2011 Michigan Bike Summit

Beyond Bike Lanes

Saturday, March 26, 2011
11:30 AM

Lansing, Michigan

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The Greenway Collaborative, Inc.
Ann Arbor, Michigan

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Agenda

- A few key human factors
- Looking at the system as a whole
- Evaluating bike facilities
- The benchmark
- Alternatives
  - Buffered Bike Lanes
  - Cycle Tracks
  - Two Stage Turn Queue Boxes
  - Bike Boxes
  - Changing Context
  - Bike Boulevards
  - Simple Changes

We will look at a number of ideas from

National Association of City Transportation Official's (NACTO)

NEW

Urban Bikeway Design Guide

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No Such Thing as a "Typical" Bicyclist

Wide Range of:

- Ages
- Education
- Skills
- Physical abilities
- Travel speeds
- Vehicle characteristics

It is challenging to plan and design for the variety of non-motorized user types

One solution does not fit all

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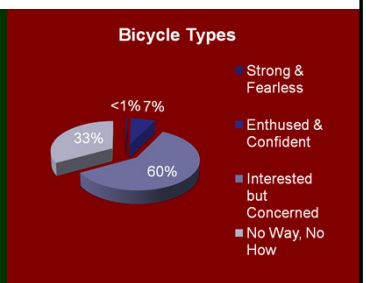
The Theory of Four Types of Bicyclists

- **Strong & Fearless**
  - <1%
  - Always Biking
  - Any Road Regardless of Condition
- **Enthused & Confident**
  - 7%
  - Frequently Bike
  - Like Designated Facilities Such As Bike Lanes
- **Interested but Concerned**
  - 60%
  - Occasional Rider
  - Local Roads and Trails
- **No Way, No How**
  - 33%



Not Really This Clear Cut and There Is Movement Between the Groups.

Developed by Roger Geller, Bicycle Coordinator, Portland Office of Transportation

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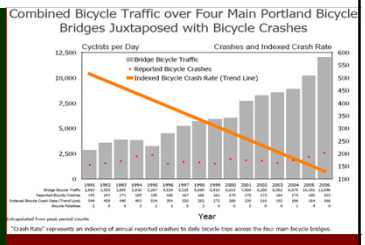
Safety in Numbers

- The most effective way to increase the safety of pedestrians and bicyclists is to increase the numbers of pedestrians and bicyclists
- Pedestrians and bicyclists become expected roadway users



In Portland the number of crashes held almost steady while the number of cyclists dramatically increased

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Safety in Numbers

- The concept applies community wide and to specific locations and times
- Less frequent use needs more visible facilities to increase motorist's awareness
- This is the opposite of how motorized facilities are dealt with

Dangerous designs and situations may be off-set by expectations

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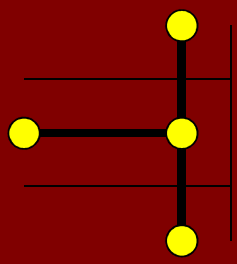
Looking at the System as a Whole

- Cannot look at solution for a road segment without considering what happens at the intersection
- Must determine how to transition from one solution to another
- May need to expand view of the transportation corridor



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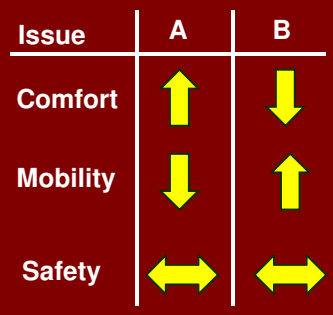
User Evaluation Factors

- When choosing a route you are subconsciously evaluating issues related to comfort, mobility and safety
- Generally increased comfort comes at the expense of mobility
- And increased mobility at the expense of comfort
- The safety issues may simply change



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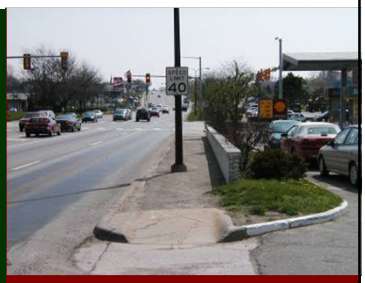
Context, Context, Context

