



ROUNDBABOUTS: HOW THEY WORK FOR PEDESTRIANS

Roundabouts:

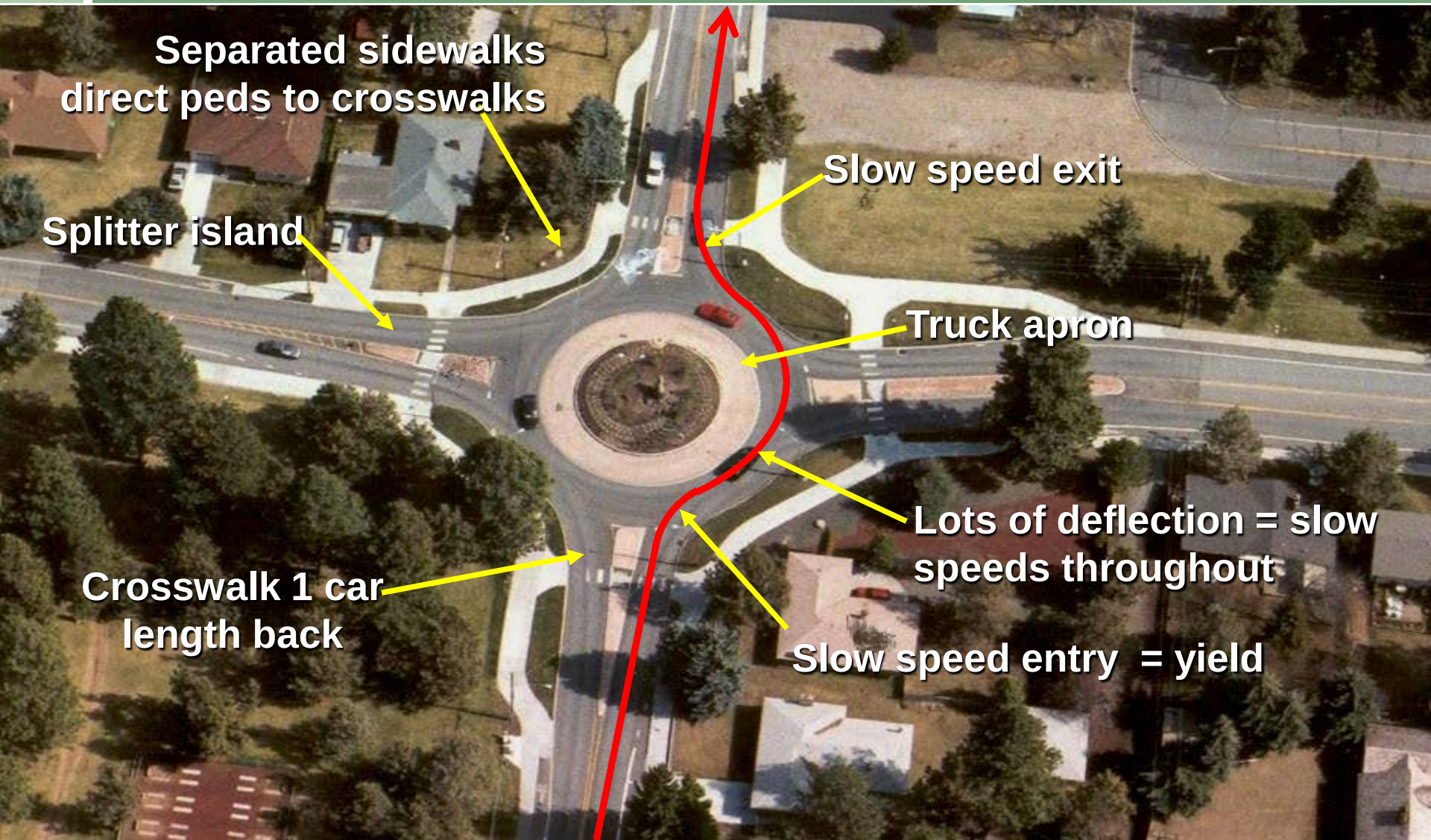
Learning Objectives:

8-2

- At the end of this module, you will be able to:
- Explain why roundabouts reduce crashes
- Describe the safety benefits for pedestrians and motor vehicles of roundabouts
- Describe how roundabout safety depends on correct design

