Department for Transport

Traffic Advisory Leaflet 1/97
February 1997

Cyclists at road narrowings

Introduction

Traffic calmed streets can offer a more attractive environment for cycling, by reducing motor vehicles speeds to a level more compatible with the speed of cyclists. If schemes are designed with the needs of cyclists in mind, they can be a valuable component of measures to encourage more cycling. Cyclists have expressed concerns about the design of some traffic calming features, particularly those which involve a narrowing of the carriageway. A prevalent feeling is of being "squeezed" by motor vehicles overtaking within the narrowing, or being pressured by vehicles following close behind.

This leaflet provides design advice based on research into these issues undertaken by the Transport Research Laboratory (TRL), on behalf of the Driver Information and Traffic Management Division of the Department of Transport. The results are described fully in TRL Report 241. Additionally, "Cycle-Friendly Infrastructure: Guidelines for Planning and Design" gives detailed advice on how cyclists can be accommodated at a range of traffic calming features.

Summary

There was no increase in cycle accidents following the introduction of the schemes of which the narrowings studied formed part. However, cyclists did feel threatened by the proximity of motor vehicles at the narrowings, in particular by the feeling of being "squeezed" at the point at which the carriageway begins to be narrowed. Most drivers were prepared to overtake cyclists within or close to the narrowing, often passing closer to cyclists than they would do in the absence of the feature.

Overall, cyclists valued the improved behaviour of drivers and slower vehicle speeds resulting from the traffic calming schemes. The provision of specific cycle facilities was also appreciated: where provided, they contributed to an overall feeling of safety at the narrowing. Cycle bypasses, offering an alternative for cyclists away from the narrowing, were especially liked. These were more likely to be used by cyclists where they offered little deviation from the route followed by the all-vehicle lane, were unobstructed, of adequate width and offered easy access back into the all-vehicle lane. The research stressed the importance of careful attention to the detailed design of features and consideration of their maintenance implications.

Method

15 narrowings in 5 towns were filmed, for approximately 4 hours each. The period usually included the morning or afternoon peak hour. Motor vehicles and cyclists were filmed approaching, travelling through, and leaving the narrowing. Data for more than 2,500 cyclists was analysed from the 15 sites.

The sites studied included the following types of narrowing:

Central islands for the purposes of this study this comprised islands in the carriageway, with or without pedestrian crossing facilities

Pinchpoints build outs constructed opposite each other, on both sides of the carriageway

Chicanes build outs staggered on alternate sides of the carriageway

Some narrowings combined central island and pinchpoint features. In a few cases, the wider schemes of which the narrowings formed part also included other types of traffic calming feature such as road humps.

Some narrowings included no specific provision for cyclists. Where identifiable features to assist cyclists were included they comprised:

Cycle lanes marked within the carriageway; either mandatory or advisory, sometimes on the outside of parking bays

Cycle bypasses either within the carriageway but segregated from the all-vehicle lane, or a short section of cycle track away from carriageway

Cycle tracks away from the carriageway bypassing a number of narrowings, or offering a route free from motor vehicles alongside a busy main road

Interviews with cyclists were carried out at three of the urban sites. These were located in different traffic environments and had differing design characteristics.

Driver and Cyclist Interaction

Local Transport Note 2/95 recommends that where a pedestrian refuge island is introduced, a vehicle lane width of 4.5m should be maintained. Whilst this allows motor vehicles to pass cyclists safely, it has little or no speed controlling effect. If a narrowing is being introduced for traffic calming purposes a reduced width will normally be necessary.

The extent to which motorists will overtake cyclists within a narrowing will vary depending on the characteristics of the site. In the schemes studied, this was less sensitive to running lane widths than to other site specific characteristics. It should normally be anticipated that at least 70% of drivers will attempt to overtake a cyclist within or close to a 3.5m narrowing.

The interview surveys showed that the proximity of motor vehicles at a narrowing was of concern to cyclists, especially at the point where the carriageway begins to be narrowed.

Where the carriageway width is narrowed to a single lane by a pinch point motorists are more likely to wait behind cyclists.

Accidents

Accidents for all vehicles, and accidents involving cyclists, either fell or remained at the same level at each of the sites following the installation of the schemes. Overall at the sites studied, accidents involving cyclists fell from an average of 1.51 accidents per year to an average of 0.96 accidents per year. There was also a reduction in the proportion of serious and fatal accidents. These results were not statistically significant, and data on changes in motor vehicle and cycle flows were not available.

Cycle Lanes

Where cyclists are to continue to cycle through the reduced carriageway width, one option is to mark a cycle lane through the narrowing.

The research found that the addition of a cycle lane is unlikely to discourage a driver from overtaking a cyclist within a narrowing, if they perceive there is sufficient space to do so.

However, a cycle lane may still be of value. A cycle lane can serve to increase the separation width when cycles are being overtaken by motor vehicles. Cycle lanes through narrowings were cited as helpful by cyclists interviewed, and were valuable in reducing cyclists' anxieties. Cycle lanes may also aid speed reduction by giving the appearance to motorists of a reduced lane width.

