Innovations in Bicycle Facilities

Steve Durrant, ASLA

alta PLANNING + DESIGN

Washington DC – Charlotte – Boston – New York – Portland – Berkeley – Los Angeles – Madison - Bozeman
San Diego – Las Vegas – Minneapolis – Chicago

Innovations in Bicycle Facilities

NACTO

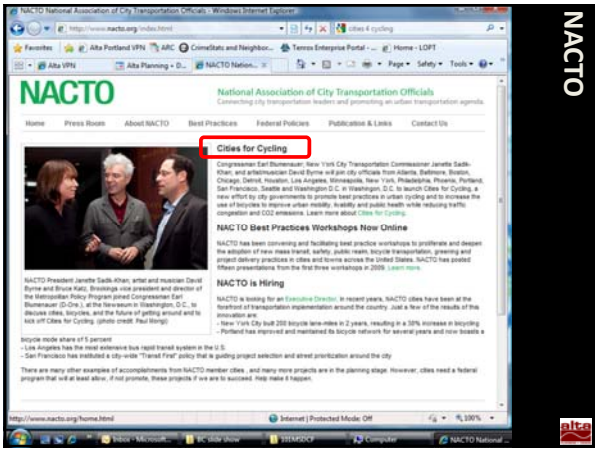
National
Association of
City
Transportation
Officials

NACTO

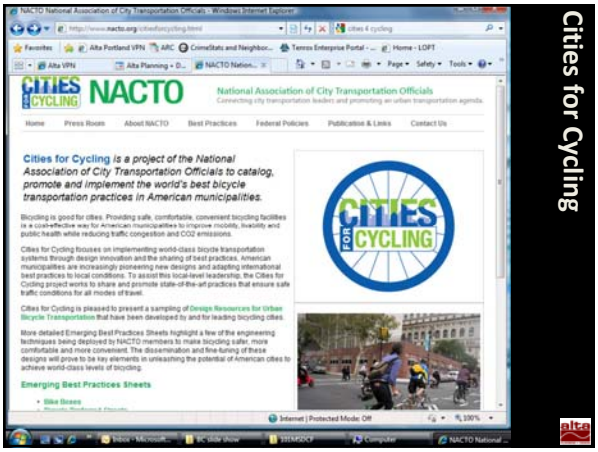
Cities for Cycling

is a project of the National Association of City Transportation Officials to catalog, promote and implement the world's best bicycle transportation practices in American municipalities.

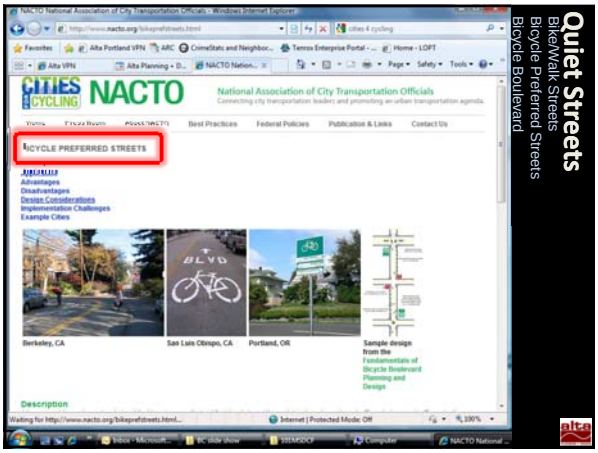
MEMBER CITIES: Atlanta, Baltimore, Boston, Chicago, Detroit, Houston, Los Angeles, Minneapolis, New York, Philadelphia, Phoenix, Portland, San Fran, Seattle, Wash. D.C.



NACTO



Cities for Cycling



Quiet Streets
Bike/Walk Streets
Bicycle Preferred Streets
Bicycle Boulevard


PLAY
STREET
NO THRU TRAFFIC
NO PARKING
IN THIS BLOCK
8AM-5PM
MON THRU FRI
DEPT OF TRANSPORTATION
Quiet Streets


Quiet Streets
Bicycle Boulevards in Portland, Oregon


Quiet Streets
From a fully developed arterial (with destinations)


Quiet Streets
Bike/Walk Streets can be Residential or Commercial


Quiet Streets
Bike/Walk Streets can be Residential or Commercial


Quiet Streets
Bike/Walk Streets can be Residential or Commercial

Bike/Walk Street "Application Levels"

- Level 1 – Signing and Sidewalks
- Level 2 – Pavement markings
- Level 3 – Intersection treatments
- Level 4 – Traffic calming
- Level 5 – Traffic diversion

Level 1 → Level 5

Intensity of treatments

Quiet Streets

Level 1 – Signing and Sidewalks

Wayfinding signs

- Direct users to and along the Bike/Walk street
- Direct users to places of interest
- Visual queue to motorists
- Placed at key intersections and "decision points"