Essential roundabout characteristics

8-3



Separated sidewalks
direct peds to crosswalks

Splitter island

Slow speed exit

Truck apron

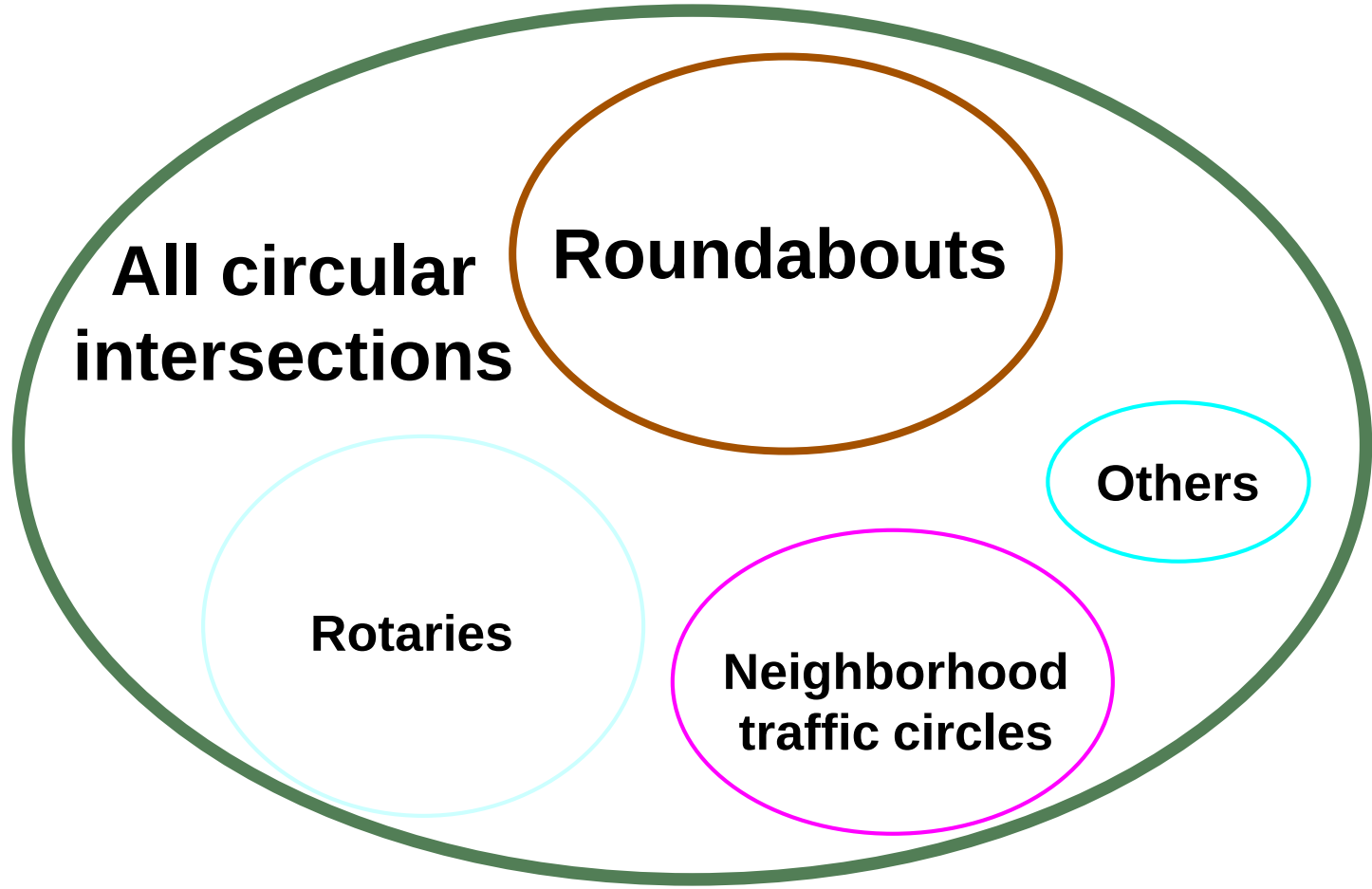
Crosswalk 1 car
length back

Lots of deflection = slow
speeds throughout

Slow speed entry = yield

Roundabouts are a type (or subset) of circular intersections

8-4



Bottom Line: Not all circular intersections are roundabouts!!



