Intersections

Two bodies can't occupy the same space at the same time

Designing Streets for Bicyclists – Intersections 5-1

Intersections

- Avoid unusual conflicts
- Provide direct path for cyclists, close to that of motor vehicles
- Bicyclists should be visible; their movements should be predictable
- Simple right angles best for bicyclists

Designing Streets for Bicyclists – Intersections 5-2

Bigger isn't always better…

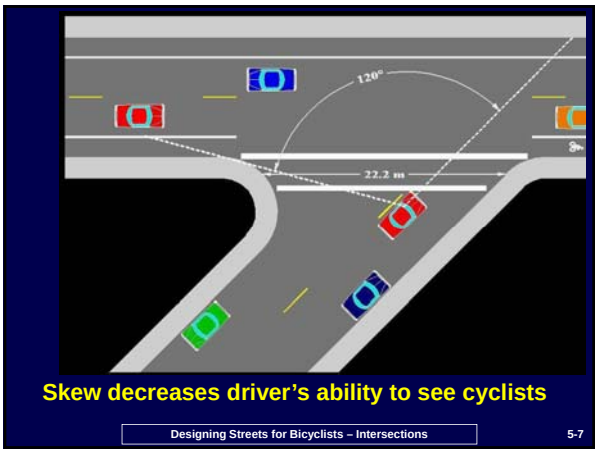
Albuquerque NM | Designing Streets for Bicyclists – Intersections 5-3

Albuquerque NM | Designing Streets for Bicyclists – Intersections 5-4

Albuquerque NM | Designing Streets for Bicyclists – Intersections 5-5

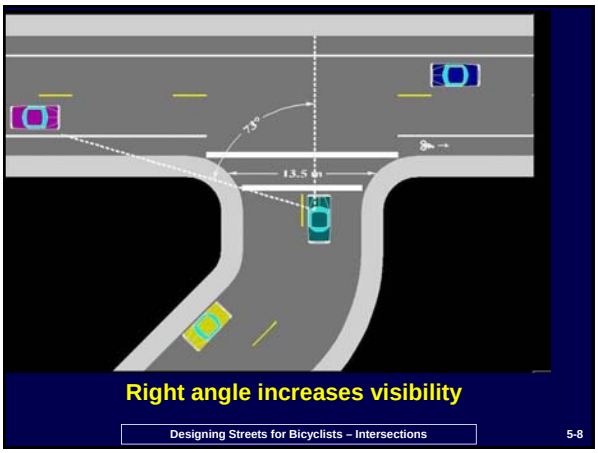
Compact urban intersections are better

Philadelphia PA | Designing Streets for Bicyclists – Intersections 5-6



Skew decreases driver's ability to see cyclists

Designing Streets for Bicyclists – Intersections 5-7



Right angle increases visibility

Designing Streets for Bicyclists – Intersections 5-8

Right angle/better visibility helps cyclists

Geneva CH | Designing Streets for Bicyclists – Intersections 5-9

Right angle/better visibility helps cyclists

Geneva CH | Designing Streets for Bicyclists – Intersections 5-10

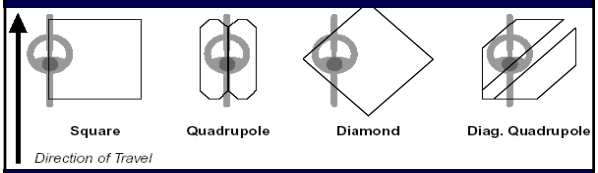
Shallow angle/poor visibility not good for cyclists

Honolulu HI | Designing Streets for Bicyclists – Intersections 5-11

Driver relies on rear-view mirror to see traffic

Honolulu HI | Designing Streets for Bicyclists – Intersections 5-12

Bicycle Detection at Signals



This figure indicates where cyclists should wait in order to actuate the signal

Designing Streets for Bicyclists – Intersections 5-13

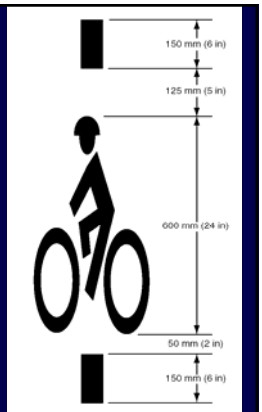
Loop detector in bike lane detects cyclists