Quiet Streets

Level 1 – Signing and Sidewalks

Wayfinding signs

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Quiet Streets

Level 1 – Signing and Sidewalks

Quiet Streets

- Level 2 – Pavement markings

Quiet Streets

- Level 3 – Intersection treatments

Quiet Streets


• Level 3 – Intersection treatments
Quiet Streets


• Level 3 – Intersection treatments
STOP
Quiet Streets


• Level 4 – Traffic calming
STOP
Quiet Streets

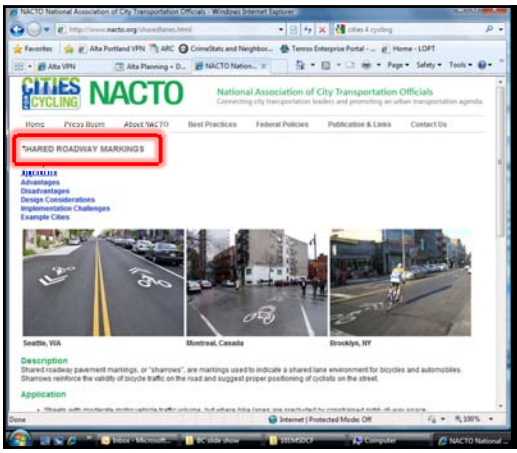

• Level 4 – Traffic calming
Quiet Streets


Encouragement Programs
24% increase in bike/walk
11% reduction in car trips
Quiet Streets


Quiet Streets
The main source of the $2 million per year funding will be the Bureau of Environmental Services' (BES) Green Streets program.
Integration
Bicycle Boulevards in Portland, Oregon

Shared Lane Marking

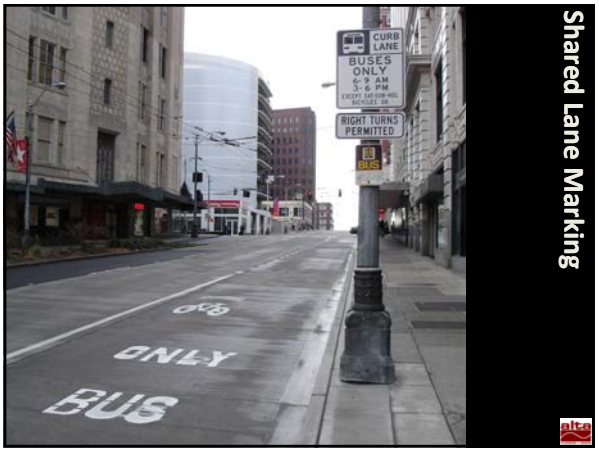
Shared roadway pavement markings are markings used to indicate a shared lane environment for bicycles and automobiles. SLMs reinforce the **validity of bicycle traffic** on the road and suggest **proper positioning** of cyclists on the street.

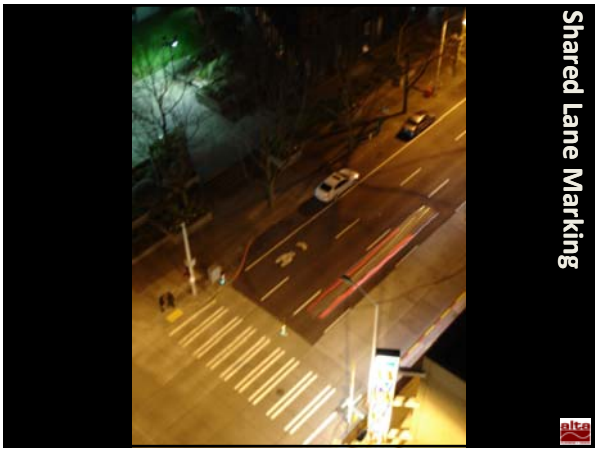


Shared Lane Marking

Shared Lane Marking

Shared Lane Marking

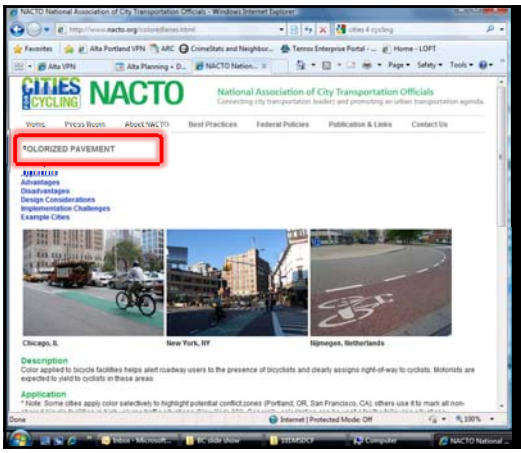




Colorized Lanes

Color applied to bicycle facilities helps alert roadway users to the presence of bicyclists and clearly **assigns right-of-way** to cyclists. Motorists are expected to yield to cyclists in these areas.

