All About Guidance #1
What's in Your Library?

For technical assistance during the webinar, call 1-800-263-6317.
Choose these audio prompts: 2, 1

December 16, 2015

apbp
Association of Pedestrian and Bicycle Professionals
Expertise for sustainable transportation

Continuing Education

To document Professional Development Hours (PDH) or Certification Maintenance (CM) credit for the AICP:

- Log your attendance on the site host's sign-in sheet
- Site hosts: return the completed sign-in sheet to APBP after the webinar (fax to 866-720-3611 or e-mail webinars@apbp.org)
- A Certificate of Attendance may be downloaded and printed here: http://www.apbp.org/?page=Webinar_certificate
- Planners: APBP has applied to the AICP for 1.0 CM credits for this webinar

Today's presenters

Andy Clarke, Director of Strategy, Toole Design Group

Dan Goodman, Transportation Specialist, Office of Livability, FHWA

Tony Hull, Pedestrian and Bicycle Transportation Planning Specialist, Civil Street

Today's webinar presenters

Andy Clarke has spent 30 years in the forefront of bicycle policy and programs in the United States and Europe. He was President of the League of American Bicyclists for 12 years, after establishing APBP as the first Executive Director. Andy was instrumental in the development of the Bicycle Friendly Community program and has worked on each Federal transportation bill since ISTEA in 1991.

Today's webinar presenters

Dan Goodman is a Transportation Specialist on the Livability Team in the Office of Human Environment at the Federal Highway Administration (FHWA). He is a member of the Transportation Research Board's (TRB) Pedestrian Committee and chair of its Pedestrian Research Subcommittee. He serves as FHWA's representative to the AASHTO Joint Technical Committee on Non-Motorized Transportation.

apbp Association of Pedestrian and Bicycle Professionals
Expertise for sustainable transportation

Today's webinar presenters

Tony Hull is an independent Nonmotorized Transportation Consultant with over 15 years of experience planning, design and evaluation of active transportation projects. His work includes extensive experience overseeing the development and implementation of pedestrian and bicycle count programs in the states of Delaware, Minnesota and Ohio. Most recently, Tony served as a key researcher and co-author of the NCHRP 797 Guidebook on Pedestrian and Bicycle Volume Data Collection. He is a graduate of the Ohio State University, serves on the TRB Committee on Pedestrians and is a long time member of APBP. Tony lives in Minneapolis, Minnesota, where it is never too cold for a nice walk or bicycle ride.

What's in Your Library?

All About Guidance Part I

December 16, 2015

Tony Hull

tony@civilstreet.com

All About Guidance – APBP Two-Part Series

December #1 What's in your Library?

- Introduction overview about guides/standards
- New FHWA resources and guidance about design flexibility
- New era of design guidance, Mass DOT example

January #2 Using guidance effectively

- Case studies of practical applications for design guides to improve transportation outcomes

Why do we use guides?

Transportation agencies need to follow credible standards for designing streets

- Document acceptable practices
- Maintain consistency with design
- Maximize return on transportation investments
- Identify appropriate solutions
- Reduce liability

Guidance Develops Through Research

- Transportation Research Board
- National Cooperative Highway Research Program (NCHRP)
- State and Local Research Boards
- FHWA Experiment Process
- University Transportation Research Centers
- Performance Based Practical Design (PBPD)

All About Guidance #1
What's in Your Library?

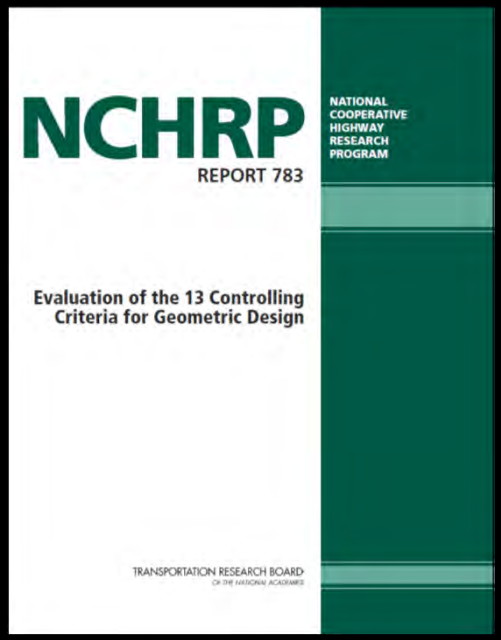
For technical assistance during the webinar, call 1-800-263-6317.
Choose these audio prompts: 2, 1

December 16, 2015

apbp Association of Pedestrian and Bicycle Professionals
Expertise for sustainable transportation

Research is Changing the State of Practice

The NCHRP Report 783 “Evaluation of the 13 Controlling Criteria for Geometric Design” (2014)

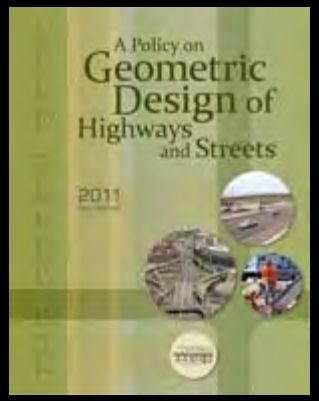


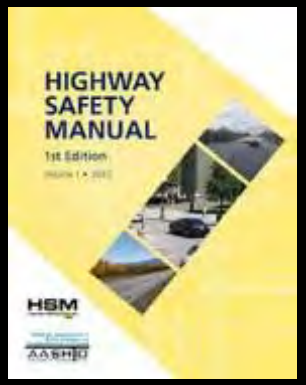
“The NCHRP Report 783 found that the 13 controlling criteria had minimal influence on the safety or operations on urban streets”

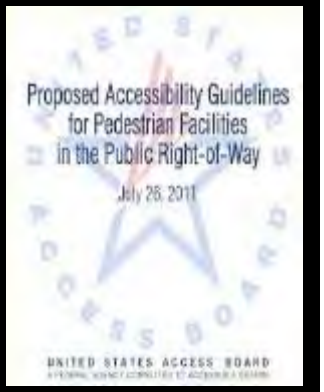
FHWA currently proposing significant revisions to the 13 controlling criteria

Why do we choose guides?

There is much confusion about the difference between guidance and standards, and the relationship hierarchy among various manuals



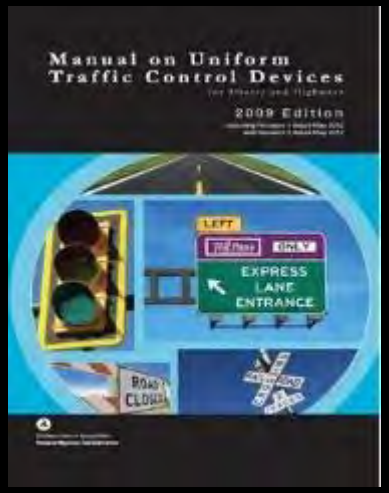




Standards

Standards are statutory requirements that must be followed.

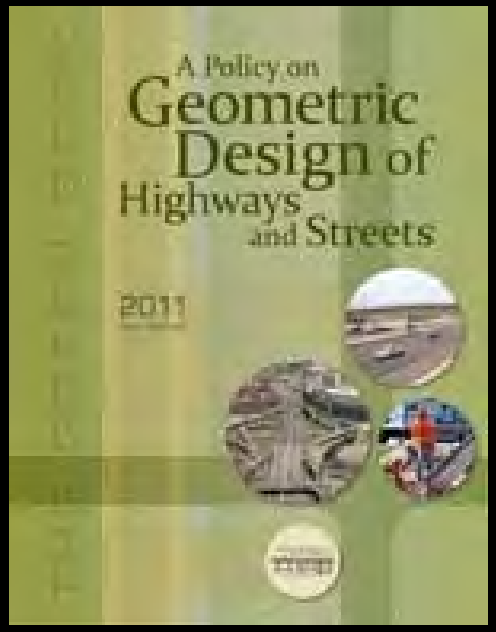
- MUTCD
- AASHTO Green Book *[NHS]*
- State highway and vehicle codes
- Locally adopted standards
- PROWAG [once adopted]



There are federal standards, such as the MUTCD that may be adopted by states or supplemented with state versions of the federal standard.

AASHTO Green Book – *The Bible*

The AASHTO Policy on Geometric Design "the Green Book"



The Green Book provides detailed engineering guidance for structural and geometric elements, street width, lane width, shoulder width, medians, and other street features.

The Green Book is a standard when designing streets and roads that are part of the National Highway System (NHS).

Street Design – not a one-stop shop

The AASHTO Green Book contains detailed standards for traditional highway design, but has never been intended as a stand alone resource.



The Green Book, MUTCD, HCM, and other highway design manuals should always be consulted, but creating safe healthy livable streets require us to use an expanded library!

Modern Guides and Manuals

Guides and Manuals provide recommendations for addressing various conditions to inform designers based on solid research and best practices.

- AASHTO Ped & Bike Design Guides
- NACTO Bike, Transit & Street Design Guides
- ITE Design for Walkable Urban Thoroughfares
- State and Local Design Guides
- Best Practices

Thank you

All About Guidance Part I

December 16, 2015

Tony Hull

tony@civilstreet.com

ALL ABOUT GUIDANCE #1 WHAT'S IN YOUR LIBRARY?

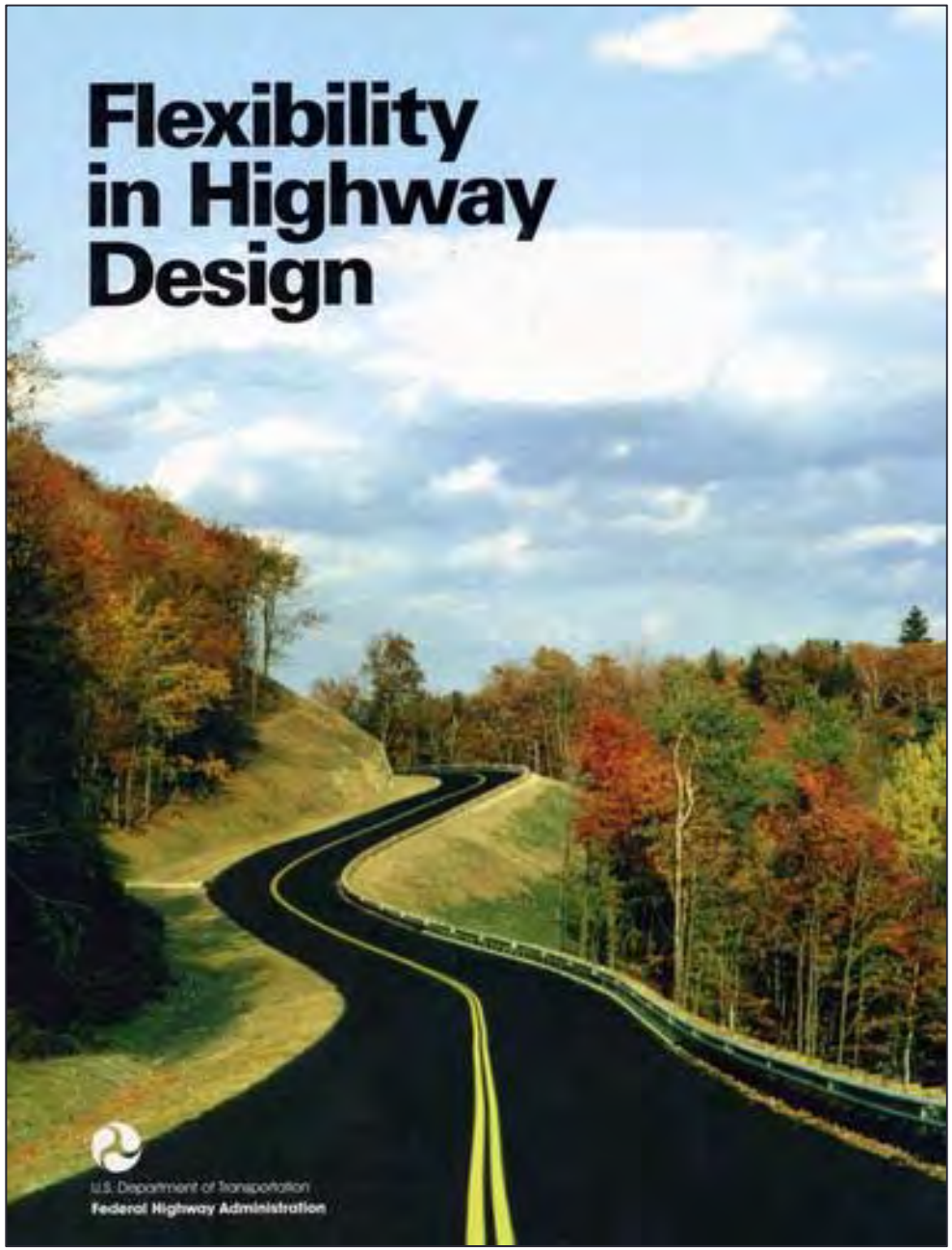
APBP Webinar
December 16, 2015

U.S. Department of Transportation

Federal Highway Administration

FHWA Supports

- An integrated, safe, and convenient transportation system for all users
- Sustainable transportation policies and practices
- Connected pedestrian and bicycle *networks*
- Design flexibility