- Land Use
  - Building placement
  - Parking
  - Destinations
- Physical
  - ROW
  - Utilities
- Demand
  - Latent demand for infrastructure
  - Connections to rest of network



Cannot simply take what works in one place and drop it in another context and expect it to work

But, you may be able to change the context

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Feasibility

- Social
  - Education
  - Empathy
- Regulatory
  - FHWA and Manual of Traffic Control Devices
  - Always looking to evaluate promising innovations
- Cost Benefits
  - $'s per mile compared to use
  - Ability to address other issues
- Maintenance

Despite multiple feasibility issues, some projects have been constructed against all odds

There is always a fear of backlash though when pushing things too far, too fast

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Evaluating the Alternative to Bike Lanes

- **User**
  - Comfort
  - Mobility
  - Safety
- **Context**
  - Land Use
  - Physical
  - Demand
- **Feasibility**
  - Social
  - Regulatory
  - Cost Benefit
  - Maintenance

Evaluation Factors	Bike Lane	Alternative
User:		
Comfort		
Mobility		
Safety		
Context:		
Land Use		
Physical		
Demand		
Feasibility:		
Social		
Regulatory		
Cost Benefit		
Maintenace		
Score		

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So What Are the User Issues With Bike Lanes?

Comfort:

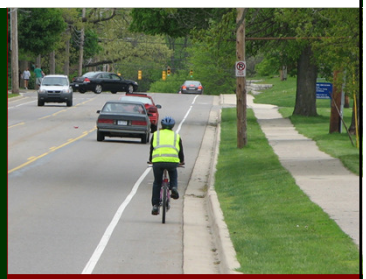
- Depends on traffic speeds, volumes, heavy vehicles and number of lanes

Mobility:

- Left turns with multiple lanes of traffic – especially high speed traffic

Safety:

- Conflicts with right turning vehicles
- Conflicts with on-street parallel parking



Comfort, mobility and safety for majority of bicyclists drops off rapidly when: speeds are over 35 MPH, there are more than three lanes, with on-street parking and or complex busy intersections

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Buffered Bike Lanes

Comfort Mobility Safety

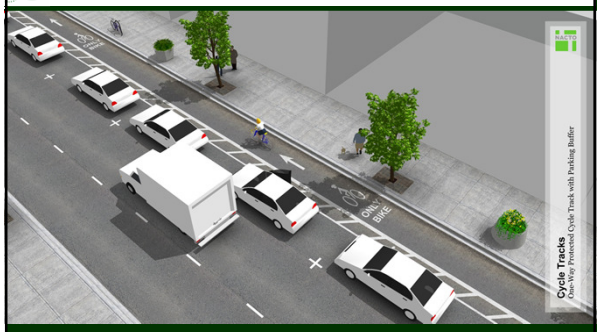
Buffered Bike Lanes

Buffered Bike Lanes at Intersections

Buffered Bike Lanes at Intersections

One-Way Protected Cycle Track

One-Way Protected Cycle Track



One-Way Protected Cycle Tracks

One-Way Protected Cycle Tracks

One-Way Protected Cycle Tracks

Raised Cycle Tracks

Raised Cycle Tracks

Raised Cycle Tracks

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Raised Cycle Tracks

Cycle Tracks at Intersections

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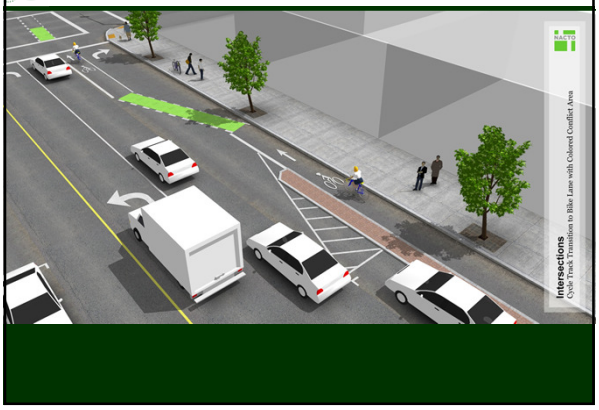