8-5

Augusta ME

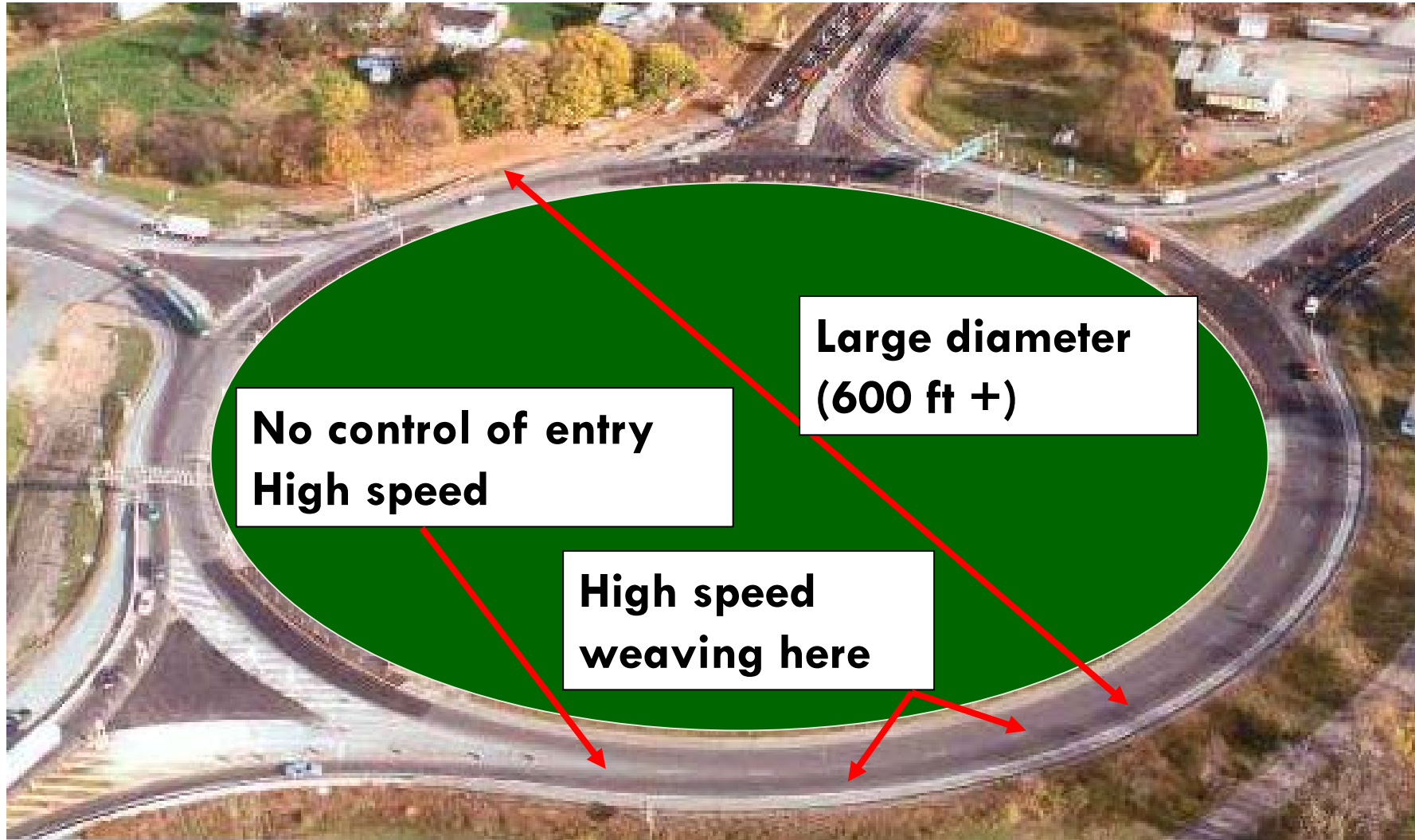
A roundabout is not:

1. A rotary, with large size & high speeds

Problems with Existing Rotary

8-6

Kingston NY



Rotary Reconstructed to Roundabout

8-7

Kingston NY

**Smaller diameter
(Typically 120 – 250 feet)**





8-8

Washington DC

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



8-9

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



8-10

Paris FR

A roundabout is not:
4. Paris

Before and After Example

8-11

Asheville NC



Before and After Example

8-12

Asheville NC



Advantages for Pedestrians

8-13

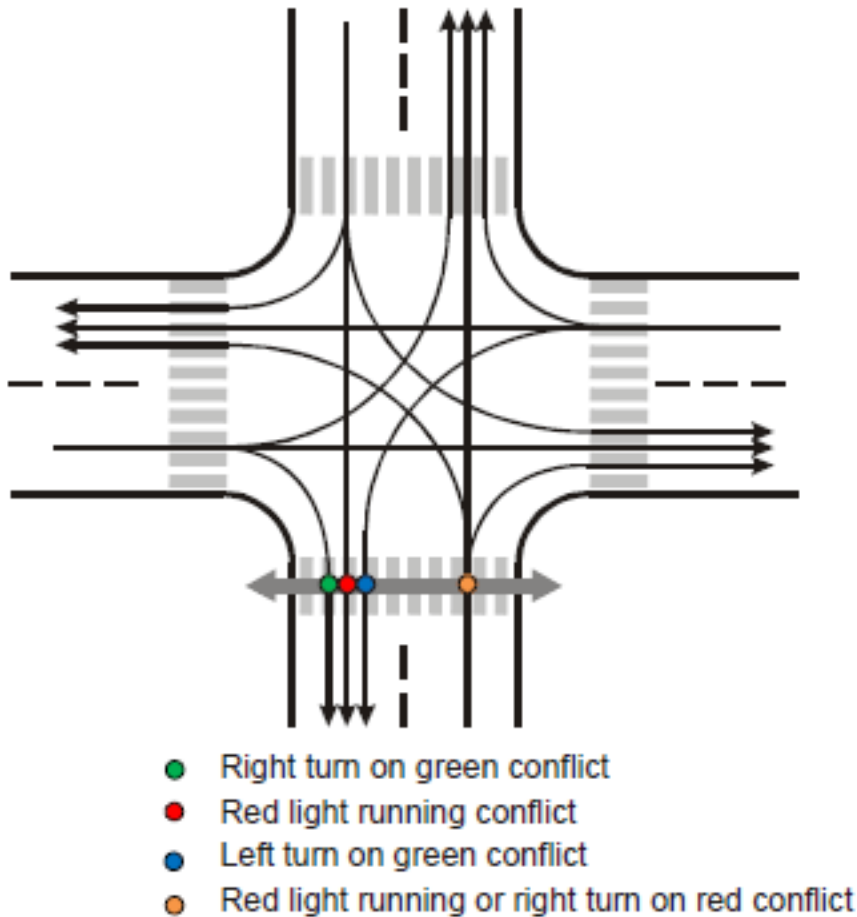
Bird Rock, San Diego, CA

- ❑ Reduced vehicle speeds
- ❑ Reduced number of conflict points
- ❑ Shorter crossing distances
- ❑ Splitter island provides a refuge – ped crosses one direction of traffic at a time
- ❑ Crosswalk is placed one car length back