Colorized Lanes



Colorized Lanes

Colorized Lanes

Colorized Lanes

- Convenience of riding on the street with some psychological separation
- Novice cyclists are more likely to ride in bike lane, not on sidewalk
- Street appears narrower - motorists drive slower
- Used in many cities within the US (Seattle, Olympia, Portland) and worldwide

Colorized Lanes

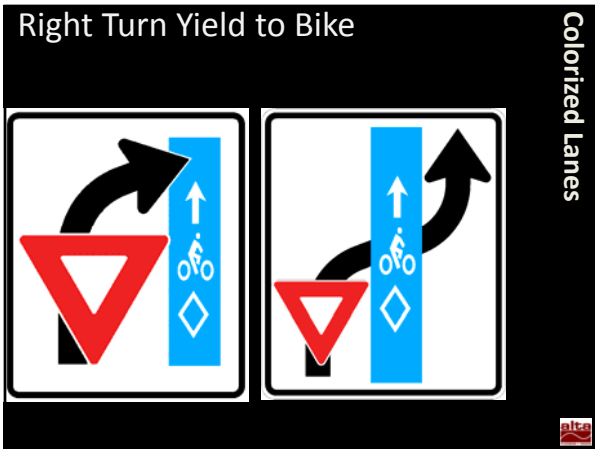
Colorized Lanes


Colorized Lanes

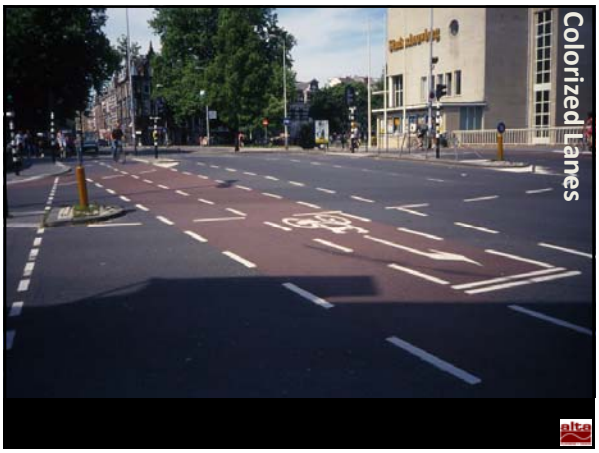

Grand Ave
Hawthorne Blvd
Colorized Lanes


Grand Ave
Hawthorne Blvd
YIELD TO BIKES
Colorized Lanes


YIELD TO BIKES
Colorized Lanes

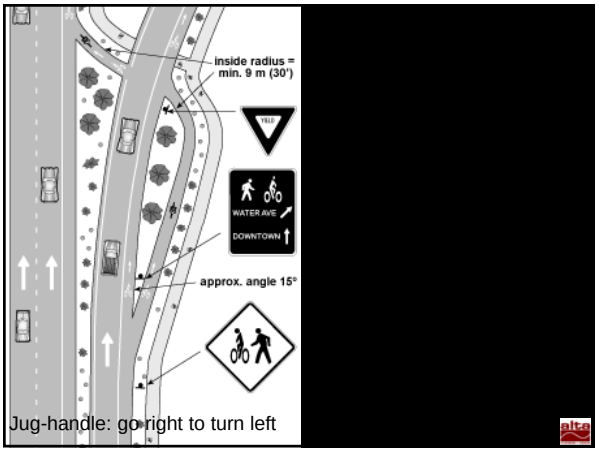

Right Turn Yield to Bike
Colorized Lanes


DO NO
ENTER
EXCEPT
& BICYCL
ONLY
BUS
Colorized Lanes




Jug-handle: go right to turn left


Jug-handle: go right to turn left



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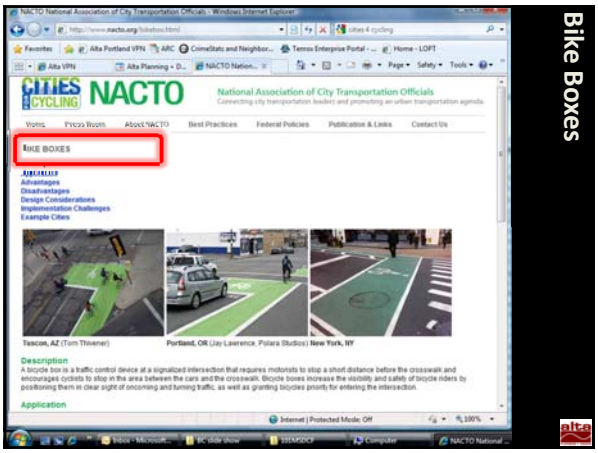
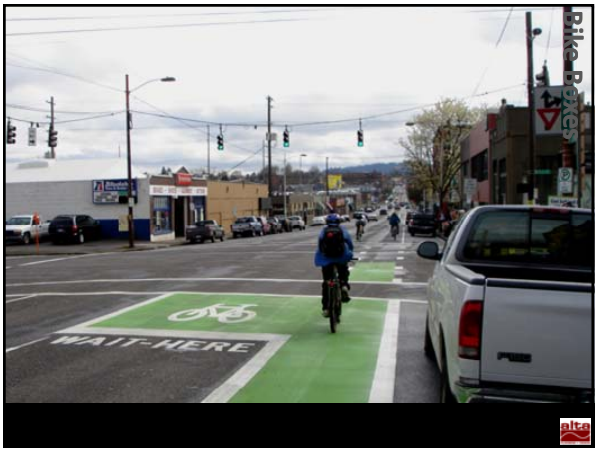

