Session 8 Objectives

• What is a “Complete Street”
• How we have been designing streets?
• How we can design “Complete Streets”
A Complete Street?

Safe access for all users of all ages and abilities. Motorists, transit users, pedestrians and bicyclists can move safely along and across complete streets.
Not a Complete Street
More of a Complete Street
Benefits of Complete Streets:

• Improved pedestrian, bicyclist, transit user & motorist safety

• Improved mobility and access for a large segment of the population that cannot or does not drive

• Improved public and environmental health

• Increased transportation capacity and modal options improve mobility and combat congestion

• Increased economic activity and property values

• Improved quality of life through more livable and sustainable transportation systems, communities, commerce, social interaction and growth
Mobility vs. Speed

• **Speed:** Measurement of how fast you are moving
• **Mobility:** Measuring if you are moving
  – **Travel:** Movement from point A to point B, (such as a trip to work)
  – **Circulating:** Movement around a community (stopping for gas, banking and groceries)
  – **Access:** Movement into a destination (You park, get off the bus or park your bicycle and walk into your destination)
National Complete Streets Status

2000 US DOT Guidance:

Bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist.

Few jurisdictions embrace or follow this guidance.
Complete Streets Status in Minnesota

- HF 3800 passed in May 2008
- Directs Transportation Commissioner to conduct feasibility study and cost/benefit analysis of adopting state-wide Complete Streets policy
- Report Recommended a State policy
- The Proposed State Policy are in current bills are H.F. 2801 and S.F. 2461
- The Commissioner has created a partnership with CS Stakeholders to identify process issues with implementation
- Hennepin County along with the City of Rochester adopted a policy in 2009
Additional Resources


• National Complete Streets Coalition. *Let’s Complete America’s Streets*. Available at http://www.completethestreets.org/
User Groups

- Pedestrians
- Bicyclists
- Vehicles
  - Trucks
  - Cars
  - Transit Vehicles
- Transit Users
- Parking
Peak Period Level of Service

Results in “open streets” for non-peak periods.
Peak Period Level of Service

Results in poor pedestrian crossings.
Peak Period Level of Service

Results in no room for bus stops.

Diversion routes past TWO schools!
Peak Period Level of Service

Results in no space allocated for bicycles.
Safety/Maintenance Concerns
Other modes are secondary
MassHighway Design Guide

- Design Guidance
- Ranges of Acceptable Criteria to encourage design flexibility
- Measurements of Effectiveness (for all users)
- Design Speed is a choice
- Allocation of Space
Chapter 3: **Enhancement** -- Level of Service is **one** Measure of Effectiveness

**Transportation MOE’s**

(for all users)

- Condition of facilities
- Safety and comfort
- Mode choice
- Network connectivity
- User population
- Traditional LOS
  - Travel time
  - Congestion
  - Specific measures elsewhere

**“Other” MOE’s**

- Environment preservation
- Cultural resource preservation
- Community enhancement
- Economic development
- Aesthetics
- Environmental justice/equity
- Impact mitigation
  - Noise
  - Air Quality
  - Wildlife Habitat
Chapter 3: Revised Design Speed Approach

- Design speed is a choice

- Choice of design speed needs to consider:
  - Roadway context
  - Implications for pedestrian and bicycle safety and comfort
  - Implications for regional mobility

- To ensure safety, the choice of design speed needs to be informed by existing operating speed and the likelihood of change associated with the design

- Flexibility is provided to allow design speeds lower, the same, or higher than existing operating speeds, depending on the project’s purpose
Chapter 5 Cross-Section: Flexible Multimodal Accommodation Approaches

- Descriptions have been developed for the cases:
  - Case 1: Independent Accommodation
  - Case 2: Partial Bicycle/MV Sharing
  - Case 3: Bicycle/MV Sharing
  - Case 4: Pedestrian/Bicycle Sharing
  - Case 5: Shared by All Users
Case Study: US 151, Madison WI

11 - Park/Bike
11 - Thru
10 - Thru
11 - Thru
8 - Median
11 - Left
11 - Thru/RT
11 - Park/Bike

13 - Park/Bike
11 - Thru
10 - Thru
11 - Thru
15.5 - Median
11 - Thru
10 - Thru
11 - Thru
11 - Park/Bike
Case Study: US 151, WI
Saturday morning
35 mph Posted Speed
25 mph travel speed
3.7 mile trip length
6 out of these 8 vehicles will travel together for over 3 miles.
Complete Street Design Process

1. Understand Context
2. Problem Statement
3. Alternative Development
4. All Users’ “LOS”
5. Design Flexibility
## Not all roads are the same

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<thead>
<tr>
<th></th>
<th>Interstate</th>
<th>Rural Highway</th>
<th>Urban Arterial</th>
<th>Local Road</th>
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<td><img src="image" alt="Rural Highway 40" /></td>
<td><img src="image" alt="Urban Arterial 44" /></td>
<td><img src="image" alt="Local Road E Main St" /></td>
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<td>Mobility</td>
<td>Mobility and Peak Period LOS</td>
<td>Local Access</td>
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<td>On-Street Bike Lanes or Multi-Use Trail</td>
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<td>At-Grade</td>
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Bicyclist Characteristics
# Urban Bikeway Design