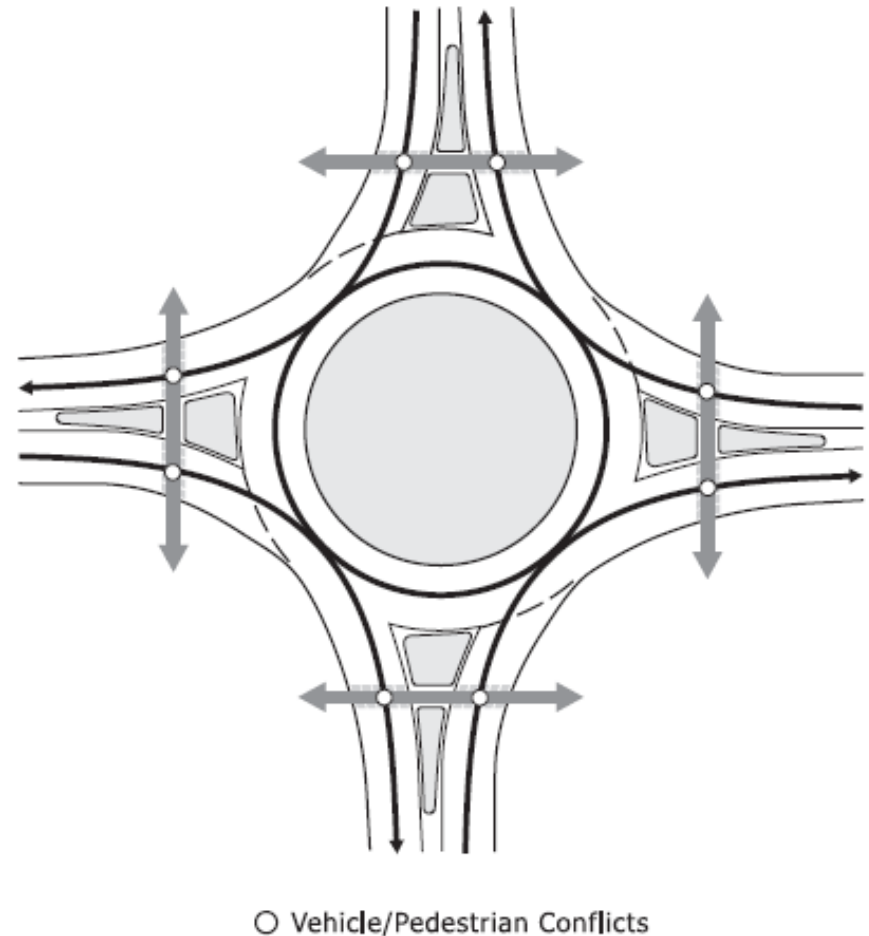


Vehicle-Pedestrian Conflict Points

8-14



Conventional Intersection
16 Conflict Points



Roundabout
8 Conflict Points

Roundabout are Safer for All Users

8-15

Clearwater FL

Pedestrian crashes:

- CMF = 0.73 (CRF = 27%)

All crashes:

- Conversion from Two-way stop control:

- All crashes: CMF = 0.56 (CRF = 44%)
- Injury crashes: CMF = 0.18 (CRF = 82%)

- Conversion from signal control:

- All crashes: CMF = 0.52 (CRF = 48%)
- Injury crashes: CMF = 0.22 (CRF = 78%)



Observational Pedestrian Safety Findings

8-16

Santa Barbara CA San Diego CA

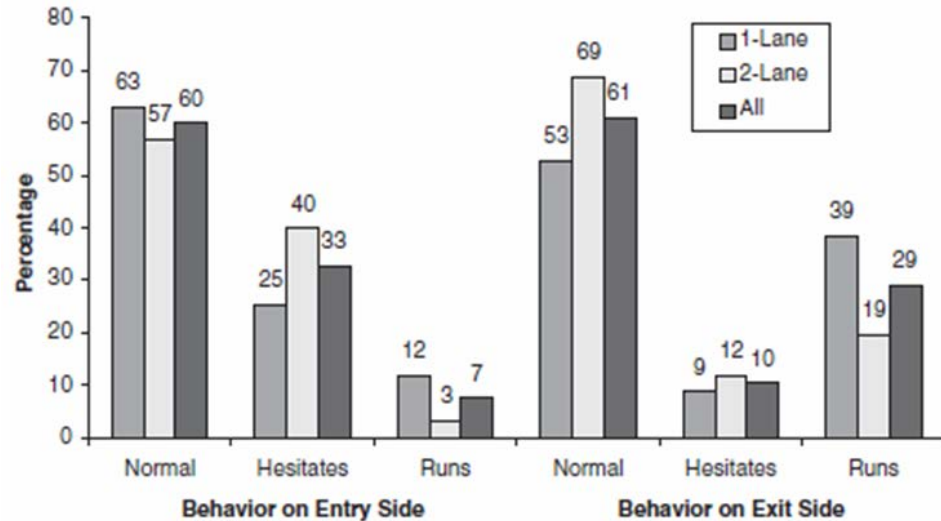


Figure 59. Pedestrian crossing behaviors when a vehicle was present and the crossing began on the entry side.