2013 Bicycle and Pedestrian Facility Design Flexibility Memorandum

"This memorandum expresses the Federal Highway Administration's (FHWA) **support for taking a flexible approach to bicycle and pedestrian facility design**. The American Association of State Highway and Transportation Officials (AASHTO) bicycle and pedestrian design guides are the primary national resources for planning, designing, and operating bicycle and pedestrian facilities. The National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* and the Institute of Transportation Engineers (ITE)*Designing Urban Walkable Thoroughfares* guide builds upon the flexibilities provided in the AASHTO guides, which can **help communities plan and design safe and convenient facilities for pedestrian and bicyclists**. FHWA **supports the use of these resources** to further develop nonmotorized transportation networks, particularly in urban areas."

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_flexibility.cfm

Outcomes

U.S.Department of Transportation
Federal Highway Administration

- Provide more comfortable walking and bicycling environments
- Improve safety for nonmotorized users
- Publicize the range of options available to better inform tradeoffs
- Encourage context sensitive solutions
- Enable a more proactive design approach
- Develop projects cost effectively that meet the identified purpose and need
- Create well-connected pedestrian and bicycle networks

Connected Multimodal Networks

U.S.Department of Transportation
Federal Highway Administration

Enhancing Access To:

- Jobs
- Transit
- Active transportation opportunities around schools
- Recreation and physical activity opportunities
- Grocery stores, government buildings, health care, and other essential services
- Residential areas

Network Principles

- Cohesion
- Directness
- Accessibility
- Alternatives
- Safety and Security
- Comfort

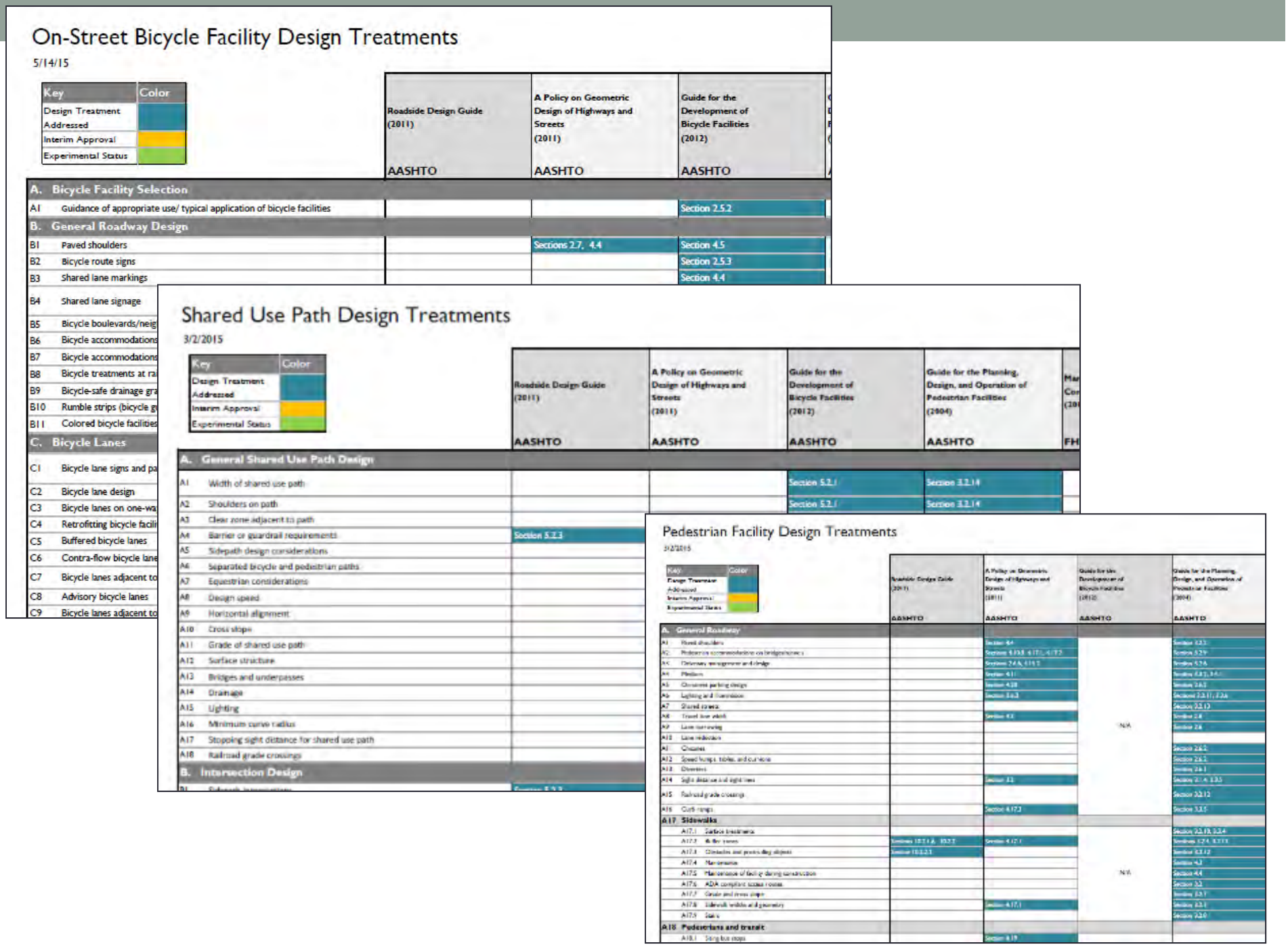
Challenges

U.S.Department of Transportation
Federal Highway Administration

- Achieve proactive outcome oriented design process
- Focus on engineering judgement/study, documentation, and experimentation
- Study applications of flexibility so results can inform updates to guidelines and practice
- Design for the activity you want to see
- Build capacity to navigate between guides

http://www.pedbikeinfo.org

Title	Sponsoring Agency
Roadside Design Guide	AASHTO
A Policy on Geometric Design of Highways and Streets	AASHTO
Guide for the Development of Bicycle Facilities	AASHTO
Guide for the Planning, Design, and Operation of Pedestrian Facilities	AASHTO
Manual on Uniform Traffic Control Devices	FHWA
Designing Walkable Urban Thoroughfares: A Context Sensitive Approach	ITE & CNU
Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges	ITE
Traffic Control Devices Handbook	ITE
Urban Bikeway Design Guide	NACTO
Urban Street Design Guide	NACTO
Draft Guidelines: Public Rights-of-Way Accessibility Guidelines and Shared Use Path Guidelines	U.S. Access Board



On-Street Bicycle Facility Design Treatments

5/14/15

Key	Color
Design Treatment Addressed	
Interim Approval	
Experimental Status	

		Roadside Design Guide (2011) AASHTO	A Policy on Geometric Design of Highways and Streets (2011) AASHTO	Guide for the Development of Bicycle Facilities (2012) AASHTO
A.	**Bicycle Facility Selection**			
A1	Guidance of appropriate use/ typical application of bicycle facilities			Section 2.5.2
B.	**General Roadway Design**			
B1	Paved shoulders		Sections 2.7, 4.4	Section 4.5
B2	Bicycle route signs			Section 2.5.3
B3	Shared lane markings			Section 4.4
B4	Shared lane signage			
B5	Bicycle boulevards/neig			
B6	Bicycle accommodations			
B7	Bicycle accommodations			
B8	Bicycle treatments at ra			
B9	Bicycle-safe drainage gra			
B10	Rumble strips (bicycle g			
B11	Colored bicycle facilities			
C.	**Bicycle Lanes**			
C1	Bicycle lane signs and pa			
C2	Bicycle lane design			
C3	Bicycle lanes on one-wa			
C4	Retrofitting bicycle facili			
C5	Buffered bicycle lanes			
C6	Contra-flow bicycle lane			
C7	Bicycle lanes adjacent to			
C8	Advisory bicycle lanes			
C9	Bicycle lanes adjacent to			

Shared Use Path Design Treatments

3/2/2015

Key	Color
Design Treatment Addressed	
Interim Approval	
Experimental Status	

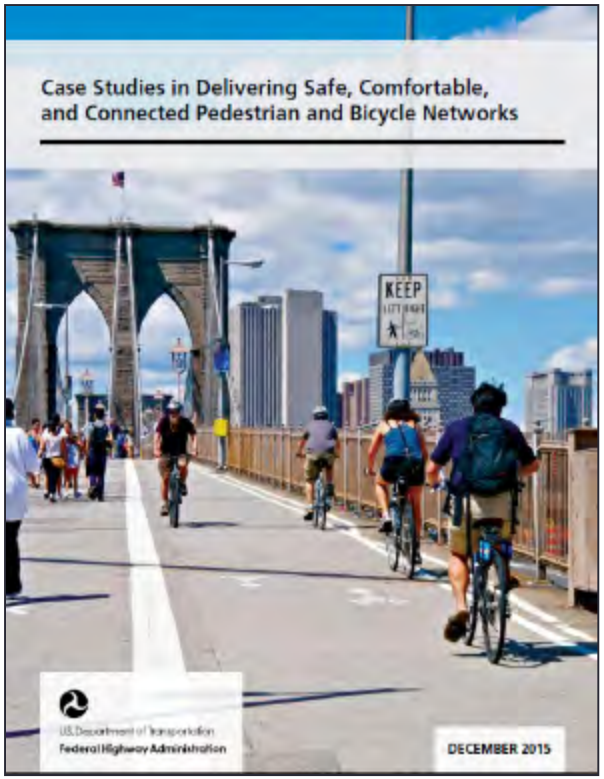
		Roadside Design Guide (2011) AASHTO	A Policy on Geometric Design of Highways and Streets (2011) AASHTO	Guide for the Development of Bicycle Facilities (2012) AASHTO	Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004) AASHTO
A.	**General Shared Use Path Design**				
A1	Width of shared use path			Section 5.2.1	Section 3.2.1.4
A2	Shoulders on path			Section 5.2.1	Section 3.2.1.4
A3	Clear zone adjacent to path				
A4	Barrier or guardrail requirements	Section 5.2.3			
A5	Sidepath design considerations				
A6	Separated bicycle and pedestrian paths				
A7	Equestrian considerations				
A8	Design speed				
A9	Horizontal alignment				
A10	Cross slope				
A11	Grade of shared use path				
A12	Surface structure				
A13	Bridges and underpasses				
A14	Drainage				
A15	Lighting				
A16	Minimum curve radius				
A17	Stopping sight distance for shared use path				
A18	Railroad grade crossings				
B.	**Intersection Design**				