**Table 4-1: Bikeway Design Selection for Urban (Curb and Gutter) Cross Section – English Units**

<table>
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<tr>
<th>Motor Vehicle ADT (2 Lane)</th>
<th>&lt;500</th>
<th>500-1,000</th>
<th>1,000-2,000</th>
<th>2,000-5,000</th>
<th>5,000-10,000</th>
<th>&gt;10,000</th>
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<td><strong>Motor Vehicle ADT (4 Lane)</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>2,000-4,000</td>
<td>4,000-10,000</td>
<td>10,000-20,000</td>
<td>&gt;20,000</td>
</tr>
<tr>
<td><strong>Motor Vehicle Speed</strong></td>
<td>25 mph</td>
<td>SL</td>
<td>WOL</td>
<td>WOL</td>
<td>WOL</td>
<td>BL = 5 ft</td>
</tr>
<tr>
<td></td>
<td>30 mph</td>
<td>SL with sign</td>
<td>WOL</td>
<td>BL = 5 ft</td>
<td>BL = 5 ft</td>
<td>BL = 6 ft</td>
</tr>
<tr>
<td></td>
<td>35 - 40 mph</td>
<td>WOL</td>
<td>BL = 5 ft</td>
<td>BL = 5 ft</td>
<td>BL = 6 ft</td>
<td>BL = 6 ft</td>
</tr>
<tr>
<td></td>
<td>45 mph and greater</td>
<td>BL = 5 ft</td>
<td>BL = 5 ft</td>
<td>BL = 6 ft</td>
<td>BL = 6 ft</td>
<td>BL = 6 ft or PS = 8 ft</td>
</tr>
</tbody>
</table>

BL = Bicycle Lane, SL = Shared Lane, WOL = Wide Outside Lane, SUP = Shared-Use Path, PS = Paved Shoulder

Source: Mn/DOT Bikeway Facility Design Manual
Pedestrian Characteristics

- Pedestrians

- Pedestrians with Walking Difficulty
  - Older or children
  - Persons with disabilities
    - Physical:
      - Wheelchair (manual, motorized or scooters)
      - Walkers, Crutches or Canes
    - Visual:
      - Low Vision
      - Blind (cane or guide dog)
    - Hearing:
Pedestrian Characteristics

• Mn/DOT’s ADA Transition Plan
  http://www.dot.state.mn.us/ada/

• PROWAG: Public Right-of-Way Accessibility Guidelines

• Many challenging and conflicting details
  – Accessible push button criteria
  – Slopes and landing areas
  – APS: Audible Pedestrian Signal “noise”
Pedestrian Design

- Pedestrian Crossing Time
- Pedestrian Waiting Time
- Poor/ Incomplete Sidewalks
- Safety
- Lighting
Transit Design

- Frequency
- Access
- Safety
- Lighting
- Convenience
- Advantages
Intersection Design

• **Design Vehicle:** Verify site specific needs
• **Turning paths:** Consider encroachment into other lanes

Source: Guide for the Planning, Design, and Operation of Pedestrian Facilities, AASHTO
Intersection Design

- Bump-outs
  - Shorten crosswalks
  - Improve pedestrian visibility
  - Provide easier ADA accessibility
  - Create maintenance concerns
Maintenance
Maintenance
Design Example

- The project corridor is not homogeneous.
- Used a segmental approach.
- Different cross-sections were identified for each segment.
Existing 76th Street

- 7000 ADT - very straight flat street
- Neighborhood complaints of speeding
- Frequent driveways and cross streets

Utility issues
Quality ped access?
No Snow Storage.
Close to traffic
No Ped Access
No Bike Lanes
Or Shoulders
Existing street 44' Wide
Design Flexibility
76th Street Segment

- 2 lanes
- Off-street trail - On street bike lanes
- Narrowed lane widths
Design Details
Drainage Considerations
Design Exceptions

- Highly Recommended Resource
Design Exceptions

If the decision is made to go forward with a design exception, it is especially important that measures to reduce or eliminate the potential impacts be evaluated and, where appropriate, implemented. This guide presents and illustrates a variety of mitigation strategies, including real-world case studies from several States.
Tort Liability

1. Bring decisions you make under an umbrella of immunity
2. Document, document, document
3. Training – keep current
4. Think systematically
5. Maintain your system
6. Be more proactive about safety issues
7. Document decisions and the evaluation process
8. Consider interim measures
9. Be aware of, but not overly concerned about, tort liability
• Document ALL critical design decision.
  – Why standard design was selected
  – How flexibility was used in a holistic context
  – Why Design Exception was justified
Session 8 Objectives

• What is a “Complete Street”

A street that is “acceptable” to ALL users

• Vehicles
• Transit
• Pedestrians
• Bicyclists
• Parking
Session 8 Objectives

- How we have been designing streets?

Designed for vehicles and *if possible*, accommodated other modes
Session 8 Objectives

• How we can design “Complete Streets”
  – Measure effectiveness for all modes
  – Consider off-peak operations
  – Use design flexibility
    • Targeted Speed
    • Design Vehicles
    • Design Details