

# Designing for Pedestrian Safety

## Roundabouts: How They Work for Pedestrians

Presented by:

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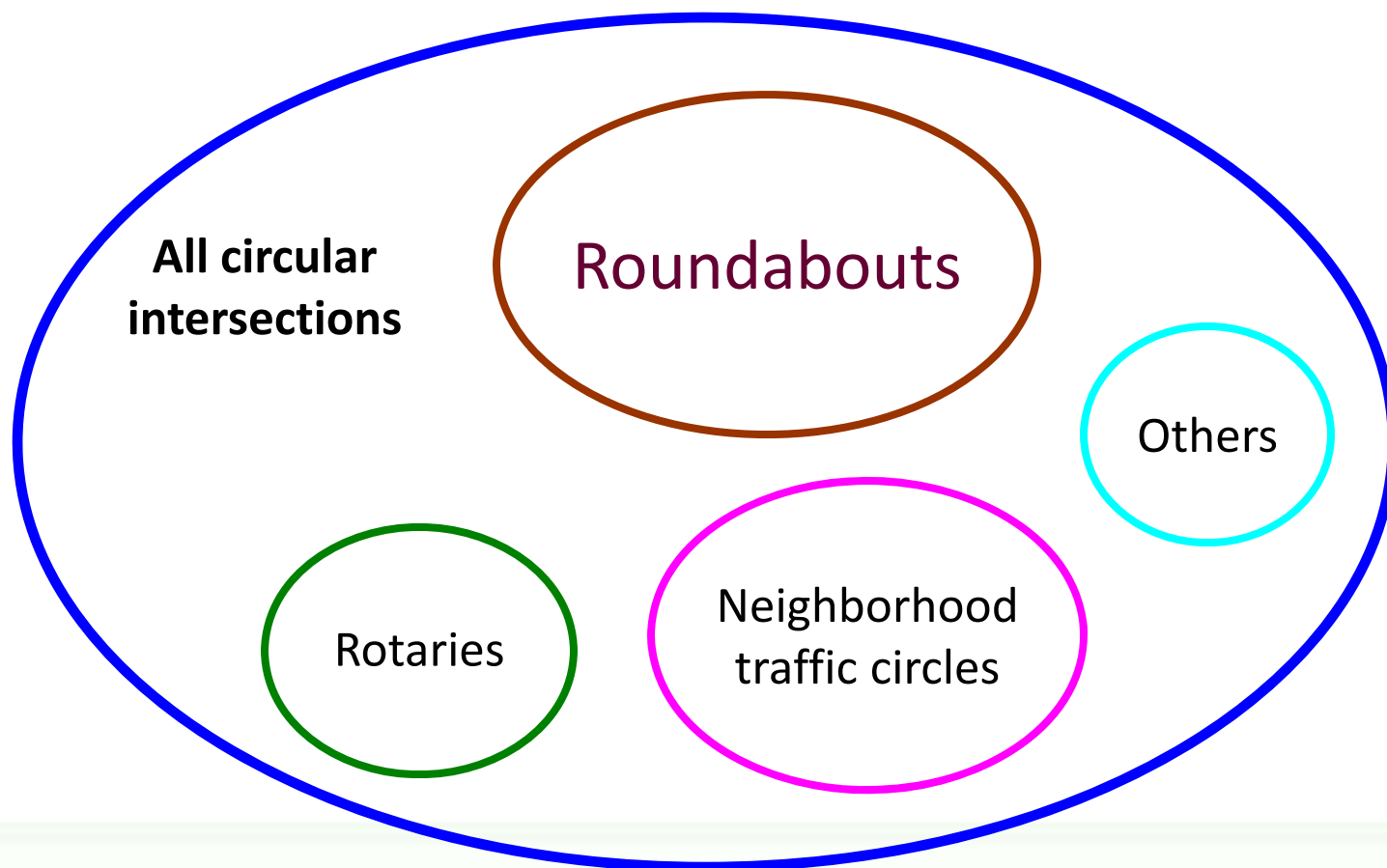


# Roundabouts: Learning Objectives

At the end of this module, you will be able to:

