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Signalised Roundabout Design for Pedestrian and Cyclist Safety

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Outline

- Introduction
- Issues
- Options considered
- Signalised roundabout design
- National walking and cycling targets and objectives
- Conclusions



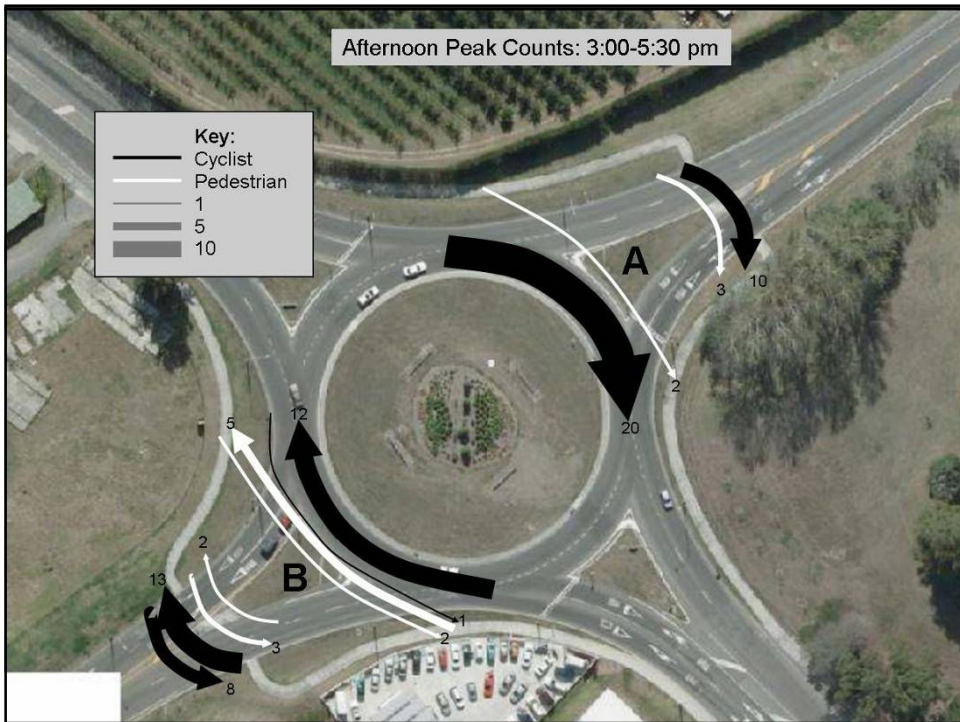
Introduction

- Intersection of two arterials
- Urban arterial – 50 km/h; AADT 15,000 vpd
- Rural arterial – 100 km/h; AADT 7–12,000
- 9% heavy vehicles
- 56 pedestrians and 174 cyclists per day crossing rural arterial

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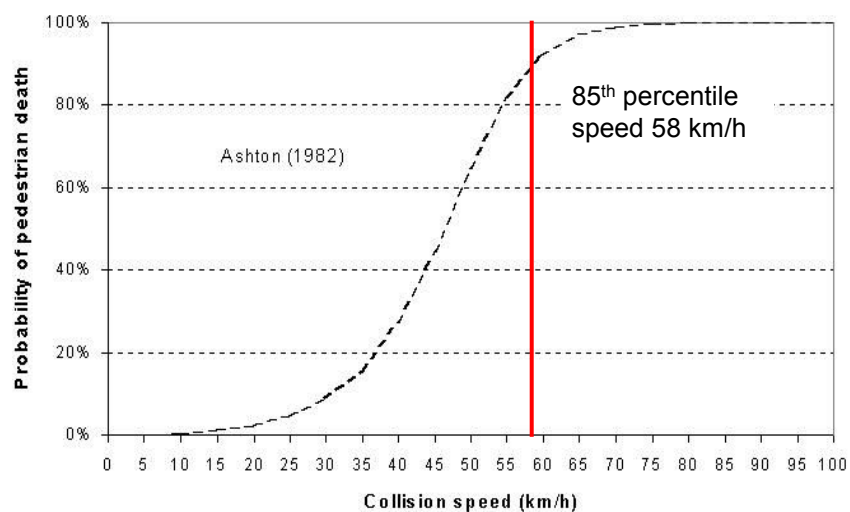