Bike Boxes
NACTO
National Association of City Transportation Officials
BIKE BOXES
Description
Application


Bike Boxes


Bike Boxes
WAIT HERE


Bike Boxes
WAIT HERE


Bike Boxes


Bike Boxes
Portland


Bike Boxes
Portland


Bike Boxes


Bike Boxes

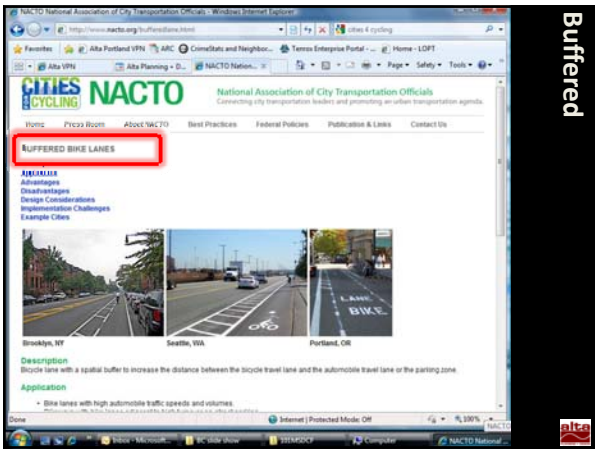

Bike Boxes
Portland


Bike Boxes
Portland


Bike Boxes
Portland

Buffered

Bicycle lane with a spatial buffer to **increase the distance** between the bicycle travel lane and the automobile travel lane or the parking zone.



Buffered

Buffered

Portland

Buffered

Buffered

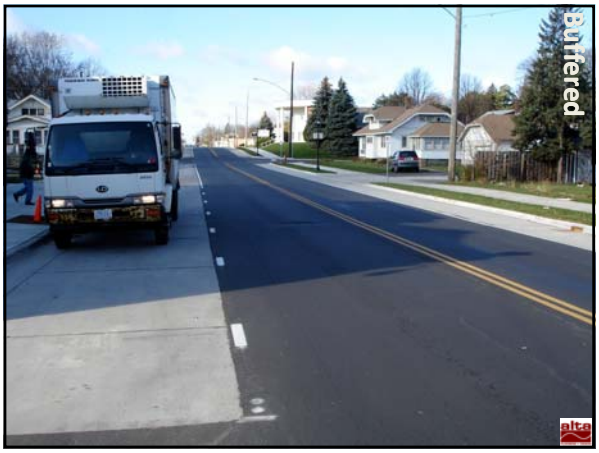
Buffered

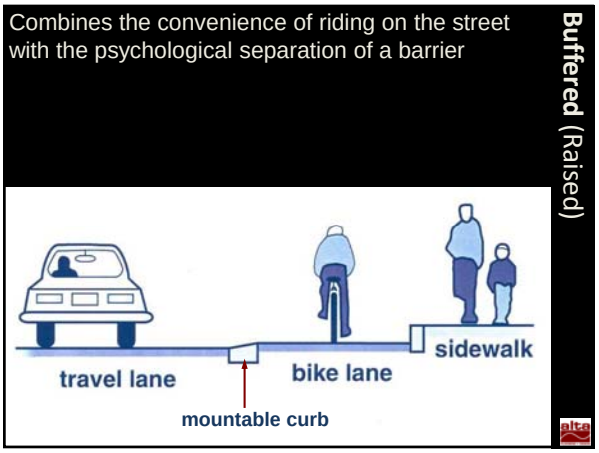

Buffered
Portland


Buffered
Portland


Buffered
Portland


Buffered
BIKE LANE


Buffered


Buffered (Raised)
Combines the convenience of riding on the street with the psychological separation of a barrier
travel lane
bike lane
sidewalk
mountable curb

Buffered (Raised)

