Segregated cycle lanes and tracks at priority junctions

Background

As part of a major programme of off-street trials of innovative cycling infrastructure, Transport for London (TfL) commissioned TRL to investigate options for segregated cycle tracks at priority side-road junctions. As there has to be a break in segregation to allow vehicles to cross, consideration has to be given to how cyclists are taken past the side road safely and without loss of priority.

A series of four trials was conducted at TRL in which a kerb-segregated cycle track was terminated at different distances from a side road junction, with the cycle lane continuing past the side-road delineated with road markings and coloured surfacing. Three trials took place on TRL's closed road network, and one in TRL's DigiCar driving simulator. The trials variously involved members of the public driving or riding past the test junctions.

Current practice

A review of practices in the UK and elsewhere was undertaken. Current UK guidance recommends that where an off-carriageway cycle track is returned to the carriageway to give cyclists priority past side-roads they should be re-introduced at least 20m before the junction, so as to establish their presence in the traffic. Similar approaches also appear in overseas guidance. However, an alternative approach is to continue the segregation right up to the junction and use very tight geometry (including raised crossings) to keep turning speeds down and encourage vehicles to cross the cycle lane at close to 90 degrees.

However, no specific research was identified into the basis for these approaches. It is important to note that some countries with high levels of urban cycling, such as Denmark and the Netherlands, legally require turning traffic to give way to cyclists and pedestrians on their nearside.

Raised cycle track crossing side-road, Brighton

Approach to the junction

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Design Objectives

The design objectives for the trial were to answer to key questions:

- What set-back distance minimises the risk of conflict between all road users?
- What set-back distance is the most appealing and preferred by the different road users?

The reports focussed on four key areas: Speed, In-lane position, Stopping positions, and Qualitative responses.

Findings

The video observations for the three test track trials all consistently showed that the segregation set-back distance had little impact on car drivers' speed and turning path, until it was within 5m of the junction. Shorter distances necessitated left-turning vehicles to slow. Drivers slowed more when a cyclist was present than without, and at the 5m set-back distance gave cyclists more lateral space.

Drivers and cyclists were split in opinion regarding preference, with drivers tending to favour maximising the extent of segregation on the approach to the junctions, whereas cyclists were divided in preferences for short and long set-back distances (to allow themselves to position themselves in the road after the end of the segregation).

Conclusions of study

The findings from the off-street trials support the two distinct strategies previously described:

- Bring segregation very close to the turning (<5m), sufficient to reduce the turning radius and so reduce turning speeds and position turning vehicles at right angles to the path of cyclists. This is best suited to lower speed roads with little space.
- End the segregation at least 20 m from the junction, giving cyclists sufficient space to re-introduce themselves into the traffic flow and for drivers to adapt to their presence. This is better suited to higher traffic speed roads.
- Avoid distances between 5m and 20m as this constrains cyclists but does not have a significant reduction effect on the speed of turning motor vehicles. Longer set-back distances may be necessary where cyclists need to turn right.

Triangular markings

Simulator trial view

Further Information

TfL - Better Junctions for Cyclists
www.tfl.gov.uk/ betterjunctions
TRL - Safer Cycling Innovations
www.trl.co.uk/cyclinginnovationtrials/

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