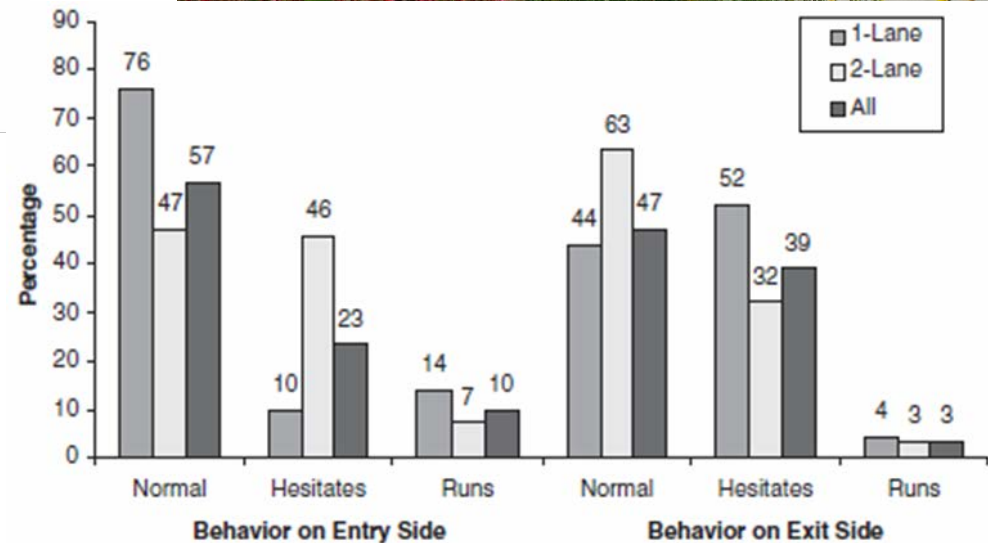


Figure 60. Pedestrian crossing behaviors when a vehicle was present and the crossing began on the exit side.

Observational Pedestrian Safety Findings

8-17

Clearwater FL Bend OR

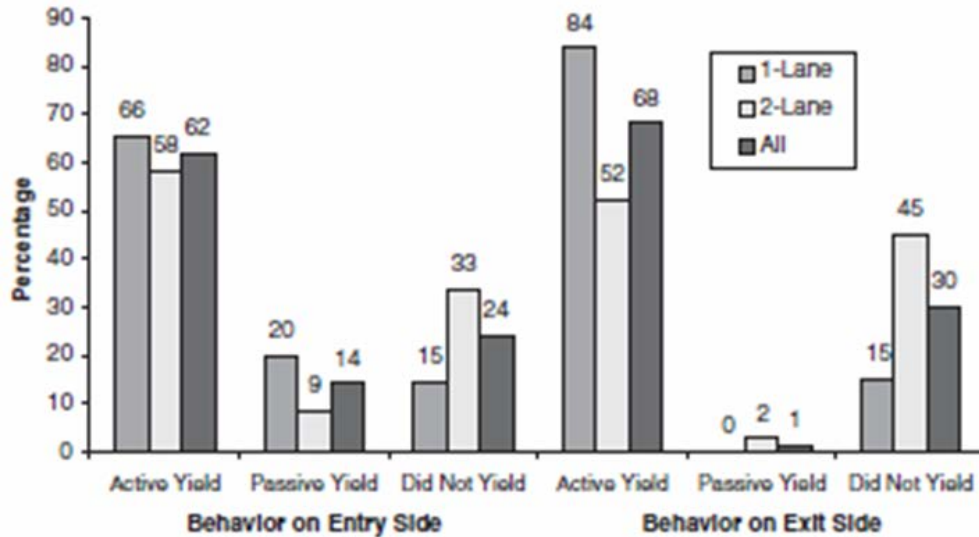


Figure 62. Yielding behavior of motorists when the pedestrian crossing begins on the entry side.

