A.10 Bus Lanes and Bus Stops

Key Principle

All bus lanes, including contraflow lanes, should be open to cyclists by default. Cyclists should only be prohibited from using them if it can be ***proven*** that it would be unsafe or not practicable to achieve this. New bus stops should be audited to ensure that they do not compromise cyclists' needs or safety.

Design Guidance

Background

Bus lanes are often located on key radial roads and provide cyclists with a direct and barrier free route into town centres. They are generally popular with cyclists and avoid the difficulties associated with parallel shared footways. Cyclists particularly value the perceived safety and reduced journey times they afford. Bus lanes are likely to form an important part of the overall cycle network and should be publicised as such.

With-flow bus lanes are open to use by cyclists by default. If a highway authority wishes to prohibit cyclists from using a with-flow bus lane, special authorisation is required because the prescribed sign for bus lanes in TSRGD does not include a variant which excludes the cycle symbol.

Contraflow bus lanes should also be open to cyclists by default. Cyclists should only be prohibited from using them if it would be unsafe or impracticable to do otherwise.

Bus and cyclist interaction

Major road bus lane on A4, Reading

Picture: Patrick Lingwood ERCDT

TRL Research indicates that bus lanes are very safe for cyclists. Of all the collisions between buses and cyclists where cyclists are injured, less than 5% occur in bus lanes. The greatest threat to cyclists using bus lanes comes from cars, mostly at junctions. These account for around 85% of cyclist injuries in bus lanes.

The same study found that even with high flows of buses and cyclists (around 100 buses and 100 cyclists per hour) there was minimal delay to buses and only a small percentage of cyclists were delayed. The primary factor affecting delay is the width of the bus lane. However, even with 3m wide lanes, most cases of delay involve buses slowing down behind a cyclist before stopping at a bus stop. This is unlikely to have much effect on overall bus punctuality. Most cyclists try to avoid delaying buses, either by cycling faster or by allowing buses to pass.

Bus lane widths

The ease with which a bus can overtake a cyclist depends on the width of the bus lane, the width of the adjoining general purpose lane, and the volume and speed of general purpose traffic.

A bus lane width of 4.5m will enable buses to safely and conveniently pass cyclists without having to partially leave the lane. The minimum preferred width is 4m since below that width buses are likely to have to leave the lane when overtaking cyclists. As long as there is room in the adjoining lane and sufficient opportunity for buses to encroach upon it, this should not cause any problems. Widths between 3m and 4m should be avoided if the bus lane is physically bounded on both sides. The absolute minimum is 3m but lanes should not be widened at the expense of cyclists travelling in the opposite direction who might feel threatened by traffic unable to pass them.

3m wide bus lane, York

Picture: Sustrans

Where a bus lane width of 4.5m is implemented, there is room to include an advisory cycle lane within the bus lane. Research has found that a cycle lane within the bus lane was generally popular with cyclists. However, such a design may lead to conflict at bus stops and research has shown that some cyclists felt that bus drivers did not expect them to stray from the cycle lane. Marking a cycle lane within a bus lane requires authorisation from DfT.

Bus lanes 3m wide have been successfully implemented in locations with both high cycle and bus flows and cyclists considered them to be as safe to use as bus lanes of greater width.

Other design features

Contraflow bus lanes can be of even greater value to cyclists than conventional bus lanes and it is recommended that cyclists be permitted to use them wherever practicable. Contraflow bus lanes should be as wide as possible to enable buses and cycles to pass each other without having to leave the lane and encroach upon

the lane used by oncoming traffic. However, for short stretches, or where the numbers of buses or cyclists are low or there is little traffic in the opposite direction, 3m lanes can be acceptable.

3m contraflow bus lane, Newport, Isle of Wight

Picture: Patrick Lingwood ERCDT

Any specific concerns identified during a safety audit should be balanced against the likely hazards faced by cyclists forced to use alternative routes if cycling is not allowed in a contraflow bus lane. The safety audit should also take into account the fact that if no contraflow facility is provided a certain proportion of cyclists will inevitably travel in the contraflow direction illegally, and at increased risk due to the lack of formal provision.

