1. Considerations at priority controlled side roads

While separated cycleways feel safer and have been proven to be safer between intersections and driveways, they are generally less safe at intersections and driveways, which are the locations where the risk is highest overall. It is crucial that this risk is mitigated through good design.

This interim guidance covers how to design a priority-controlled cycle crossing. This is based on the assumption that consideration has already been given to the form of control. Note that, in some locations it will be more appropriate to provide a signalised crossing. However decision regarding form of control may be an iterative process and the guidance relating to priority controlled crossings given in this interim guidance may be of use in this decision.

There are a number of factors that should be considered simultaneously when designing crossings for separated cycleways across side roads:

1.1 Possible crossing alignments at side streets

At intersections (and at major driveways that are formed like intersections), there are three options for horizontal alignment of separated cycleways or shared paths relative to the adjacent roadway. Note that some of the advice given here differs from that in Austroads Guide to Road Design part 4: intersections and crossings (2009).

1.1.1 Bent-in

Bending a cycleway in brings it closer to the adjacent traffic lane and therefore positions cyclists where they are most likely to be seen.

Radii used for the bends should be 30 m. The cycle facility should reach its bent-in alignment some distance prior to the side street; Austroads Guide to Road Design (section 9.6.3) recommends for this to be 30 m.

Bent-in layouts may either transition to a cycle lane across the side street (to ensure cycleway users do not have to give way to turning traffic) or involve continued separation up to the side street.

Transition to cycle lane to cross side street

When a cycleway is bent-in towards the adjacent traffic lane, there is the option of terminating the separation device and transitioning the facility to a cycle lane. In this case, the layout should be designed so that traffic crossing the cycleway gives way to cycleway users. The legal situation for this is clear, as the cycle lane is part of the ‘roadway’, and normal give way rules apply, i.e. turning traffic must give way to people riding in the cycle lane (see section 1.6.1).

A bent-in layout that transitions to a cycle lane is only appropriate for one-way cycleways with cycling in the with-flow direction.

The following figure illustrates a bent-in layout transitioning to a cycle lane to cross a side street.
Markings and the physical layout should communicate to turning motorists that they are expected to give way to people cycling in the cycle lane and ensure that this occurs at low speeds. If on-road parking is provided on the approach, parked vehicles should not obscure visibility of cyclists to motorists on the approach to a zone of potential conflict.

Green coloured surfacing and cycle logos should be used across the conflict point. Whilst the legal context requires the cycle facility to be ‘on the roadway’ before turning motorists are obliged to give way to people cycling, there is a balance to be achieved in terms of minimising the length of zone of potential conflict. For layouts similar to Figure 1, turning motorists may pull onto the cycle lane when approaching the intersection to reduce the disruption to following through traffic.

Figure 1: Bent-in cycleway layout (from Austroads Guide to Road Design part 4)

Note that the above figure, while from Austroads Guide to Road Design part 4 (2009) is also reproduced in the Cycling Aspects of Austroads Guide, which is freely available. Note also that Australian traffic control devices are used; whilst a similar layout may be adopted in New Zealand, signs and markings must conform to the specifications in the Traffic Control Devices Manual.
avoid this use of the cycle lane as a pseudo deceleration lane, flexiposts could be installed along the right side of the cycle lane. This would reduce the potential for conflict whilst still providing a layout where people in the cycle lane ride directly adjacent to motor traffic at carriageway level. As flexiposts physically separate general traffic, however, they may preclude the cycle lane from the definition of ‘roadway’. Therefore, if flexiposts are installed, they should be terminated at least 5 m from the intersection to ensure the layout complies with the intentions regarding the legal context.

Where an auxiliary left turn lane is involved, the point at which vehicles can cross the cycle lane should be restricted. If the auxiliary left turn lane is to the left of the cycle lane, vehicle movements should be restricted to entering at the beginning of the turn lane, as per Figure 2. Again, the legal context requires that the flexiposts be terminated 5 m from the side street.

Figure 2: Auxiliary left turn lane to left of cycle lane

An alternative to providing a separate left turn lane and cycle lane is a mixing lane, shared by cyclists heading straight ahead and motorists turning left. This requires the cycle lane to terminate and use of sharrows to indicate the intended positioning of cyclists. As all road users must comply with all road markings, left turn arrows cannot be marked in such a mixing lane; this would preclude people on bikes to legally proceed straight ahead. This is illustrated in Figure 3.
1.1.2 Straight

Keeping a separated cycleway in a straight alignment on the approach to a side street can accommodate crossing layouts where drivers give way to cycleway users, or where cycleway users give way to the side street traffic. This layout can be used for both one-way and two-way cycleways, and with modifications to the traffic control devices depending on which users are assigned priority (see section 1.4.3). The considerations discussed here may also apply to shared path crossings with straight alignments.

Figure 4 illustrates a two-way cycleway with a straight layout to cross a side street.
Note that the above figure, while from Austroads Guide to Road Design part 4 (2009) is also reproduced in the Cycling Aspects of Austroads Guide, which is freely available. Note also that Australian traffic control devices are used; whilst a similar layout may be adopted in New Zealand, signs and markings must conform to the specifications in the Traffic Control Devices Manual and should be in-line with the relevant sections in this guidance.

As discussed for the separated cycleways options tool (SCOT), where contra-flow cycling is involved, the importance of speed control is increased.

