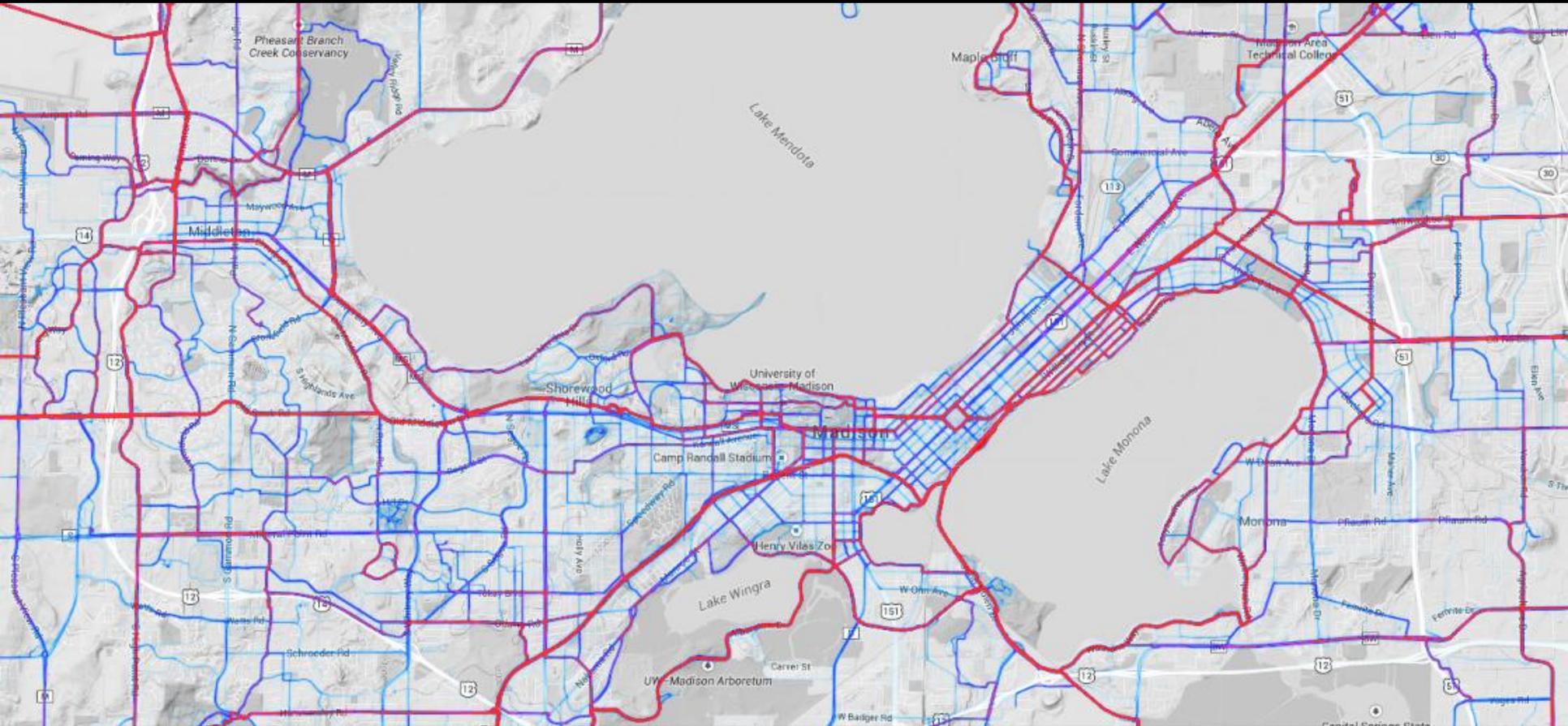


Google earth

2000

Imagery Date: 6/12/2014 43°04'38.09" N 89°24'10.69" W elev 861 ft eye alt 26848 ft



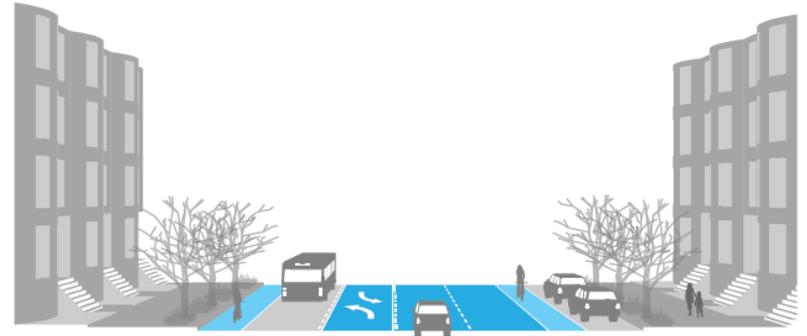




Traditional road classifications emphasize vehicle movement.

Traditional Highway Class

- ▶ Arterials
- ▶ Collectors
- ▶ Locals



Complete Street Types emphasize the character of the entire street.

Complete Street Types

New Street Types

- ▶ Downtown Commercial
- ▶ Downtown Mixed-use
- ▶ Neighborhood Main
- ▶ Neighborhood Connector
- ▶ Neighborhood Residential
- ▶ Industrial

Special Street Types

- ▶ Shared Street
- ▶ Parkway
- ▶ Boulevard

Neighborhood Main Street

DOWNTOWN COMMERCIAL
DOWNTOWN MIXED-USE
NEIGHBORHOOD MAIN STREET
NEIGHBORHOOD CONNECTOR
NEIGHBORHOOD RESIDENTIAL

INDUSTRIAL
SHARED STREETS
PARKWAYS
BOULEVARDS

Overview

Neighborhood Main Streets are typically located in the heart of a residential part of the city. Characterized by dense single-floor commercial and retail use, they are often concentrated in an area only a few blocks long. They are the nucleus of the city's neighborhood economies, providing residents with daily essentials, locally-owned shops, and services such as banking and dry-cleaning. The curbside uses on these streets prioritize transit, short-term customer access, and loading for local shops and restaurants.

Because these streets are a meeting ground for residents, they should be designed to support gathering and community events such as farmer's markets and holiday tree-lighting. In addition, they are characterized by community facilities such as libraries, community centers, and health centers.

A Neighborhood Main Street is often one of the only through streets in a neighborhood, and many such streets link with well-known neighborhood squares. They often serve as hubs for bus routes and as destinations for local walking and bicycling trips. (Note: This street type can include corridors not currently participating in the Main Streets Program.)



Example Streets

- ▶ Dorchester Avenue (South Boston/Dorchester)
- ▶ Center and South Streets (Jamaica Plain)
- ▶ Dudley Street (Roxbury)
- ▶ Birch Street and Roslindale Square (Roslindale)
- ▶ Meridian Street, Maverick, and Central Squares (East Boston)

Boulevards

DOWNTOWN COMMERCIAL
DOWNTOWN MIXED-USE
NEIGHBORHOOD MAIN STREET
NEIGHBORHOOD CONNECTOR
NEIGHBORHOOD RESIDENTIAL

INDUSTRIAL
SHARED STREETS
PARKWAYS
BOULEVARDS

Overview

Boulevards, like Parkways, are defined by their grand scale and urban design. Boston has a rich heritage of these streets, with Commonwealth Avenue in the Back Bay being recognized as one of the nation's premier boulevards. They usually have a consistent design for the length of the corridor, often with wide planted medians or furnishing zones, and they connect important civic and natural places. Boulevards also often feature longer block lengths.

Significant mature tree cover, combined with promenades or median malls provide great walking and social spaces along Boulevards. Boulevards differ from Parkways in that they normally have buildings and active land uses along both sides of the street. Medians may also accommodate light-rail or bus rapid-transit service.

Example Streets

- ▶ William J. Day Boulevard (South Boston)
- ▶ Commonwealth Avenue (Back Bay, Fenway, Allston/Brighton)
- ▶ Huntington Avenue (Fenway/South End)



Optimizing Use of Street Space

1 Road Diet

A road diet is a reduction in overall roadway width.



Remove Lanes

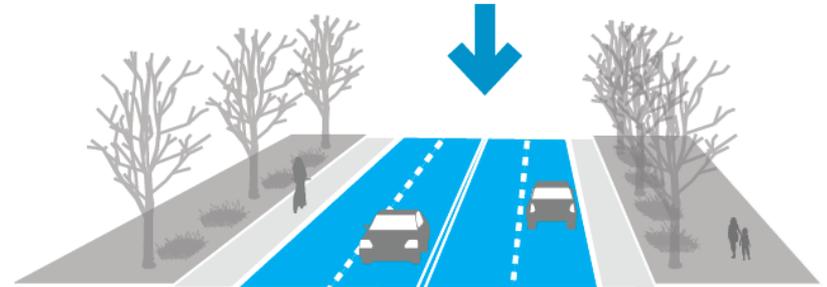


2 Lane Diet

A lane diet is a reduction in travel lane width.



Reduce Lane Widths



Optimizing Use of Street Space

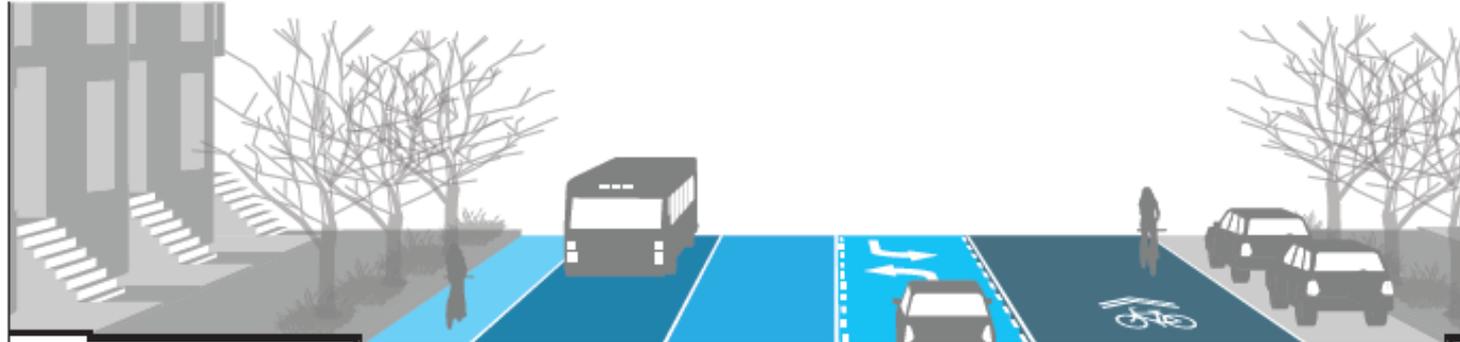
Minimum Lane Widths in the City of Boston

The chart below presents proposed guidelines for lane widths on in the City of Boston. The lane widths shown in the chart should be considered minimums in new construction within constrained rights-of-way, major reconstruction, and retrofit street design— in other words, on streets where trade-offs are required in order to meet the needs of all users.

A design exception may be required for some values on federal or state-funded projects. Due to coordination with other jurisdictions, minimum lane width values are categorized by the traditional highway based classification system. Decisions regarding lane widths in the City should support the desired characteristics of Boston's new street types.

Presence of heavy vehicles is a key consideration when using minimum lane widths. Wider lanes (11'-12') are appropriate in locations with high volumes of heavy vehicles (>8%).

Engineering judgment is necessary to make final determinations regarding lane widths. Studies show that narrower lane widths have no measurable impact on capacity, however they may result in a reduction of travel speeds by 1-3 mph. In response to specific conditions on a given street, lane widths that are different from those below may be required.



