



TRB Roundabout Conference,
May 2008, Kansas City, USA

ROUNDABOUTS IN AUSTRALIA

Views of Australian Professionals

Presenter: **Rahmi Akçelik**

 SIDRASOLUTIONS.COM

© 2000-2008 AKCELIK & ASSOCIATES PTY LTD

Roundabouts in Australia



 SIDRASOLUTIONS.COM

© 2000-2008 AKCELIK & ASSOCIATES PTY LTD

Roundabouts in Australia



Australia – size of USA,
population 21 million

Roundabouts in Australia



We drive on the left-
hand side of the road

Roundabouts in Australia



Roundabouts are very common ...

Roundabouts in Australia



Roundabouts in Australia



SIDRASOLUTIONS.COM

© 2000-2008 AKCELIK & ASSOCIATES PTY LTD

Roundabouts in Australia

This paper

A collation of comments received from Australian traffic and transport professionals in response to a survey about the current status of roundabouts in Australia ...



SIDRASOLUTIONS.COM

© 2000-2008 AKCELIK & ASSOCIATES PTY LTD

Survey Questions

- Are we currently building many roundabouts?
- When a new intersection is built (or an unsignalised intersection is upgraded), what sort of priority is given to **roundabouts vs signals**?
- Are we replacing signals with roundabouts, or are we replacing roundabouts with signals?



Survey Questions

- **Statistics** about roundabouts in your jurisdiction (how many roundabouts in total, residential vs major traffic roundabouts, etc)?
- What is our current experience with roundabouts in terms of **efficiency** (delays, congestion), **environmental aspects** and **safety**?



Survey Questions

- Are roundabout **metering signals** in use in your jurisdiction (and how many)?
- Are there any **fully-signalised roundabouts** (all approaches as well as circulating roads controlled by signals) in your jurisdiction?



Survey Questions

- What is the **public's view** on roundabouts (car and truck drivers, pedestrians, cyclists, etc)? Does everybody love them or do we have opposition?
- What effort is being made for **educating road users** (drivers, cyclists, pedestrians) in using roundabouts correctly?



Survey Questions

- Do you use models other than **SIDRA INTERSECTION** for roundabout analysis?
- What do you think about the **future of roundabouts** in Australia?



Responses

- Australia is continuing to build roundabouts but new installations are mostly in newly developed **residential and commercial areas**.



Responses

- “Other intersection forms (unsignalised and signalised) are built more often than roundabouts. This has always been the case.”
- There are not as many roundabouts in Sydney where signalised intersections play an important role.



- When a new intersection is built (or an unsignalised intersection is upgraded), usually both **roundabout and signal options** are considered.
- Various factors are mentioned in relation to the choice between these two intersection types.



Choosing between Signals and Roundabouts

- Capacity
- Safety
- Implementation cost
- Space available
- Location (urban, suburban, rural, CBD)
- Operating speeds
- Impact on pedestrians and cyclists



Choosing between Signals and Roundabouts

- Traffic movements
- Heavy vehicles
- The number and angle between legs
- Form of control at adjacent intersections
- Signal coordination
- Future considerations
- Social impacts



- Many respondents identified the issue of **unbalanced flows** at roundabouts.

See various papers by the author on unbalanced flows and metering signals
[**Presentation at this conference:
Session 3A, 1-3 pm, Monday**]



Replacing signals with roundabouts or roundabouts with signals?

- Overall trend is to **replace roundabouts with signals** rather than the other way round. The reasons given include:
 - roundabout **capacity** limitations
 - **unbalanced** flow situations
 - better allowance for road users such as **pedestrians and cyclists**.



- A respondent commented: “Some see **roundabouts as an evolutionary step before signals**. A saturated signalised intersection is often treated through the construction of extra lanes, slip lanes and so on, rather than considering the option of a roundabout.”



- Replacing a roundabout with signals due to capacity reasons applies particularly to **two-lane roundabouts** since it is not common to expand them to **three-lane roundabouts** to improve capacity (although it occasionally happens).



- Conversion of a large two-lane motorway interchange roundabout to a signalised “**Squareabout**” which will have four sets of traffic signals was mentioned.



- Difficulties for **pedestrians and cyclists** were acknowledged by most respondents. Difficulties by **trucks, people with disabilities** and **school children** were also mentioned. Respondents stated:
 - "Roundabouts are notoriously difficult to design for cyclists and pedestrians."
 - "Pedestrians complain that multi-lane roundabout (two or more lanes at entry or exit) are hard to cross."



- There was an agreement that:
 - **single lane roundabouts** were popular, and
 - **three-lane roundabouts** were not favoured.
- One respondent mentioned "a movement away from **two-lane roundabouts**".



Efficiency of roundabouts

- One respondent stated "roundabouts are more efficient than signals" but "motorists soon lose patience with roundabouts though delay is less than signals".
- Another respondent stated "Roundabouts are more suited to **local roads or rural arterial roads**."
- There was a general agreement about **safety of roundabouts** ...



