



U.S. Department of Transportation
**Federal Highway
Administration**

AASHTO
THE VOICE OF TRANSPORTATION



Pedestrian and Bicycle Information Center

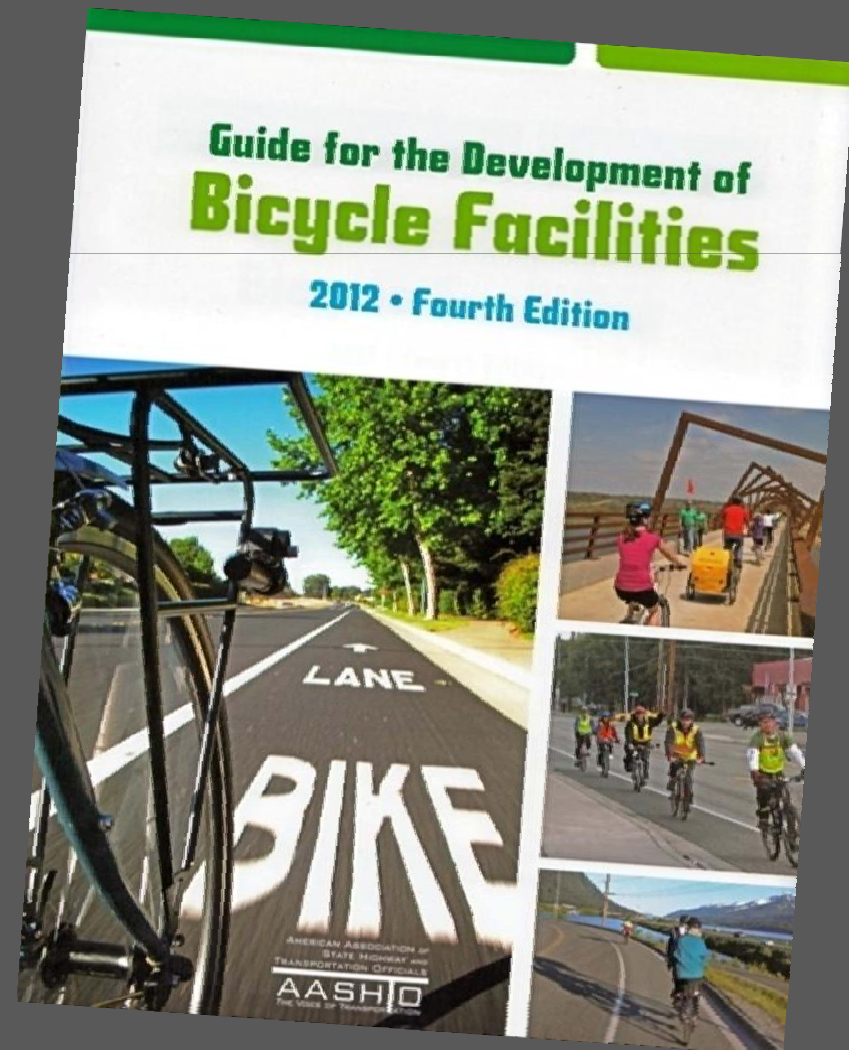
Maintenance and Operations

Presentation by:

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November 6, 2012



WEBINAR #7: MAINTENANCE & OPERATIONS

Today's Webinar

- ➔ Recommended maintenance programs and activities
- ➔ Bikeways in work zones



FOLLOW THE CONVERSATION ON TWITTER

➔ Toole Design Group is live tweeting this webinar

➔ @tooledesign

➔ #AASHTO #BikeGuide

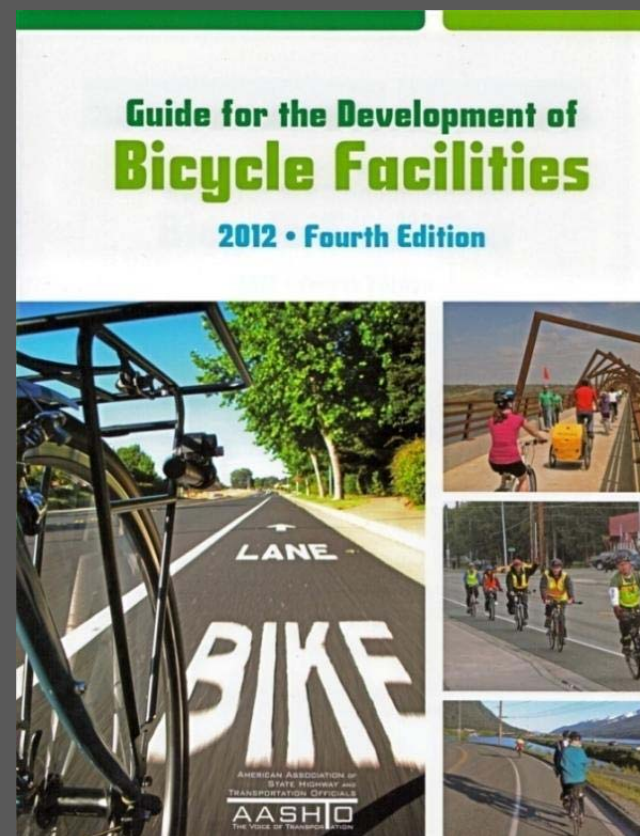


The screenshot shows the Twitter profile for Toole Design Group (@tooledesign). The profile includes a red logo, the name 'Toole Design Group', the handle '@tooledesign', a bio describing the firm as a leading planning, engineering, and landscape architecture firm specializing in bicycle and pedestrian transportation, and the website 'http://tooledesign.com'. It also shows statistics: 294 tweets, 338 following, and 215 followers. Below the profile is a 'Tweet to Toole Design Group' section with a text input field containing '@tooledesign'. To the right is a 'Tweets' section featuring a tweet from Toole Design Group (@tooledesign) dated 27 Sep, which reads: 'Counted: 330 bikers, walkers, joggers enjoying the morning in #Seattle on #BurkeGilman as part of #CBC annual count. Were you one of them?' with an 'Expand' link.

DISCOUNT FOR WEBINAR PARTICIPANTS

http://www.walkinginfo.org/training/pbic/AASHTO_Promo_Flyer.pdf

Link will be emailed to webinar attendees



Maintenance and Operations
Follow the conversation: @tooledesign

SOME BACKGROUND

➔ What is AASHTO?

- ➔ Mission: “provides technical services to support states in their efforts to efficiently and safely move people and goods”

➔ Some history

- ➔ Last Guide – 1999, largely written in 96-98
- ➔ Survey to update Guide - 2004

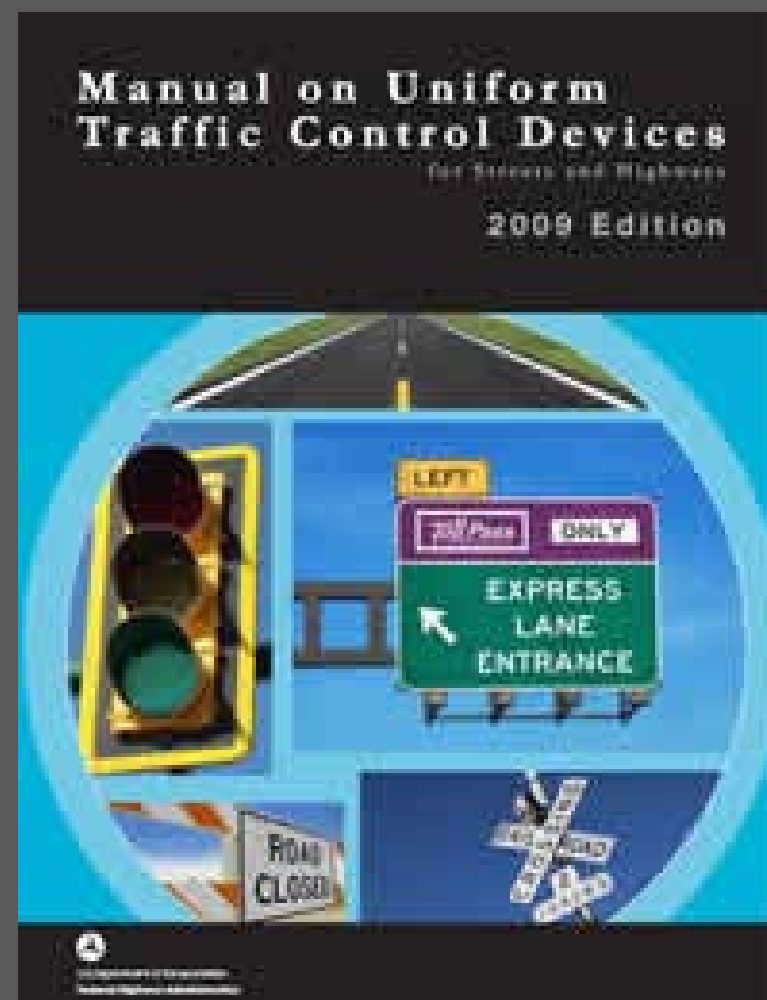
➔ Standards vs. guidance (Shall vs. should or may)