Issues

- 60 m diameter roundabout generates high MV speeds
- 10 crashes per year for last 5 years
- Peds and cyclists face MV 85th percentile speeds of about 58 km/h at two locations
- Pedestrians need to travel at about 3 m/s (11 km/h) to cross safely; a fit, healthy adult typically walks at 1.5 m/s
- Suppressed pedestrian/cycle demand?

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Speed versus safety trade-off



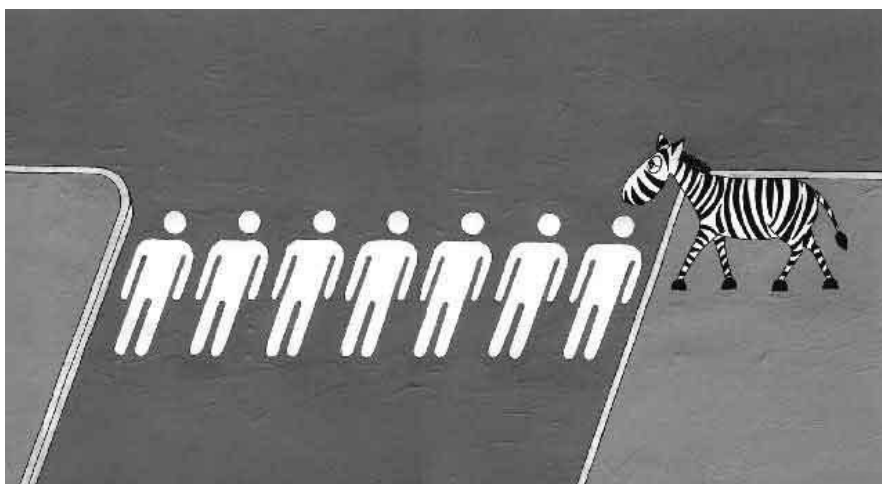
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Options considered

- Do minimum
- Install ped refuge islands
- Move crossing closer to roundabout
- Provide cycle lanes in roundabout
- Reduce roundabout size
- **Signalise roundabout**
- Remove roundabout and signalise intersection
- Grade-separate (peds/cyclists or full traffic)

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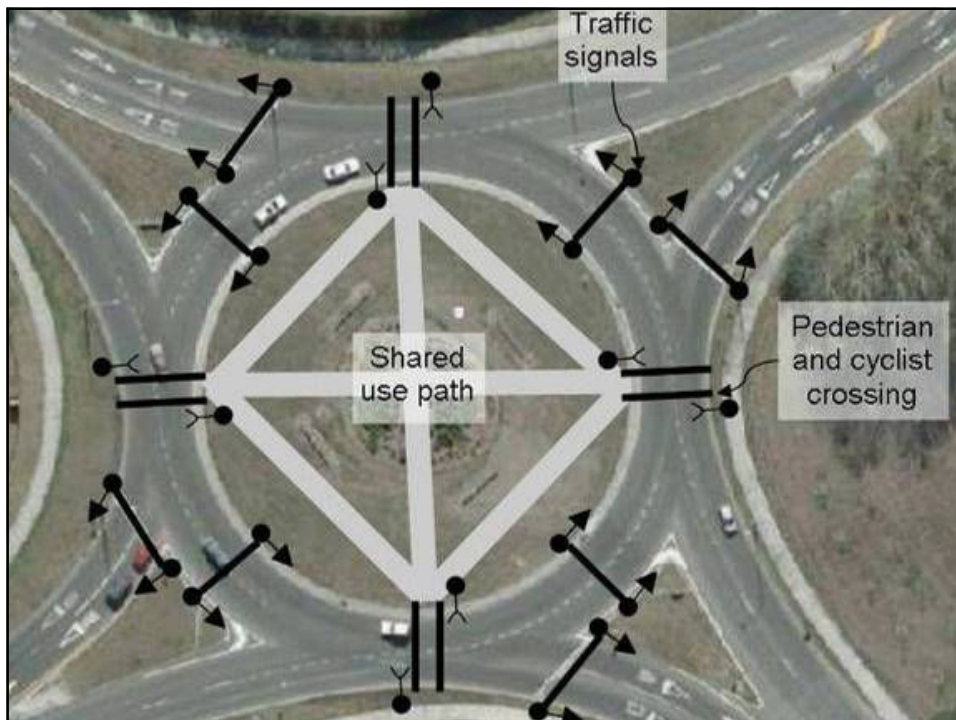
Zebra crossing option rejected