Pedestrian Facility Design Treatments

5/27/2015

Key	Color
Design Treatment Addressed	
Interim Approval	
Experimental Status	

		Roadside Design Guide (2011) AASHTO	A Policy on Geometric Design of Highways and Streets (2011) AASHTO	Guide for the Development of Bicycle Facilities (2012) AASHTO	Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004) AASHTO
A.	**General Roadway**				
A1	Paved shoulders		Section 4.4		Section 3.2.1
A2	Pedestrian accommodations on bridges/structures		Sections 4.11.3, 4.17.1, 4.17.2		Section 5.3.9
A3	Pedestrian management at bridge		Sections 2.4.3, 4.11.2		Section 4.7.6
A4	Medians		Section 4.11		Section 4.8.1, 3.4.1
A5	Pedestrian parking design		Section 4.28		Section 3.6.3
A6	Lighting and illumination		Section 3.6.3		Sections 3.3.11, 3.3.6
A7	Shared streets				Section 3.2.13
A8	Travel lane width		Section 4.3		Section 2.8
A9	Lane narrowing			N/A	Section 2.8
A10	Lane reduction				
A11	Crosswalks				Section 2.6.2
A12	Speed bumps, tables, and cushions				Section 2.6.2
A13	Diverters				Section 2.6.1
A14	Sight distance and sight lines		Section 3.3		Sections 2.7.4, 3.3.5
A15	Railroad grade crossings				Section 3.3.13
A16	Curb ramps		Section 4.17.2		Section 3.3.5
A17	**Sidewalks**				
A17.1	Surface treatments				Section 3.2.13, 3.3.4
A17.2	At-grade crossings	Sections 10.7.1.A, 10.7.2	Section 4.17.1		Sections 3.2.4, 3.2.13
A17.3	Obstacles and protruding objects	Section 10.3.2.3			Section 3.3.12
A17.4	Maintenance				Section 4.3
A17.5	Maintenance of facility during construction			N/A	Section 4.4
A17.6	ADA compliant access routes				Section 3.3
A17.7	Grades and cross slopes				Section 3.3.1
A17.8	Sidewalk widths and geometry		Section 4.17.1		Section 3.3.1
A17.9	Stairs				Section 3.3.6
A18	**Pedestrians and transit**				
A18.1	Transit stops		Section 8.1.9		



Bicycle and Pedestrian Funding, Design, and Environmental Review:
Addressing Common Misconceptions

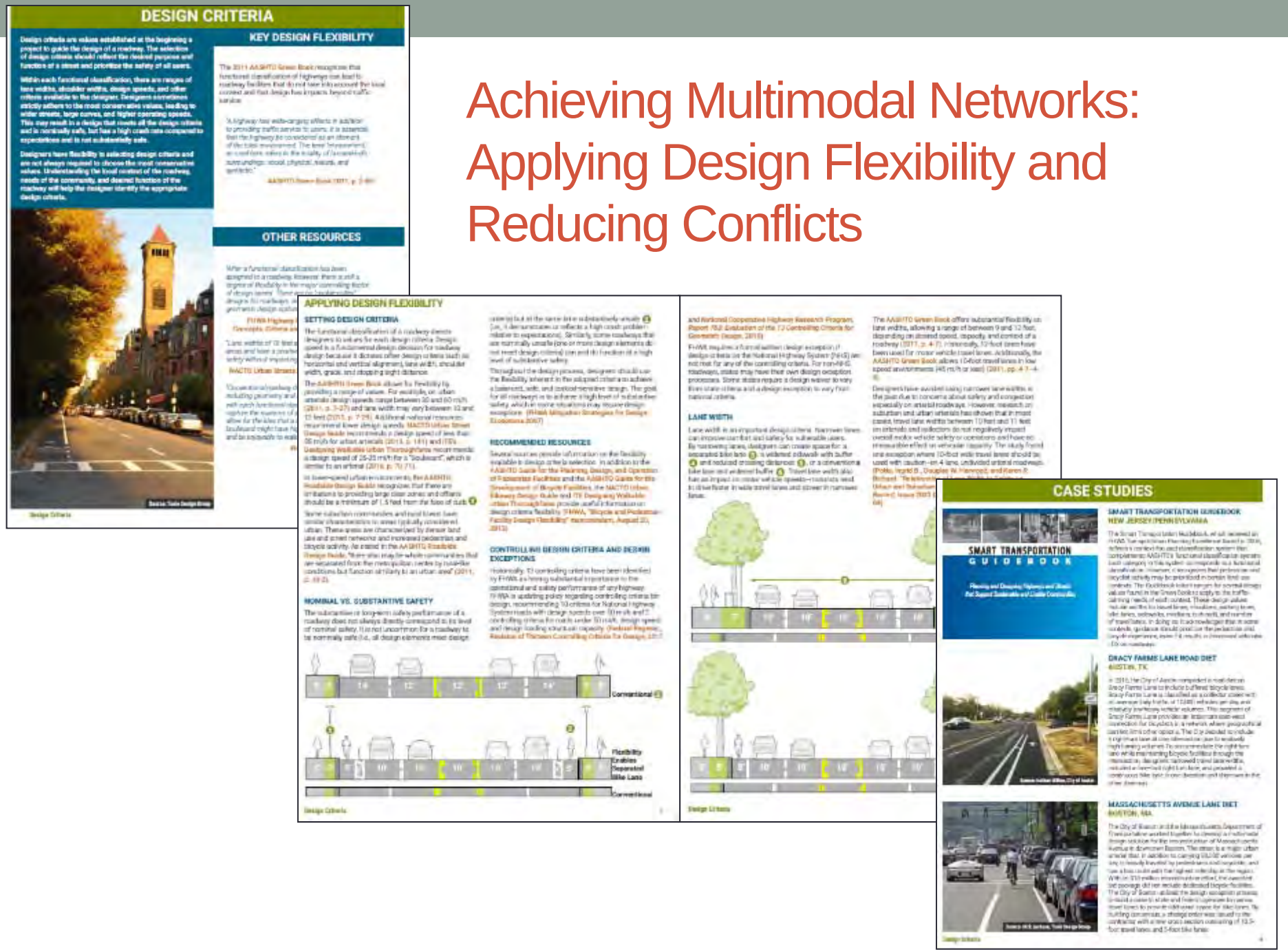
August 20, 2015

Introduction

The U.S. Department of Transportation (DOT) has been working to address nonmotorized safety issues nationwide and help communities create safer, better-connected bicycling and walking networks as part of the Department's Safer People, Safer Streets Initiative.

Since launching the Safer People, Safer Streets Initiative in 2014, DOT has engaged safety experts, existing and new stakeholders, local officials, and the public on a range of targeted strategies to encourage safety for bicyclists and pedestrians on and around our streets, including bus stops, transit stations, and other multimodal connections. Through these discussions, a

Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts



Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts

U.S.Department of Transportation
Federal Highway Administration

1. Design Criteria
2. Intersection Geometry
3. Traffic Calming and Design Speed
4. Road Diets
5. Crossing Treatments
6. Signalized Intersections
7. Paved Shoulders
8. Separated Bike Lanes
9. Slow Streets
10. Bus Stops
11. State Highways Transitioning to Main Streets
12. Bridge Design

1. Network Connectivity
2. Improving Access to Existing Transit Stations
3. Multimodal Access to New Transit Stations
4. School Access
5. Accessibility
6. Turning Vehicles
7. Freight Interaction
8. Transit Conflicts
9. Separated Bike Lanes at Intersections
10. Shared Streets
11. Shared Use Paths
12. Midblock Path Intersections

Coming Soon!

U.S.Department of Transportation
Federal Highway Administration

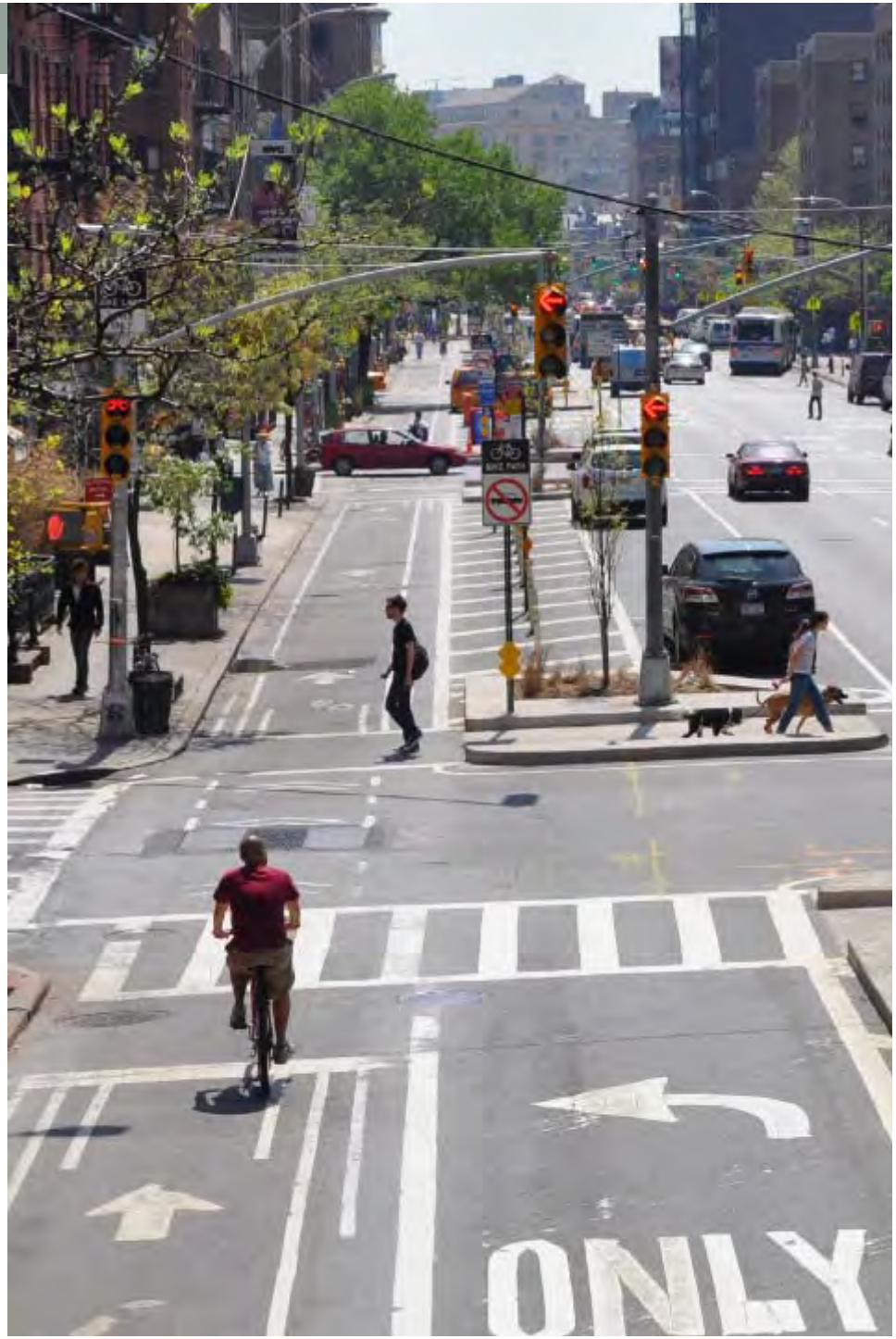
- Workbook for Building On-Road Bicycle Networks through Resurfacing Projects
- Bike Network Mapping Idea Book
- Guidebook for Evaluating, Establishing, and Tracking Pedestrian and Bicycle Performance Measures
- Small Town and Rural Street Design Guide
- Strategic Agenda for Pedestrian and Bicycle Transportation