➔ Relationship between AASHTO Guide and the MUTCD

➔ Innovation vs. accepted practice

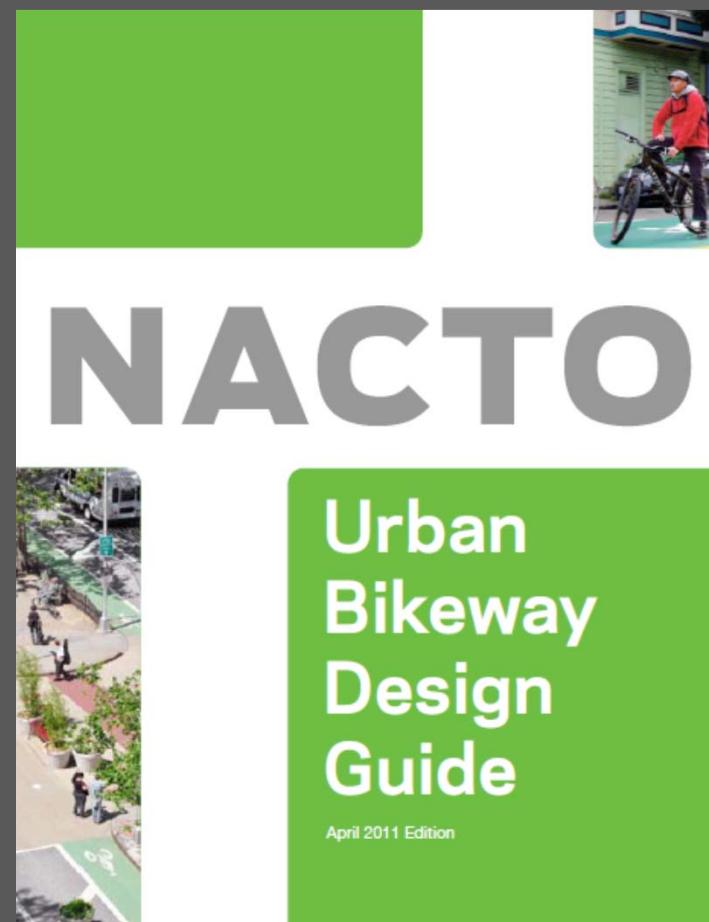
RELATIONSHIP TO OTHER MANUALS

- ➔ 2009 MUTCD – FHWA
- ➔ 2011 AASHTO Green Book
- ➔ Public Right-of-Way Accessibility Guidelines (PROWAG)
- ➔ 2010 Highway Capacity Manual



AASHTO VS. NACTO GUIDE: EITHER/OR?

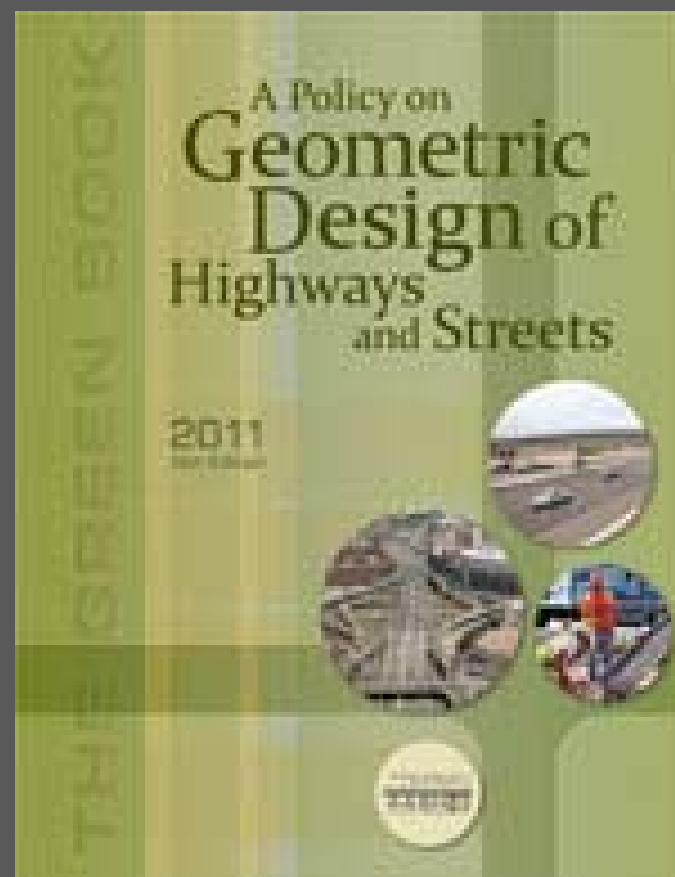
- ➔ AASHTO covers paths + on-road bikeways
- ➔ AASHTO covers design comprehensively
- ➔ AASHTO covers many – but not all latest innovations
- ➔ NACTO is a source of information for solutions that are currently experimental
- ➔ NACTO covers colored pavement markings with some maintenance considerations