Street Type	FHA Classification	Lane Width by FHA Classification					
		Bike lane	Transit lane	Vehicle lane	Left Turn lane	Special lane	Parking lane
Downtown Commercial	Arterial	4' 5' ● If adjacent to parking	11'	10' ● 12' ● If adjacent to parking	10' ●	12' ● 12' ● Bike + bus lane peak hour restricted parking lane	7' ●
Downtown Mixed Use		5' If adjacent to curb		12' If adjacent to curb			
Neighborhood Main	Collector	4' 5' ● If adjacent to parking	N/A	10' ● 10' ● If adjacent to parking	10' ●	N/A	7' ●
Neighborhood Connector		4' If adjacent to curb		10' If adjacent to curb		12' peak hour restricted parking lane	
Neighborhood Residential	Local	4' 5' ● If adjacent to parking	N/A	10' ● 10' ● If adjacent to parking	N/A	N/A	7' ●
Industrial Street		4' If adjacent to curb		10' If adjacent to curb		N/A	
Shared Street		4' 5' ● If adjacent to parking		10' If adjacent to parking		N/A	
Parkway		4' If adjacent to curb		10' If adjacent to curb		N/A	
Boulevard							

- Wider lanes (11'-12') are appropriate in locations with high volumes of heavy vehicles (>8%).
- Shared lane bicycle legends are permitted on lanes of any width, in locations with and without parking.
- Wider bike lanes (6'-7') are preferred in locations with heavy parking turnover.
- Typical street construction in Boston is granite curb with flush pavement leaving no gutter pan or flag.
- Decisions regarding parking lane width when adjacent to bike lanes should consider parking turnover rates and vehicle types.
- Wider lanes (13'-14') are preferred where feasible to enable bicyclists and buses to pass each other.

Optimizing Use of Street Space



Context Sensitive Toolbox

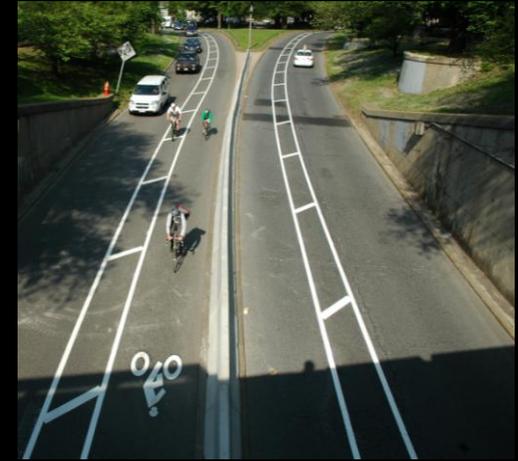
Paths



Separated Bike Lanes



Bike Lanes



Shared Use Markings



Neighborways



Spot Improvements





**Separated Bike Lanes
VANCOUVER, BC**





SPACE NATIONAL
3,000 - 28,000 RSF
202.463.2100

FEDERAL ENERGY
REGULATORY COMMISSION

CN

810
UNION CENTER PLAZA

4707
metroaccess

Public
PUBLIC
PARKING

TWO-WAY

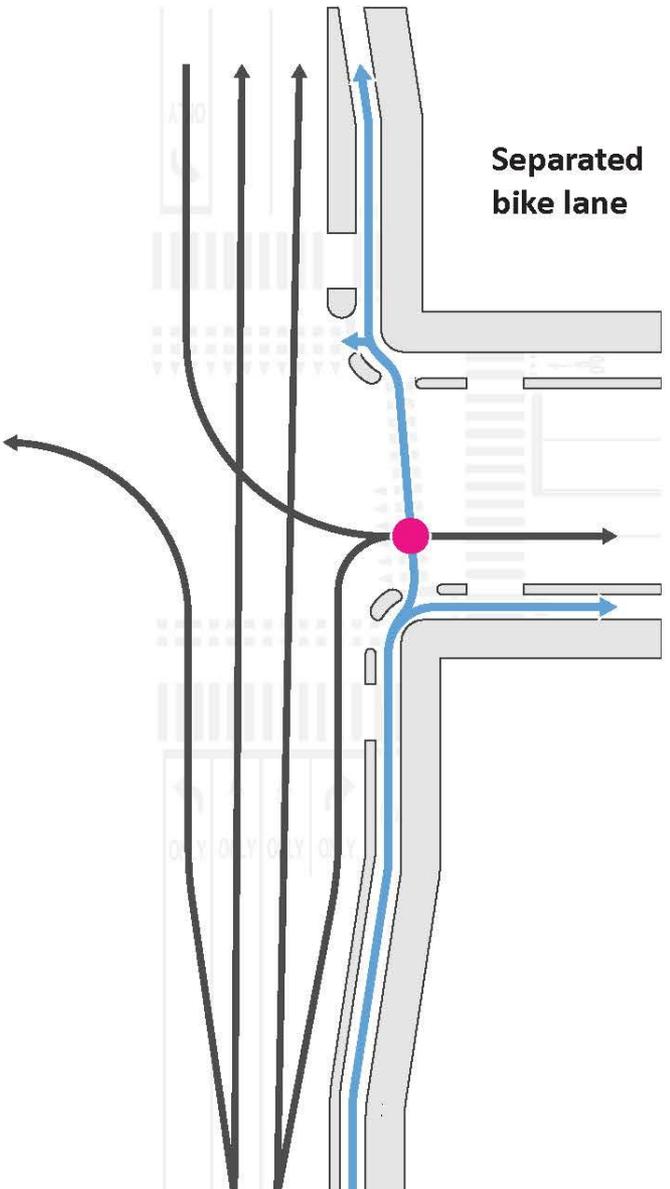
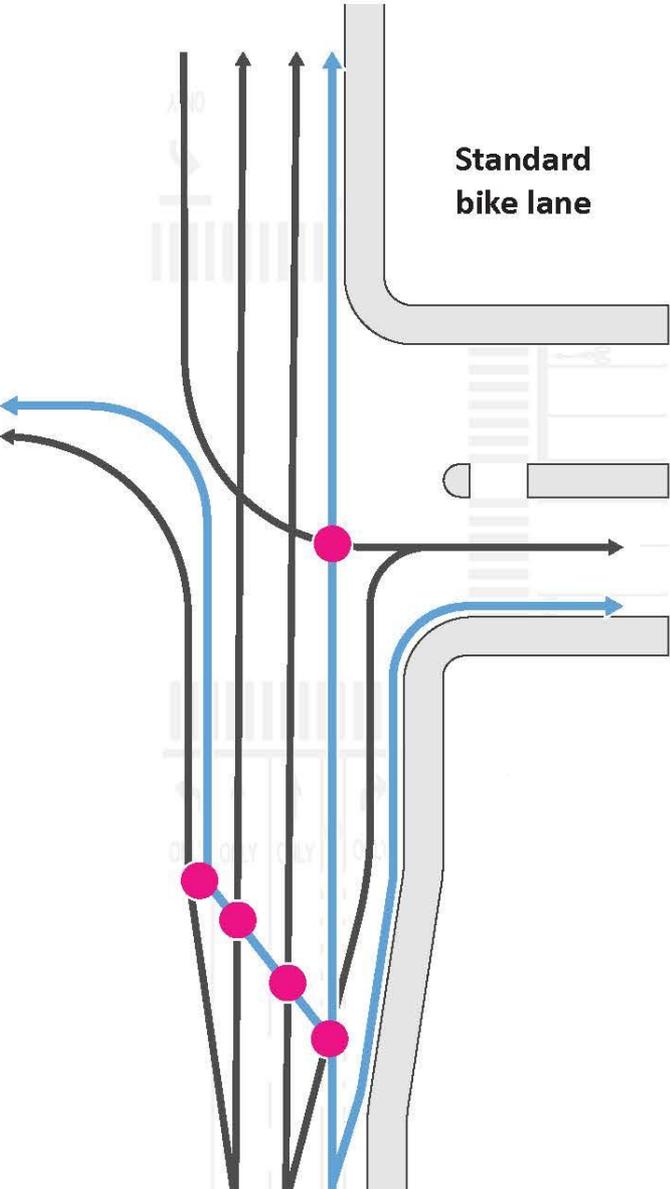
- “Edge” conditions with few crossings
- Contra-flow movement on one-way street
- Not enough room for one-way separated bike lane on both sides of the street



NEW YORK



Intersection Conflict Points



Separated Bicycle Lane Types

Sidewalk Sidewalk Buffer Bike Lane Street Buffer Street

Sidewalk level



Intermediate level



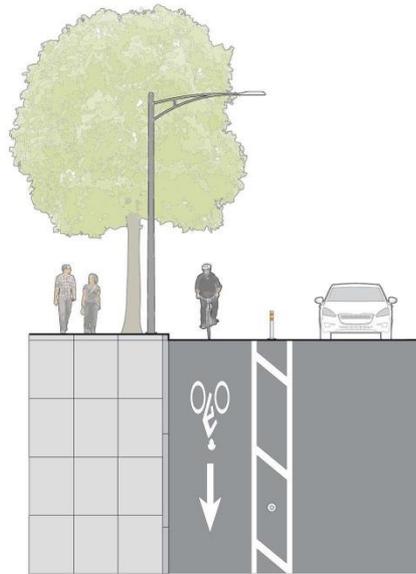
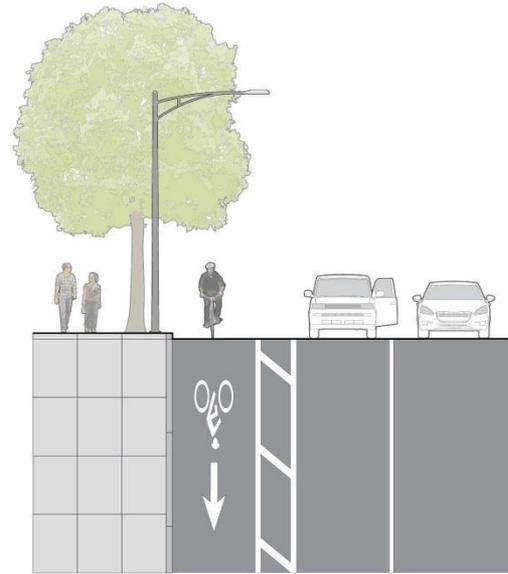
Street level, curb separated



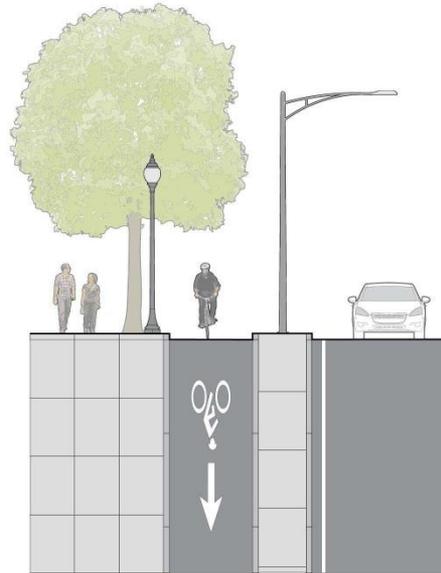
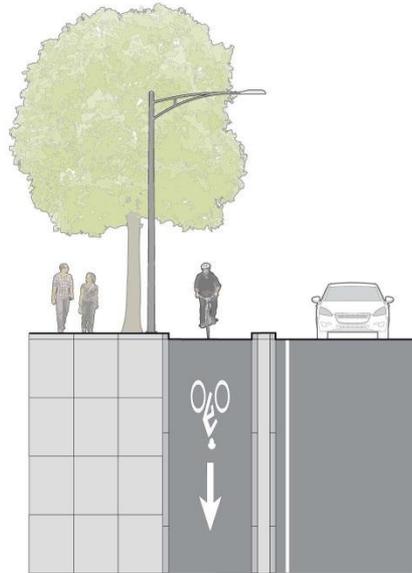
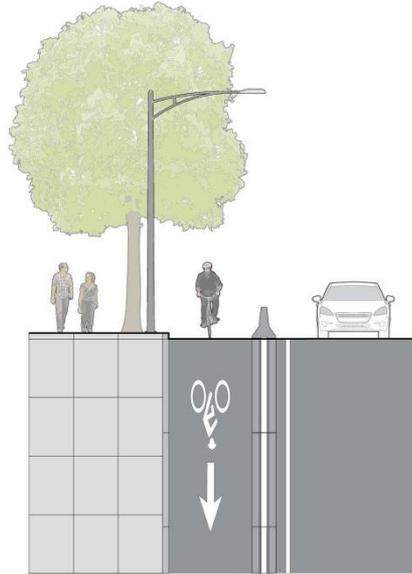
Street level, object separated