Dan Goodman

Office of Planning, Environment, and Realty

Federal Highway Administration

daniel.goodman@dot.gov



All About Guidance and Flexibility… Oh, and Engineering Judgment

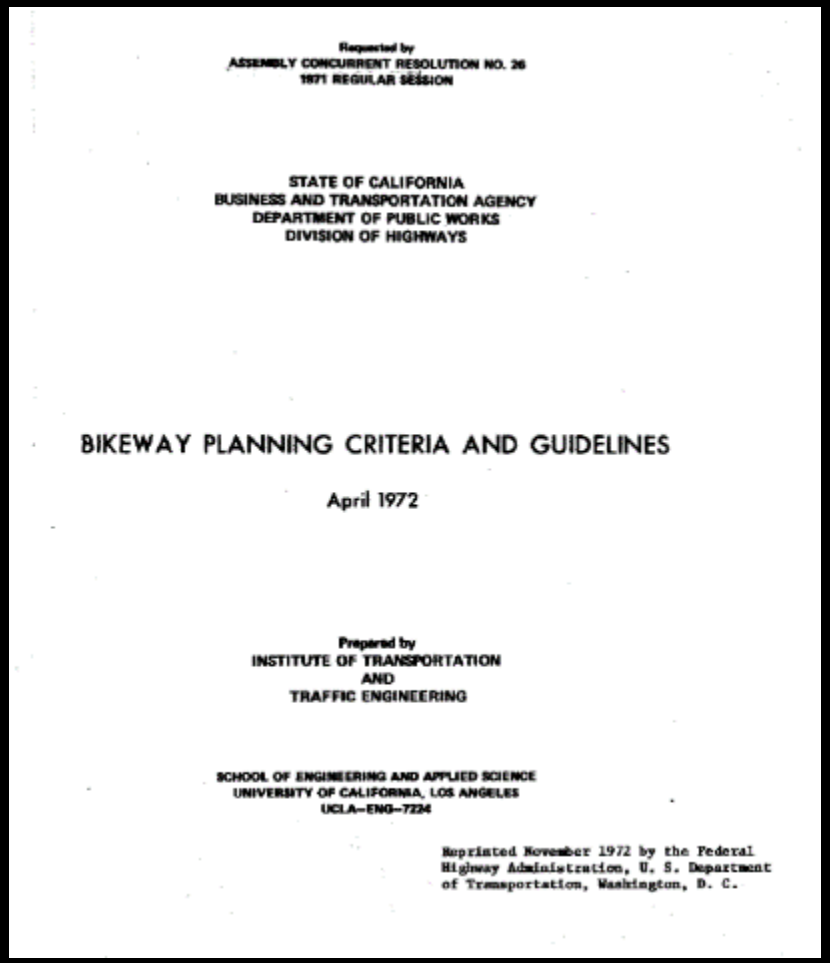
Andy Clarke

Toole Design Group

@tooledesign


SEPARATED BIKE LANE
PLANNING & DESIGN GUIDE
2015
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
BIKE SHARE
PHILADELPHIA
BIKE SHARE
STRATEGIC BUSINESS PLAN
Bike Sharing in the United States:
State of the Practice and Guide to Implementation
CITY OF BOSTON TRANSPORTATION DEPARTMENT
VISION ZERO BOSTON
ACTION PLAN
MAYOR MARTIN J. WALSH
NOVEMBER, 2015

1972-2012 Guidance



Requested by
ASSEMBLY CONCURRENT RESOLUTION NO. 26
1971 REGULAR SESSION

STATE OF CALIFORNIA
BUSINESS AND TRANSPORTATION AGENCY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

BIKEWAY PLANNING CRITERIA AND GUIDELINES

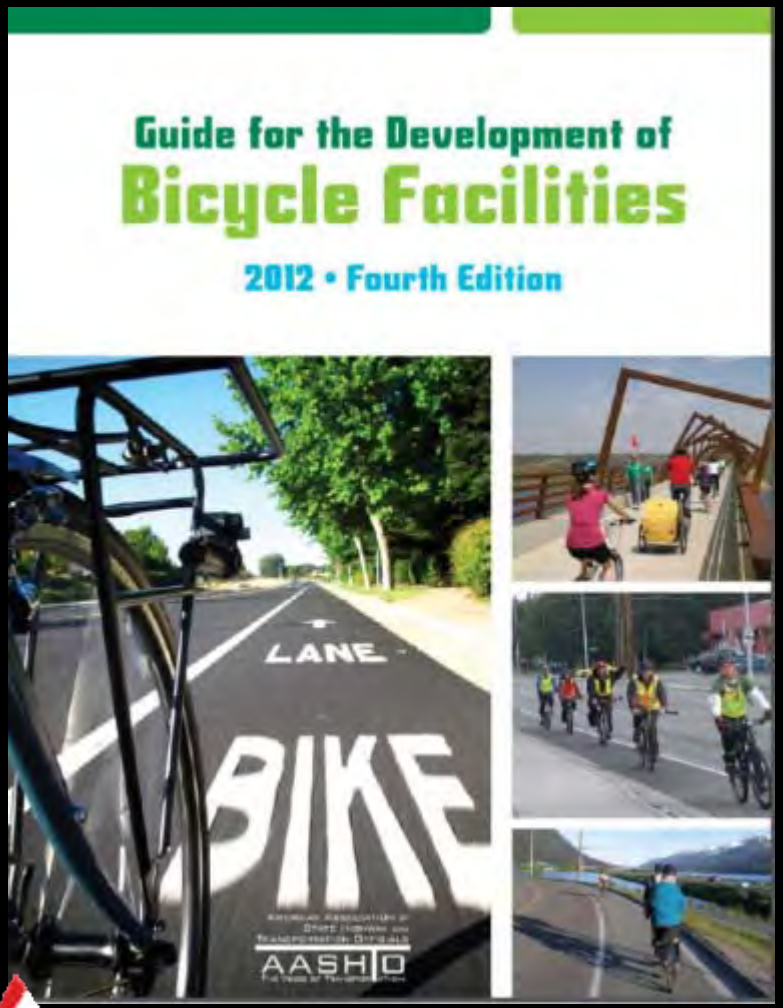
April 1972

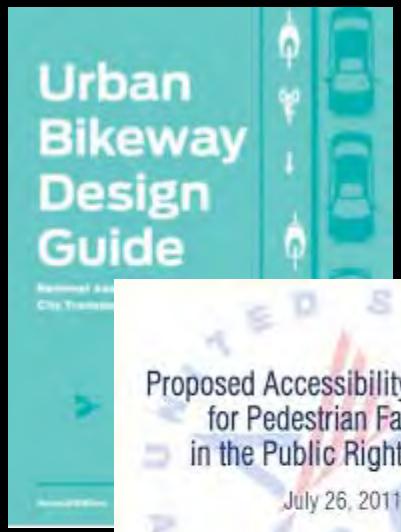
Prepared by
INSTITUTE OF TRANSPORTATION
AND
TRAFFIC ENGINEERING

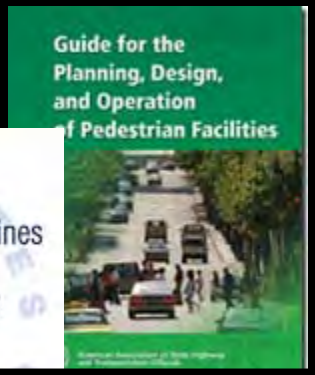
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
UNIVERSITY OF CALIFORNIA, LOS ANGELES
UCLA-ENG-7234

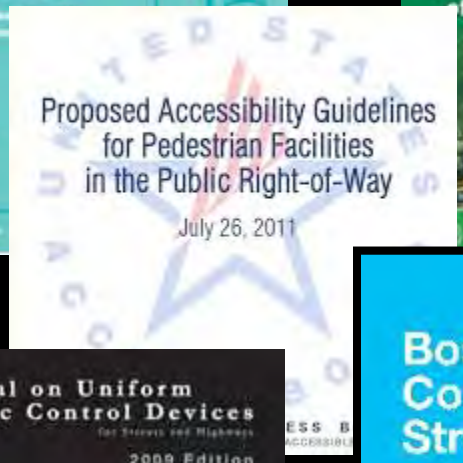
Reprinted November 1972 by the Federal Highway Administration, U. S. Department of Transportation, Washington, D. C.