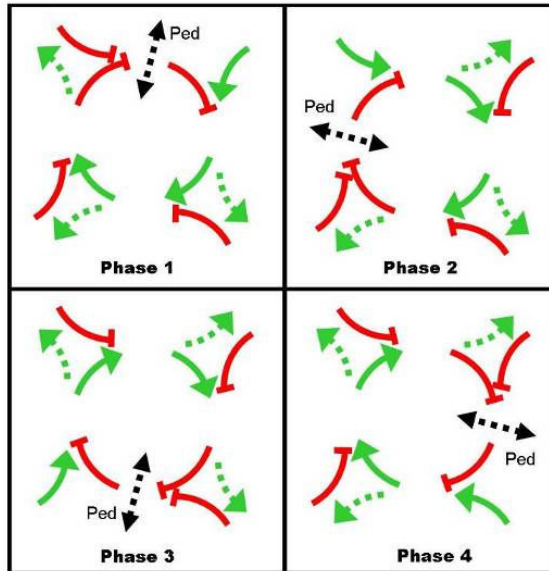
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Study recommendations

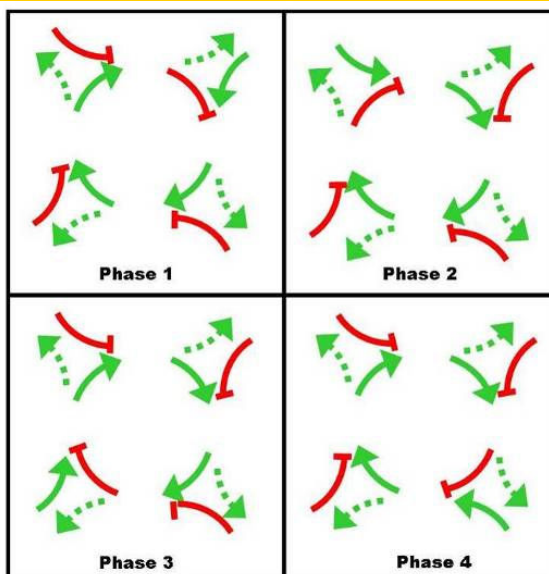
- Refuge islands (short term)
- Comprehensive traffic operations and safety review needed, including:
 - Consideration of signalised roundabout



Phasing with crossing demand



Phasing without crossing demand



National targets

- NZTS target: 30% of total trips in urban areas by walking and cycling by 2040
- GPS target: increase walking and cycling trips by 1% per annum through to 2015



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NZTS objectives

- Ensuring environmental sustainability
- Assisting economic development
- Assisting safety and personal security
- Improving access and mobility
- Protecting and promoting public health

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Existing and proposed v. NZTS

NZTS Objective	Existing Roundabout	Signalised Roundabout
Environmental sustainability	X	✓
Economic development	✓	X
Safety and personal security	X	✓
Access and mobility	X	✓
Public health	X	✓

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Conclusions

- Large (and multi-lane) roundabouts are problematic for pedestrians and cyclists
- Look at all options, including signalling roundabout
- Consider NZTS objectives and GPS targets for each project
- Conflicting objectives are likely
- No new facility or “improvement” should make things worse for peds or cyclists

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