Complete Streets

DESIGNING FOR BICYCLIST SAFETY
WORKSHOP LEARNING OUTCOMES

- Describe core bicyclist safety concepts
- Distinguish between various bicyclist facilities
- Identify innovative design features to enhance bicyclist safety
- Relate national objectives and priorities to improve bicycle travel
- Identify means of assessing quality of bicyclist facilities
NOTE OF CAUTION

The knowledge and practice of designing for bicyclists is rapidly changing. Images in these materials and other guidelines may be outdated. Always check for the latest MUTCD interim and experimental TCD’s.
Designing for Bicyclist Safety

IMPERATIVE FOR IMPROVEMENT
LEARNING OUTCOMES

- Discuss the opportunities to improve bicycle travel
- Identify key safety factors for bicyclists
WHAT ARE THE OPPORTUNITIES?

- 50% of trips are ≤ 3 miles
- > 1/3 of U.S. adults say they would commute by bike if safe facilities were available
- 1 out of every 11 U.S. households do not own an automobile
BICYCLIST SKILL & COMFORT

Experienced & Confident

- Navigate on streets
- Some prefer bike lane, shoulders, shared-use paths when available
- Prefer direct route
- Speeds up to 25 mph on level and 45 mph on downgrade
- Longer trips

Casual/Less Confident

- Difficulty gauging traffic or unfamiliar with rules of road
- Prefer shared use paths or bike lanes on low volume streets
- Prefer separation from traffic
- May ride on sidewalk
- Avoid traffic
- Speeds of 8 to 12 mph
- Trips of 1 to 5 miles
Reasons for bicycling

- Recreation 26.0%
- Exercise or health reasons 23.6%
- To go home 14.2%
- Personal errands 13.9%
- To visit a friend or relative 10.1%
- Commuting to school/work 5.0%
- Bicycle ride 2.3%
- Other 4.9%
BICYCLIST CHARACTERISTICS

Preferences
- Feel safe
- Feel secure
- Lower speed
- Lower volume
- Lower truck %
- Fewer lanes

Behaviors
- Violate traffic control
- Slow on uphill
- Fast on downhill
DEATHS AND INJURIES

In 2015
- 818 killed
- 45,000 injured
- Cyclists accounted for 2.3% of all traffic fatalities

...but make up 1% of all trips.
BICYCLE FATALITIES BY YEAR

From 2006 to 2015

- Total traffic fatalities decreased by 18%
- Bicyclist fatalities increased by 6%
BICYCLE INJURIES BY YEAR

From 2006 to 2015

- Total traffic injuries decreased by 5%
- Bicyclist injuries increased by 2%
BICYCLE CRASH CHARACTERISTICS

- 57% of fatalities at non-intersection locations
- 58% of injuries at intersections
MOST COMMON CRASHES

- Rural
  - Turn/merge into path of motorist
  - Motorist overtaking
MOST COMMON CRASHES

- Urban
  - Motorist failed to yield
  - Bicyclist failed to yield at midblock
  - Bicyclist failed to yield at intersection
TYPES OF BICYCLISTS – CITY OF PORTLAND

- Enthused and Confident, 6%
- Strong and Fearless, 1%
- Interested but Concerned, 60%
- No Way No How, 33%

Strong & Fearless
Enthused & Confident
Interested, but Concerned
Not Interested
LEVELS OF TRAFFIC STRESS (LTS)

- LTS 1: Suitable for almost all
- LTS 2: Suitable to most adult cyclists
- LTS 3: More traffic stress
- LTS 4: Strong and fearless
# Levels of Traffic Stress (LTS)

<table>
<thead>
<tr>
<th>LTS 1</th>
<th>LTS 2</th>
<th>LTS 3</th>
<th>LTS 4</th>
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<tbody>
<tr>
<td>- Physically separated from traffic or low-volume, mixed-flow traffic at 25 mph or less</td>
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<tr>
<td>- Bike lanes 6 ft wide or more</td>
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<td>- Intersections easy to approach and cross</td>
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<td>- Comfortable for children</td>
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<tr>
<td>- Bike lanes 5.5 ft wide or less, next to 30 mph auto traffic</td>
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<td>- Unsignalized crossings of up to 5 lanes at 30 mph</td>
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<tr>
<td>- Comfortable for most adults</td>
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<tr>
<td>- Typical of bicycle facilities in Netherlands</td>
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<tr>
<td>- Bicycle lanes next to 35 mph auto traffic, or mixed-flow traffic at 30 mph or less</td>
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<tr>
<td>- Comfortable for most current U.S. riders</td>
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<tr>
<td>- Typical of bicycle facilities in U.S.</td>
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<td>- No dedicated bicycle facilities</td>
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<td>- Traffic speeds 40 mph or more</td>
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<tr>
<td>- Comfortable for “strong and fearless” riders (vehicular cyclists)</td>
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In order for this group to regularly choose bicycling as a mode of transportation, a physical network of visible, convenient, and well-designed bicycle facilities is needed.

WELL-CONNECTED NETWORK
KEY SAFETY FACTORS

- Speed
- Number of lanes
- Visibility
- Traffic volume & composition
- Conflict points
- Proximity
- Bike control
- Connectivity
COMPLETE STREET

Portland, Oregon
PROVIDE SPACE ON STREET...

Corvallis, Oregon
Corvallis, Oregon

Where can we put bicyclists?
Corvallis, Oregon

How can we design to better include bicyclists?
LEARNING CHECK

How long are typical trips for the casual, less confident rider?

a) 1 to 5 miles
b) 5 to 8 miles
c) 10 to 12 miles
What percentage of trips in the U.S. are less than 3 miles?

a) 37 %  
b) 50 %  
c) 60 %
Most bicycle facilities in the U.S. are what level of traffic stress?

a) LTS 1
b) LTS 2
c) LTS 3
d) LTS 4
What level of traffic stress is comfortable for most adult bicyclists?

a) LTS 1
b) LTS 2
c) LTS 3
d) LTS 4
LEARNING OUTCOMES

- Discuss the opportunities to improve bicycle travel
- Identify key safety factors for bicyclists
Designing for Bicyclist Safety

QUESTIONS