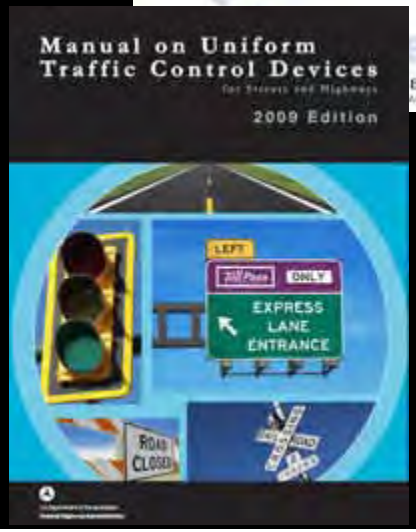
Careful What you Ask For

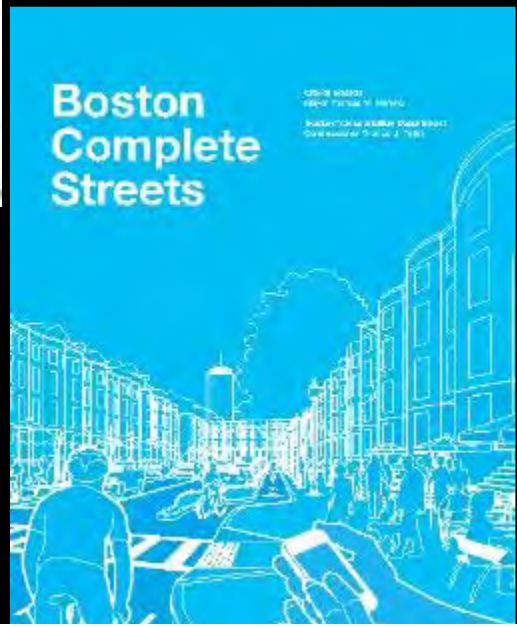


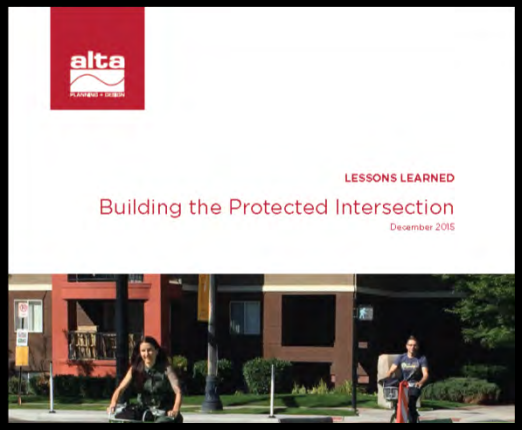






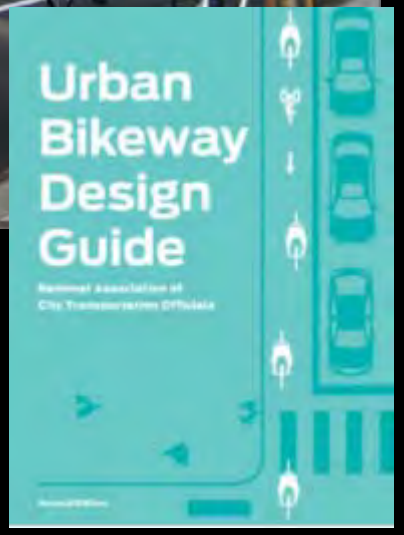





alta
LESSONS LEARNED
Building the Protected Intersection
December 2015

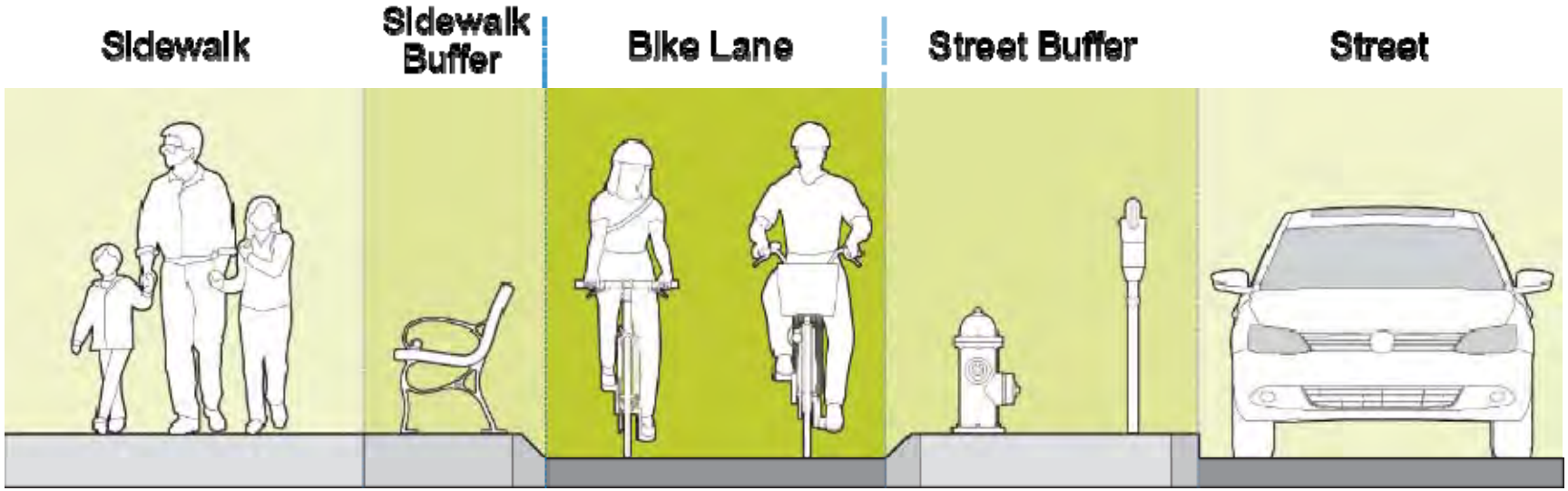

Federal Highway Administration
SEPARATED BIKE LANE
PLANNING AND DESIGN GUIDE


SEPARATED BIKE LANE
PLANNING & DESIGN GUIDE
2015
MASSACHUSETTS DEPARTMENT
OF TRANSPORTATION


Urban
Bikeway
Design
Guide


SEPARATED BIKE LANE
PLANNING & DESIGN GUIDE
2015
MASSACHUSETTS DEPARTMENT
OF TRANSPORTATION

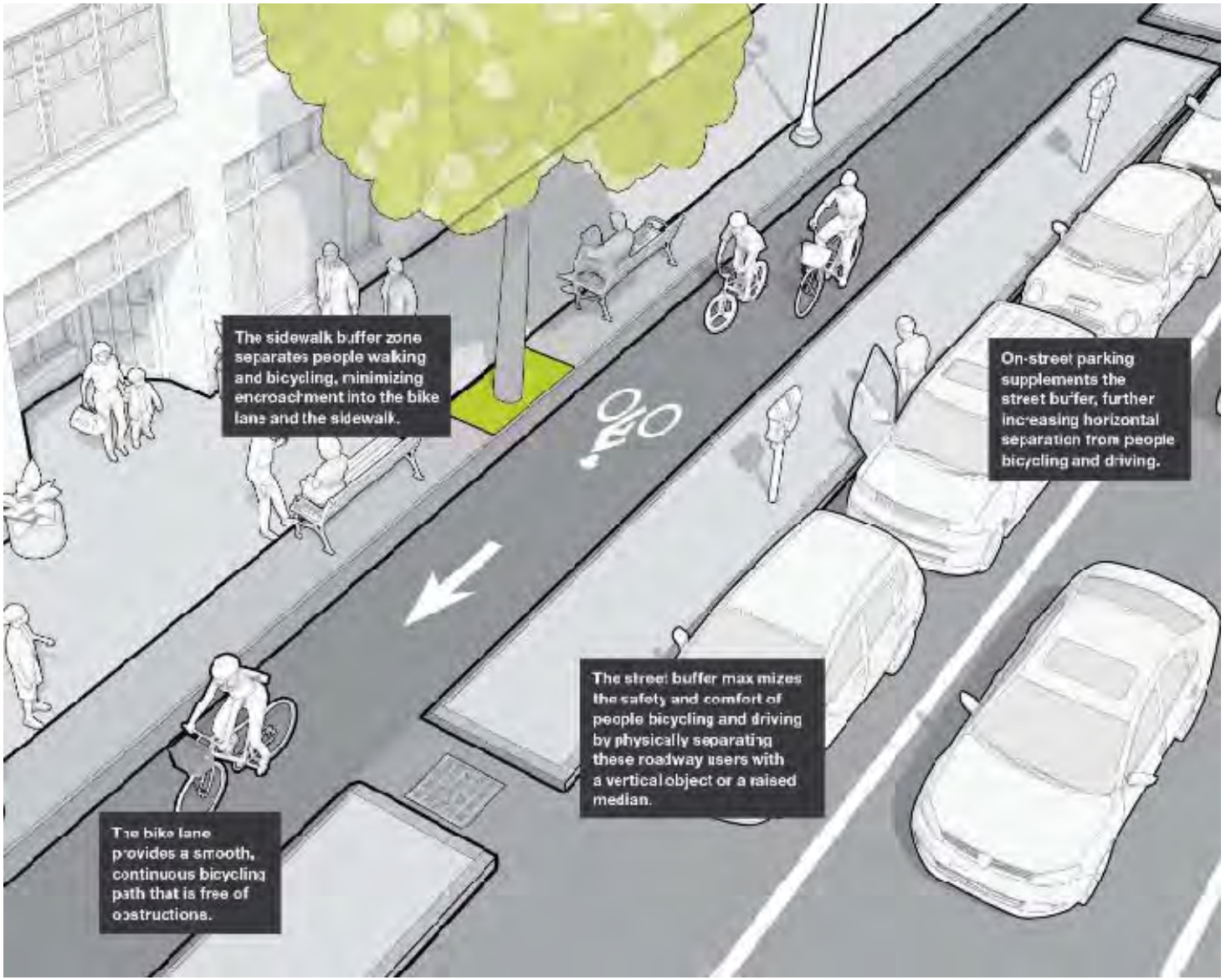
What is a Separated Bike Lane?