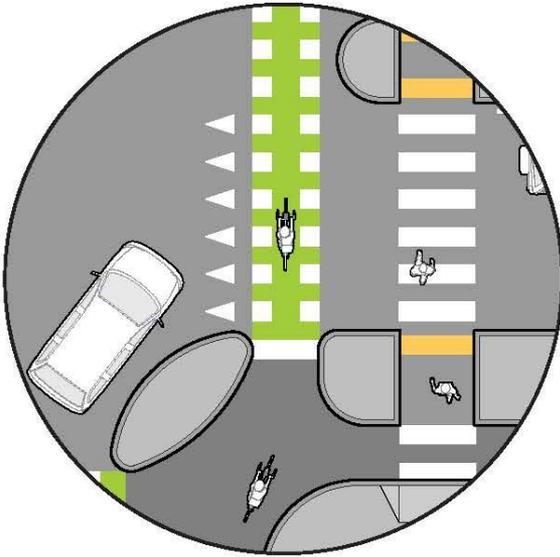


Street Buffer Examples

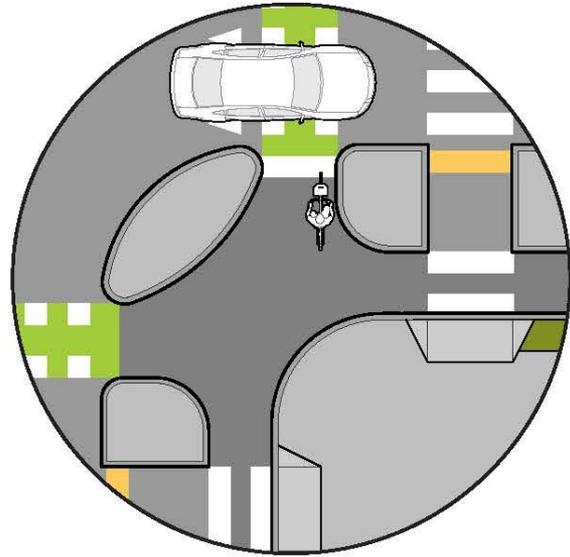


Street Buffer Examples (cont.)