Cycle Tracks at Intersections

Two Way Cycle Tracks

Two Way Cycle Tracks

Two Way Cycle Tracks

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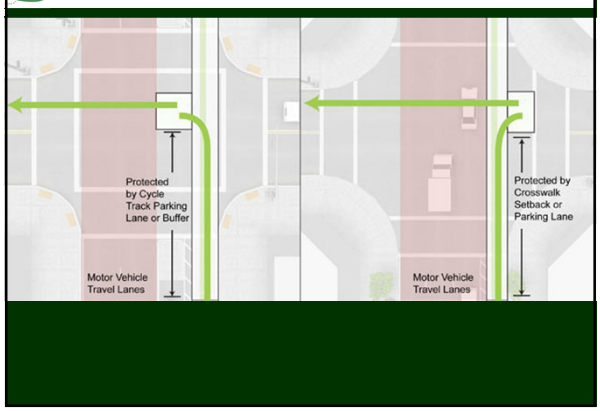
Two Way Cycle Tracks

Two-Stage Turn Queue Box



Two-Stage Turn Queue Box

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Bike Boxes

Bike Boxes

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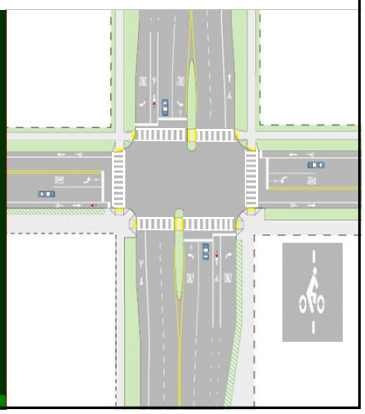
Bike Boxes

Simple Things for Intersections

- Advance stop bars for bike lanes
  - Potential to color lanes
- Dash merge zone to pocket bike lanes
  - Potential to color lanes
- Restrict right-on-red – consider sightline issues
- Markings for optimal placement to trigger left turn signal
- Islands – humanize the space



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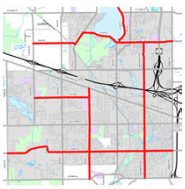
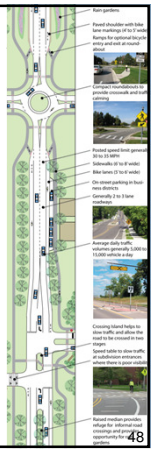
Change the Context

- Design key non-motorized routes such that motorists will naturally driving 30 to 35 MPH
- Place emphasis on the needs of the non-motorized users
  - Wide bike lanes
  - Numerous mid-block crossings
  - Traffic calming measures





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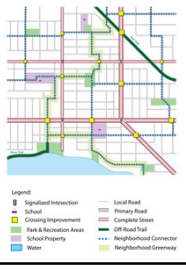
Create Appealing Alternative Routes

- Provide connections to key destinations using local roads and connecting pathways
- Provide wayfinding improvements to help people navigate what can be confusing routes
- Make improvements to the routes to make them more bicycle and pedestrian friendly



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Questions or Comments

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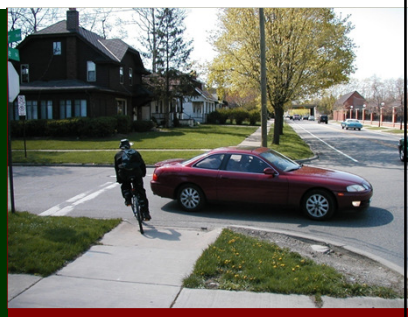
Sidewalks/Roadside Pathways vs. Bike Lanes

- Motorists Are Not Looking for Bicyclists on Sidewalks or Sidepaths Especially When They Are Bicycling Opposite the Flow of Traffic
- Bicycling on the Sidewalk is Generally Slower and More Inconvenient than Bicycling on the Roadway.
  - the presence of pedestrians
  - motorists that block the sidewalk or crosswalk.



There is a reason experienced bicyclists Travel on the road

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Options

Operational issues in a nutshell:

- Comfort level drops off on roads with in higher speed and more than three lanes
- Conflicts with on-street parking
- Conflicts with right turning vehicles at intersections
- Challenges turning left on busy, high speed multi lane roads

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What Doesn't Work So Well With Bike Lanes

- Parking

Pavement quality and debris along the edge of the road are also significant factors

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Norm's Theory of Bad Design

- A good idea that made sense at one time

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