

# Advanced stop lines for cyclists

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## Purpose

This leaflet summarises the findings of studies to monitor trial installations of Advanced Stop Lines for cyclists (ASLs); provides basic design details for two different layouts; and suggests possible further developments.



*Barmby Gate, Newark*

## Introduction

Since the first ASL was introduced in Oxford 1986, a further three sites, namely Newark, Bristol and York, have been installed as part of the Department of Transport's (DOT) investigation into the performance of this facility. Although not forming part of the DOT trials, similar ASLs have also been provided in Cambridge and Newcastle.

In addition to these sites Avon County Council have developed a simplified form of ASL which has been installed extensively throughout Bristol. Other authorities have also tried this layout, examples being Manchester and Cambridge.

The Department, through the Transport Research Laboratory, has monitored the performance of the initial trial sites and some of the simplified sites.

## Authorisation

Signs authorisations that are required are mentioned at appropriate points in the following text. The procedures to follow are outlined in Traffic Advisory Leaflet 2/93. Before seeking any authorisation it is essential that the local Police understand and agree to the proposed arrangement.

## The Original Layout

This has been well documented in Traffic Advisory Leaflets, 10/86 (Oxford), 3/89 (Newark), and 6/91 (Bristol). All these layouts consist of 5m deep reservoir and a mandatory cycle lane. 1.5m should generally be regarded as the minimum width for the cycle lane, though in Oxford the lane was only 1.2m wide.

At the first stop line bounding the reservoir there is a signal head incorporating a green cycle aspect. **Currently the use of this cycle aspect needs special authorisation.** At the second stop line, which cyclists must obey, is a second signal head. This is accompanied by the informative sign, **which requires special authorisation.** "CYCLES WHEN RED LIGHT SHOWS WAIT HERE".

A sign to Diagram 812.5 should be sited in advance of the start of the mandatory cycle lane. This is accompanied by an additional sign "MOTOR VEHICLES WHEN RED LIGHT SHOWS WAIT AT FIRST SIGNAL", and **this sign also requires special authorisation.** At the start of the cycle lane a sign to Diagram 654.1 is used to indicate that the lane is for cyclists only.

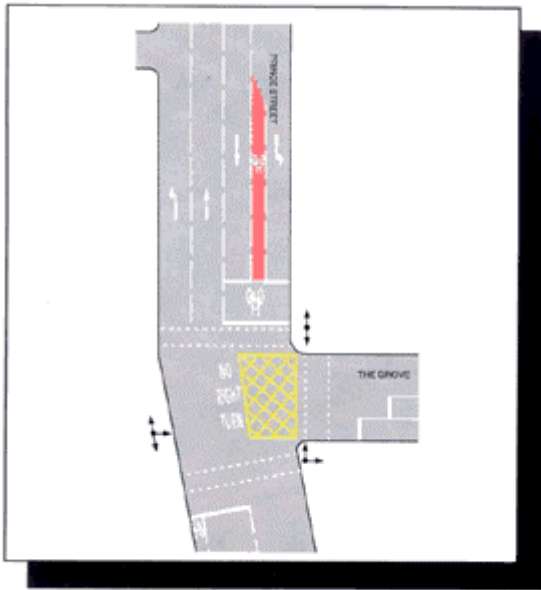
In York the original layout was modified slightly by the use of an advisory cycle lane. This was because it was necessary to maintain two traffic lanes on the approach to the junction, and the road width was insufficient to provide a mandatory cycle lane. The advisory lane works reasonably well, but with some encroachment into it. When a cycle lane is blocked the advantage of the reservoir for cyclists is largely lost. The length of cycle lane on the approach will vary according to the particular circumstances of individual sites but should generally be as long as the longest queue of traffic when the signal is red.

Research into the original layouts showed that there was some encroachment into the reservoir by motor vehicles. There was no evidence to suggest that cyclists passed the red signal because of misinterpretation of the green cycle symbol on the first signal head. In fact the number of cyclists passing the red light was no worse than at a conventional signalled junction. Although not statistically significant, measurements at the York site showed a slight increase in the saturation flow.

## Layout Variations

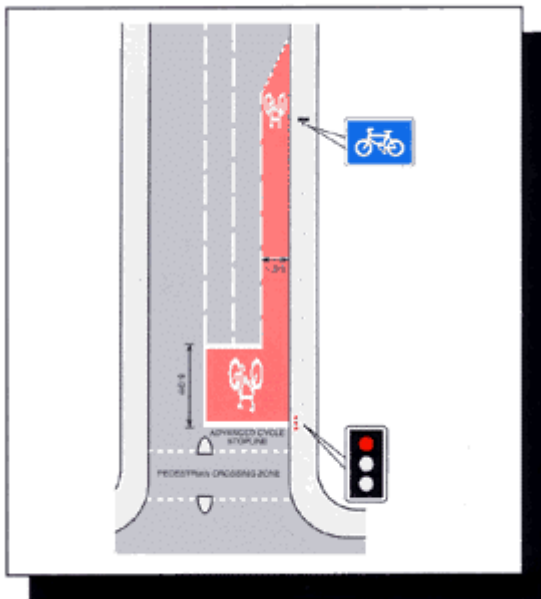
### Layout of ASL on Prince Street, Bristol

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*Layout of ASL on Prince Street, Bristol*

### Schematic layout of Avon Variation



*Schematic layout of Avon Variation*

The layout developed by Avon County Council has only one signal head located in the same position as for a standard junction layout.