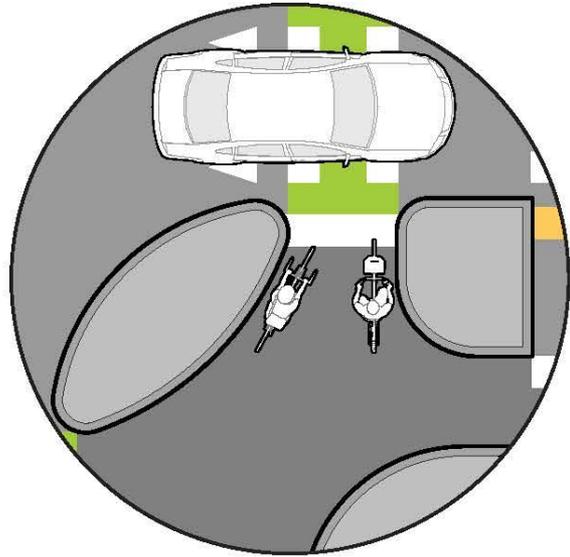




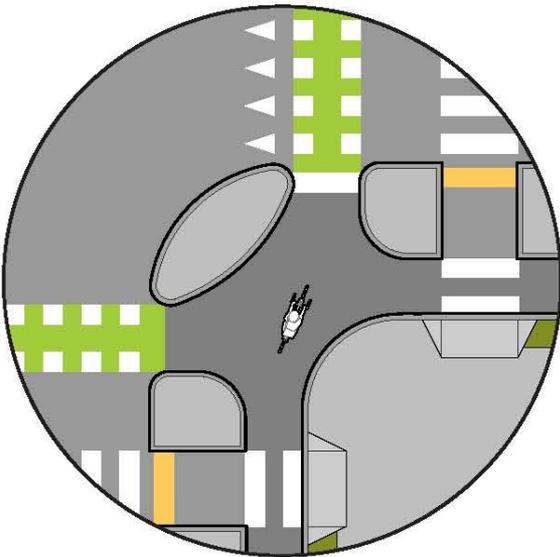
Bicycle crossing



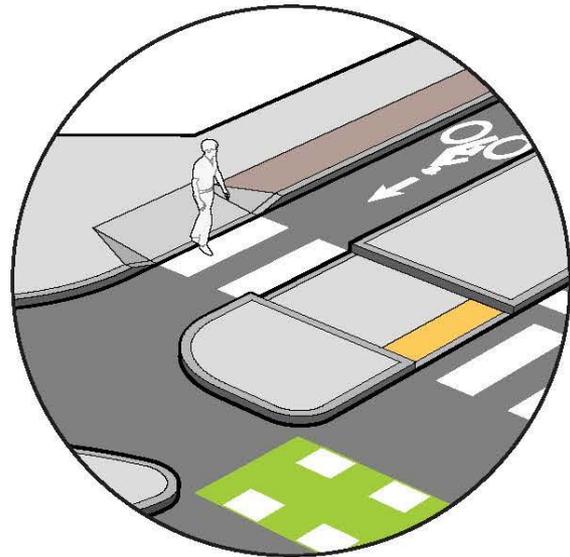
Bicycle stop line



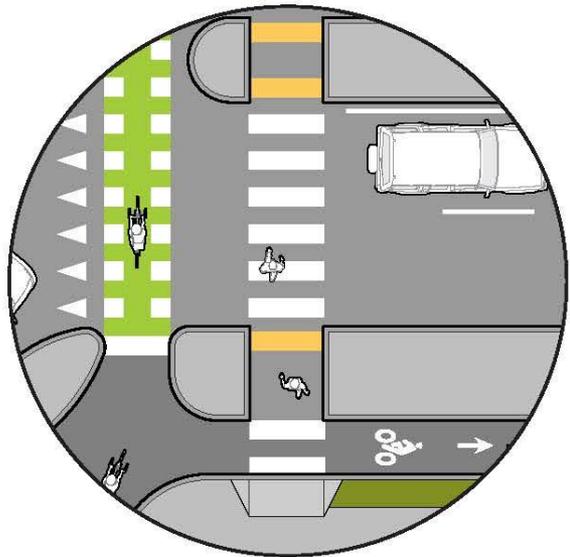
Bicycle queuing area



Corner deflection island



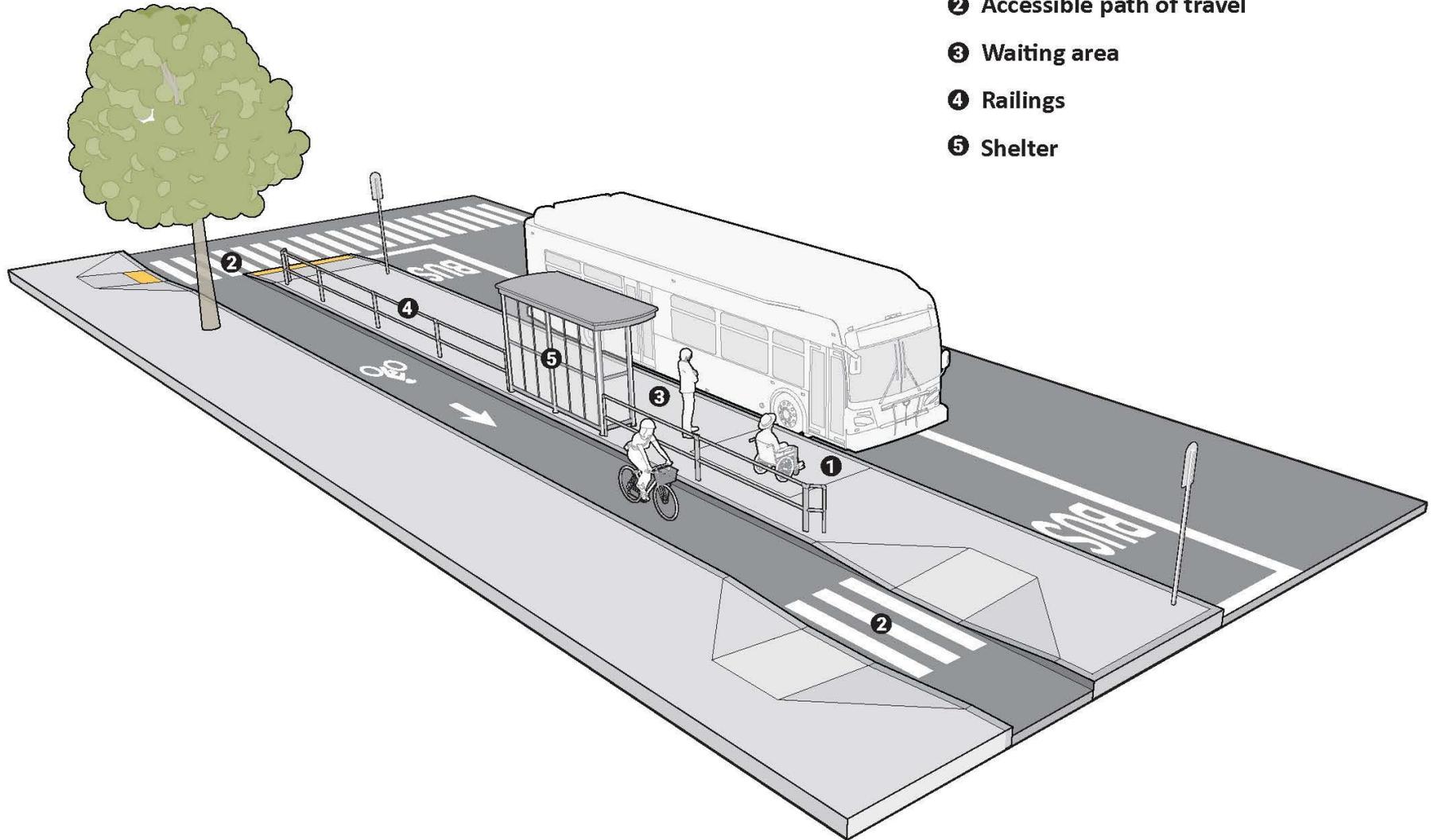
Pedestrian ramps



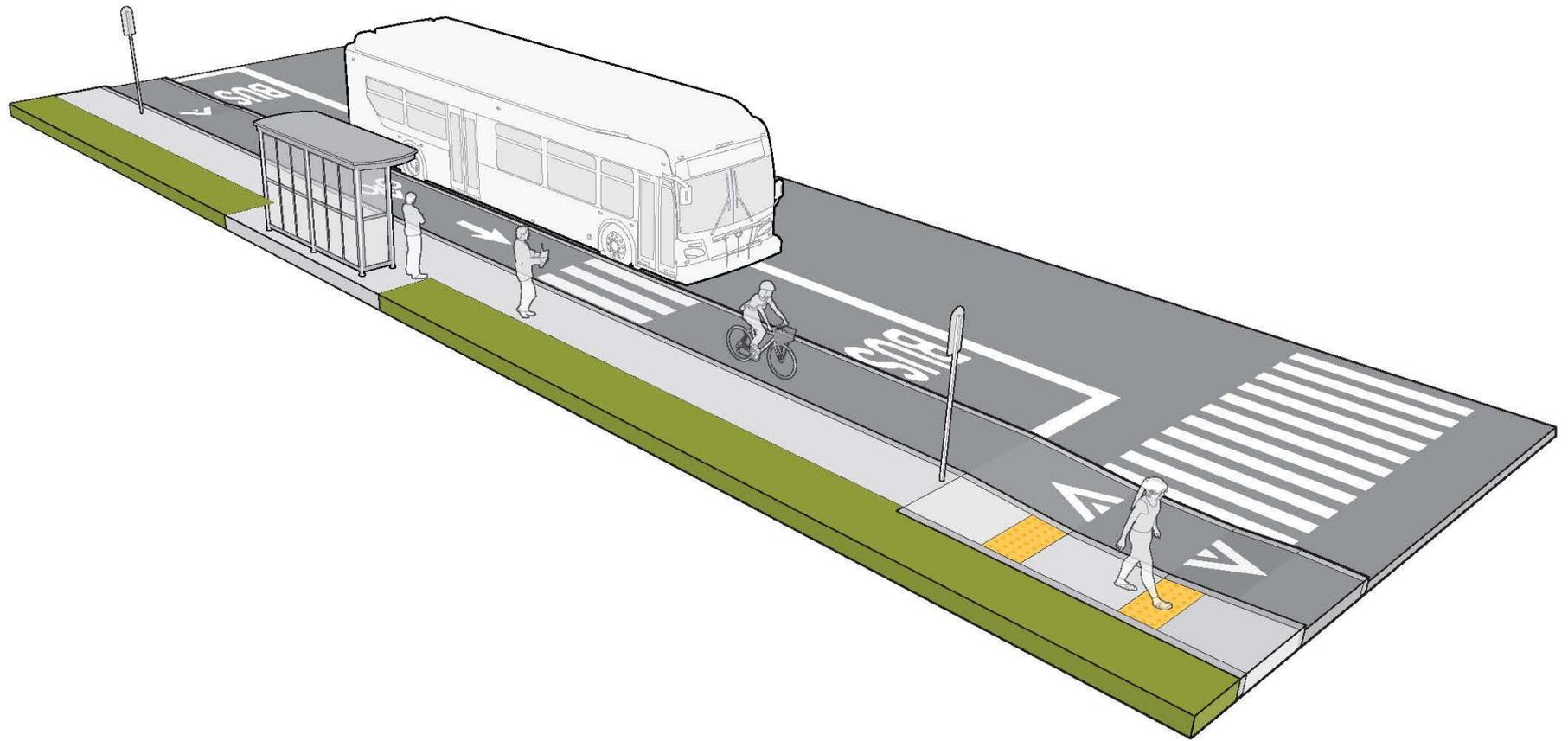
Pedestrian crossing

Transit Stop Elements

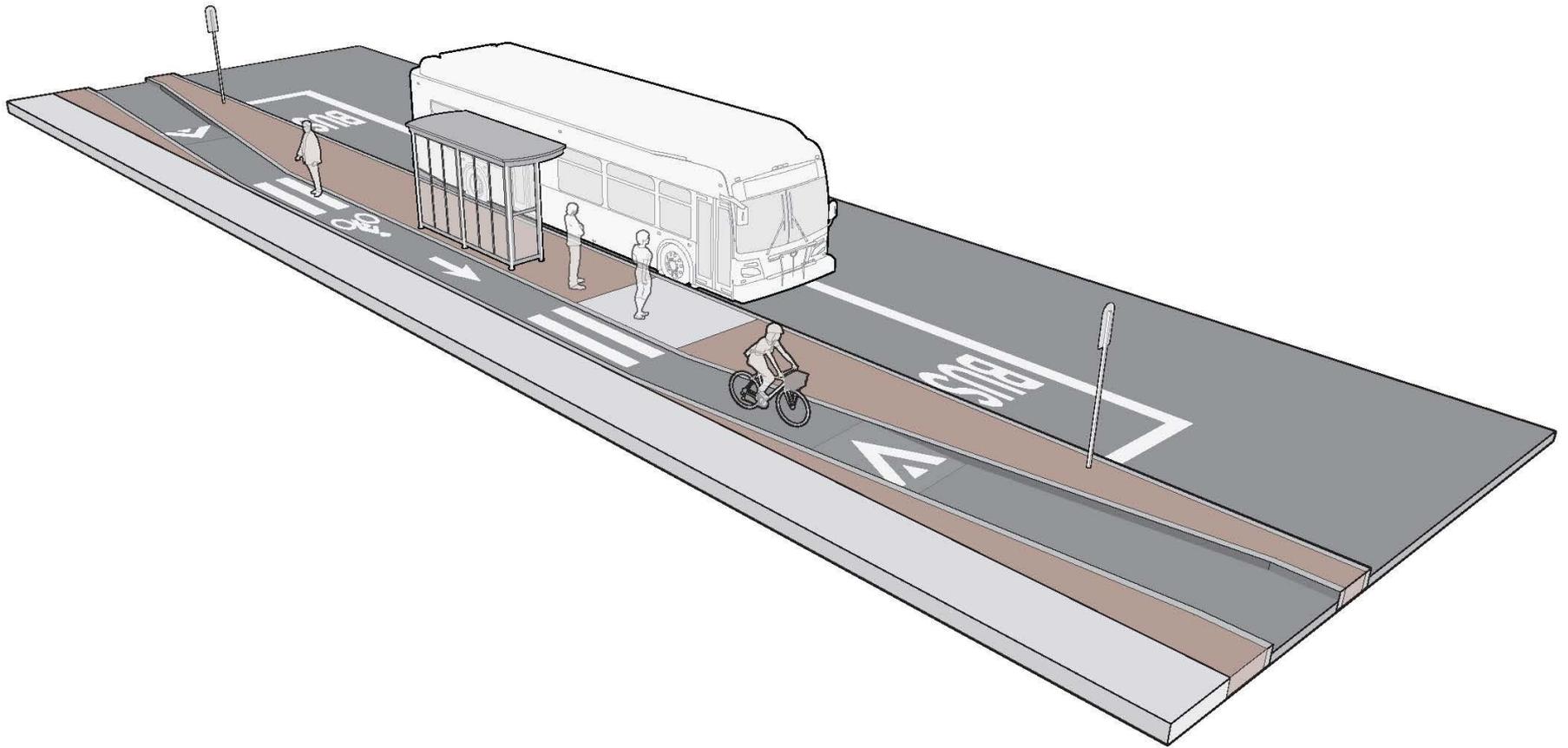
- ❶ Accessible landing pad
- ❷ Accessible path of travel
- ❸ Waiting area
- ❹ Railings
- ❺ Shelter

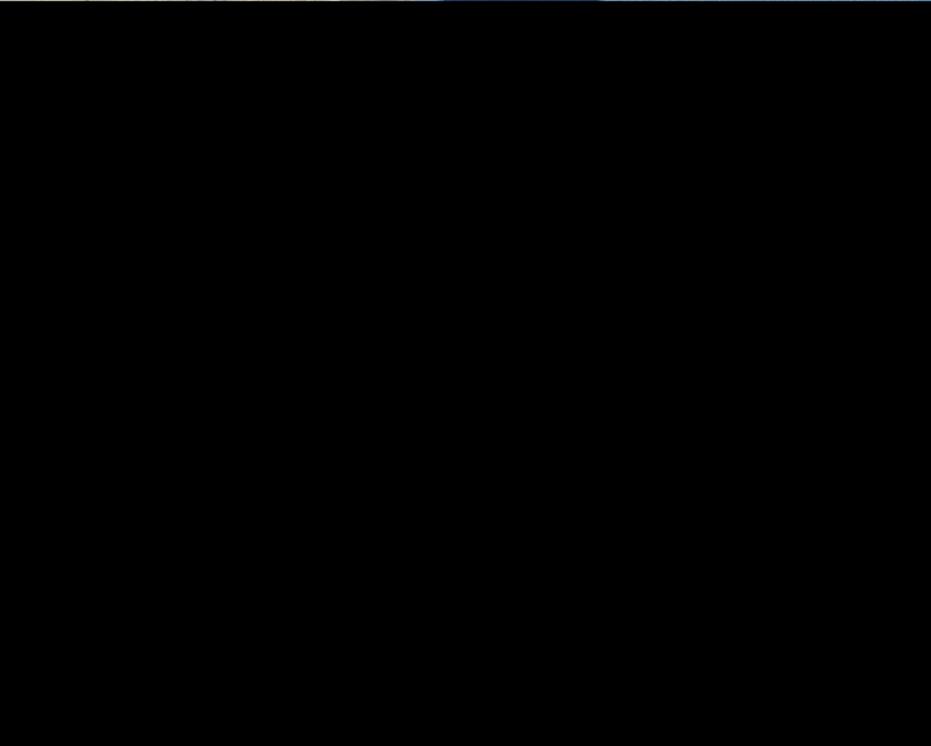


Transit Stop Variation



Transit Stop Variation





BUFFERED BIKE LANES

- Greater comfort level than conventional bike lane
- Passing zone
- Less effective on streets with loading or double-parking



SEATTLE

BIKE BOX

- Prevents “Right Hook” collisions
- Gives bicyclists priority at signalized intersections
- Clears intersection of cyclists quickly



SAN FRANCISCO





TWO-STAGE TURN QUEUE

- Facilitates safe left or right turn
- Typically used with cycle tracks
- Used when merging is not an option or potentially dangerous