Separated Bike Lane Planning and Design Guide

massDOT
Massachusetts Department of Transportation

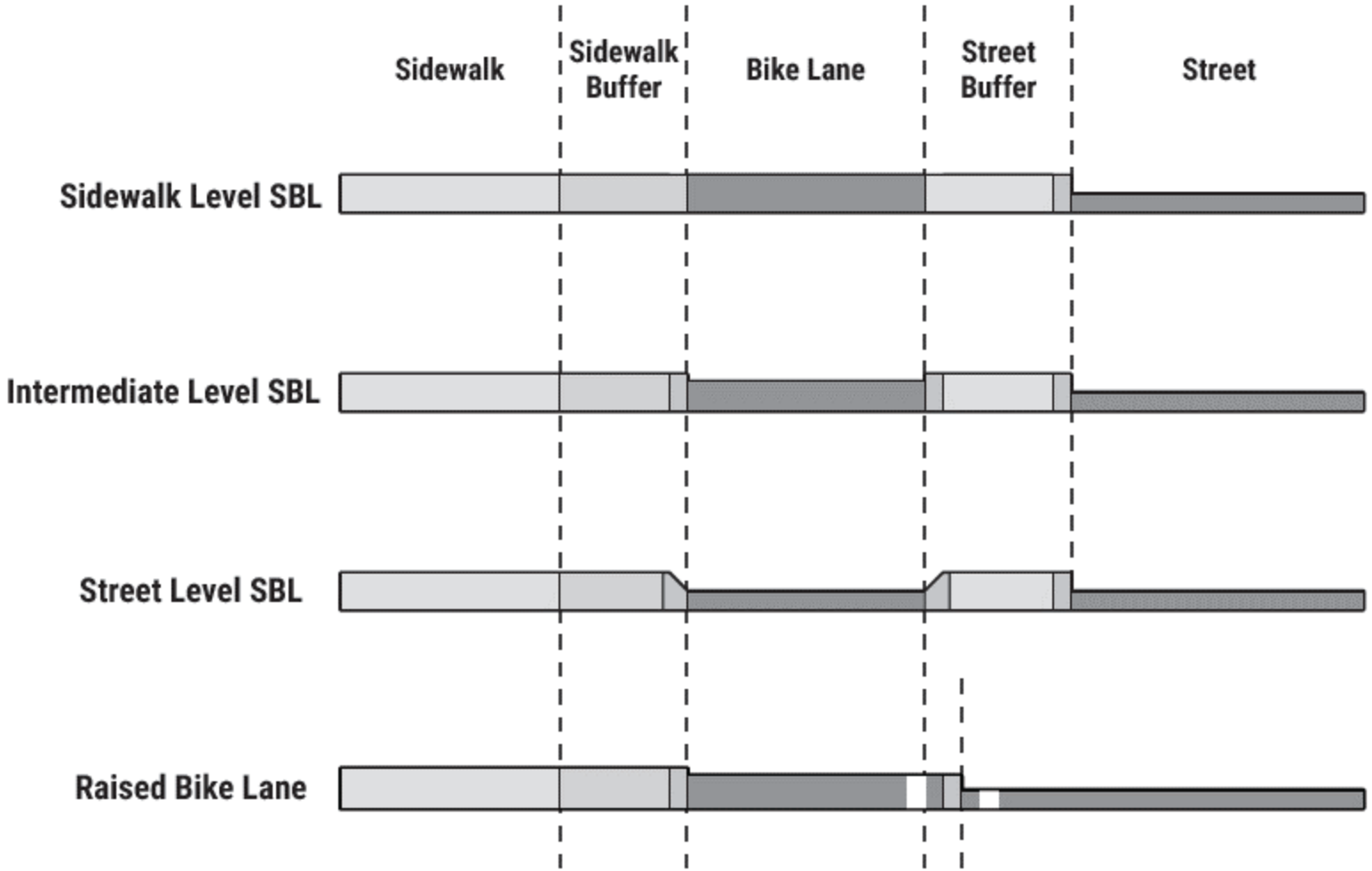
Benefits of Zones



Separated Bike Lane Planning and Design Guide

massDOT
Massachusetts Department of Transportation

Separated Bike Lanes Types

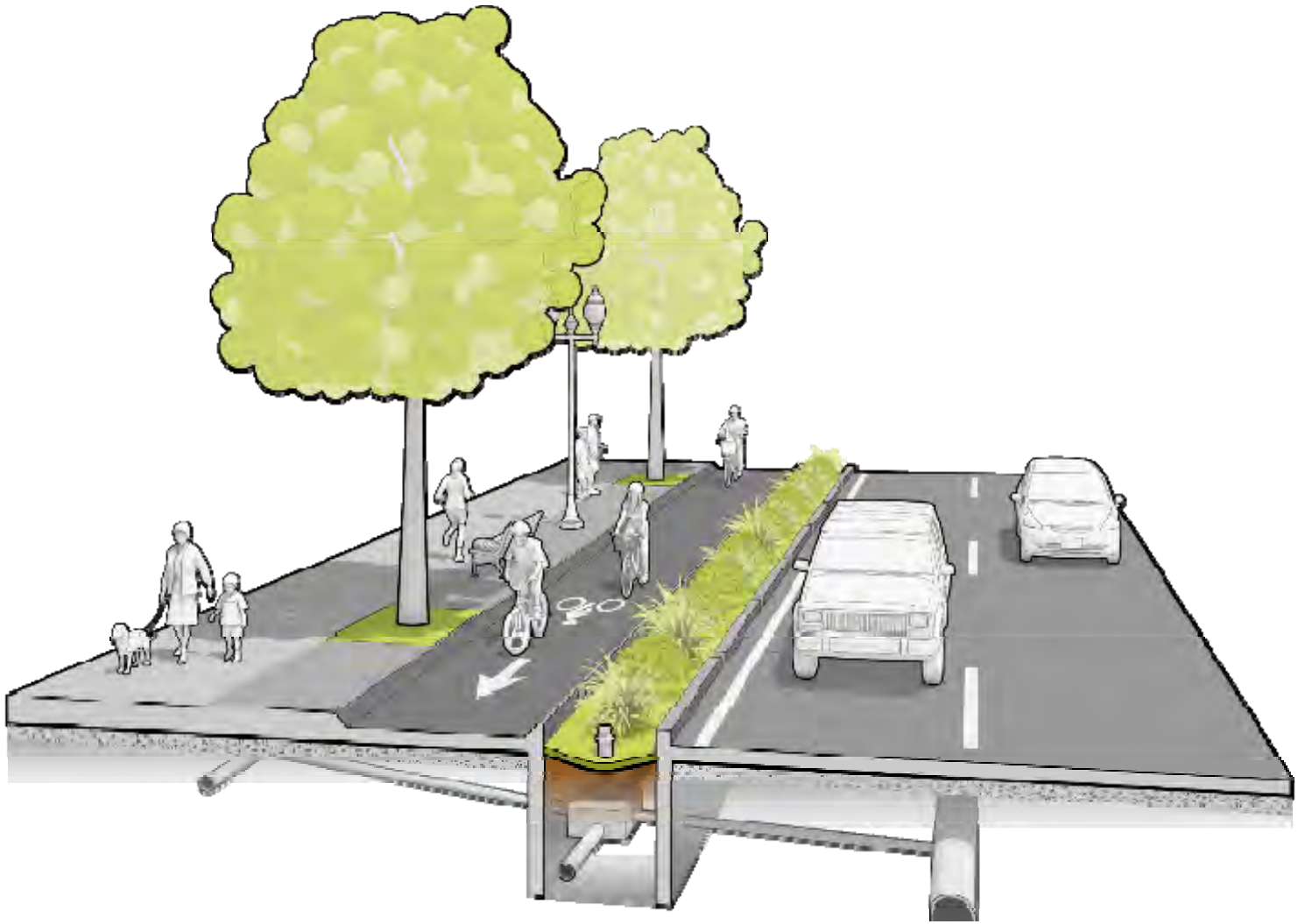


Separated Bike Lane Planning and Design Guide

massDOT
Massachusetts Department of Transportation

Landscaping

Drainage and Stormwater Management

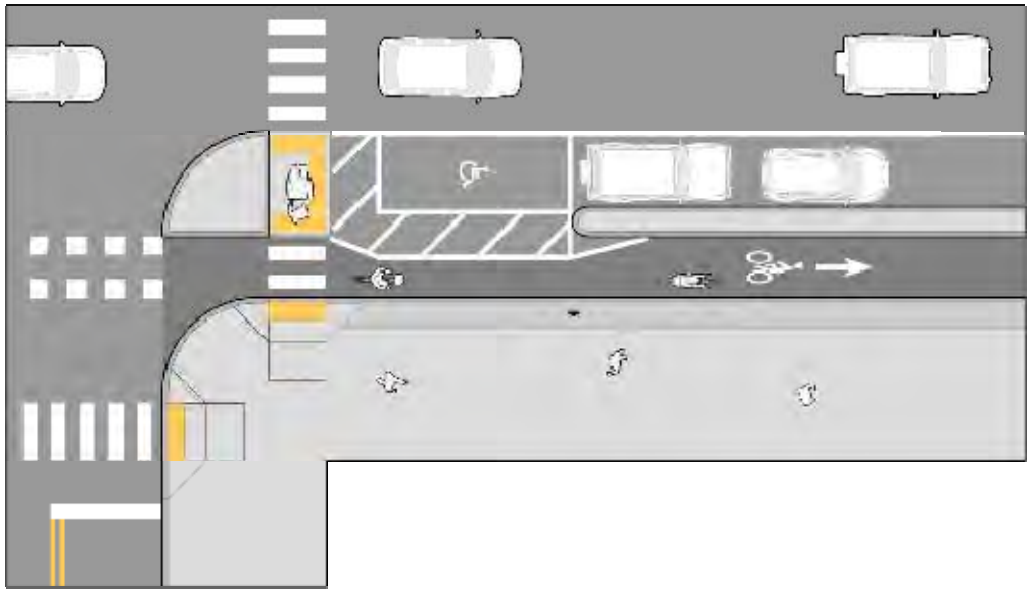


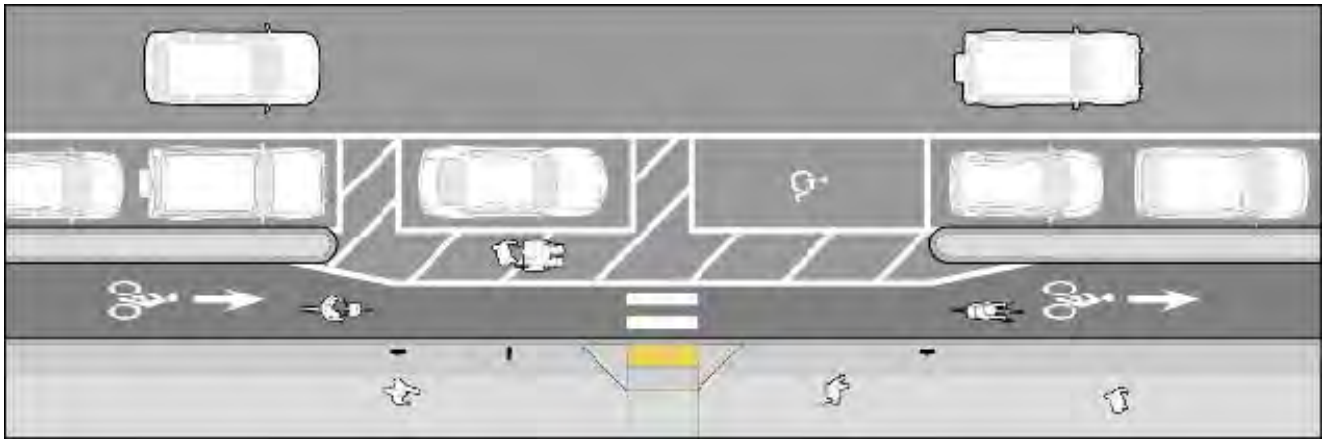
Separated Bike Lane Planning and Design Guide

massDOT
Massachusetts Department of Transportation

Accessibility

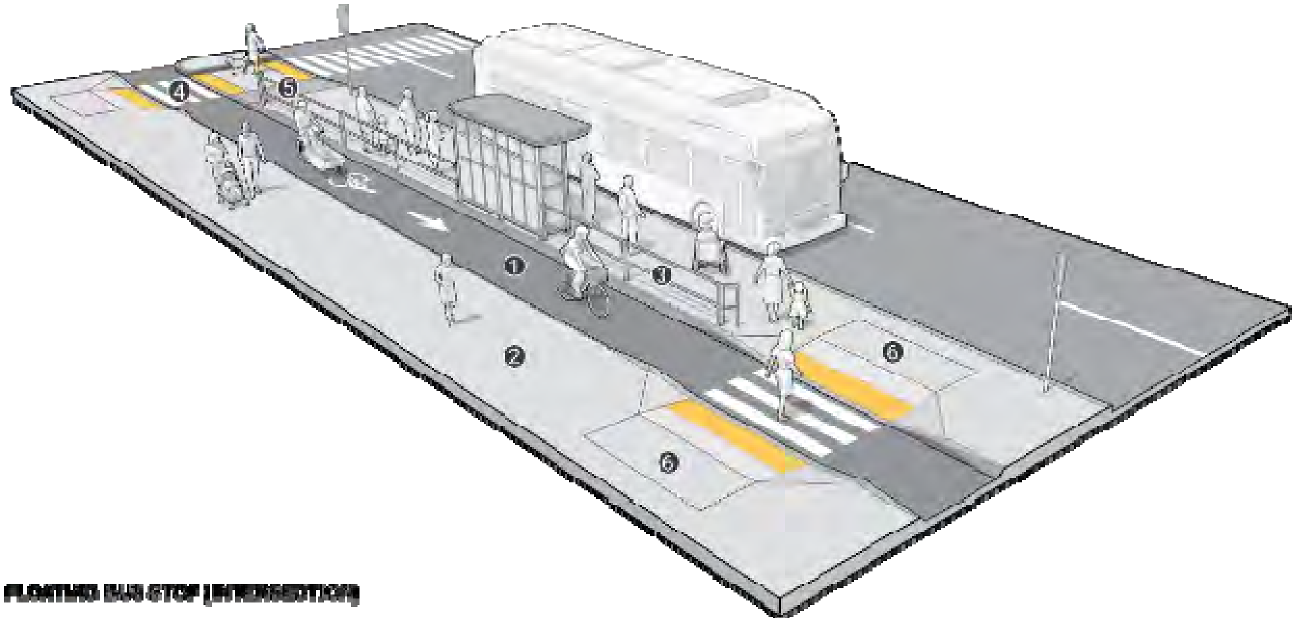
- Compatible with accessible curbside uses:
  - Parking
  - Loading
  - Bus stops





Elements of Transit Stops

EXHIBIT 5.4.C: **FLOATING BUS STOP (FAR-SIDE)**



FLOATING BUS STOP (INTERSECTION)

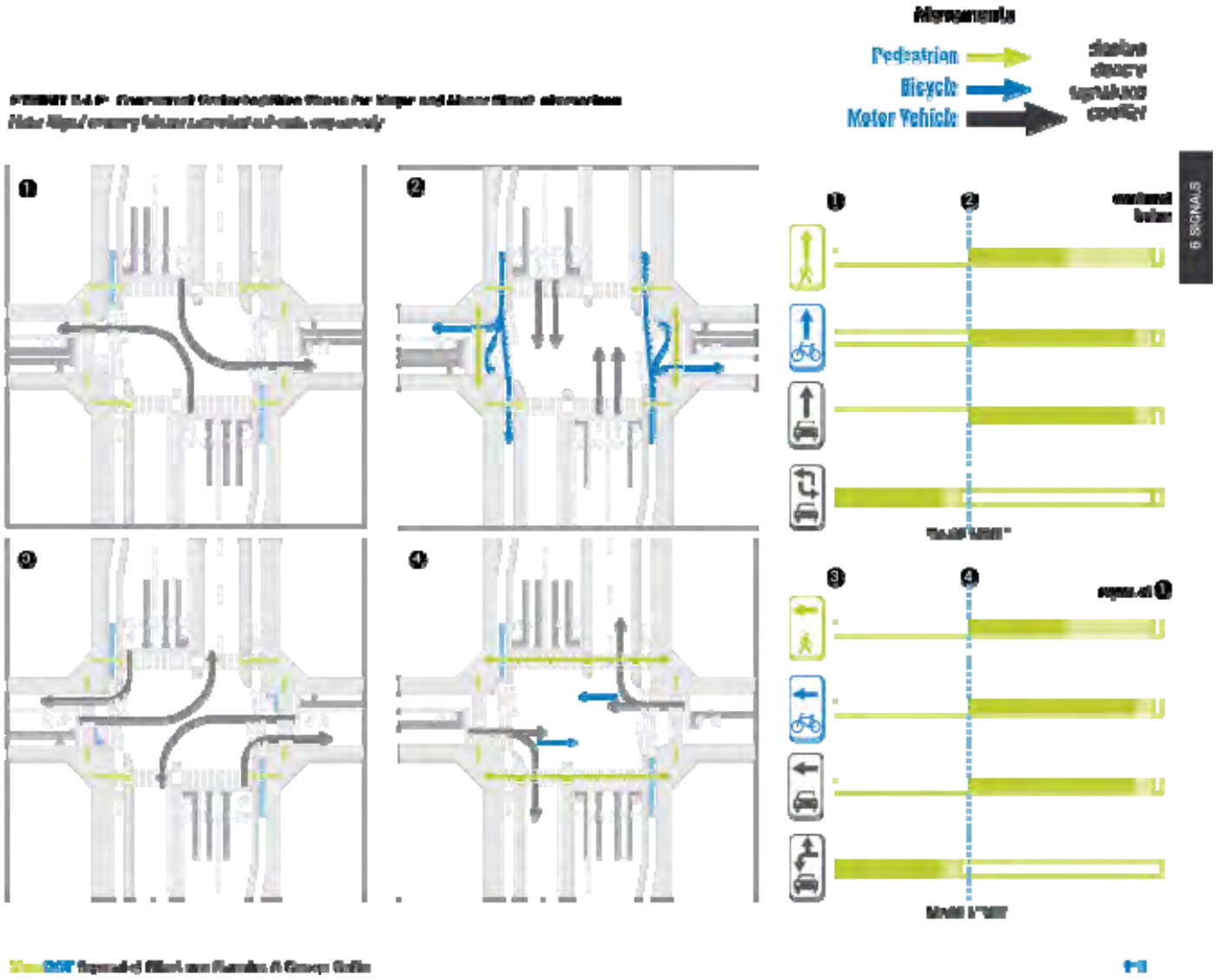
[illegible]