If a cycle lane through a narrowing leaves an all vehicle running lane width of less than 3m, then it should be expected that at least 20% of motor vehicles will encroach into the cycle lane. This level of encroachment will increase where there is an increased proportion of lorries and buses in the traffic mix.

Cycle lanes should normally be at least 1.5m wide. If a cycle lane is being introduced only in the vicinity of the narrowing then over short lengths a slightly reduced width may be acceptable. However, an advisory lane of adequate width will usually be preferable to a narrower mandatory lane.

It is preferable to begin the cycle lane in advance of the point at which the carriageway begins to be narrowed.

If a cycle lane is being introduced along the whole of a route which includes narrowings, it is preferable not to locally reduce the width of the cycle lane in the vicinity of the narrowing. If this is cannot be avoided the cycle lane should be narrowed gradually, with the narrowing completed prior to the point at which the carriageway width starts to reduce.

Cycle Bypasses

Where site conditions permit, a cycle bypass at a narrowing will be preferable to a cycle lane.

Cycle bypasses provide maximum protection for cyclists. The interview surveys showed that cyclists valued cycle bypasses and felt safest where they were physically segregated from traffic at the narrowing.

Where a cycle bypass is provided, it will not be necessary to allow sufficient space for a motorist to pass a cyclist within the all-vehicle lane. A reduced running lane width can thus be accommodated, resulting in lower motor vehicle speeds. At the central island sites studied, where cycle bypasses were introduced the remaining lane width was 3m or below, and average speeds observed were at or below 25mph.

From the schemes studied, better use will be made of cycle bypasses where the following principles of good design are adhered to:

- deviation from the straight line is minimised
- the cyclist is guided towards the cycle bypass in a cycle lane, which begins in advance of the point at which the carriageway begins to be narrowed
- access to the bypass is kept clear of parked vehicles
- the bypass remains at the same level as the main carriageway, rather than rising to footway level for a short length
- cyclists have easy access back onto the main carriageway, preferably designed so that they are not required to give way on rejoining the main traffic flow
- a width of at least 1.5m is provided through the bypass (though over very short lengths a reduced width may be acceptable)

The research showed that where there was a series of narrowings along a route, a bypass in the form of a continuous cycle track was valuable and well used.

Summary of Design Principles

Cycle Facilities

- A cycle bypass should be the first option where a narrowing is introduced on a road subject to a speed limit of 30mph or more.
- If adequate width for a cycle bypass cannot be found, a cycle lane will be the next best solution on a road subject to a speed limit of 30mph or more.
- Where average speeds are below 20mph, cyclists and motorists should be able to comfortably share space. The maintenance of low vehicle speeds reduces the need for specific provision for cyclists.
- If space is available away from the carriageway, a cycle track is useful to bypass a series of narrowings.

Speed Control

- In 20mph zones, a narrowing will normally need to be 3.5m or less to be effective in controlling vehicle speeds.
- Narrowings of 3.5m or less should not be used on roads subject to a 40mph limit.

Maintenance

Maintenance requirements for cycle bypasses will need to be carefully considered from the outset. Cycle bypasses will not be swept by the passage of motor vehicles. Debris is therefore more likely to accumulate within them, reducing the effective width of the bypass and making it less attractive

and more hazardous for cyclists. Arrangements for regular sweeping will therefore need to be made. In some cases undergrowth and planting will need to be cut back. Care should also be taken that drainage is adequate. Drainage gullies contained within the kerbface are more cycle-friendly than those laid flush within the carriageway, particularly where traffic lanes are narrow. Reduced widths will have additional consequences for maintenance.

Location of Narrowings

Advice on the appropriate location of narrowings is given in Traffic Advisory Leaflet 7/95. This stresses the need to ensure that narrowings are not encountered at high speeds, and that drivers are able to modify their speeds as necessary prior to reaching the narrowing.

Further Information

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References

TRL Report 241: Cyclists at Road Narrowings
TRL Project Report 102: Horizontal Deflection (chicane) Trials at TRL

IHT/BA/CTC/DOT (1996): Cycle-Friendly Infrastructure: Guidelines for Planning and Design

Traffic Advisory Leaflet 7/93: Traffic Calming Regulations
Traffic Advisory Leaflet 11/94: Traffic Calming Regulations (Scotland)
Traffic Advisory Leaflet 9/94: Horizontal Deflections
Traffic Advisory Leaflet 7/95: Traffic Islands for Speed Control
Traffic Advisory Leaflet 8/97: Cycling Bibliography

Local Transport Note 2/95: The Design of Pedestrian Crossings

Highways Act 1980 (as amended by the Traffic Calming Act 1992)
Roads (Scotland) Act 1984 (as amended by the Traffic Calming Act 1992)
Highways (Traffic Calming) Regulations 1993 (SI 1993/1849)
Roads (Traffic Calming)(Scotland) Regulations 1994 (SI 1994/2488)
Traffic Signs Regulations and General Directions 1994 (SI 1994/1519)

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