OTTAWA, CA

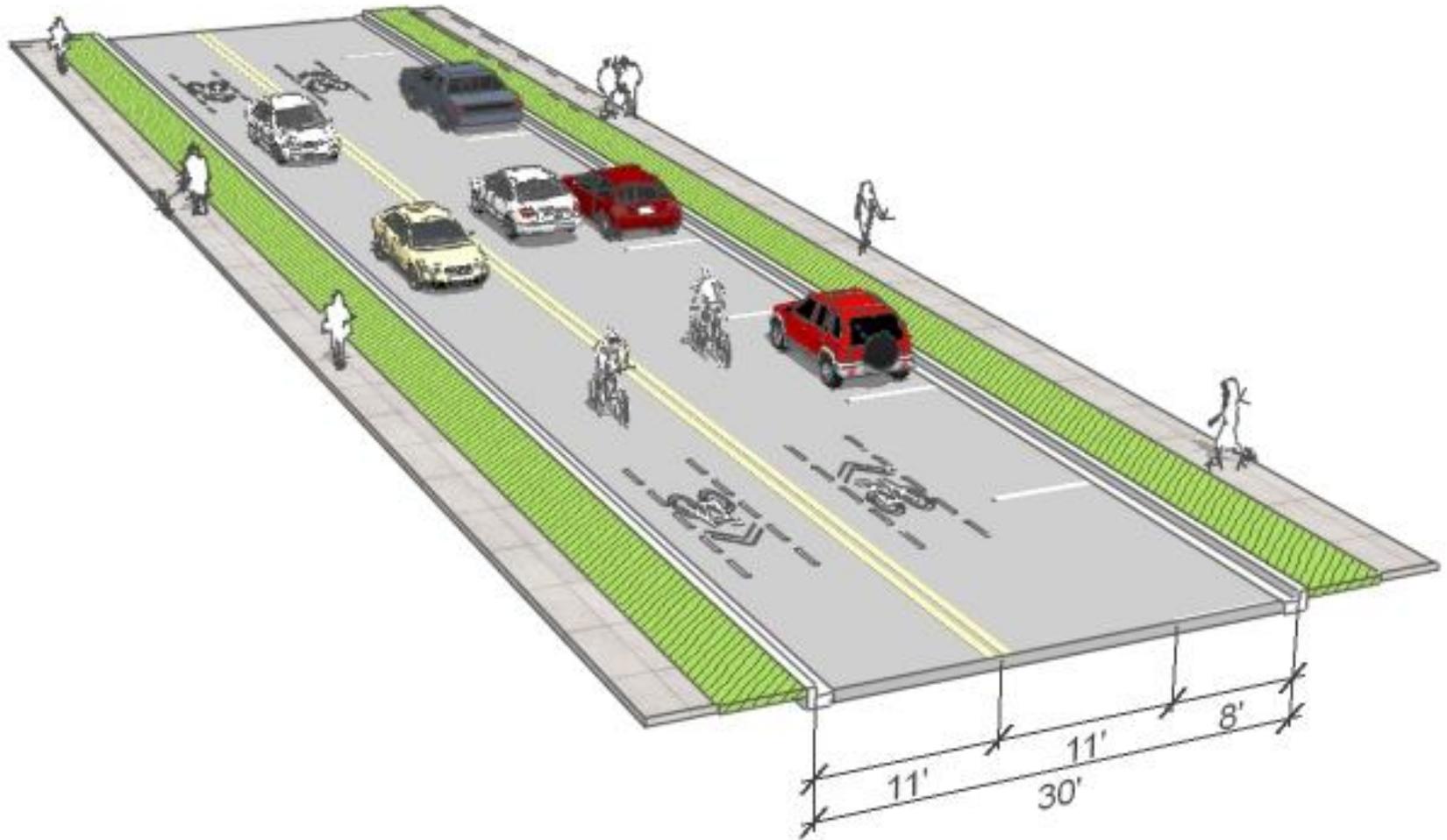


Priority Shared Lane Markings

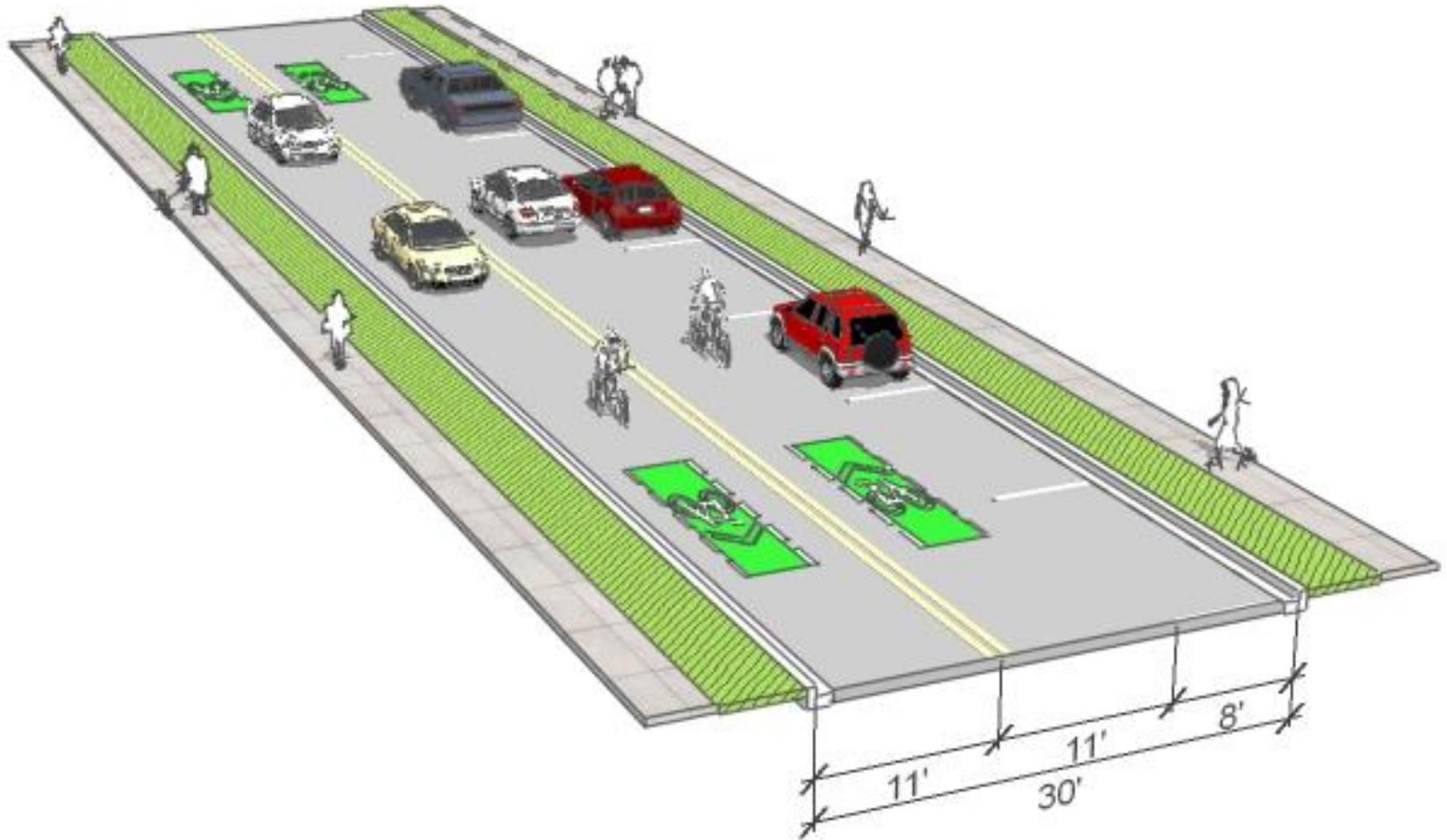


Priority Shared Lane Markings

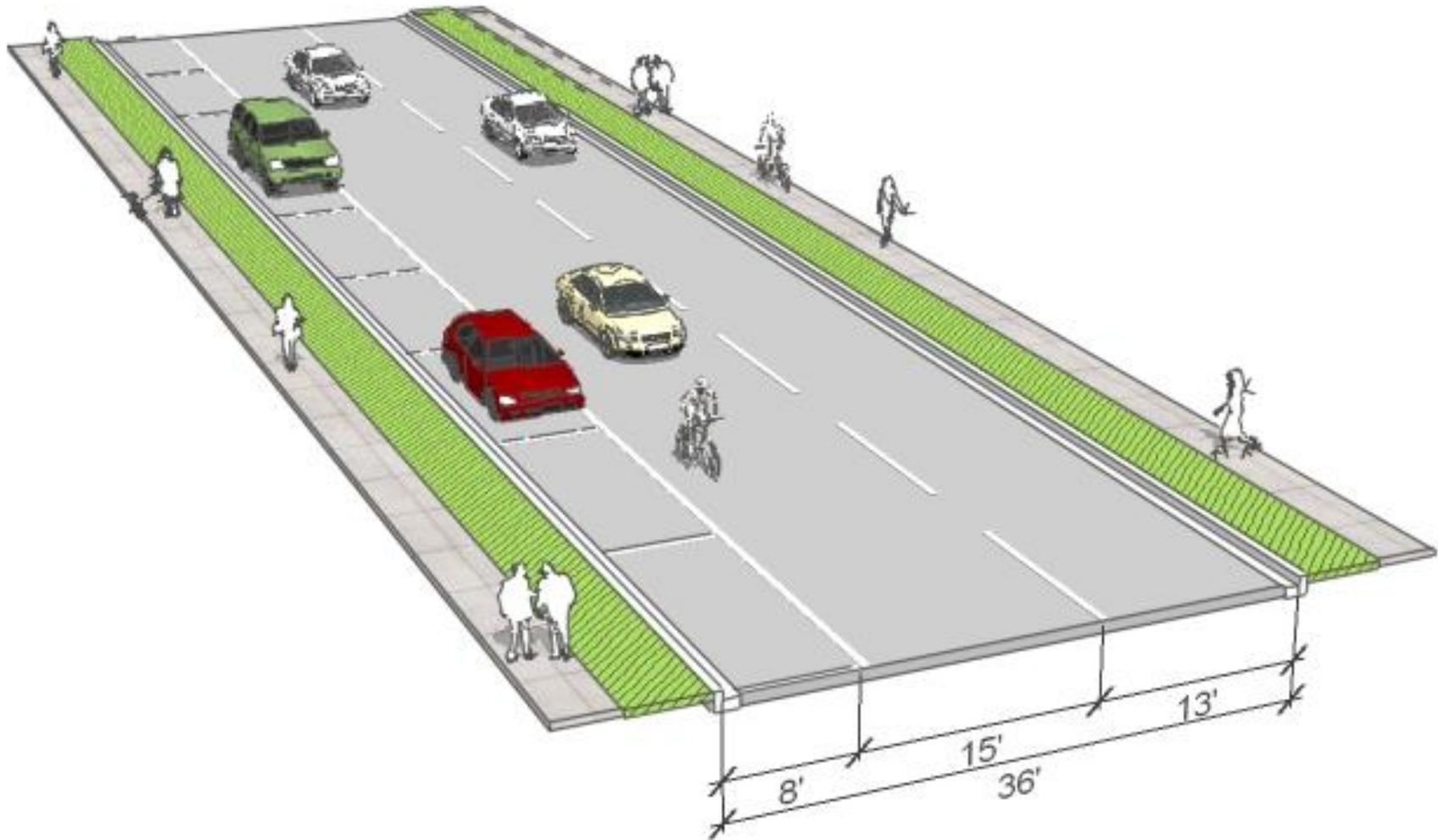
Mills and Langdon



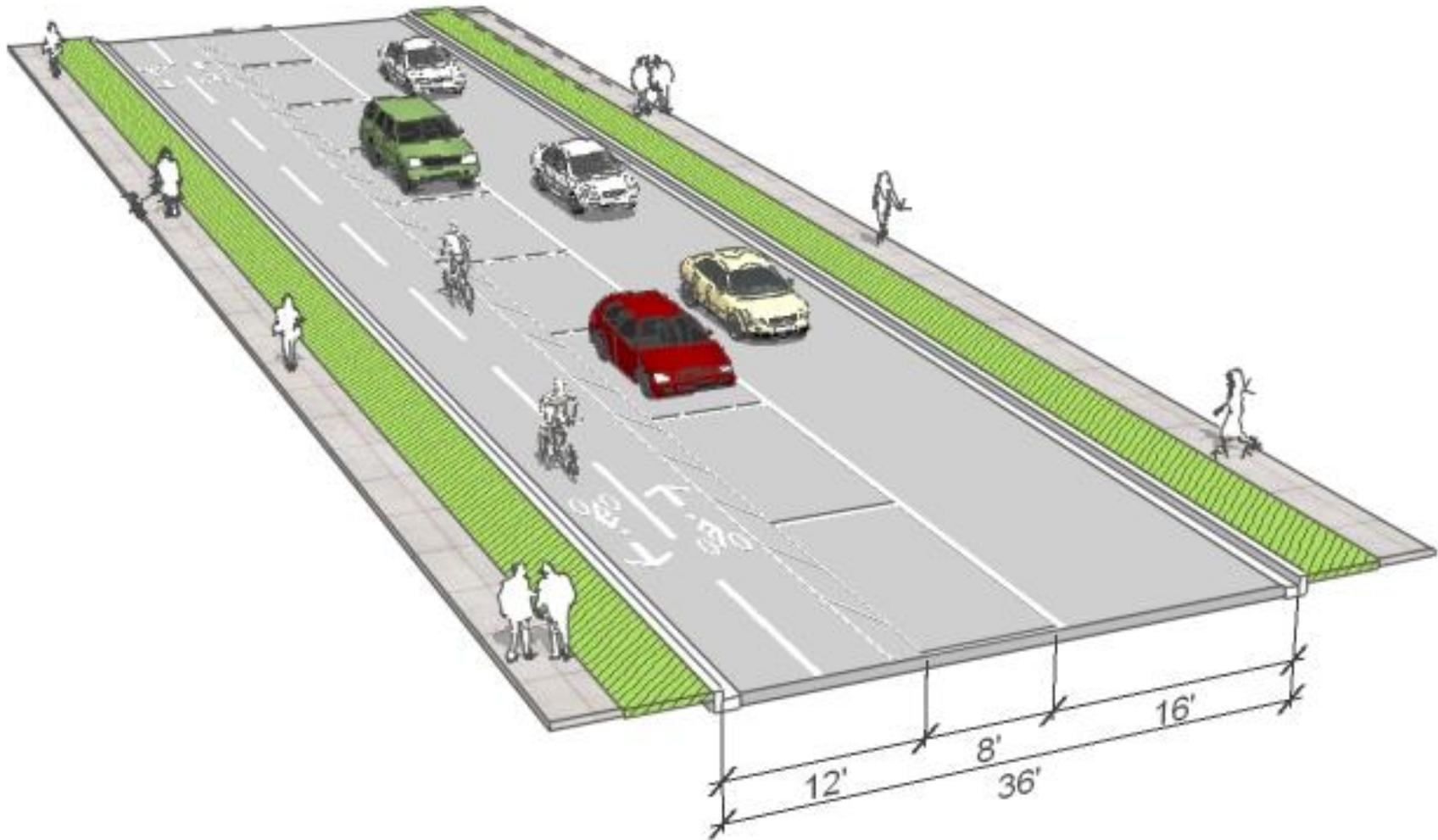
