

Getting Pedestrians Across Roundabouts

*Pedestrian Signal Warrants and Design at Roundabouts
in Australia, Great Britain and the USA*

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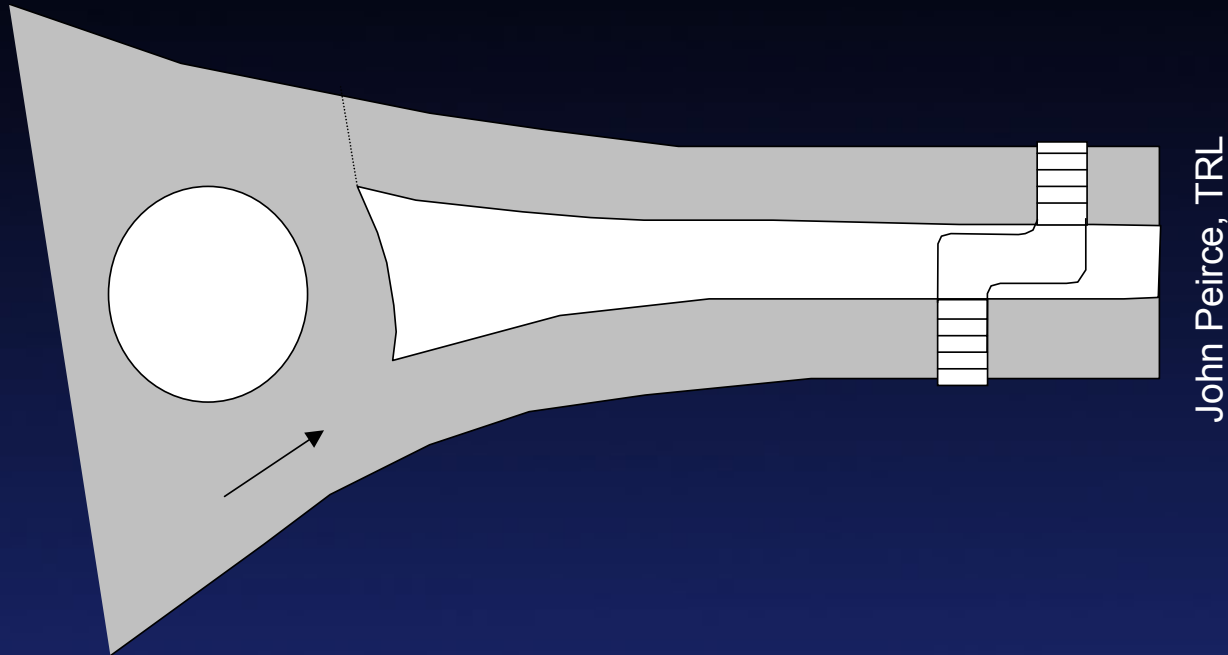
Presentation Outline

- 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

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Crosswalk Location



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

Accessible Pedestrian Signals (APS)

US Access Board



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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



John Peirce, TRL

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Sydney, NSW Ped Signals *Red+Flashing Yellow*



Utah's Newest Roundabout

Dec. 2003

School Crossing Flashers



Alpine, Utah

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Ped Activated Signal *Sept. 2003 University of Utah*



Ped Activated Signal - *University of Utah*



DON'T WALK



WALK - Stop Bars



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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 Northbound



UNCCHARLOTTE

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UNCC Busiest Crosswalk



Ro

UNCC Busiest Crosswalk



UNCC Westbound



Bus Transfer and Detour



UNCC Ped Signal Design

Existing T-Intersection



Clearwater Beach, FL *Signal Later Removed*



Clearwater Beach, FL *Signal Later Removed*



Clearwater Beach, FL



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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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