Designing Streets for Bicyclists – Intersections 5-14

Advance loop detector extends green time for cyclists

Corvallis OR | Designing Streets for Bicyclists – Intersections 5-15

MUTCD standard for signal loop marking for bicyclists



Designing Streets for Bicyclists – Intersections 5-16

Loop detector in travel lane with cyclist stencil

Portland OR | Designing Streets for Bicyclists – Intersections 5-17

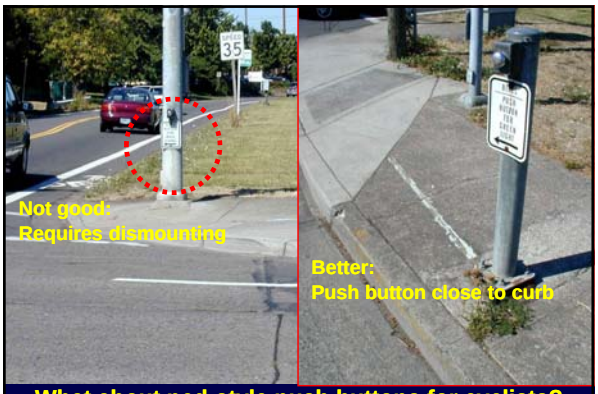
Loop detector sensitive to cyclists: it works!

Corvallis OR | Designing Streets for Bicyclists – Intersections 5-18

Good advice:

"Lean for the green"

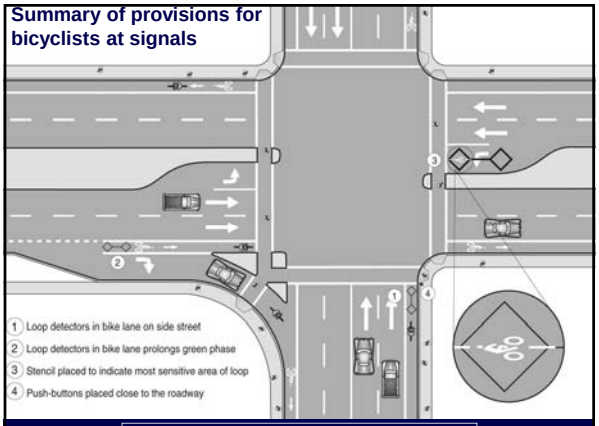
Designing Streets for Bicyclists – Intersections 5-19



What about ped-style push buttons for cyclists?

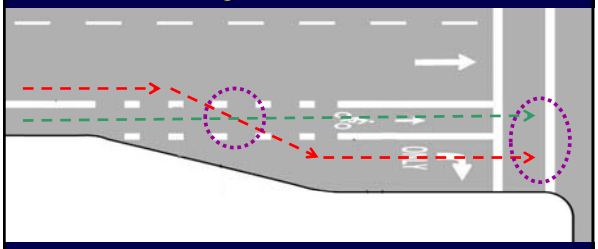
Designing Streets for Bicyclists – Intersections 5-20

Summary of provisions for bicyclists at signals



Designing Streets for Bicyclists – Intersections 5-21

Bike lane & right-turn lane channelization



Always place bike lane to left of RTL to

- Separate conflicts
- Make bicyclists' movements more predictable
- Take advantage of speed difference

Designing Streets for Bicyclists – Intersections 5-22

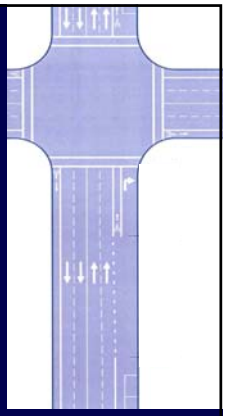
Corvallis OR Designing Streets for Bicyclists – Intersections 5-23