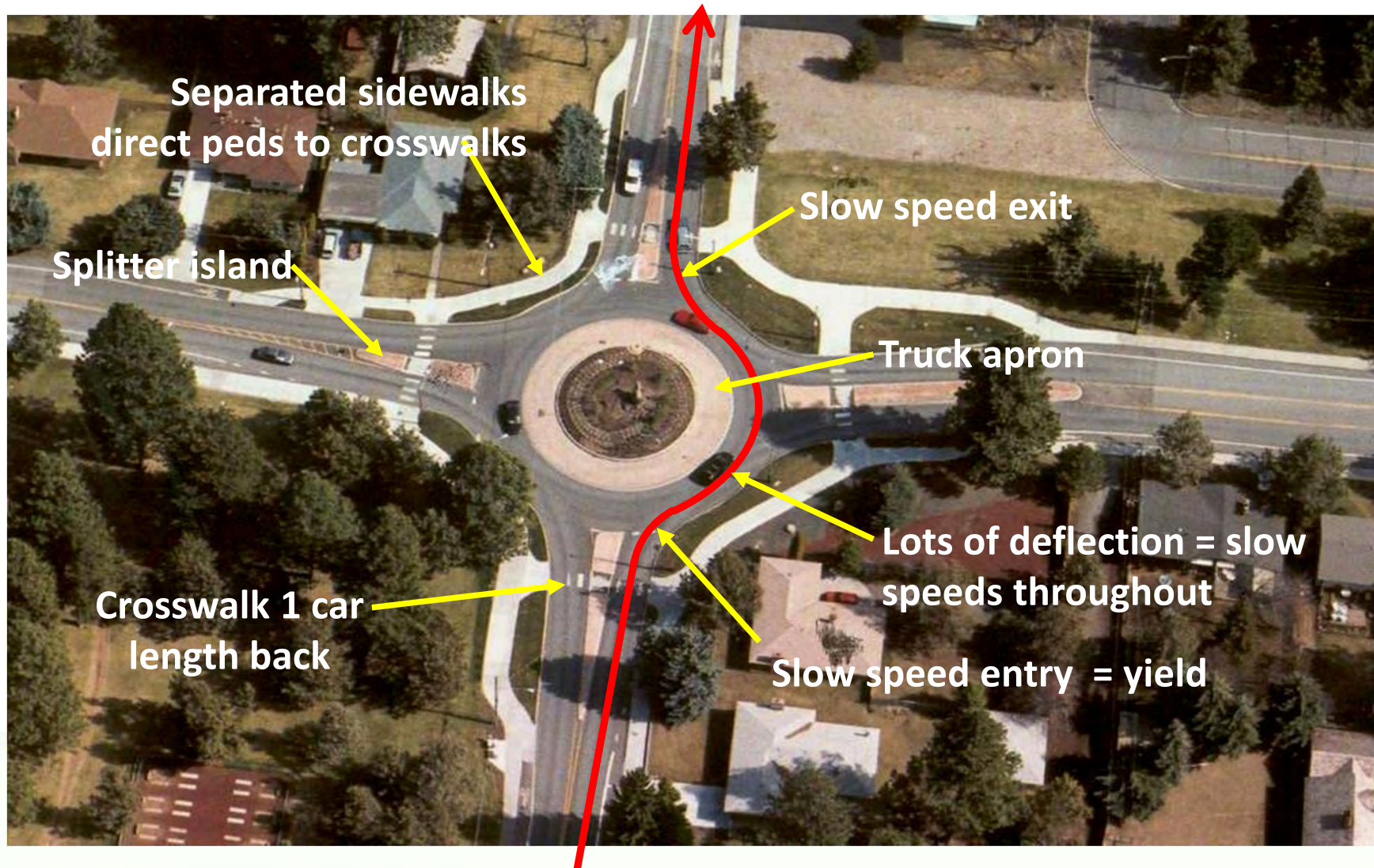
- ⇒ Explain why roundabouts reduce crashes
- ⇒ Describe the safety benefits for pedestrians and motor vehicles of roundabouts
- ⇒ Describe how roundabout safety depends on correct design

