ROUNDABOUTS:
HOW THEY WORK FOR PEDESTRIANS

Module 8

Golden CO
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
Essential roundabout characteristics

- Slow speed entry = yield
- Slow speed exit
- Truck apron
- Splitter island
- Separated sidewalks
direct peds to crosswalks
- Crosswalk 1 car length back
- Lots of deflection = slow speeds throughout
- Slow speed entry = yield
Roundabouts are a type (or subset) of circular intersections

All circular intersections

Roundabouts

Rotaries

Neighborhood traffic circles

Others

Bottom Line: Not all circular intersections are roundabouts!!
A roundabout is not:

1. A rotary, with large size & high speeds
Problems with Existing Rotary

Kingston NY

- No control of entry
- High speed
- High speed weaving here
- Large diameter (600 ft +)
Rotary Reconstructed to Roundabout

Smaller diameter
(Typically 120 – 250 feet)
A roundabout is not:

2. A Washington DC style circle, with traffic signal controls
A roundabout is not:
3. A traffic-calming mini circle
A roundabout is not:
4. Paris
Before and After Example
Before and After Example

Asheville NC
Advantages for Pedestrians

- 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

Conventional Intersection
16 Conflict Points

Roundabout
8 Conflict Points
Roundabout are Safer for All Users

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

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

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

- **Central Island (Do Not Use)**
- **Concrete Apron**
- **Splitter Island**
- **Stop For Pedestrians**
- **Look To The Left**
- **Look Towards Entry Lane**
- **Stop For Pedestrians**
- **Look Towards Roundabout**
Narrow entry slows drivers
1. At entry lane

Well defined crossings & splitter islands
2. At exit lane

Well defined crossings & splitter islands
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
Multi-lane roundabouts have potential for “multiple threat” and higher speeds
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:

- 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

- 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
Raised Crosswalk at Two-lane Roundabout
Rectangular Rapid Flash Beacon at Multilane Roundabout

- 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

**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

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
Case Study: 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

- 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?