



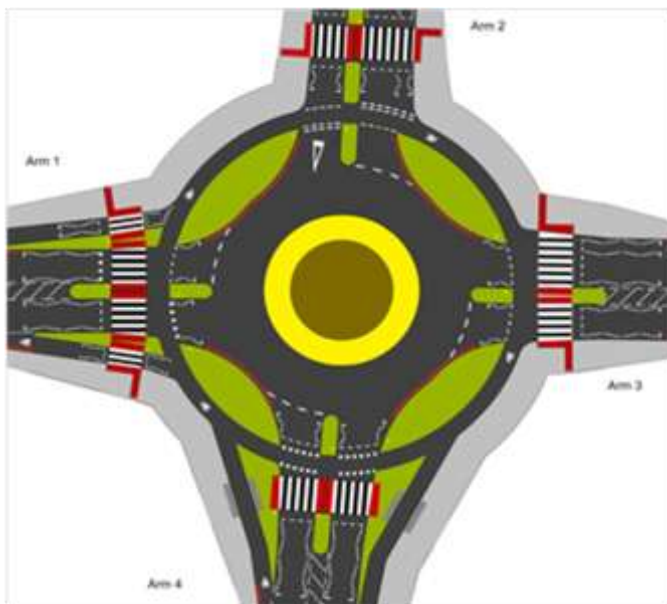
## Off-street trials of the safety implications of a Dutch-style roundabout with orbital priority cycle track

### Background

As part of a major programme of off-street trials of innovative cycling infrastructure, Transport for London (TfL) commissioned TRL to investigate the safety implications of a 'Dutch style' roundabout with an orbital cycle track, conducted at an off-street build facility at TRL. The trials were part of a wider programme of off-street trials of innovative cycling infrastructure commissioned by TfL to provide evidence to inform the implementation of the Mayor's Vision for Cycling (GLA, 2013). Because roundabouts are perceived by many cyclists as presenting a high risk, they are among the types of infrastructure that are likely to deter people from cycling. TfL were interested in exploring the potential for a roundabout that all types of cyclist would feel comfortable using, and hence commissioned TRL to undertake these trials.

The trials were designed to research the safety implications for cyclists. While it also involved other vulnerable road users like pedestrians as trial participants, the safety implications for these groups were not the focus of the research.

### Design



The roundabout layout used for the trials is based upon one of several types of roundabouts that can be found in the Netherlands. It draws upon the CROW (Netherlands) cycling infrastructure design guidance, and uses 'continental geometry' (short turning radii to reduce speeds and a single circulating vehicle lane). It has a kerb-segregated cycle track at carriageway level, orbiting the roundabout, with priority for cyclists across the entry and exit lanes. Several different entry/exit arm treatments were tested.

The segregated cycle track is used to keep cyclists away from circulating vehicular traffic. While this forms part of the system of segregated cycle tracks commonly used in the Netherlands, it is also used at roundabouts in urban environments where cyclists typically share roads with other traffic.

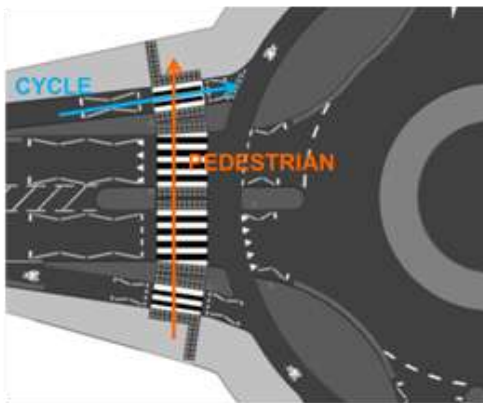


## Trials

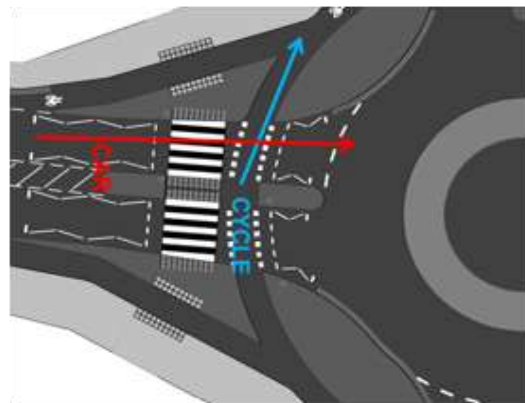
A series of trials sought to establish the ways in which cyclists, pedestrians and car drivers understood, interpreted and used this particular type of 'Dutch style' roundabout, so that its safety impacts could be assessed. This research will therefore provide evidence as to users' comprehension of priorities and if regulatory changes will be needed to implement this infrastructure in the UK.

## Findings

- In general road users of all types found the roundabout easy to use, and perceived it to be safe, although there was some concern expressed by participants about the lack of understanding about priorities.
- There was a near-universal acceptance that cyclists would enjoy safety benefits from roundabout designs such as the one trialled, mainly as a result of segregation.
- Around half of participants thought pedestrians would benefit, and around half thought that drivers would benefit.
- The geometry used in Arm 1 (and possibly Arm 4) should be the priorities for on-road trialling, where road space is available, given their generally better performance in both the measured priority violations and users' perceived safety and preference in the off road trials.



Arm 1



Arm 4

- Arms 2 and 3 (particularly the entrance geometry of both and the Arm 2 exit) should not be used for on-road trials without considerable redesign, although such an approach may need further consideration where available land precludes the use of those on Arm 1 and 4.
- There was some confusion relating to the priority at the point in which cyclists re-joined the carriageway, and road users mentioned that education would be useful.
- Cyclists tended to prefer the orbital lane in heavy traffic, although some experienced cyclists were concerned about the lack of overtaking opportunity.
- Large vehicles may have difficulty viewing cyclists circulating and on the exit, and whilst this is similar for countries which use similar roundabouts, very little research material was found on this matter. Tighter entries to the orbital cycle lane, and layouts which exit directly in to traffic were not liked by cyclists.

## Further Information

TfL - Better Junctions for Cyclists [www.tfl.gov.uk/betterjunctions](http://www.tfl.gov.uk/betterjunctions)

TRL - Safer Cycling Innovations [www.trl.co.uk/cyclinginnovationtrials/](http://www.trl.co.uk/cyclinginnovationtrials/)

See TRL Report PPR751 for more detail.