# Roundabouts are a type (or subset) of circular intersections



**Bottom Line: Not all circular intersections are roundabouts!!!**

# Essential roundabout characteristics



# A roundabout is not:



1. A New England style rotary, with large size & high speeds

# Kingston, NY – Traffic Circle

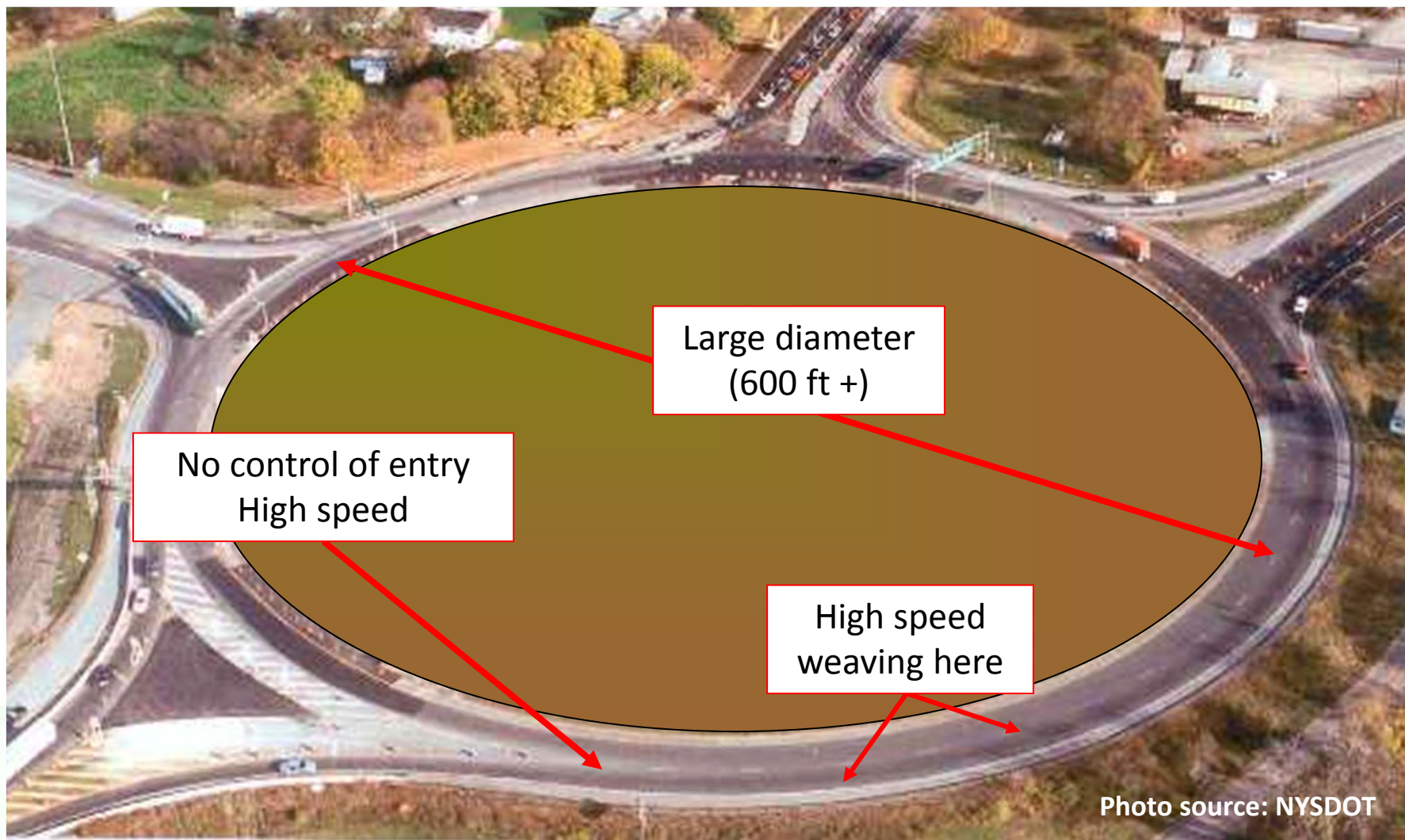
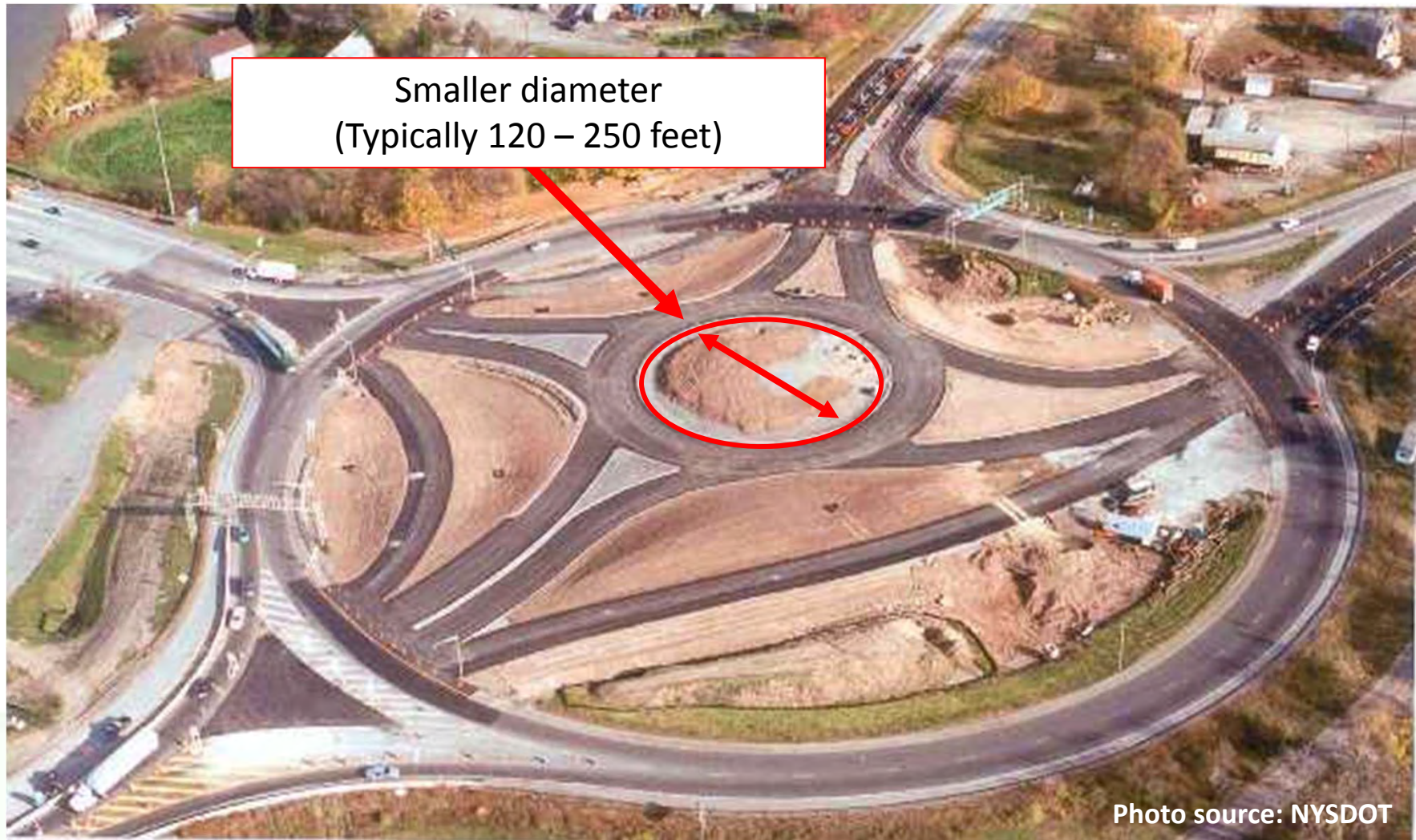