Before: where the cyclist wants to be

Bend OR Designing Streets for Bicyclists – Intersections 5-24

Other scenario

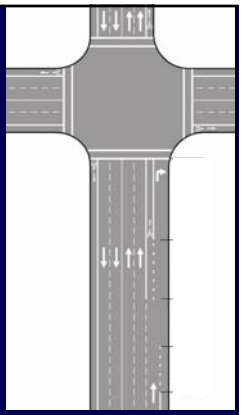
1. RTL created by dropping parking



Other scenario

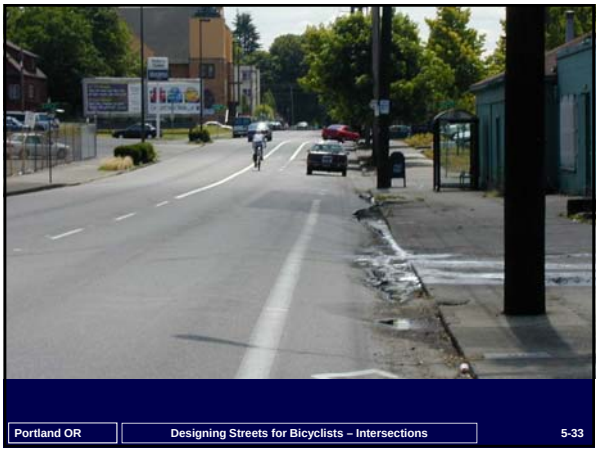
2. RTL created by dropping through lane

In this case, bicyclists must move over across a lane to reach through bike lane



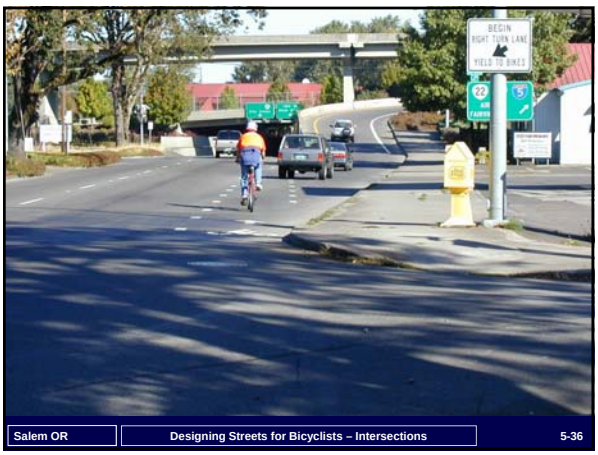

Bicyclists must cross a lane to reach through bike lane
Portland OR
Designing Streets for Bicyclists – Intersections
5-31

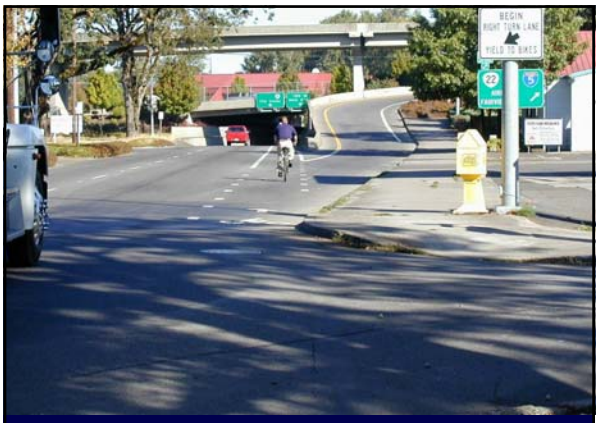

Bicyclists must cross a lane to reach through bike lane
Portland OR
Designing Streets for Bicyclists – Intersections
5-32


Portland OR
Designing Streets for Bicyclists – Intersections
5-33


Bike lane ends here
Add bike lane here
Seek opportunities for minor improvements
Designing Streets for Bicyclists – Intersections
5-34


Apply same principles at other intersections
Salem OR
Designing Streets for Bicyclists – Intersections
5-35


Salem OR
Designing Streets for Bicyclists – Intersections
5-36



Salem OR | Designing Streets for Bicyclists – Intersections | 5-37

Place bike lane correctly even if it ends past intersection

Designing Streets for Bicyclists – Intersections | 5-38

A combined right turn lane and through bike lane is a reasonable compromise in constrained conditions

Salem OR | Designing Streets for Bicyclists – Intersections | 5-39

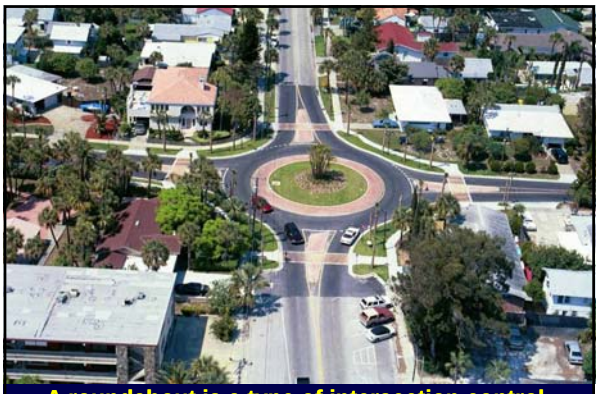
Cars will use the bike lane area when bicyclists are not there – note the customized sign

Designing Streets for Bicyclists – Intersections | 5-40

Designing Streets for Bicyclists – Intersections | 5-41

Roundabouts: Making them work for bicyclists

Designing Streets for Bicyclists – Intersections | 5-42



A roundabout is a type of intersection control

Clearwater FL | Designing Streets for Bicyclists – Intersections | 5-43

A roundabout is not:
1. A New England style rotary, with large size & high speeds