[illegible]

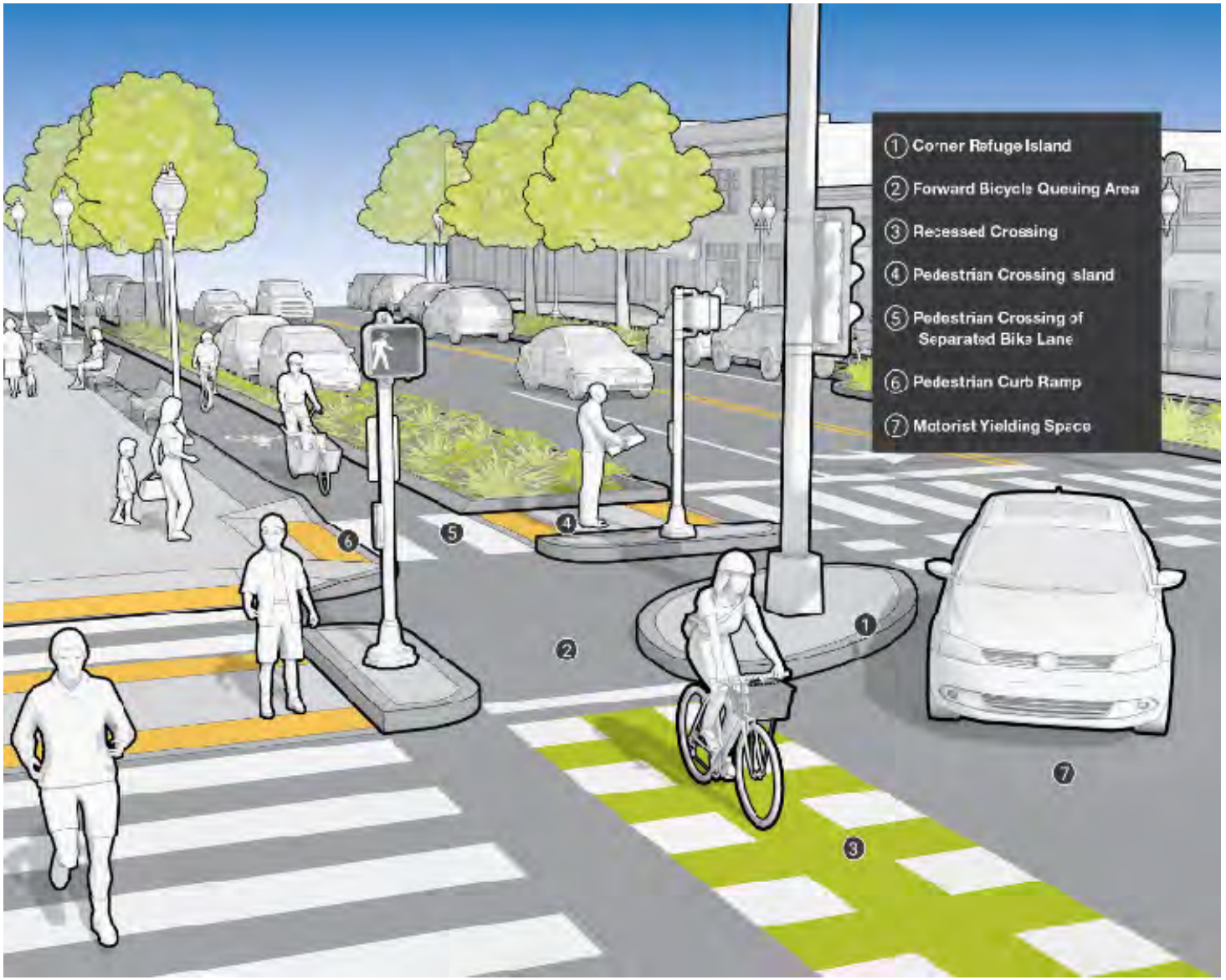
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Separated Bike Lane Planning and Design Guide

Example Signal Phasing Options



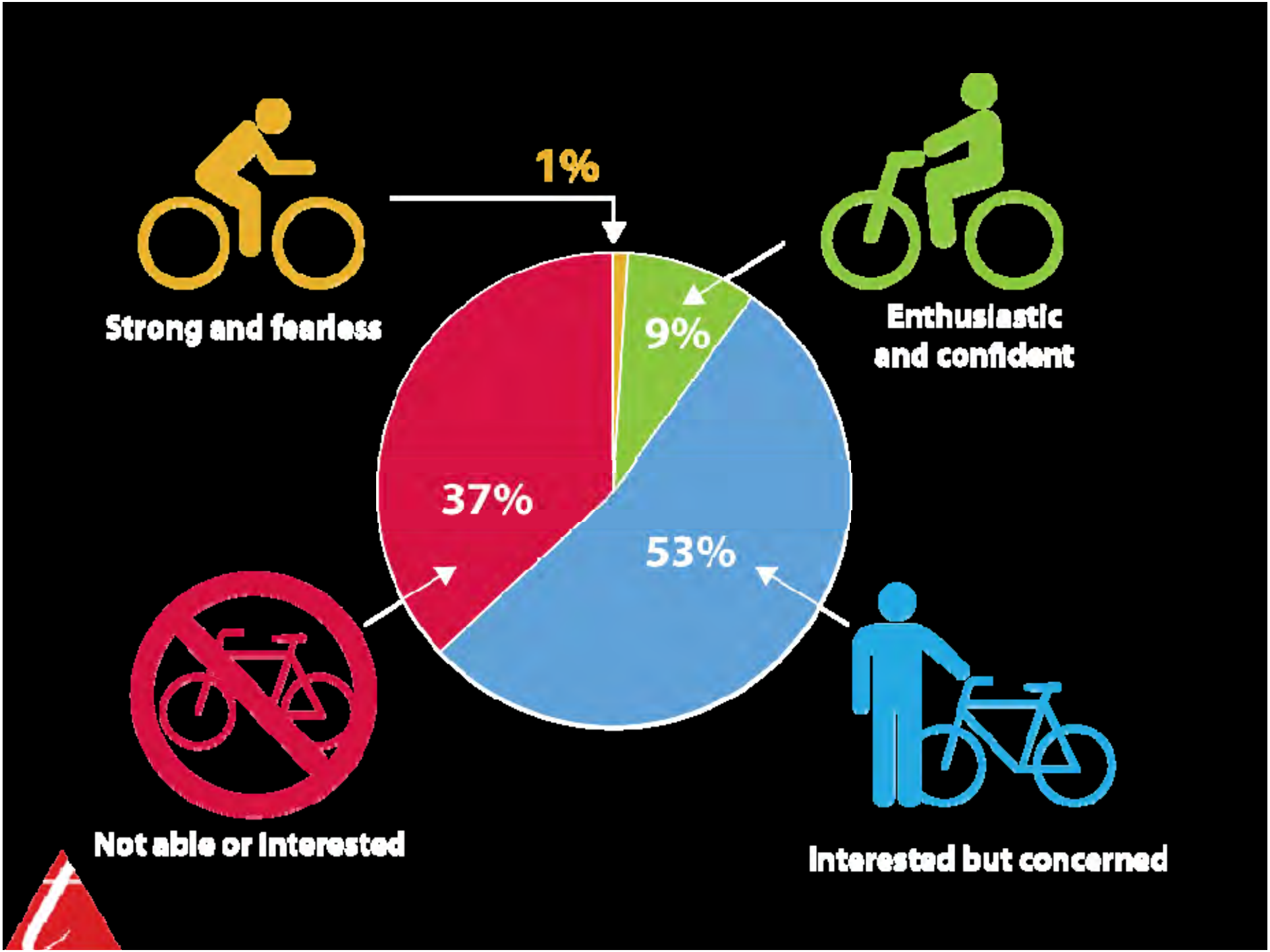
Elements of Protected Intersections



Separated Bike Lane Planning and Design Guide
Intersections

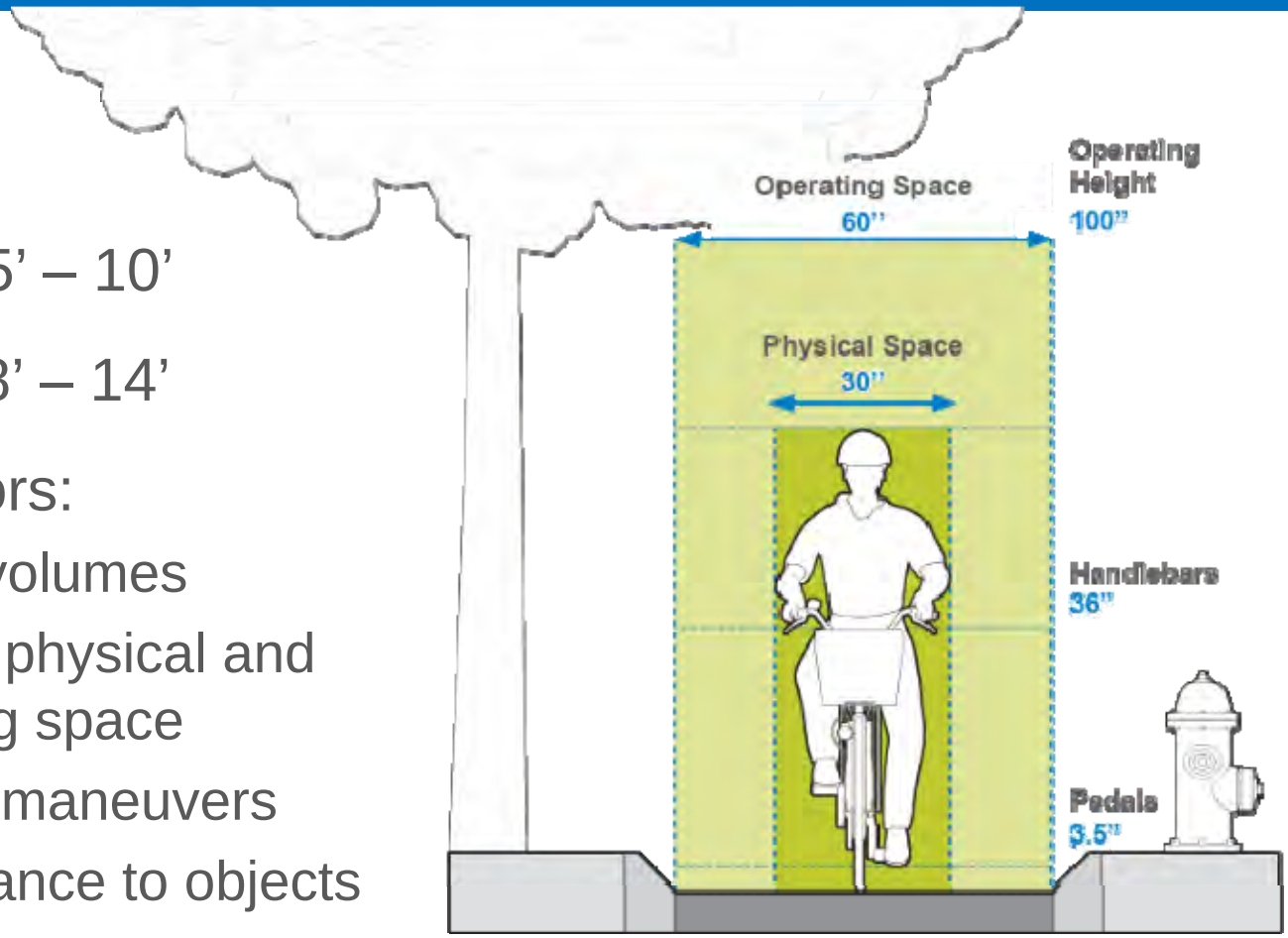
massDOT
Massachusetts Department of Transportation