- Convenience of riding on the street + psychological separation of a barrier
- Mountable curb allows cyclists to leave bike lane for turning or overtaking
- Motorists feel bump when they stray into curb
- Novice bicyclists more likely to ride in bike lane rather than on sidewalk

Cycle Track

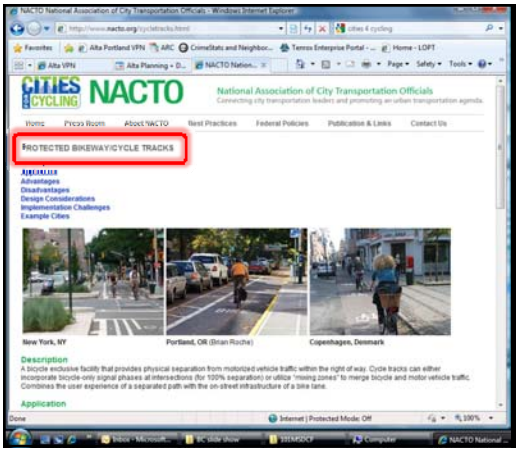
A bicycle **exclusive** facility that provides **physical separation** from motorized vehicle traffic within the right of way.

Cycle Track

A bicycle **exclusive** facility that provides **physical separation** from motorized vehicle traffic within the right of way.

Combines the user experience of a **separated path** with the **on-street** infrastructure of a bike lane.

Cycle Track



Cycle Track

Amsterdam, The Netherlands


Cycle Track
Copenhagen, Denmark


Cycle Track
Cambridge, MA


Cycle Track
Cambridge, MA


Cycle Track
Cambridge, MA


Cycle Track
Cambridge, MA


Cycle Track
YIELD TO BIKES
Cambridge, MA


Cycle Track
Vancouver, BC


Cycle Track
Vancouver, BC


Cycle Track
Munich


Cycle Track
Munich


Cycle Track
Kelowna, BC (Stantec)


Cycle Track
Kelowna, BC (Stantec)


Cycle Track


Cycle Track


Cycle Track

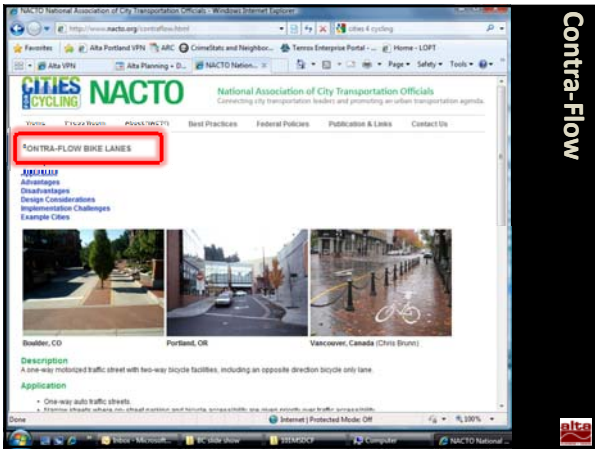

Cycle Track
Portland


Cycle Track
Portland

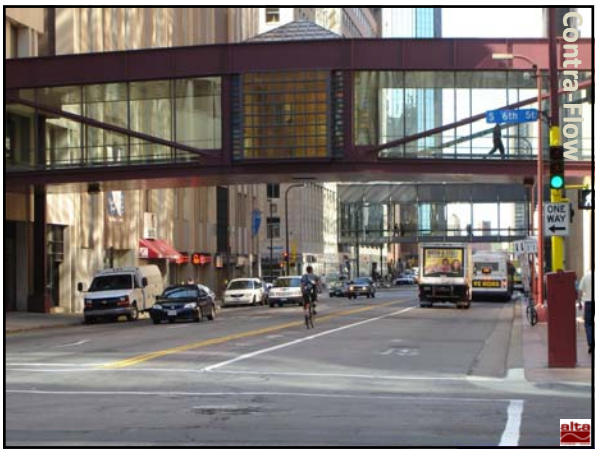

Cycle Track
Portland

Contra-Flow

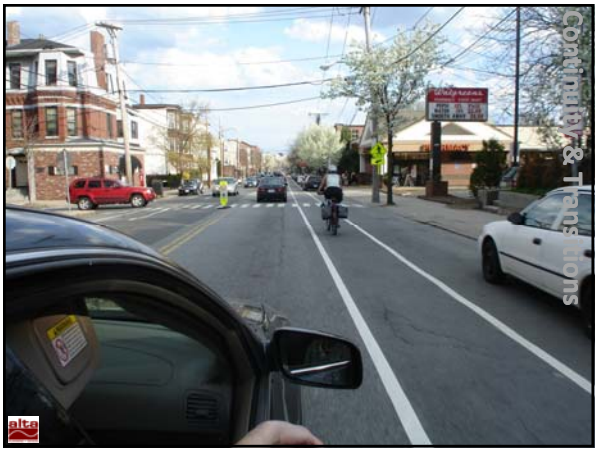
A one-way motorized traffic street with two-way bicycle facilities, including an **opposite direction** bicycle only lane.