Augusta ME | Designing Streets for Bicyclists – Intersections | 5-44

A roundabout is not:
2. A Washington DC style circle, with traffic signal controls

Washington DC | Designing Streets for Bicyclists – Intersections | 5-45

A roundabout is not:
3. A traffic-calming mini circle

Portland OR | Designing Streets for Bicyclists – Intersections | 5-46

A roundabout is not:
4. Paris

Paris FR | Designing Streets for Bicyclists – Intersections | 5-47

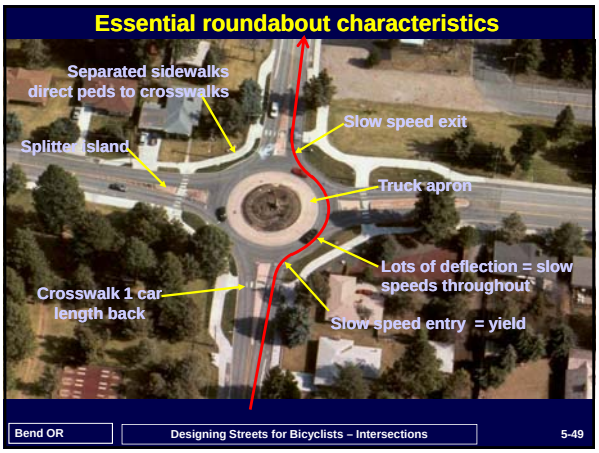
Why roundabouts are safer for all users:

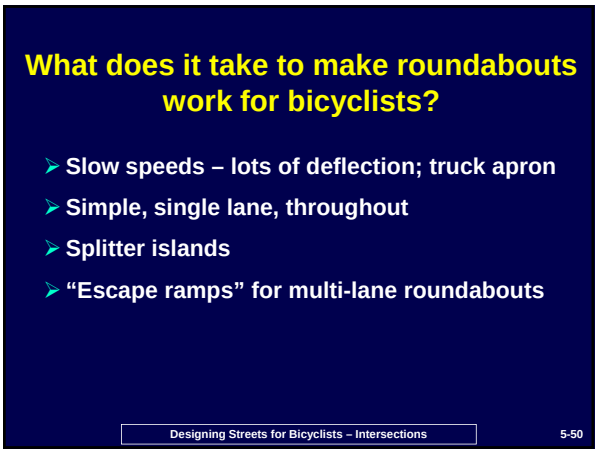
- Slow speed:
  - *Deflection, truck apron, splitter islands, "reverse super"*
- Reduced conflicts
- No left turns
- Yield on entry

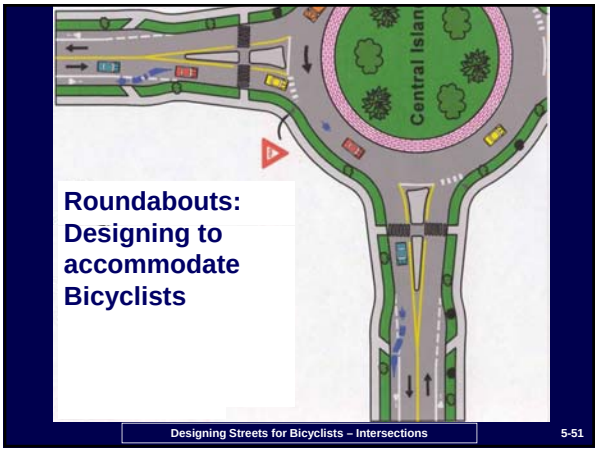
CRF (all users):

- About 54% overall
- 27% pedestrian crashes
- Up to 76% fatals and serious injuries

Clearwater FL | Designing Streets for Bicyclists – Intersections | 5-48


Essential roundabout characteristics
Separated sidewalks direct peds to crosswalks
Slow speed exit
Splitter island
Truck apron
Lots of deflection = slow speeds throughout
Crosswalk 1 car length back
Slow speed entry = yield
Bend OR
Designing Streets for Bicyclists – Intersections
5-49


What does it take to make roundabouts work for bicyclists?
Slow speeds – lots of deflection; truck apron
Simple, single lane, throughout
Splitter islands
"Escape ramps" for multi-lane roundabouts
Designing Streets for Bicyclists – Intersections
5-50


Roundabouts: Designing to accommodate Bicyclists
Designing Streets for Bicyclists – Intersections
5-51