Flexibility is not a Free for All


1%
Strong and fearless
9%
Enthusiastic and confident
37%
53%
Not able or Interested
Interested but concerned

Width

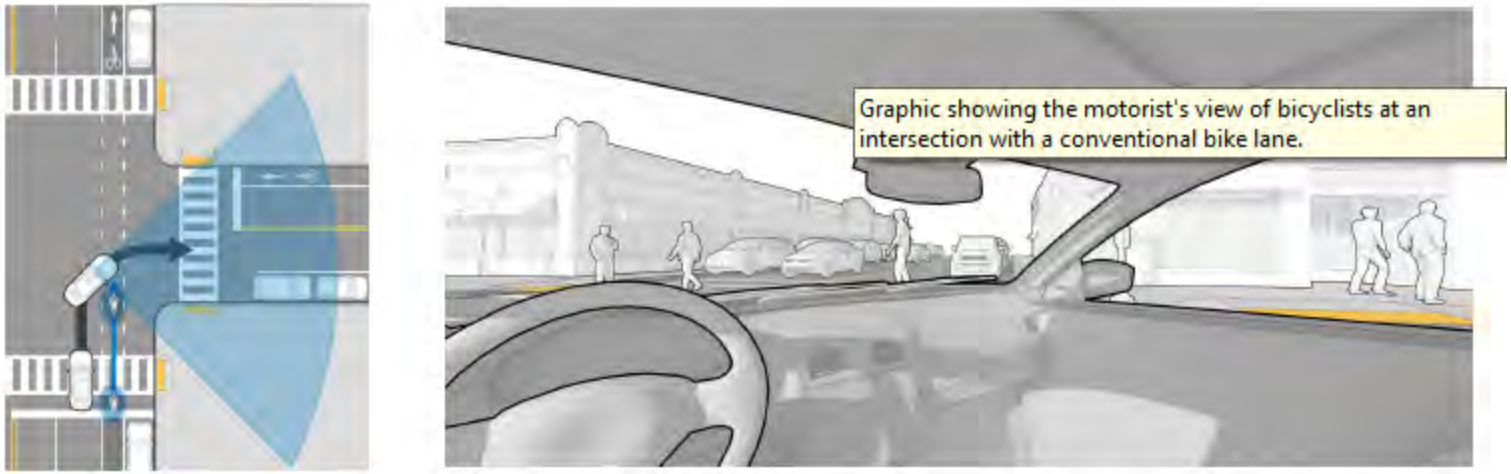
- One-way: 5’ – 10’
- Two-way: 8’ – 14’
- Width factors:
  - Bicycle volumes
  - Bicyclist physical and operating space
  - Passing maneuvers
  - Shy distance to objects
  - Curb reveal and design
  - Bike lane elevation



Comparison of Visibility

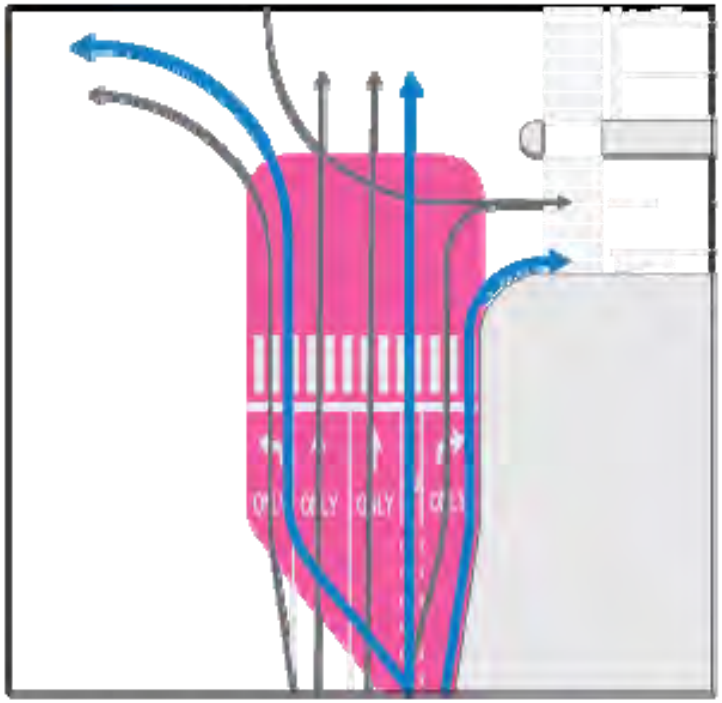
EXHIBIT 2A: MOTORIST'S VIEW AT SEPARATED BIKE LANE

EXHIBIT 2B: MOTORIST'S VIEW AT CONVENTIONAL BIKE LANE



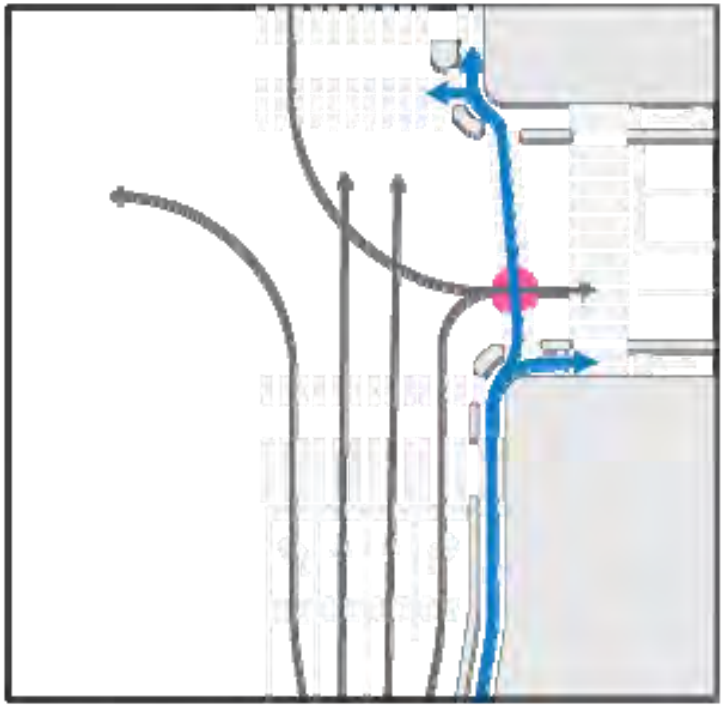
Bicyclist Exposure at Intersections

Exposure Level:
High



CONVENTIONAL BIKE LANES AND SHARED LANES

Exposure Level:
Low



PROTECTED INTERSECTIONS

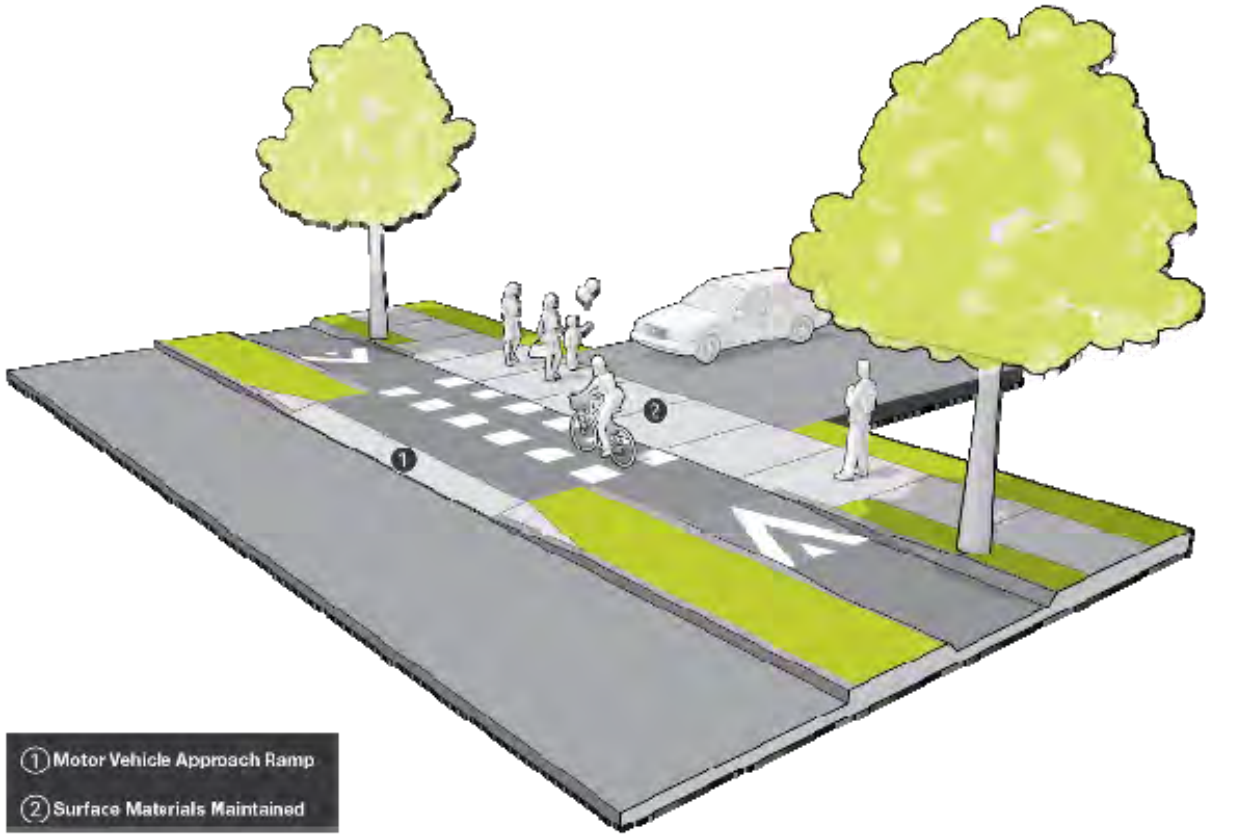
Bicycle →
Motor Vehicle →
Conflict Area ●

Separated Bike Lane Planning and Design Guide

massDOT
Massachusetts Department of Transportation

Driveway Crossing

EXHIBIT 4.2D: RAISED DRIVEWAY CROSSING



4 INTERSECTIONS

Design for what, and who, you want

Conclusion

- Wealth of planning and design information now available
- Permission given to use it [by FHWA]
- Must be used for good – equity, livability
- Flexibility doesn’t guarantee success
  - Stay focused on outcomes
  - Train engineers around you

Thank You

Andy Clarke
Toole Design Group
aclarke@tooledesign.com

@tooledesign