DESIGN GUIDANCE OF GREEN BOOK

➔ Streets designed to meet design principals of the “Green Book” will typically accommodate bikes by providing adequate:

- ➔ sight distance
- ➔ Vertical & horizontal curves
- ➔ Cross slopes



ENGINEERING JUDGMENT

“The treatments described reflect typical situations; local conditions may vary and engineering judgment should be applied.”

FINAL WEBINAR & PAST WEBINARS

- ➔ August 10: Overview
- ➔ August 22: Planning Chapter
- ➔ September 4: On-Road Bikeways Part I
 - ➔ Bike Lanes (including Intersections)
- ➔ September 18: On-Road Bikeways Part II
 - ➔ Shared lanes
 - ➔ Bicycle boulevards & signing
 - ➔ Signals
- ➔ October 9: Shared Use Paths
 - ➔ General design principles
 - ➔ Pathway geometry
- ➔ October 23: Shared Use Paths
 - ➔ Intersection Design
 - ➔ Mid-block crossings
- ➔ November 6: Bikeway Maintenance and Operation

WEBINAR 7: MAINTENANCE AND OPERATION

➔ Recommended maintenance programs and activities

- ➔ Sweeping
- ➔ Snow clearance
- ➔ Surface repairs
- ➔ Traffic signal detectors
- ➔ Signs and markings



➔ Operation of bicycle

facilities in work zones will also be discussed.

MAINTENANCE PROGRAM

➔ Components

- ➔ Sweeping
- ➔ Surface repairs
- ➔ Pavement overlays
- ➔ Vegetation
- ➔ Traffic signals
- ➔ Signs and markings