The risk to cyclists over lengths of contraflow bus lanes between junctions is relatively low. Most accidents involving cyclists using these lanes occur at the start and end points and at junctions. Particular care is therefore required when designing these elements, especially where it needs to be made clear to motorists that they can expect to encounter cyclists using the lanes as well as buses.

Bus lanes usually end just before and then restart immediately after junctions with side roads. Where this occurs, there may be some advantage in providing a 1.5m wide advisory cycle lane with coloured surfacing across the junction to bridge the gap.

Hours of operation

Generally, safety and convenience for cyclists improves when bus lanes operate for 24 hours per day. Enforcement of parking during off-peak periods is essential as cars parked in bus lanes are considered a problem by most cyclists.

In some circumstances peak hour only bus lanes may be required, such as where they run through a local shopping centre with a need for parking and loading. Where this occurs, a width of over 3.5m will allow cyclists to overtake parked vehicles without having to leave the lane.

Bus gates and bus only links

Some bus lanes lead to bus gates or other locations where general traffic is excluded. In both instances cyclists should be able to continue to use the facilities if practicable. Bus gates may need cycle by-passes to allow this.

Bus gate with cycle by-pass, Cambridge

Picture: Rob Marshall ERCDT

Where unauthorised traffic is prohibited from entering by bus-only activated traffic signals, it may also be necessary to provide a means for detecting cyclists. A design which allows cyclists to bypass the signals altogether may be more appropriate.

Bus stops

A bus stop within the general carriageway means that cyclists will occasionally need to negotiate their way around a stationary bus. On a wide road with little traffic, this may be merely inconvenient. On a busy road where width is limited, the manoeuvre could be hazardous to the point that cyclists may decide it is better to wait for the bus to pull away rather than mix with heavy traffic to get past it.

Manual for Streets:

6.5.10 First and foremost, the siting of bus stops should be based on trying to ensure they can be easily accessed on foot. Their precise location will depend on other issues, such as the need to avoid noise nuisance, visibility requirements, and the convenience of pedestrians and cyclists.

Bus stops are indicated by markings to diagram 1025.1. Cycle lanes cannot be marked within this area. Where a cycle lane is interrupted by a bus stop there is no need to formally end the cycle lane then re-start it with a Diagram 1009 taper after the bus stop. The cycle lane is simply discontinued over the length of the bus stop markings (see picture below).

Headington Road, Oxford

Picture: Patrick Lingwood
ERCDT

Where coloured surfacing is used in the cycle lane, the colour alone may be continued through the bus stop markings. This can help alert bus drivers to the possible presence of cyclists.

Where the stop is located within an all-purpose lane or a bus lane less than 3.5m wide, cyclists will need to leave the lane to pass a stopped bus. The flow and speed of general traffic will influence whether this proves hazardous. If the road is a single carriageway two-lane road, there is little that can be done to mitigate this. However, if the road is a single carriageway four-lane road, there may be scope for localised widening of the nearside lane in the vicinity of the bus stop at the expense of the offside one.

Where there is problem with bus stops being obstructed by unauthorised parking, bus boarders are sometimes used. These are created by extending the footway some distance into the carriageway over the length of the stop. They discourage parking at stops but they can exacerbate conditions for cyclists as a result of the stopped bus taking up space which they might have used to pass stationary buses. A wide nearside lane can mitigate this to some extent. Where space permits, a different approach might be to take cyclists behind the stop by using a short section of cycle track. However, this needs careful design if conflict between pedestrians and cyclists is to be avoided.

Central refuges are sometimes provided near bus stops to assist pedestrians crossing the road or to simply calm traffic. Care should be taken to ensure that such features do not create hazards for cyclists by creating pinch points.