Contra-Flow


Contra-Flow
ONE WAY


Continuity & Transitions


Continuity & Transitions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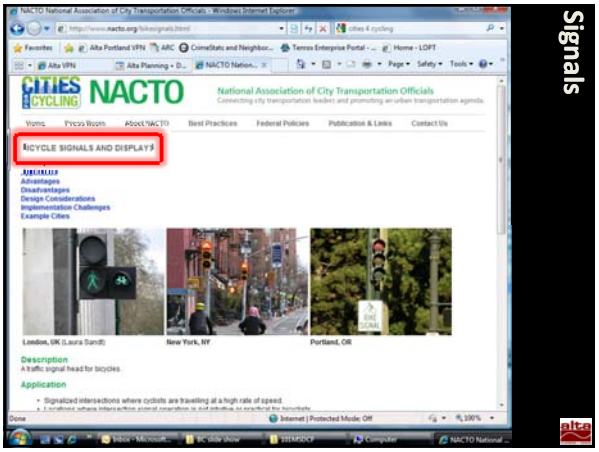

Signals
CITIES FOR CYCLING
NACTO
National Association of City Transportation Officials
BICYCLE SIGNALS AND DISPLAYS
Description
Application


Signals


Signals
HAWK signal


BIKE SIGNAL
PUSH BUTTON FOR
Signals

Request to Experiment

The Process

Request to Experiment

FHWA experimentation procedure:

Requests *for experimentation should* ***originate*** *with the* ***agency responsible*** *for managing the roadway where experiment will take place.*

That organization forwards the request to the ***FHWA****.*

The FHWA must approve the experiment ***before*** *it begins.*

Request to Experiment

All requests must include:
A statement of the ***nature of the problem****, including data that justifies the need for a new device or application.*

Describe the ***proposed change****, how it was developed, how it deviates from the current MUTCD.*

Illustrations *that enhance understanding of the device or its use.*

Explain *how the device was developed,* ***if it has been tried****, the adequacy of its performance, and the process by which the device was chosen.*

A statement that the concept of the traffic control device is ***not protected*** *by a patent or copyright.*

Request to Experiment

All requests must include:
The time ***period*** *and* ***locations*** *of the experiment.*

A detailed research or ***evaluation plan****. Before and after studies, quantitative data enabling a scientifically-sound evaluation of the* ***performance****.*

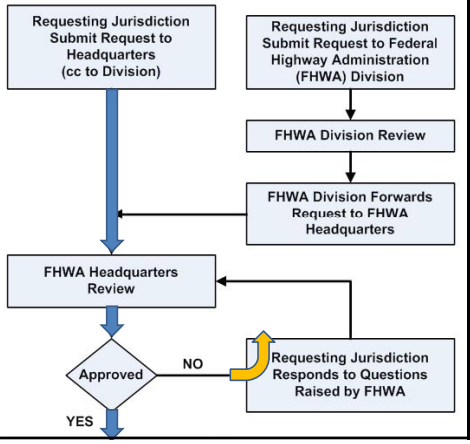
An agreement to ***restore*** *the site following completion.*

Agreement to ***terminate*** *the experiment if the experiment causes significant safety hazards.*

An agreement to provide ***progress reports*** *for the duration of the experiment.*

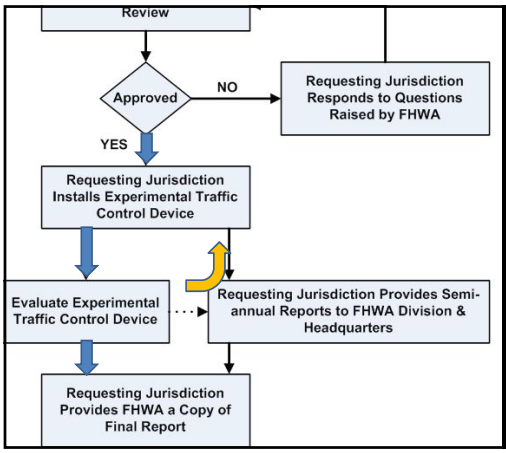
Request to Experiment

4-12 Weeks



Request to Experiment

1Year Minimum



Request to Experiment

At the conclusion of the experiment:

If the experiment demonstrates an ***improvement****, it* ***may remain in place*** *as a request is made to update the MUTCD.*