Mills and Langdon



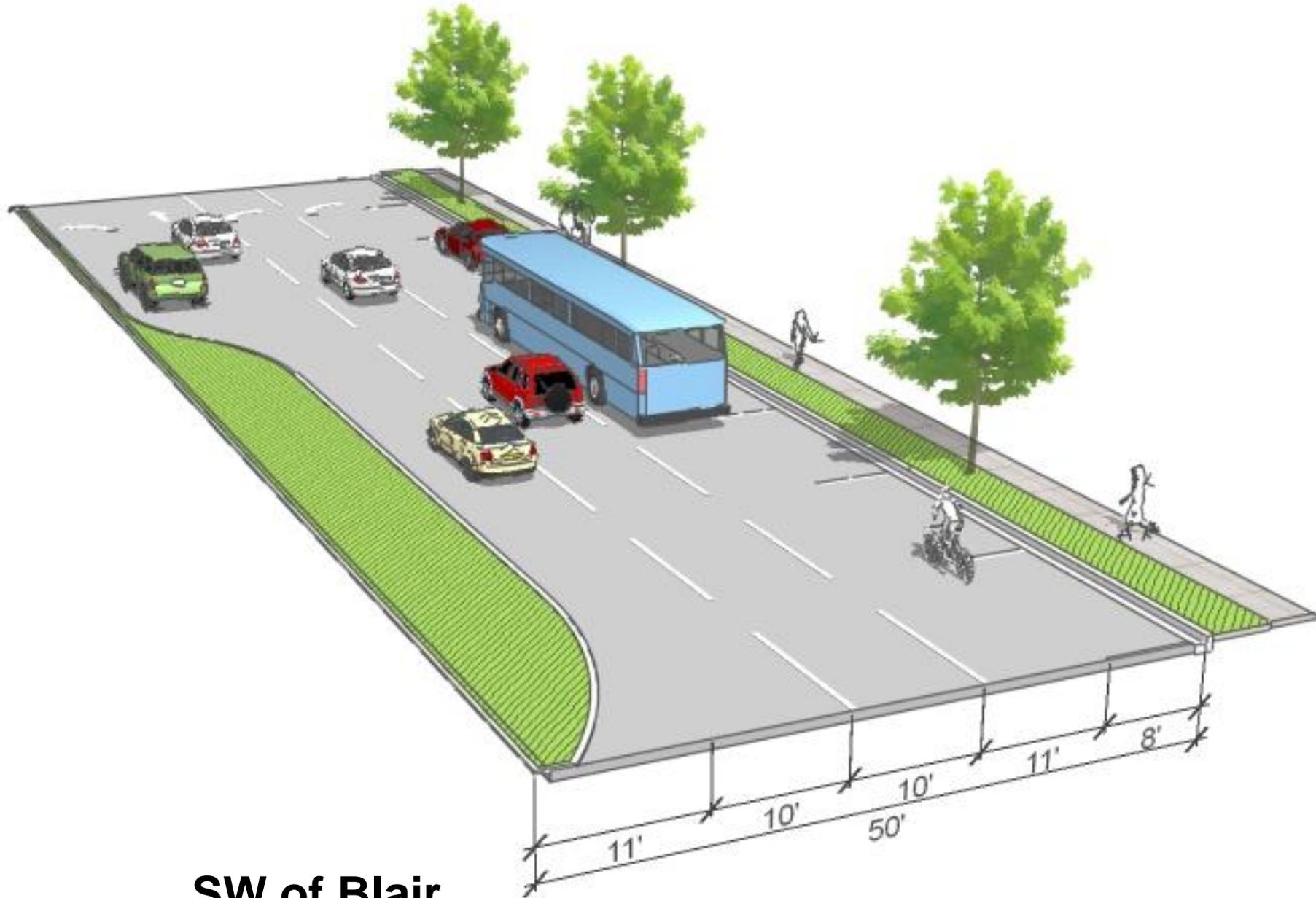
Bassett Existing



Bassett Concept

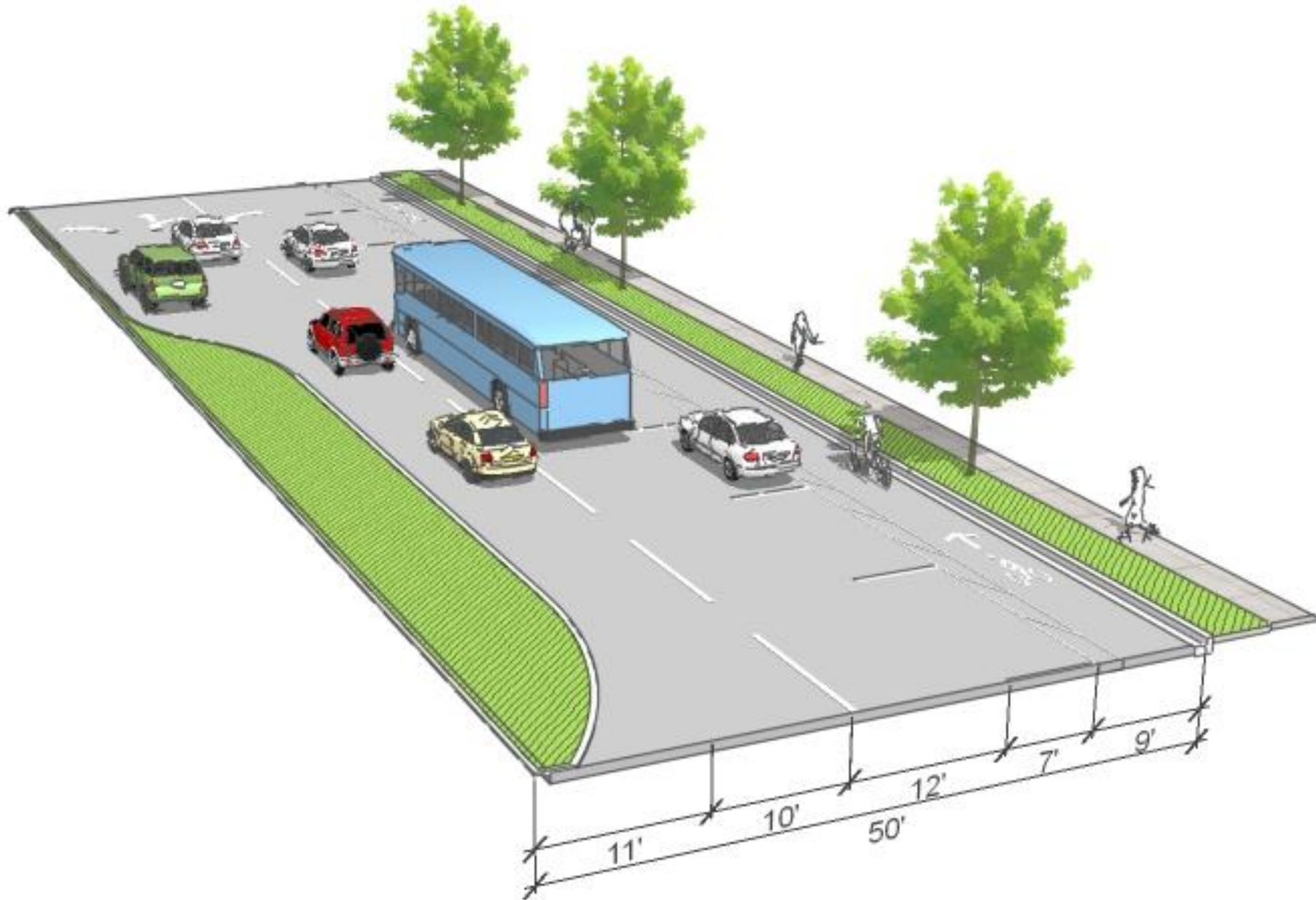


East Washington Existing

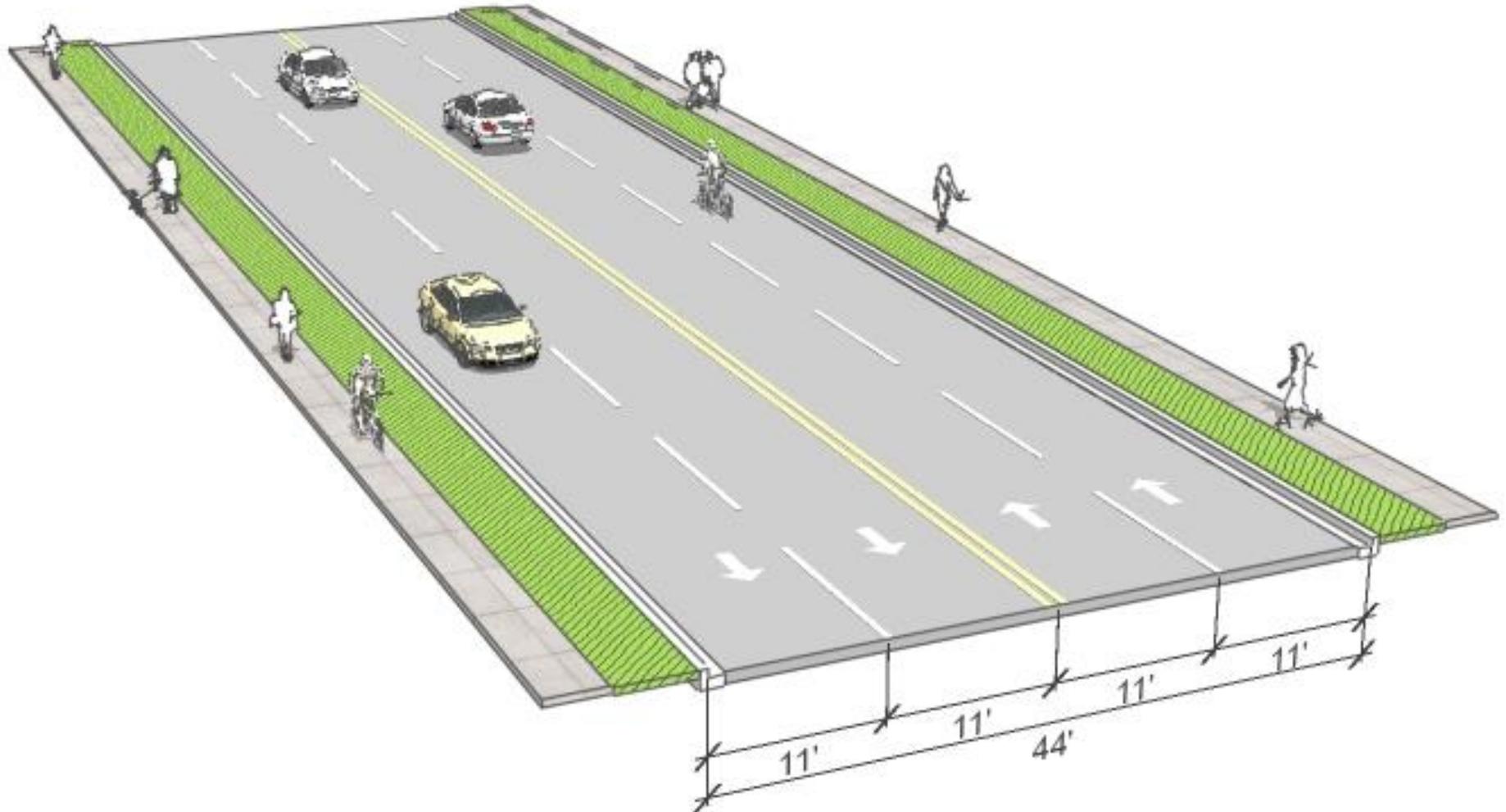


SW of Blair