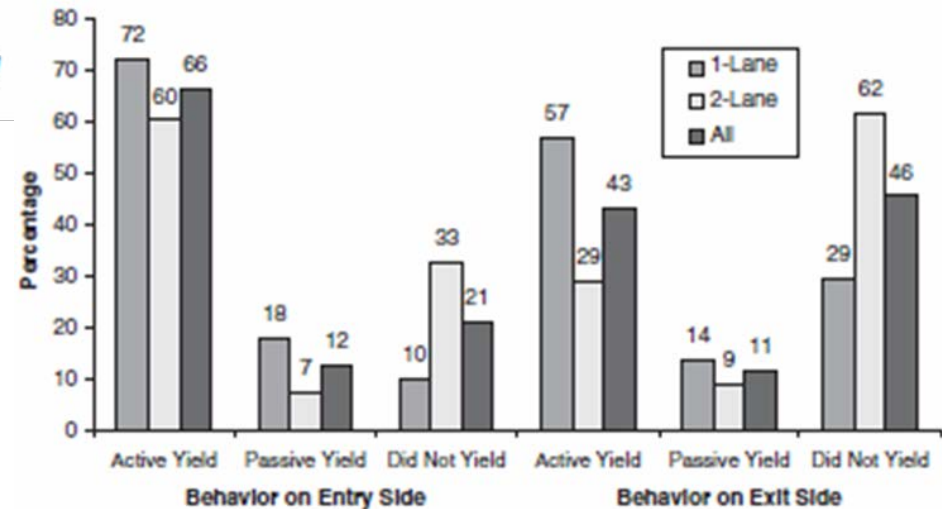
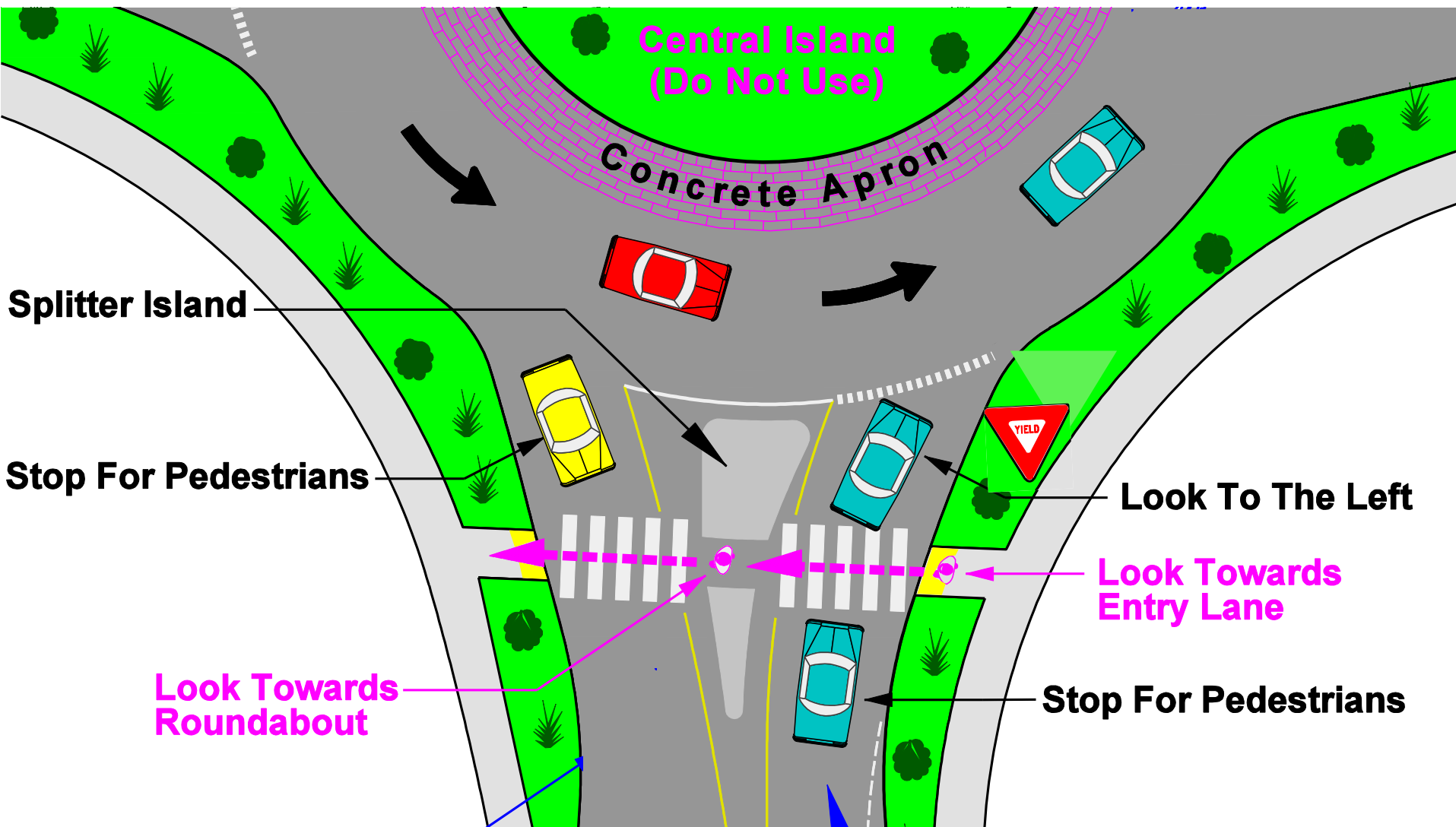