Photo source: NYSDOT

**Kingston, NY**

# **Traffic Circle reconstructed to Roundabout**



# A roundabout is not:



## 2. A Washington DC style circle, with traffic signal controls



# A roundabout is not:



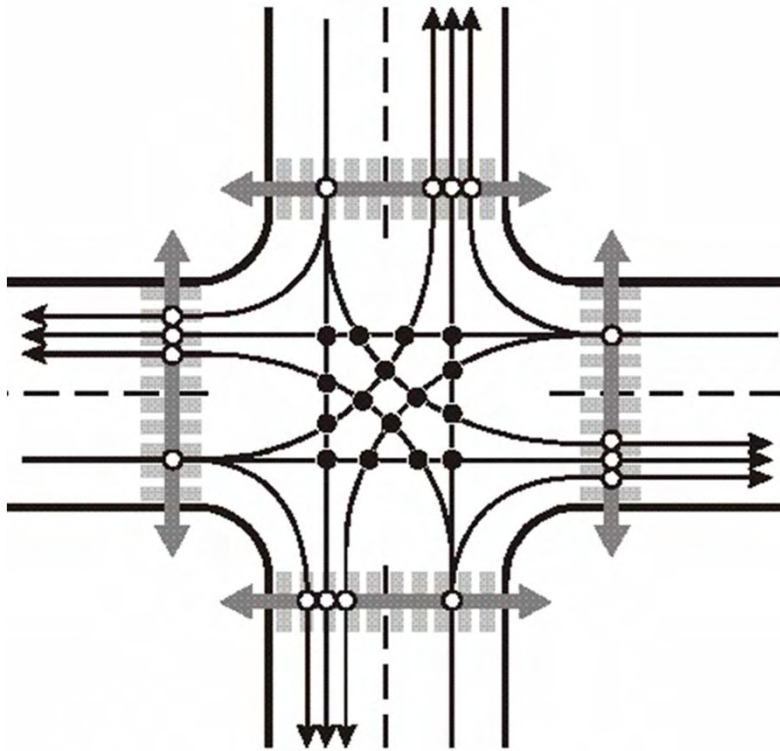
## 3. A traffic-calming circle

# A roundabout is not:



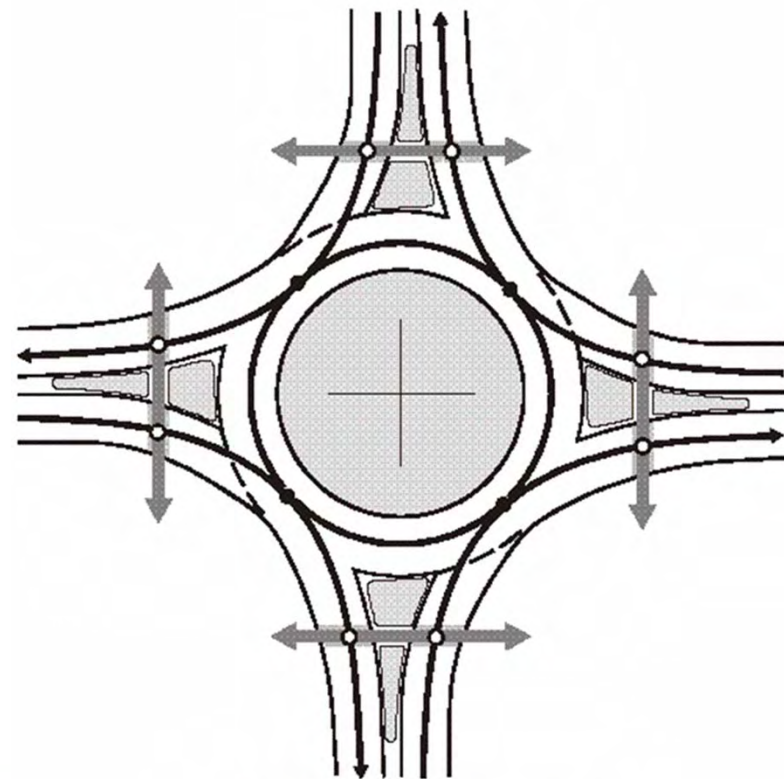