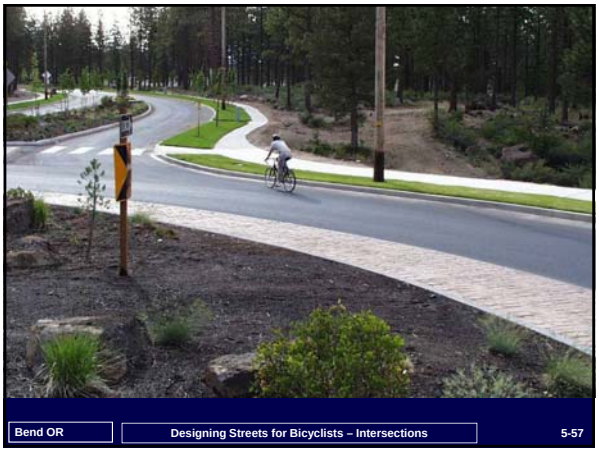

End bike lane to encourage cyclist to enter roadway
Bend OR
Designing Streets for Bicyclists – Intersections
5-52

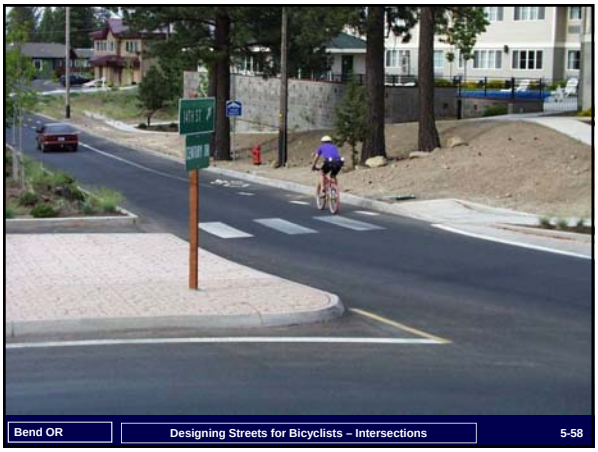

End bike lane to encourage cyclist to enter roadway
Bend OR
Designing Streets for Bicyclists – Intersections
5-53


Slow speed allows cyclists to share roadway
Bend OR
Designing Streets for Bicyclists – Intersections
5-54

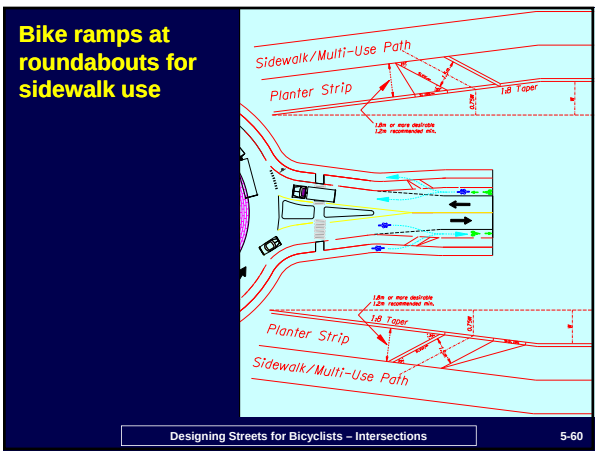

Bend OR
Designing Streets for Bicyclists – Intersections
5-55

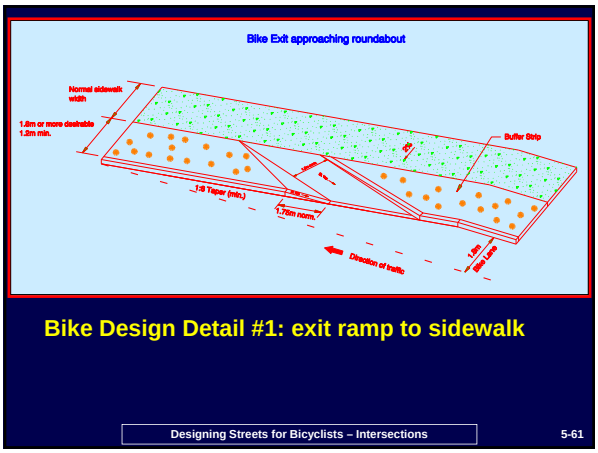

Bend OR
Designing Streets for Bicyclists – Intersections
5-56


Bend OR
Designing Streets for Bicyclists – Intersections
5-57


Bend OR
Designing Streets for Bicyclists – Intersections
5-58


What if a cyclist doesn't want to enter the roundabout?
Bend OR
Designing Streets for Bicyclists – Intersections
5-59


Bike ramps at roundabouts for sidewalk use
Sidewalk/Multi-Use Path
Planter Strip
1:8 Taper
Planter Strip
Sidewalk/Multi-Use Path
Designing Streets for Bicyclists – Intersections
5-60



Bike Design Detail #1: exit ramp to sidewalk