The reservoir has a depth of 5m, like the original layout. Cambridgeshire County Council reduced the depth to some 3m, but have reverted to 5m, as cyclists had been inhibited from using the reservoir by the proximity of vehicles behind them. The reservoir incorporates a cycle symbol to Diagram 1057 of the Traffic Signs Regulations and General Directions; **in this location the symbol requires special authorisation**. The reservoir is uncoloured. In Manchester a variation has been tried where the reservoir is coloured in a bright contrasting green.

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An advisory cycle lane is used on the approach, which is generally about 1.5m wide but of varying length at different junctions, to accord with the circumstances. At most sites the cycle lane is coloured red to contrast with the adjacent carriageway. In Manchester a mandatory cycle lane was used, coloured green to match the reservoirs.

No additional advance warning signs are provided. Study of these layouts has not shown any safety problems.

The variation cycle lanes and reservoirs were used satisfactorily by most cyclists. Encroachment of the reservoir and advisory cycle lanes by motorists was generally greater than with the original design. However, the mandatory cycle lane on the approach in Manchester was observed more fully by motorists than the advisory lane used at the other variation sites: the reservoir of the Manchester scheme was encroached upon to a lesser degree even than the original sites. This was almost certainly due to the brightly coloured reservoir.

### **Where to use ?**

A full analysis of all junctions where ASLs are proposed should be carried out before a final decision is made. ASLs will not necessarily be of benefit to cyclists at all signal controlled junctions. Where right turning cyclists predominate, a careful study of the signal timings and vehicle flows (including cycle flows) is necessary. On minor approach arms to signalled junctions with low vehicle flows, an ASL may be of doubtful value.

ASLs have been used successfully at sites with motor vehicle flows up to 1000 vehicles per hour, and with two lane approaches. In Bristol they have been used on the approach to a signalised roundabout. Success will depend on cars not blocking the cycle lane or encroaching on the reservoir, and on signal timings which ensure that cyclists are not frequently stopped.

### **Which one ?**

It is for the local highway authority in conjunction with the local police force to determine the layout which is most appropriate for a particular location, and to seek the necessary signs authorisations from DOT. The original layout is clear in its explanation to all road users of the particular action to take. Where ASLs are being introduced in a town for the first time there may be some advantage in using this layout. The mandatory cycle lane recommended in the original layout is more likely to stop encroachment by motor vehicles. On the other hand, the Avon variation is considerably cheaper, allowing more sites to be installed in any financial year. It is also easier to adjust, should this be required. To reduce encroachment the sign "MOTOR VEHICLES WHEN RED LIGHT SHOWS WAIT AT FIRST STOP LINE" might be helpful; **this would require special authorisation.**

Both layouts would benefit from a distinctively coloured cycle lane approach and reservoir, used with the cycle symbol in the reservoir - **which in this location requires special authorisation.**

Special authorisation for the various traffic signs mentioned will be required for some time, as these have yet to be included in the Traffic Signs Regulations and General Directions.

### **Further Development**

ASLs can significantly improve safety for cyclists at signal controlled junctions. However, there is a potential problem of cyclists travelling in a cycle lane conflicting with vehicles turning left at the junction. Avon County Council have positioned a cycle lane centrally at one site and this may help to overcome the problem.

A better understanding is needed of signal timings when an advanced stop line is proposed. A short signal cycle which would benefit cyclists might create disbenefits for motorists, particularly when a large number of cyclists turn right. The aim would be to determine optimum timings for a variety of conditions.

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Where there is a long green phase cyclists turning right would possibly be better placed on the offside. If they used a nearside cycle lane they could find themselves at risk unless they waited for the signal to change to red. For this situation it might be better to have an off side cycle lane instead of or in addition to a near side one.

Partial reservoirs, not covering the full width of the approach lanes, might also have a useful role to play. This measure might be advantageous when more than one traffic lane turns right.

### **Enquiries**

The Traffic Advisory Unit (TAU) is a multi-disciplinary group working within the Traffic Policy Division in Driver Information the Department of Transport. The TAU seeks to promote the most effective traffic management and parking techniques for the benefit, safety and convenience of all road users.

TAU sponsors a wide range of research into traffic management issues, much of it undertaken by the Transport Research Laboratory.

Enquiries, and requests for unpriced TAU publications to:

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