## 4. Paris

# Vehicle-Pedestrian Conflicts at Intersections



○ Vehicle/Pedestrian Conflicts

**16 Conflicts**



○ Vehicle/Pedestrian Conflicts

**8 Conflicts**

⇒ **Why roundabouts are safer for all users:**

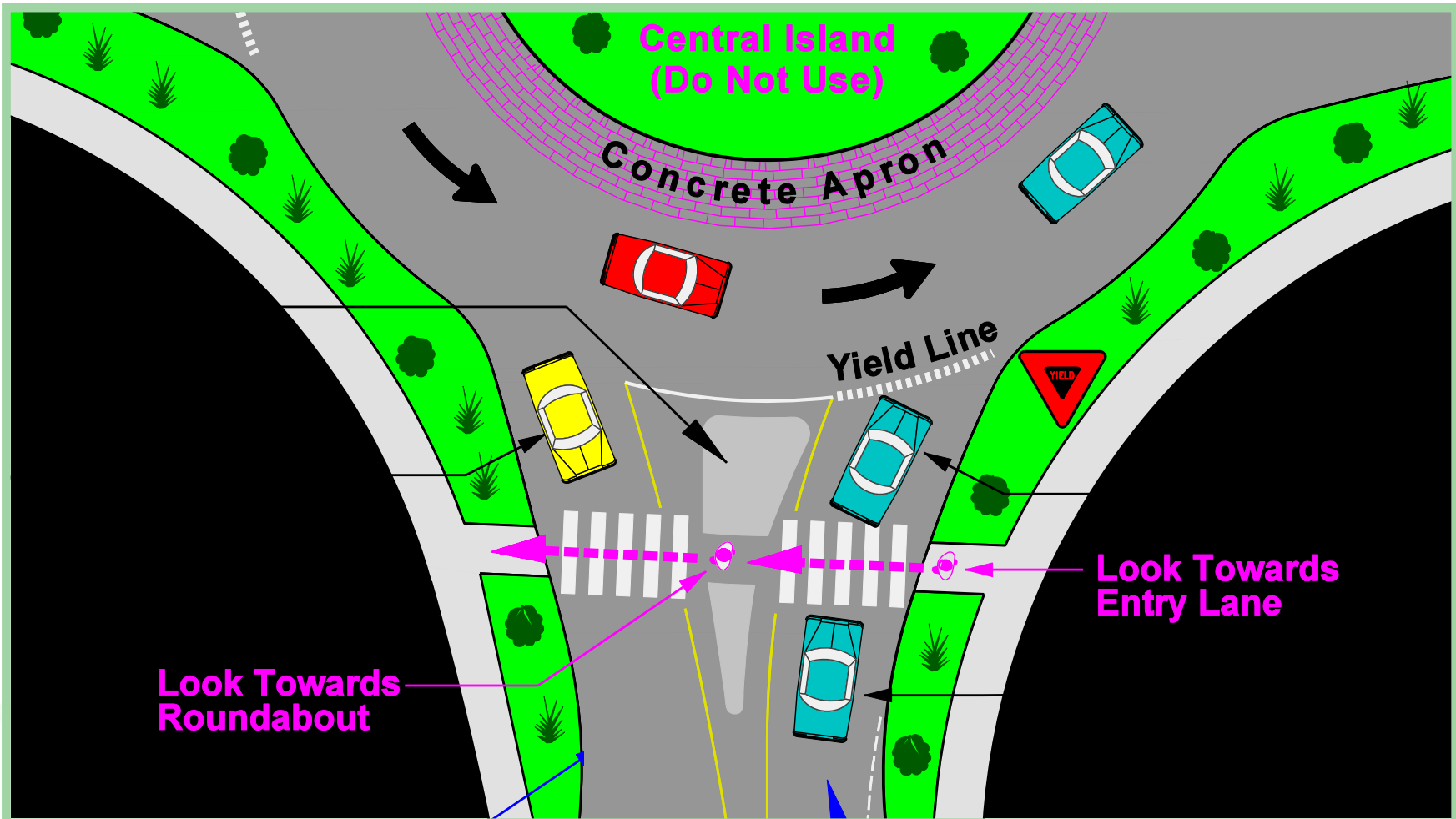
- **Slow speeds for all traffic**
- **Reduced conflicts**
- **Yield on entry**
- **No left turns**