Figure 63. Yielding behavior of motorists when the pedestrian crossing begins on the exit side.

Pedestrian Movements at Roundabouts

8-18





8-19

Chico, CA

Narrow entry slows drivers



1. At entry lane

Well defined crossings & splitter islands



2. At exit lane

Well defined crossings & splitter islands

Roundabout near Schools



8-22

Clearwater FL

- ❑ Slow speeds improve safety at schools
- ❑ There are 100-plus roundabouts at schools in the US

Lighting at Roundabouts

- ❑ Center Mounted Lighting:
- ❑ Peds visible only as silhouettes
- ❑ Signs not visible



Lighting at Roundabouts

- ❑ Approach Mounted Lighting:
- ❑ Peds illuminated
- ❑ Signs illuminated



Study Source: Hasson and Lutkevich



8-25

Monona WI

Multi-lane roundabouts have potential for
“multiple threat” and higher speeds



8-26

Vail CO

Drivers may take a straighter, faster path on entry and exit, resulting in higher speeds – lane markings are recommended to minimize this

Roundabout concerns for peds with vision impairments:



8-27

- Circulating traffic masks the sound cues used to identify gaps and masks the sound of yielding vehicles
- Problems are much worse at multi-lane roundabouts

Possible Mitigation Measures for Blind Pedestrians at Multi-Lane Roundabouts

8-28

- Public Right-of-Way Accessibility Guidelines (PROWAG, proposed rule July 26, 2011) require signals at multi-lane roundabout approaches:
 - Pedestrian Hybrid Beacon (HAWK)
 - Regular Red-Yellow-Green Signal
- Research – other solutions may work:
 - Raised Crosswalk
 - Rectangular Rapid Flash Beacon
 - Ped signal may rest in dark (optional use by peds)

Pedestrian Hybrid Beacon at Two-lane Roundabout

8-29

Golden CO



Raised Crosswalk at Two-lane Roundabout

8-30

Golden CO



Rectangular Rapid Flash Beacon at Multilane Roundabout

8-31

Olympia WA



- FHWA study found some benefits to accessibility after RRFB installation at multilane roundabouts
- Other impacts (volume, speeds, configuration) also impact yielding

Case Study: Great Neck Plaza, NY

Great Neck Plaza, NY

Problem/Background

- Small, dense, suburban community on Long Island
- High pedestrian activity & older population
 - Busy central business district
 - High-use train station
- Excessive vehicle speeds



Case Study: Great Neck Plaza, NY

Great Neck Plaza, NY

Solution

- City received traffic calming grant from state DOT
 - Goal: calm traffic, enhance visibility of pedestrians, & improve crosswalk safety
- 4-way STOP replaced by roundabout
 - Contrasting pavement color, curb extensions, fencing, and islands used to direct traffic
- Other locations: illuminated pedestrian crossings and speed awareness devices installed
- Cost: \$365,000 for the roundabout, \$275,000 for the other improvements



Before



After

Case Study: Great Neck Plaza, NY

Great Neck Plaza, NY

Results

- Pedestrian collisions reduced near the roundabout after installation
- Users indicate a safer pedestrian environment
- Vehicle flow improved
- Effect of pedestrian crossing signs & speed warning devices not as good
- Officials and residents consider project a success



Speed awareness device
installed at same time as
roundabout

Roundabout: Learning Outcomes

8-35

- You should now be able to:
- Explain why roundabouts reduce crashes
- Describe the safety benefits for pedestrians and motor vehicles of roundabouts
- Describe how roundabout safety depends on correct design

8-36

Questions?