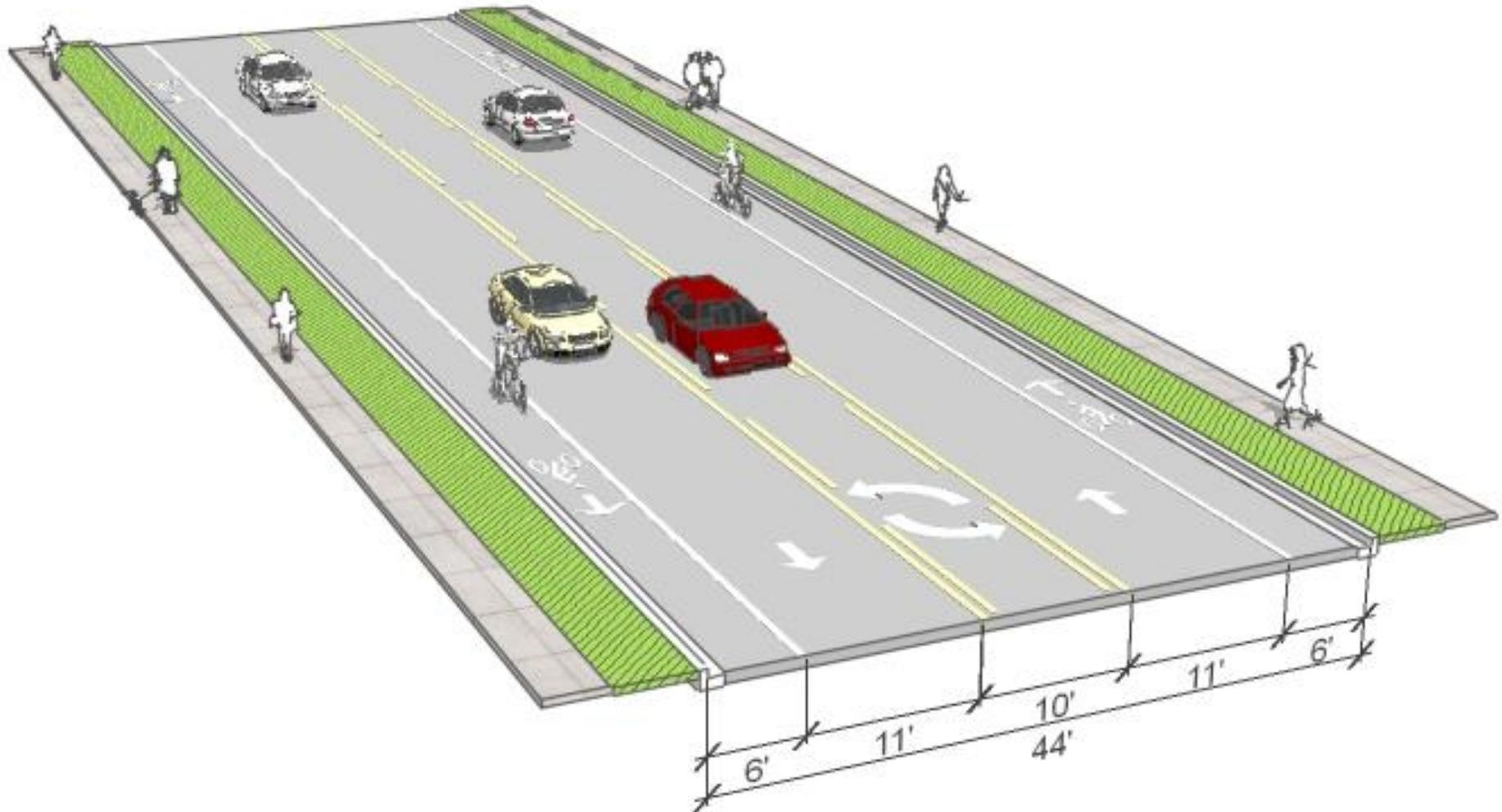
East Washington Concept



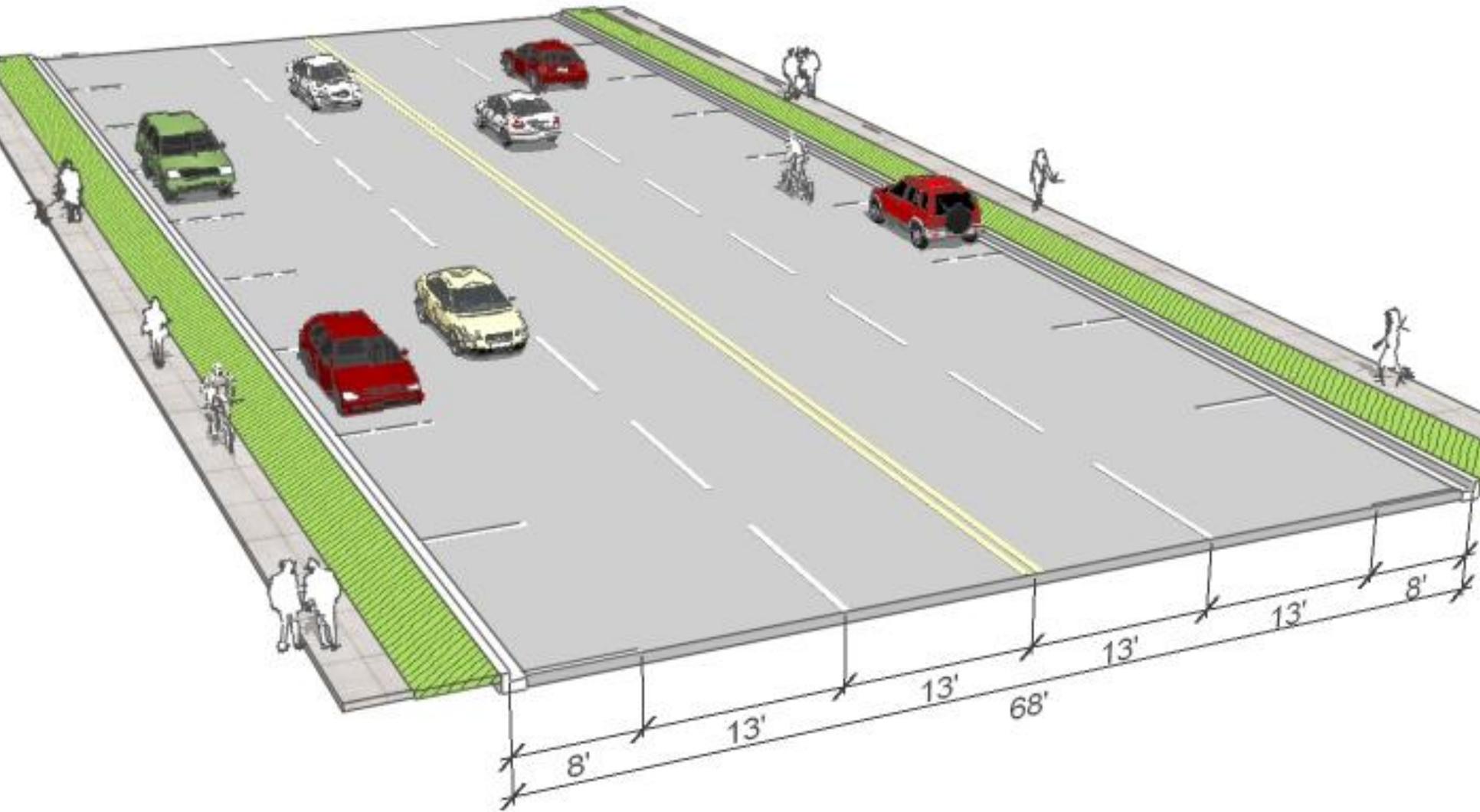
Road Diet Candidate Existing



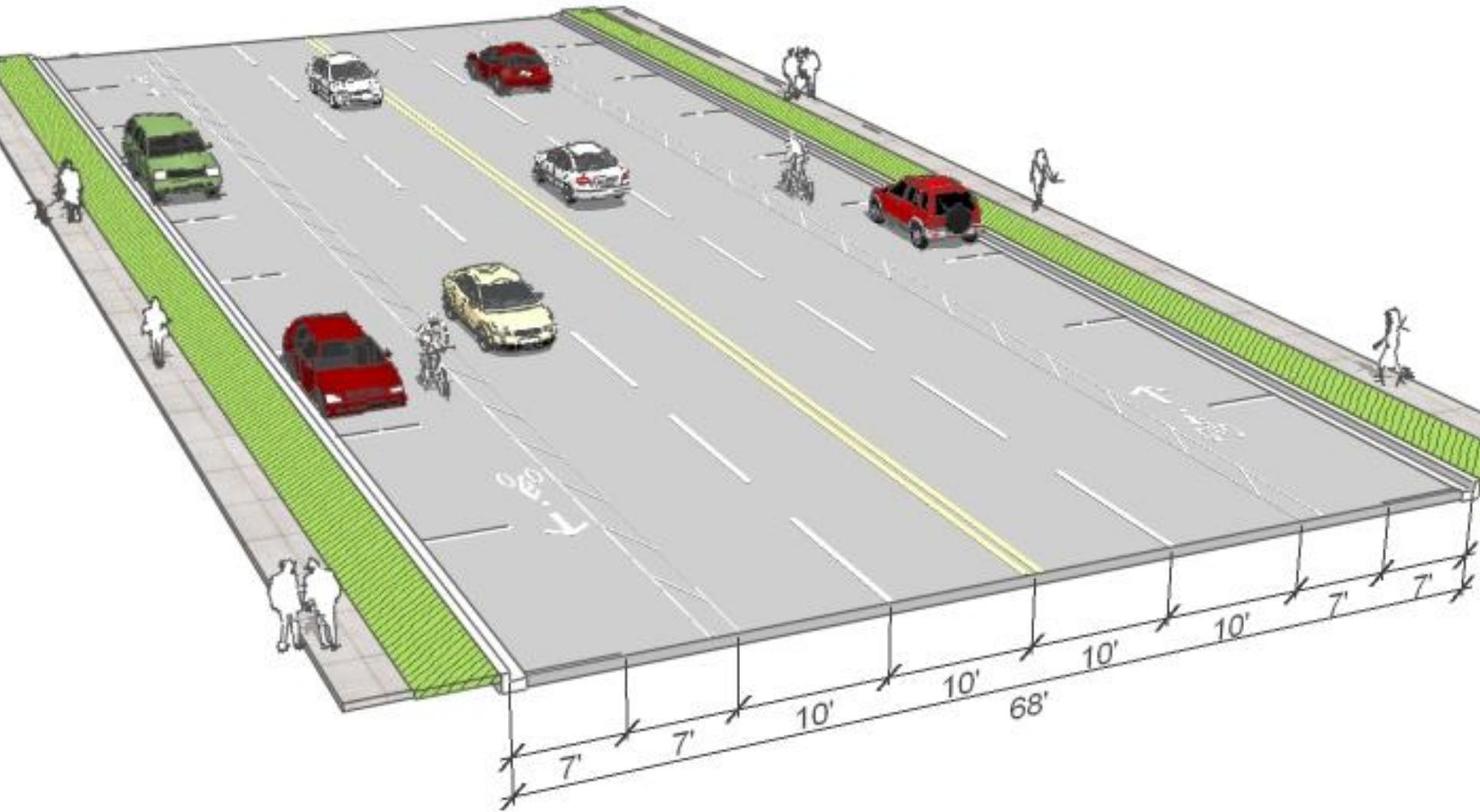
Road Diet Candidate Concept



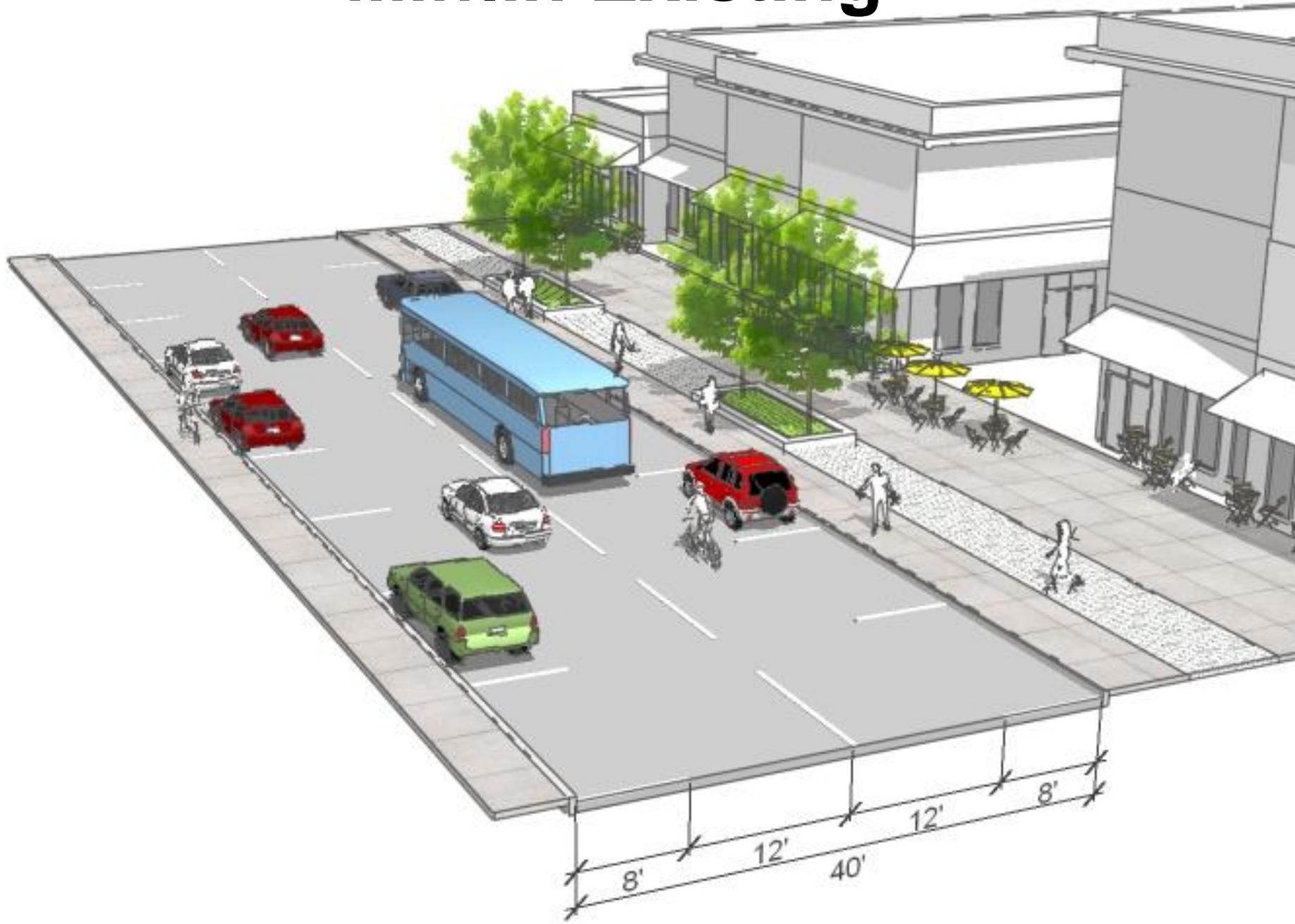