⇒ **CRF (all users):**

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



# Pedestrian movements at roundabout



# Advantages for Pedestrians

- ⇒ Pedestrian crosses only one direction of traffic at a time
- ⇒ Splitter island provides a refuge and shortens the traveled distance
- ⇒ Reduced vehicle speeds



Photo Source: Ken Sides



Photo Source: Anthony Butzek  
(City of Asheville, NC)



## Narrow entry slows drivers



**1. At entry lane**

**Well defined crossings & splitter islands**



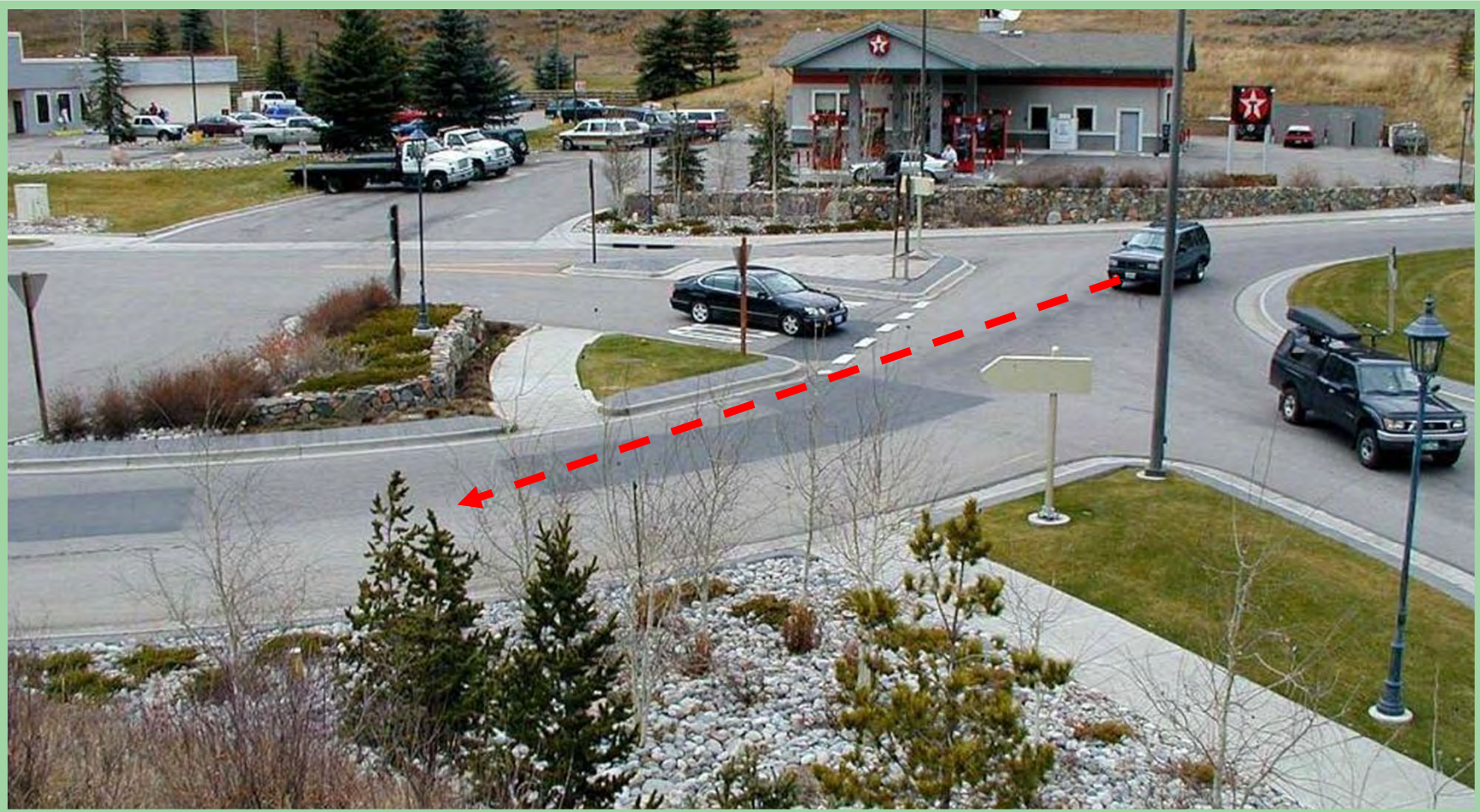


## 2. At exit lane

**Well defined crossings & splitter islands**



## Truck apron keeps roadway narrower



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