- One respondent stated: "In general, a well-designed **roundabout is the safest type of intersection control**. ... fewer vehicle accidents occur at roundabouts than at intersections containing traffic signals, stop or give-way (yield) signs. Unfortunately, this same safety performance does not apply to **pedestrians and cyclists**. "



Road user education

- There is a significant level of road user education in the use of roundabouts. There was a general agreement on the **need for more effort**.
- The issues mentioned:
 - Failure to use indicators
 - Waiting for excessively long gaps
 - Giving way (yielding) to vehicles on the **right** or vehicles diagonally opposite that might be turning **right**.



Signals at roundabouts

- Respondents did not indicate many roundabouts with **metering signals** or **fully-signalised roundabouts** in their jurisdictions. However, roundabout metering signals are drawing much attention in Australia currently (as an alternative to replacing roundabouts with signalised intersections) due to growing demand flows at roundabouts.

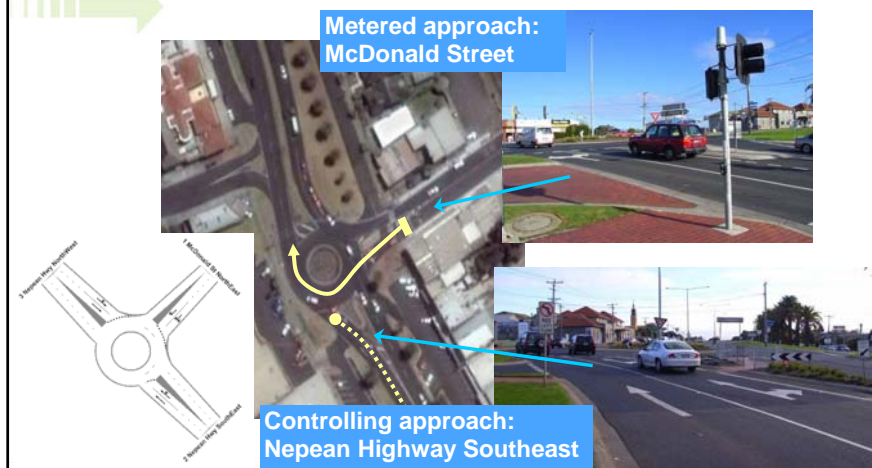


Signals at roundabouts

- Victoria appears to have the largest number of roundabouts with metering signals.
[Presentation at this conference:
Session 3A, 1-3 pm, Monday]
- The recent **cost** of installing metering signals on one leg of a roundabout in Victoria was stated as **AUD \$80,000 to \$90,000**.



Metering signals: Nepean Hwy - McDonald St



Statistics about roundabouts in Australia

- Not readily available! The number of roundabouts given by several respondents indicated an average of 2700 persons per roundabout). If representative, there would be roughly **8,000 roundabouts** in Australia (population about 21 million). This is well short of 15,000 roundabouts mentioned on the US Insurance Institute for Highway Safety website.



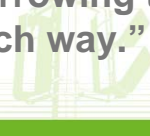
Statistics about roundabouts in Australia

- If the USA had roundabouts at the same rate as Australia (corresponding to the estimated **8,000** roundabouts), there would be well over **100,000** roundabouts in the USA (population about 300 million)!



Some interesting details

- “We should consider using **stop signs at roundabouts** rather than give-way (yield) signs, when there is insufficient sight distance.”
- “For safety reasons, RTA NSW is modifying all **multi-lane zebra crossings** (two lanes each way) on State roads, by signalling the crossing or narrowing the zebra crossing to one lane each way.”



Some interesting details

- “The current Australian criterion for controlling speeds through roundabouts is **deflection** measured as a maximum radius of 100 m through the circulating carriageway. This will be changed to **entry curvature**.”



Future of roundabouts in Australia

- Most respondents agreed that roundabouts will continue to play an important role in Australia in the future.
- One respondent stated: "the general public has become used to roundabouts especially in residential areas. ... roundabouts will have a place in Australia for the years to come **as long as they are justified and properly designed and education of motorists continues.**"



Acknowledgement

The author thanks the following Australian traffic and transport professionals for the valuable information and comments they provided which forms the basis of this paper:

Andrew Morse, Brian Davis, Cameron Sims, Chris Wong, David Drozd, David Nash, Lawrence Nagy, Keith Midson, Maurice Burley, Michael Day, Milan Prodanovic, Owen Arndt, Scott Wells, Simon Chao, Slavco Naumovski, Terry Keating, Tony Fitts, Vincent Fernando, Wayne Amos.



Papers by respondents

- **BURLEY, M. (2005).** Roundabouts and Traffic Signals - Guidelines for the Selection of Intersection Control.
- **MIDSON, K. (2007).** Pedestrian Safety in Strip Shopping Centres.
- **ARNDT, O. K. (1998),** Relationship Between Roundabout Geometry and Accident Rates.
- **ARNDT, O. K. (2008).** Speed control at roundabouts - use of maximum entry path radii.



sidrasolutions.com

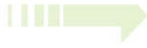
Resources pages

- Roundabouts
- Downloads
- Links

Papers referred to by respondents
will be made available for
download on our website.



Video Presentations



End of Presentation