Request to Experiment

Document Everything

Look for precedent
- *Other modes*
- *Historic*
- *Other places*

Evaluate effectiveness
- *Before*
- *During*
- *After*
- *Control*

Refine

Document

Request to Experiment

Document Everything

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- *Historic*
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- *During*
- *After*
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Refine

Document
Document

Request to Experiment

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Evaluate effectiveness
- *Before*
- *During*
- *After*
- *Control*

Refine

Document
Document
Document

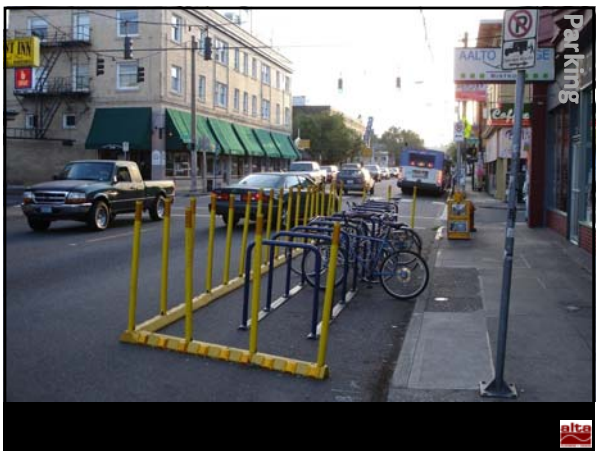
Parking


Parking


Parking


Parking


Parking


Parking

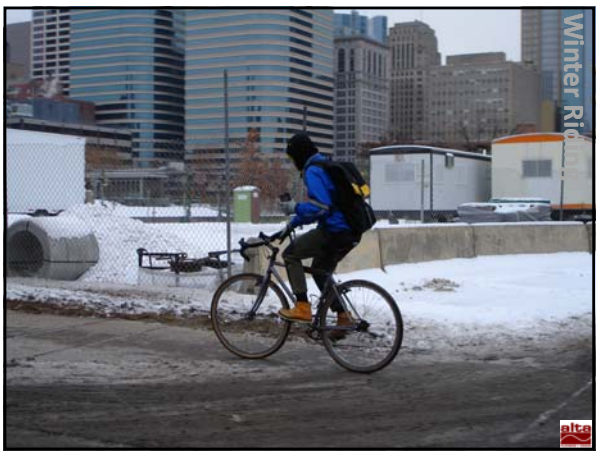

Midtown Greenway Bike Center
Midtown Greenway Bike Center
Millennium Park Bike Station
Parking