# Pedestrian Safety Findings – NCHRP 572

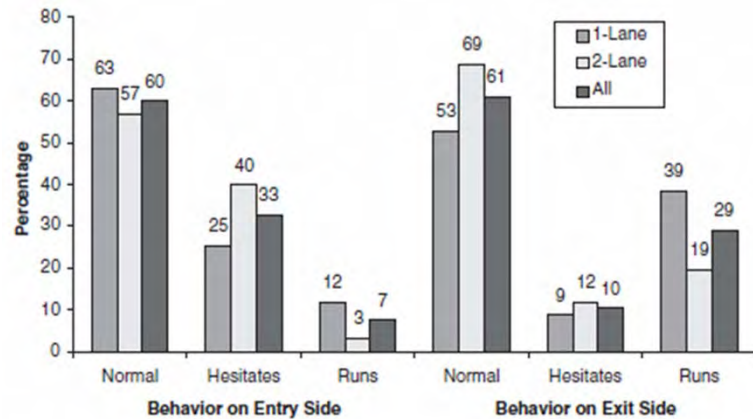


Figure 59. Pedestrian crossing behaviors when a vehicle was present and the crossing began on the entry side.

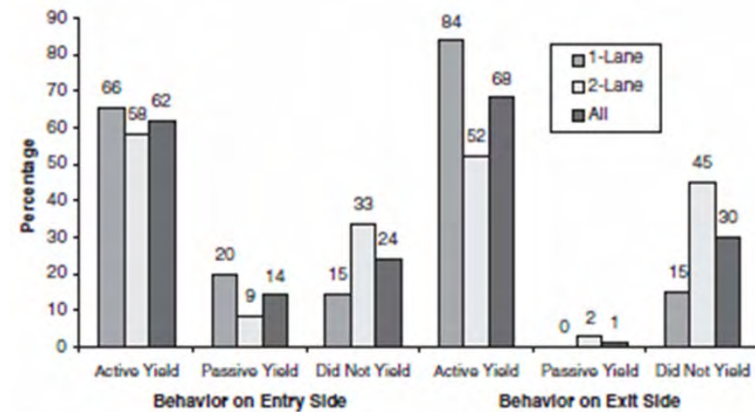


Figure 62. Yielding behavior of motorists when the pedestrian crossing begins on the entry side.

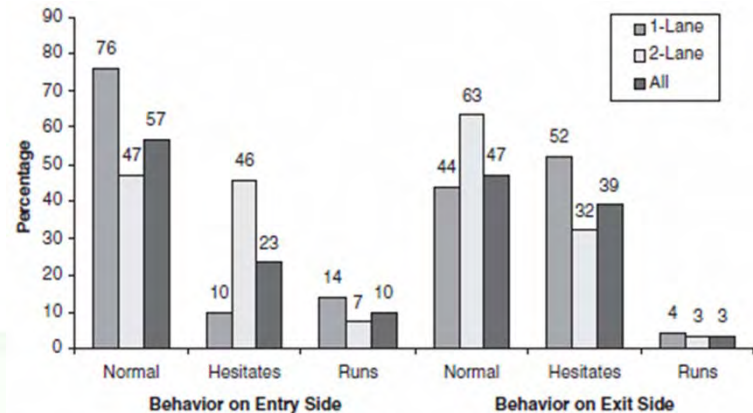


Figure 60. Pedestrian crossing behaviors when a vehicle was present and the crossing began on the exit side.

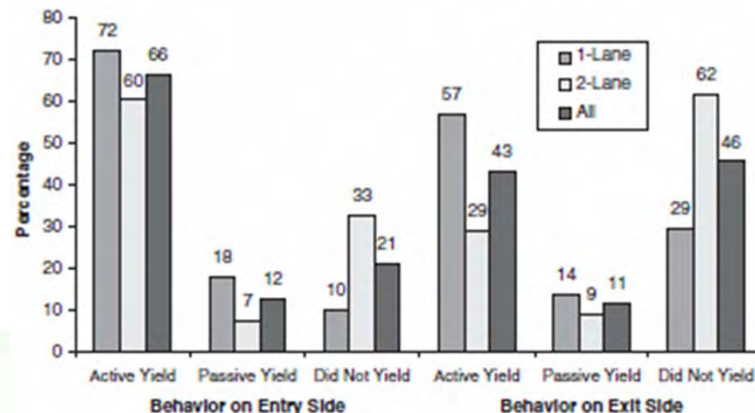


Figure 63. Yielding behavior of motorists when the pedestrian crossing begins on the exit side.

