Getting Pedestrians Across Roundabouts
Pedestrian Signal Warrants and Design at Roundabouts in Australia, Great Britain and the USA

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Presentation Outline

• Pedestrian signal warrants in UK and USA
• Crosswalk design issues
  – Lighting: visibility of pedestrian to the driver
  – Color, location, orientation, texture
• Pedestrian Signal Examples at Roundabouts
  – Flashing Yellow-Solid Red
  – Green-Yellow-Red
  – School crossing flashers
• UNC Charlotte, North Carolina
• Clearwater Beach, Florida
• University of Utah, Salt Lake City, Utah
• Homebush Bay, Sydney, NSW, Australia
• Alpine, Utah

Paper on Web: www.RoundaboutsUSA.com

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Crosswalk Location

- “Midblock” crossing
- Stagger the crossings
- Pedestrians on median look towards traffic they are about to cross

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Accessible Pedestrian Signals (APS)

US Access Board

RoundaboutsUSA
APS “Ticking Boxes”

- Emits an intermittent low-volume sound constantly when crossing
- Designed to guide the visually impaired to crossing control unit
- Automatic volume control to match background noise level
- Changes to “Cross now” noise during invitation period
- Some questions about annoyance of constant noise to nearby residents/workers
- Tells you the name of the street you are crossing
Colored Surface - UK
Tactile Surface

RoundaboutsUSA
Sydney, NSW Ped Signals  Red+Flashing Yellow
Utah’s Newest Roundabout    Dec. 2003
School Crossing Flashers

Alpine, Utah

RoundaboutsUSA
Ped Activated Signal - University of Utah
WALK - Stop Bars

RoundaboutsUSA
UNC Charlotte, NC Existing T-Intersection

- Pedestrian signal designed for the busiest crosswalk of the three existing.
- All three crosswalks are midblock locations the closest is 50’ from the yield line.
- Meets existing USA pedestrian signal warrants.
UNCC Busiest Crosswalk
UNCC Westbound
Bus Transfer and Detour
Clearwater Beach, FL  Signal Later Removed
Clearwater Beach, FL  Signal Later Removed
Clearwater Beach, FL
Pedestrian Signals in the UK

- UK roundabouts have ~50% less pedestrian crashes than traffic signals.
- There is a UK warrant for installing a signalized crosswalk. \( PV^2 \)
- P is peds crossing/hr, V is vph
- If \( PV^2 > 10^8 \) then a signalized crossing is warranted.
- At a roundabout with a splitter Island there are two crosswalks so each has to satisfy the warrant criteria. The peds cross both so P is the same, but V will be different, the entry flows on one and the exit flows on the other.
Pedestrian Signal Warrant in the USA

- **MUTCD:**
  - A. 100+ Peds/hr for 4 hours or 190 for 1 hour; and
  - B. There are fewer than 60 gaps per hour in the traffic stream. When there is a divided street median this applies in both directions of vehicle traffic.
  - **OPTION:** The Ped volume requirement may be reduced by up to 50% if ped crossing speed is less than 4 ft/s.
  - A traffic control signal may not be needed if adjacent coordinated traffic control signals consistently provide gaps of adequate length for peds to cross the street. (or a Roundabout?)

- **FHWA Ped Signal Alternatives Study:**
  - 60+ Peds/hr for 4 hours or 90/hr for 2 hours, or 110/hr for 1 hour.

- **BOULDER, CO:**
  - 50+ Peds/hr for 4 hours or 100/hr for 1 hour.
Pedestrian Signals and Vehicle Capacity

- When ped volumes are significant they can hamper the roundabout capacity on a un-signalized crosswalk as single peds stop the traffic.
- Signalized crosswalks can be set to give a good split for both vehicle traffic and peds. Crossing the peds in groups is more visible also.
- With signalized crosswalks drivers tend to watch the signals rather than the peds just like at normal traffic signals.
Conclusions Future Research:

- Apply pedestrian signal warrants customized to the city or area
- Location: midblock or at intersection?
- Crosswalk design issues
  - Lighting: Visibility of Pedestrian
  - Color, texture
- Pedestrian signal options at roundabouts
  - UK and Australia: flashing Yellow-Solid Red
  - Standard Signal: Green-Yellow-Red
  - Utah: school crossing flashers
- “Guidelines” from ADA
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