Cycle lanes continued outside of bus stop and parking, Taunton

Picture: Alex Sully ERCDT

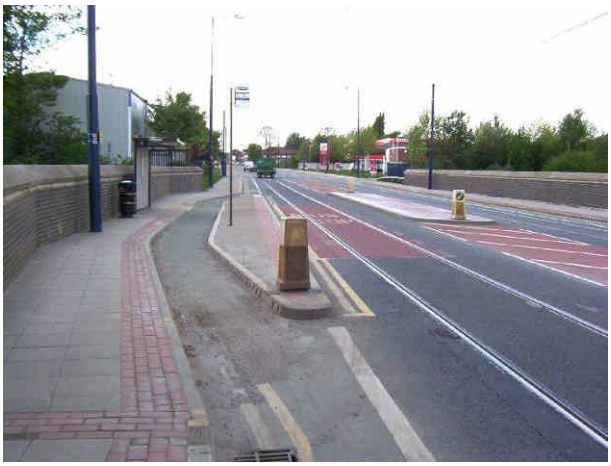
From a cyclist's perspective, the preferred arrangement is one where the bus stop is located partially or fully off the carriageway. This can be effected by putting the stop in a half-width (1.5m) bus bay, a full width (3m wide) bus bay, or by segregating the stop from the road altogether through the use of short slip roads. This arrangement may not find favour with bus operating companies in view of the additional delay to services which results from the need to wait to re-join the traffic stream.

Where a half-width bus bay is provided and bus and cycle flows are low, the cycle lane can stop and re-start as it might do at a conventional bus stop. Alternatively, where speeds are 30 mph or less and HGV flows low, an advisory cycle lane can be provided along the outside of the bay. The cycle lane should be a minimum of 1.5m wide with no sharp changes in direction for cyclists. Designers should aim for a cycle lane alignment which has a 20mph design speed.

Where traffic speeds are high or there are large volumes of HGVs, it may be desirable to create a bus-boarding island and take the cycle lane between the island and the footway. The advantage of this arrangement is that cyclists do not need to pass a stationary bus on its offside, thus avoiding conflict with other traffic. However, the arrangement may give rise to pedestrian-cyclist conflict and is therefore unlikely to be appropriate for busy bus stops or on downhill gradients where cycle speeds may be relatively high.

The cycle lane should have a minimum width of 1.5m between kerbs, partly to ensure it can accommodate a mechanised sweeper. The bus-boarding island should be 2.5m wide (minimum width 1.5m).

A flat topped hump can be installed in the cycle track bypass, to allow for easy pedestrian access to the bus boarder. The on/off ramps should have a 5% gradient (10% maximum). An alternative arrangement would be to keep the cycle lane at road level and use dropped kerbs to facilitate pedestrian access as shown below.



Nearside cycle gap and bus/tram - boarding island

Picture: Steve Essex ERCDT

Note challenges of resulting narrow footway and cycle lane plus build-up of debris in bypass and poorly sited gully

Where a footway has been converted to an adjacent-use footway and cycle track, the cycle track is usually positioned between the footway and the carriageway. If this arrangement is continued through a bus stop, there is a considerable potential for conflict between pedestrians and cyclists. Bus users may not look out for cyclists as they enter or leave a bus. Danish studies of bus passengers at bus stops next to cycle tracks show that almost all accidents at bus stops involve alighting passengers. Elderly bus users especially can be intimidated by passing cyclists. The reduction in available footway space may also mean that there is insufficient room to accommodate waiting passengers, a bus shelter and other pedestrians.

To avoid these problems, it is possible to reduce the likelihood of conflict by swapping over the footway and cycle track positions in the vicinity of the bus stop so that cyclists pass behind the bus stop shelter and waiting passengers - see below. However, on either side of the bus stop where the footway and track cross each other, this introduces two new conflict points (although it is possible that they would be much less problematic). These concerns (and others not associated with bus stops) show that it is better to keep cyclists on the carriageway if practicable.

Cycle track changing sides on approach to bus stop

Picture: Tim Pheby

Care should be taken to ensure that bus shelters, bus stop poles etc located by cycle tracks are visible to cyclists and do not become hazards.

Cycle parking at bus stops

In some locations, secure cycle parking located at bus stops, mainly on longer distance bus and coach routes, may lead to an increase in both cycle usage and bus patronage. It may also be useful to provide information about local cycle routes at the bus stop.

Manual for Streets:

6.5.12 …Consideration should be given to providing cycle parking at bus stops with significant catchment areas. Cycle parking should be designed and located so as not to create a hazard, or impede access for, disabled people.

References

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Cycling England Gallery pictorial examples

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CTC Benchmarking – Best practice case studies

Other references

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