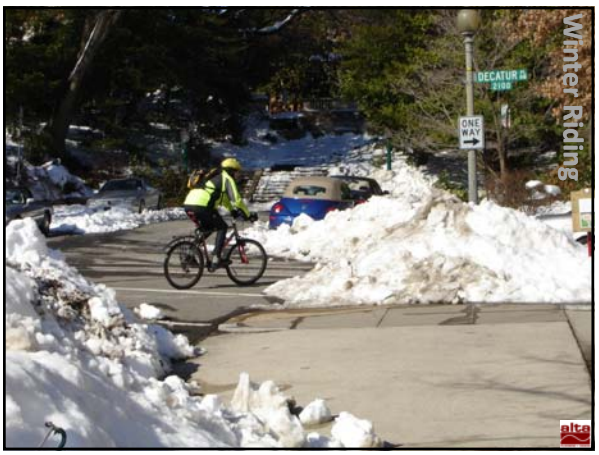

Parking


Winter Riding


Winter Riding


Winter Riding


Winter Riding


Winter Riding
DECATUR
ONE WAY


Winter Riding
STOP


Winter Riding
CURB LANE
BICYCLES & PARKING ONLY


Winter Riding

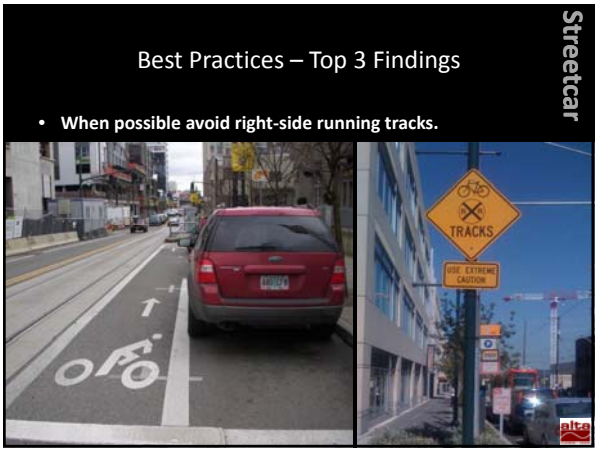

Winter Riding

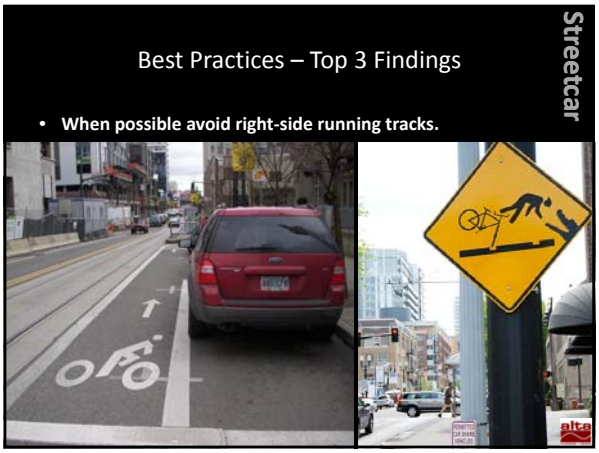

2010 – Washington DC
Steve Durrant, ASLA, LCI
alta
PLANNING + DESIGN


The Initiative for Bicycle and Pedestrian Innovation (ibpi) announces a new, week-long intensive course:
Comprehensive Bicycle and Pedestrian Design and Planning
A unique opportunity to learn in one of the foremost walking and cycling cities in America!
Portland State University


Making it Happen
Economic Development
Public Works
MPO
Community
City Traffic Eng
Client
Police


Making it Happen
Alta
City Traffic Eng
Police


Streetcar
Best Practices – Top 3 Findings
• When possible avoid right-side running tracks.
TRACKS


Streetcar
Best Practices – Top 3 Findings
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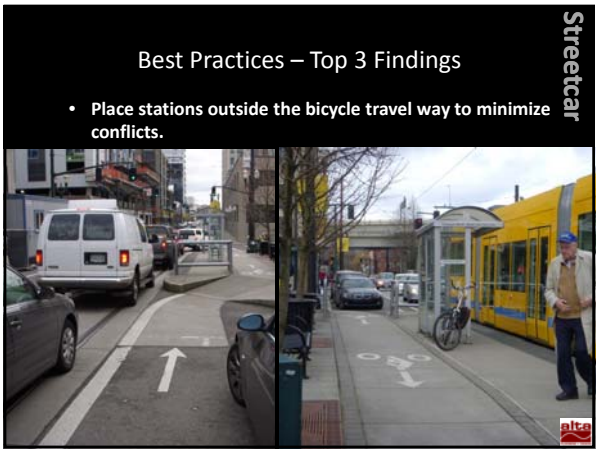
Streetcar

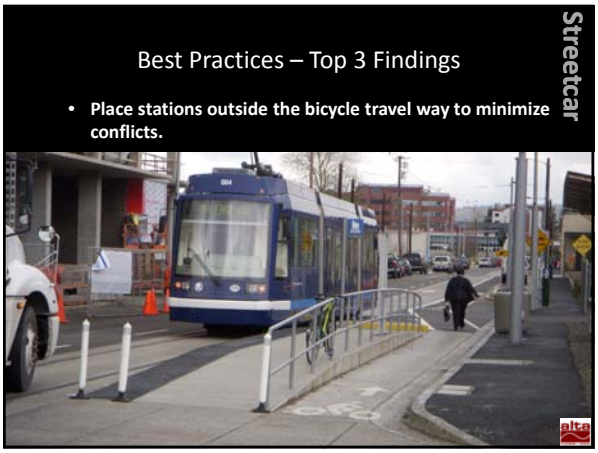

Streetcar


Streetcar


Best Practices – Top 3 Findings
Streetcar
• When possible avoid right-side running tracks.


Best Practices – Top 3 Findings
Streetcar
• Cyclists are most comfortable crossing tracks at an angle near 90 degrees. As the angle decreases the risk of catching a tire in the track increases.


Best Practices – Top 3 Findings
Streetcar
• Place stations outside the bicycle travel way to minimize conflicts.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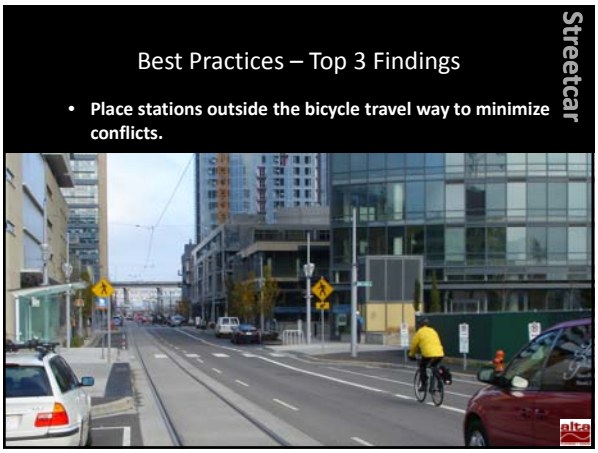
Streetcar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