



Fully segregated signalised junctions (Dutch Style)

Background

Transport for London (TfL) commissioned TRL to research a wide variety of innovative cycle signals and layouts to gain a better understanding of the potential benefits that could be expected if these facilities were to be implemented on the highway.

As well as testing new and innovative infrastructure this project focussed on a range of different junction design measures seen elsewhere in the world. This document summarises the study carried out that looked at whether the UK road network and current road user attitudes might work with a Dutch style signalised junction. This study was undertaken as a literature review only, therefore did not involve an off street trial. Dutch style is an often over-used term when discussing cycle infrastructure design, so to avoid confusion this junction is referred to as a fully segregated signalised junction. The style of signalised junction is also used in other countries, where cyclists are physically segregated from motorised traffic.

Design Characteristics

Segregation

An inherent part of the fully segregated signalised junction is that cyclists are fully segregated on the lead up to the junction and on the exit. This physical segregation can take many different forms, these variations have been studied separately in a different part of this research study (segregation set-back trials). The literature review discussed the positives that this full segregation brings as well as the drawbacks, and the interaction with pedestrians.

Corner islands and radius of turn

An important part of the junction design is that of the corner island. This island is positioned such that it can be used to protect cyclists turning left from vehicles making this same movement. The positioning of this island can make the radius of the turn smaller thus slowing traffic down as it makes the turn. The corner island also has the potential to be used as a pedestrian waiting area to discourage the pedestrians from waiting in the cycle lane and to prevent pedestrians having to cross two separate flows of traffic in one movement.



Fully Segregated Signalised Junction -
concept



Fully Segregated Signalised Junction in Denmark

Stop line location

The stop line for the cyclists in this style of junction is often in advance of the traffic stop line. This is a similar principle as is used in the UK with the Advanced Stop Line for cyclists.

Road markings

In the Netherlands, two different types of road markings are used to alert the drivers to the presence of potential hazards. Neither of these markings are widely used on the UK roads currently, however road users' interpretation of these markings has been studied as a separate part of this project.

Intervisibility between road users

With the reduced traffic speed, and with the carefully designed layout of the junction, different user groups tend to have better visibility of one another. The corner islands separate cyclists from turning vehicles, and where these movements run concurrently, the interaction occurs at 90 degrees.

Traffic signal timings

Through this literature review a number of key differences have been noted between how traffic signals are prioritised in the UK and how they are calculated in the Netherlands. There the junction timings are based around the waiting times for cyclists and the likelihood of the cyclists having to stop. This technique ensures that the junctions are not only safe for cyclists but also encourage cycling.

Conclusions of study

The literature gave a wealth of information about how this style of junction is designed and highlighted the importance of these characteristics in improving cycling on the network. There are however some unknowns that would require greater study before an implementation is possible on site. More design work is needed to understand the best way to incorporate the standard pedestrian crossing design into this junction design and ensure its usability by all pedestrian groups.

It is also felt that this style of junction has the most powerful application where it is installed as a series of junctions so that cyclists and drivers can get used to this form of junction layout and segregated facility. This would require a stretch of road that has sufficient space for the segregation between the junctions. The impact of this is that both road space and signal timing priority needs to be shifted in favour of the cyclist.

Further Information

TfL - Better Junctions for Cyclists

www.tfl.gov.uk/betterjunctions

TRL - Safer Cycling Innovations

<http://www.trl.co.uk/cyclinginnovationtrials/>