FACT SHEET 6

Intersection Form – Roundabouts

The purpose of the factsheet is to provide guidance and information regarding roundabouts. The benefits, limitations, and appropriateness of roundabouts are explored.

Conflict at intersections can be managed through the choice of intersection form. Intersections also play a key role in the performance of the road network from an efficiency perspective. A roundabout is a form of intersection in which traffic circulates clockwise around a central island, and all entering traffic is required to give way to traffic on the circulating roadway and those approaching from the right.

Benefits	Limitations
• A well designed roundabout is the safest form of intersection for motor vehicles • Can be good for pedestrians if there are raised platforms on the approaches in low speed environments and locations with a significant place function • Good for balanced approach flows • Can cater for moderate to high traffic volumes • Can be signalised to control delays on approaches	• Can require a large amount of space, depending on design layout • Large roundabouts are generally poor for pedestrian and cyclist safety, and can be intimidating • Results in excessive delays when the traffic flows are not balanced • Can be difficult for larger vehicles to negotiate • Some drivers don't know how to use roundabouts

Local Examples

- Taharepa Road / Kiddle Drive
- Heuheu Street / Ruapehu Street

Heuheu Street / Ruapehu Street

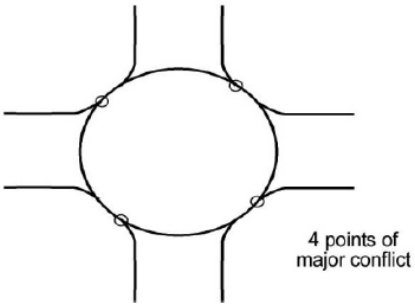
Image © 2019 Google Street View

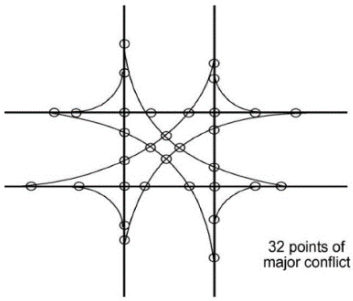
Best Practice Considerations

- The geometric design should safely limit vehicle speeds
- Off-road alternatives could be provided for less confident cyclists, particularly on multi-lane roundabouts
- Splitter islands with pedestrian/cycle crossing facilities should be provided on all approaches
- It is generally not appropriate to construct roundabouts with more than four approaches or with legs at angles of less than 90 degrees with each other
- Roundabouts can act as 'gateway treatments' between different areas of land use

Safety Performance

- Roundabouts require vehicles to slow down as they approach the intersection
- Due to the low speeds and the impact angles of crashes at roundabouts, the risk of death and serious injury crashes is lower than at priority and signalised intersections
- May have lower cyclist safety performance than traffic signals, particularly at multi-lane roundabouts
- Mini-roundabouts, or "dome" roundabouts, also show increased safety performance over priority intersections at low volume streets.
- Roundabouts significantly reduce the amount of conflict points at a four-leg intersection. A typical roundabout with four approaches only has four potential points of conflict.





(Source: Austroads)

Traffic Performance

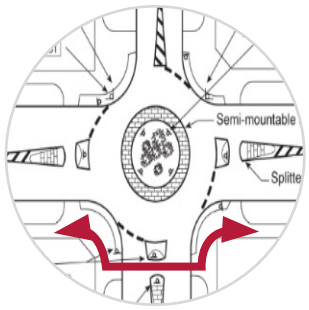
- Roundabout traffic performance can be measured by its “Level of Service”, an index measured on an A (best) to F (worst) scale.
- Roundabouts generally exhibit less delay than traffic signals during the off-peak periods, which contributes to less overall delay to traffic throughout the day.
- Unbalanced traffic flows, or dominant traffic flows that come from a single, primary direction, may lead to excessive delay at subsequent approaches
- Roundabouts can be signalised to improve the performance of unbalanced traffic flows.
- Buses and trucks require additional manoeuvring space. Good roundabout design can balance these needs without providing so much road space that intended traffic calming effects are lost.

Consideration for Pedestrians

Pedestrians do not have the priority when crossing roundabout legs unless zebra crossings are provided. Pedestrians can also have difficulty crossing multi-lane roundabouts.

A well designed roundabout for pedestrians:

- Caters for pedestrians within the splitter islands
- Has tight radii and reduced traffic lane widths which minimise the crossing distance for pedestrians
- Has reduced entry and exit speeds into and out of the roundabout. Raised platforms are one option to help slow vehicle speeds.



At roundabouts, the pedestrian crossing path is offset away from the desire line.

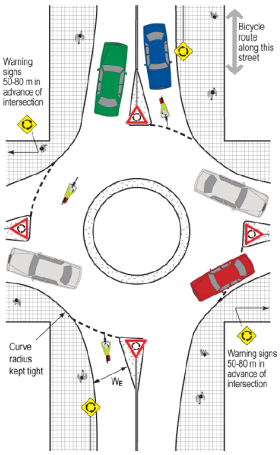
(Source: Austroads)

Consideration for Cyclists

Despite the increased safety performance of roundabouts for motor vehicles, cyclist crash rates are typically higher at roundabouts than at other intersection types. The most common cyclist crash at a roundabout involves a cyclist being struck by an entering driver who failed to see the cyclist.

Cyclist safety issues can be mitigated by controlling the speeds of motor vehicles at the roundabout. Vehicle entry and exit speeds can be reduced by narrowing the road width and increasing the deflection, or shift in vehicle alignment as it approaches the roundabout. At multi-lane roundabouts it is considered best practice to provide cyclists an off-road alternative such as a shared path with suitable crossing facilities.

Cycle lanes should terminate prior to the roundabout, they should not be used within a roundabout as they have found to result in poor safety outcomes. Cyclists are encouraged to share the lane.



(Source: Austroads)

Summary

Safety – Good for motor vehicles, can be poor for cyclists and pedestrians

Traffic – Roundabouts work best where the approaches have similar volumes

Cost – Medium - high depending on complexity and space requirements

Additional Resources:

Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings
NZ Transport Agency Traffic Control Devices Manual
NZ Transport Agency Cycle Network Guidance
NZ Transport Agency Pedestrian Planning and Design Guide
NZ Transport Agency High Risk Intersections Guide
ARNDT Roundabout Safety Analysis Software Program, Queensland Department of Transport