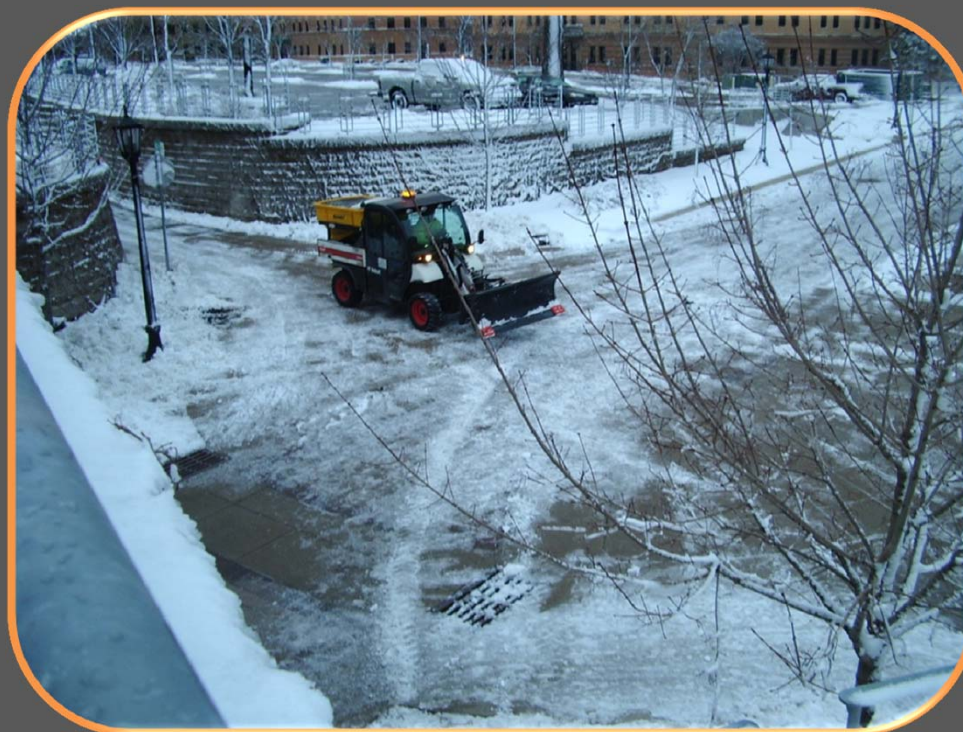


MAINTENANCE PROGRAM

➔ Components - Continued

➔ Utility cuts

➔ Snow clearance



MAINTENANCE PROGRAM

➔ Sweeping Problems

- ➔ Debris builds up in bikeway
- ➔ Sand and salt is a menace
- ➔ Fallen vegetation

➔ Sweeping Solutions

- ➔ Regular sweeping program
- ➔ Curb vs. shoulder sweeping
- ➔ Pave entire shoulder, driveway approach
- ➔ Pass ordinance to require crash clean-up



MAINTENANCE PROGRAM

➔ Surface Problems

➔ Cracks, potholes, bumps, etc.

➔ Deterioration happens

➔ Surface Repairs

➔ Inspection

➔ Reporting system

➔ Establish pavement preservation program

➔ Keep joints out of bike lanes

➔ Use high standards in construction



Cherry Creek Path Grinding

Spot Resurfacing Example



Longitudinal Cracks in Path Example



MAINTENANCE PROGRAM

➔ Pavement Deterioration

- ➔ Opportunity to use high performing repair

➔ Overlay

- ➔ Extend over entire bikeway
- ➔ Correct edge drop-offs and joint problems
- ➔ Pave driveway approaches
- ➔ Smooth transition with grates
- ➔ Use best markings



MAINTENANCE PROGRAM

➔ Vegetation problem

- ➔ Growth - sides and above
- ➔ Growth from underneath (paths)

➔ Vegetation Solutions

- ➔ Cut back vegetation
- ➔ Require adjacent landowners to cut vegetation back (paths)*

* Or give road authorities legal ability to trim vegetation



MAINTENANCE PROGRAM

➔ Traffic Signal Detector Solutions

- ➔ Adjust sensitivity
- ➔ Place stencil over hotspot
- ➔ Adjust signal timing for bicyclist clearance

➔ General Signal Maintenance

- ➔ Report a problem programs
- ➔ Quick turnaround time



MAINTENANCE PROGRAM

- ➔ Signs and Markings Solutions
 - ➔ Inspection including retro-reflectivity testing
 - ➔ Sign and marking replacement
 - ➔ Use the best, longest-lasting markings when project is constructed or overlaid (paid through project)



MAINTENANCE PROGRAM

- ➔ Chip Sealing Solutions
 - ➔ Use fine mix – 3/8 inch max
 - ➔ Where possible, do not chip seal bike lanes or paved shoulders
 - ➔ Sweep material to shoulder as soon as possible
 - ➔ Warn users of loose gravel



MAINTENANCE PROGRAM

➔ Snow and Ice Problems

- ➔ Snow that remains for more than a couple of days
- ➔ Snow that hardens and forms into ice

➔ Solutions

- ➔ Snow and ice removal
- ➔ Parking restrictions for parking lanes next to bike lanes
- ➔ Reporting system



OPERATING BIKEWAYS IN WORK ZONES

➔ MUTCD Support

- ➔ Bicyclists treated the same as motorists for work zone accommodations
- ➔ Treatments should be designed to accommodate bicyclists

➔ How

- ➔ Included in traffic maintenance plans
- ➔ May involve temporary facilities
- ➔ Train workers



OPERATING BIKEWAYS IN WORK ZONES

➔ How – Rural Highways

- ➔ Short or low volume roadways work zones usually just standard traffic control practices
- ➔ Longer or higher volume work zones provide room for vehicles to pass

➔ How – Urban Streets

- ➔ Significant indirection is not acceptable and rarely works
- ➔ Keep closure period very short if indirection is necessary



OPERATING BIKEWAYS IN WORK ZONES

➔ Detours

- ➔ Should not require bicyclists to make more than one left turn across heavy traffic
- ➔ Separate detour routes for each direction of travel should be considered
- ➔ Advanced warning



THANK YOU AND GOOD LUCK!

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Questions?

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Maintenance and Operations
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