Wisconsin Existing



Wisconsin Concept



Mifflin Existing



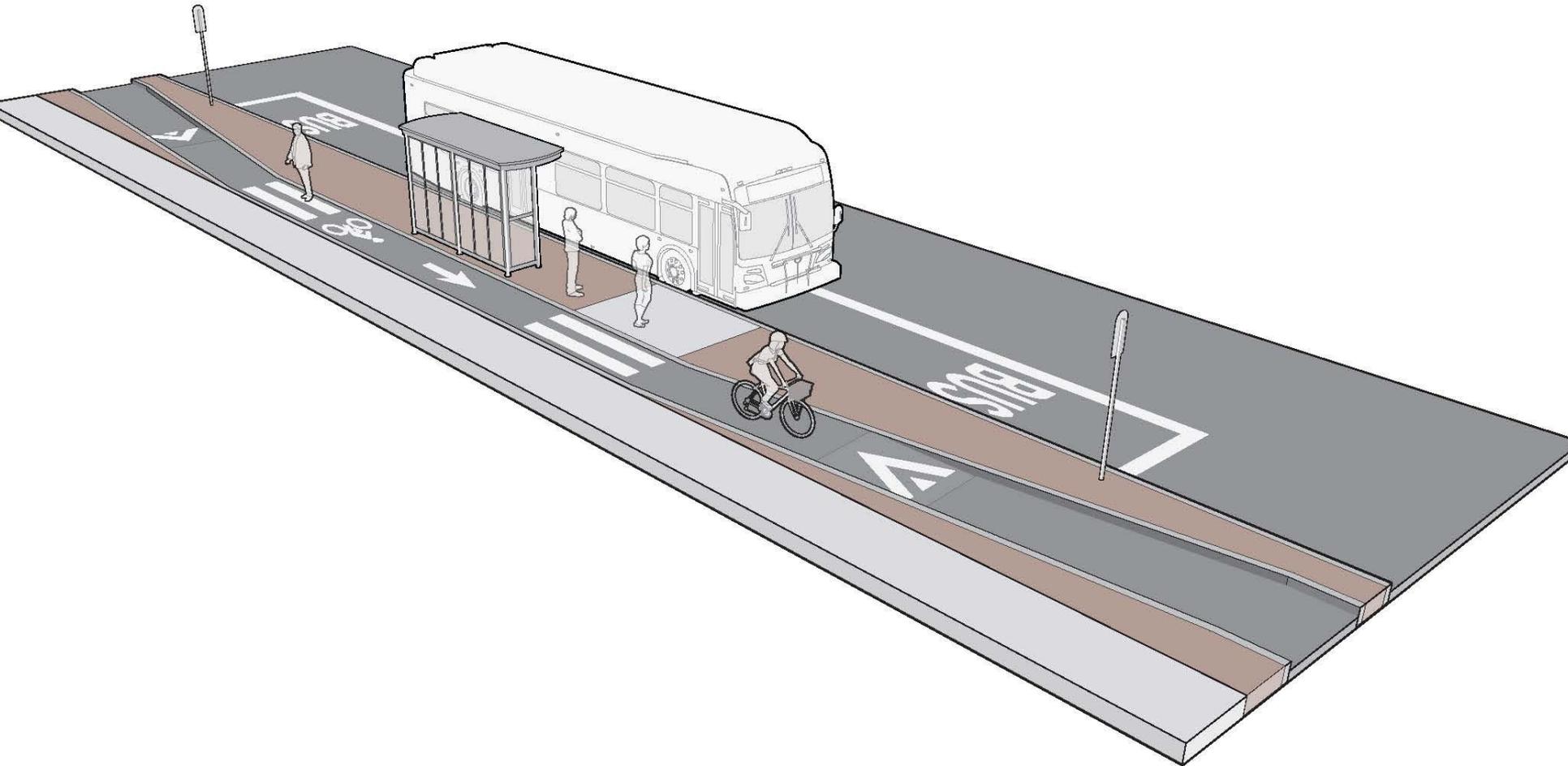
Mifflin Concept



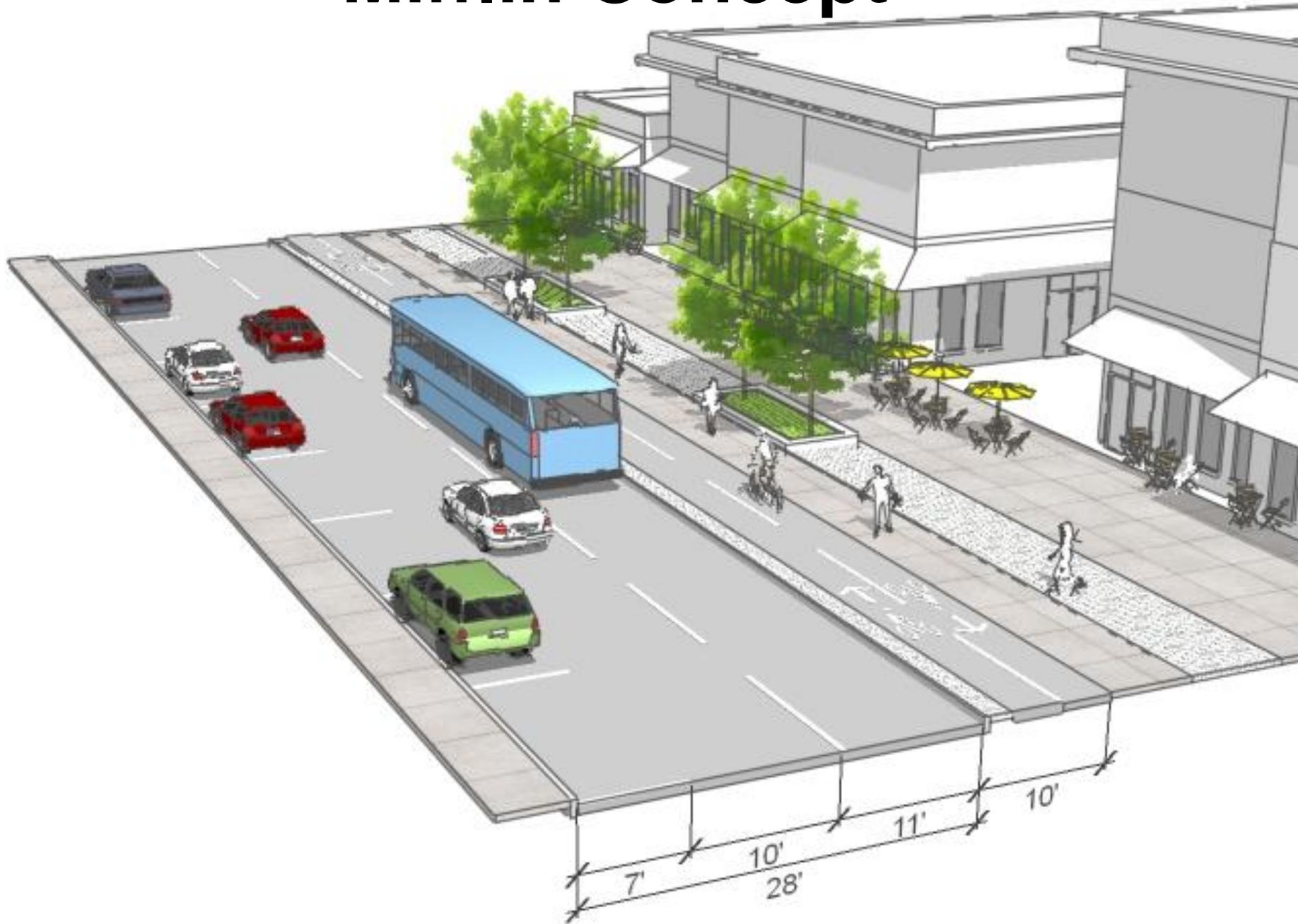
Mifflin Concept



Transit Stop Variation



Mifflin Concept





Thank You!

Toole
Design
Group