# Roundabouts and sight impaired pedestrians:



⇒ Circulating traffic masks the sound cues that sight impaired pedestrians use to identify gaps and masks the sound of yielding vehicles

# Center Mounted Lighting - 8-400W HPS



**28 Lux**



# Approach Mounted Lighting - 8-250W HPS



25 Lux





## Raised Crosswalk in Golden, CO -- NCHRP 3-78A





## Raised Crosswalk in Golden, CO -- NCHRP 3-78A



## HAWK in Golden, CO -- NCHRP 3-78A



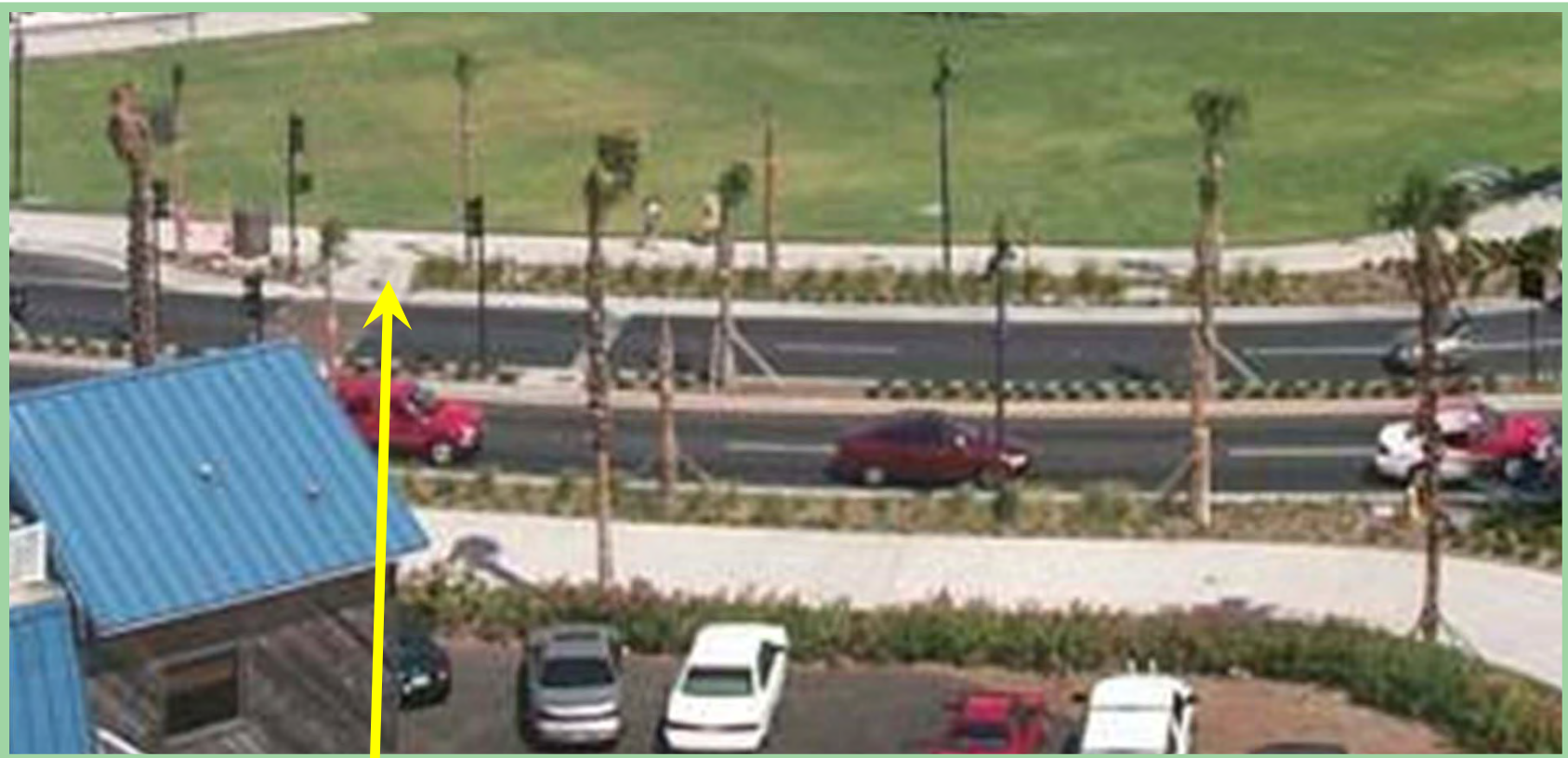
## HAWK in Golden, CO -- NCHRP 3-78A

# Possible Mitigation For 2-lane Roundabout Ped signal at selected leg(s)



**Signalized Pedestrian Crossing**

# Possible Mitigation For 2-lane Roundabout Ped signal at selected leg(s)



**Signalized Pedestrian Crossing**

# Roundabout Learning Outcomes

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

# Questions?