The busier the side street, the more operationally advantageous it is to provide a 6 m offset between the cycleway crossing and the main limit line, as is shown in Figure 4. This allows one car-length between the limit line and the cycleway crossing, so that it is possible for a vehicle to queue at the limit line without overlapping the crossing or obstructing cycleway users. (Subsequent vehicles in the queue should wait until there is space available downstream of the crossing before driving over it). It may be necessary to bend the cycleway out to provide this offset. A 6 m offset is not suitable for heavy vehicles so is not suitable in bus routes or where longer vehicles are common. In such cases a bent-in or bent-out design with a large offset is better.

If an offset is used and the cycleway has priority, two limit lines will be required on the side street – the first where drivers give way to cycleway traffic, and the second where they give way to main road traffic. Figure 5 shows an alternative design approach, where only a minimal offset is provided and the side street limit line is prior to the cycleway. This requires side street traffic to give way to both cycleway users and cross street traffic from the same location, and is possible because there is good visibility of both cycleway users and the cross street in this location.
Note that the transition between the cycleway and the crossing shown in Figure 5 has a drainage channel, which is an effective measure for reducing cycling speeds, but in this case may not be apparent to approaching cyclists. If it is necessary to slow cyclists, it is more appropriate to use a ramp, as described in section 1.6.1. Note also that Figure 5 shows a bollard without approach markings. While vertical elements can be useful in influencing motorists and people on bikes to travel at slower speeds, the use of central bollards on cycleways should be avoided where possible and, where they are necessary, the guidance regarding design, placement and additional markings of central bollards should be followed.

1.1.3 Bent–out

Bending a cycleway out gives an offset between the cycleway and the main road. This layout can be applied to one-way and two-way cycleways, and the considerations discussed here may also apply to shared path crossings with bent-out alignments. The following figure illustrates a two-way cycleway with a bent-out crossing alignment at a side street:
Figure 6: Bent–out cycle path layout (from Austroads Guide to Road Design part 4)

Note that the above figure, while from Austroads Guide to Road Design part 4 (2009) is also reproduced in the Cycling Aspects of Austroads Guide, which is freely available. Note also that Australian traffic control devices are used; whilst a similar layout may be adopted in New Zealand, signs and markings must conform to the specifications in the Traffic Control Devices Manual and should be in-line with the relevant sections in this guidance.

The offset should be determined by the largest size vehicle that is likely to cross here, with a minimum offset of 6 m (note that the appropriate offset as determined by this approach may differ from the specific range given in Figure 6). Bending out is particularly important when large vehicles cross the cycleway as drivers of large vehicles turning left from the cross road will only gain full vision of cycleway users once their vehicle is nearly perpendicular to the cycleway. This is illustrated in Figure 7, where the bus driver would have difficulty seeing users on the cycleway across the lane the bus is turning into.
Bends in the cycleway should have 30 m radii.

It is important to have clear intervisibility between the various road and cycleway users. This requires clear lines of sight (i.e. not restricted by trees, street furniture, etc.). Furthermore, where heavy vehicles are involved, and especially where it is intended that road traffic gives way to cycleway traffic, there should be a straight section of path on the approach side(s) of the crossing before the bend(s) in the path. If the bend in the path is too close to the crossing approaching cyclists will be positioned behind a driver of a vehicle waiting at the limit line, and may not be seen, especially for buses and trucks where the vehicle itself limits the driver’s field of vision. Choosing the right design vehicle, and ensuring that driver visibility from that vehicle is appropriate, is a critical design task.

Note that New Zealand guidance differs to Austroads which states that bent-out treatments are not suitable for shared paths due to legal problems (note that in most Australian states cyclists are not permitted to ride on pedestrian crossings under current road rules). Designers may interpret this guidance as pertaining to cycleways as well as shared paths. However, the New Zealand Traffic Control Devices Rule provides for use of a standard give way control in conjunction with a raised platform (see the sections on physical crossing treatments and road traffic gives way to cycleway on how to design these). Drivers generally give way to pedestrians at well-designed courtesy crossings and so cycleways designed with similar aesthetics (and the necessary traffic control devices).

1.2 Directional nature of cycleway

As is further explained under separated cycleways in the CNG planning section, there can be different cycling directions:

- One-way, in the direction of the adjacent traffic (i.e. with-flow)
- One-way, in the opposite direction of traffic in the nearest lane (i.e. contraflow)
- Two-way, i.e. involving both with-flow and contraflow cycling.

Contraflow facilities, i.e. those that are one-way in the opposite direction, or those that are two-way, especially require careful design due to the risks associated with motorists not expecting cyclists travelling in the contraflow direction. The separated cycleway options tool (SCOT) can assist with the decision whether to consider contraflow facilities along a given route.

It is not recommended to assign priority to cyclists on two-way cycleway crossings (or one-way contra-flow cycleway crossings) unless the crossing point is sufficiently offset from the intersection. That is, a bent-in crossing alignment should
not be used for two-way cycleways, rather a bent-out crossing or a straight crossing with a suitable offset could be considered. In this case, drivers are facing the crossing and the situation is more like a midblock than an intersection.

1.3 Gradient of cycleway

Gradient has a significant effect on the speed at which people are able to cycle. Figure 9 shows the average cyclist speed at different cycle facility gradients from Parkin and Rotheram (2010).

![Figure 9: Effect of gradient on cyclist speed](image)

The data given in Figure 9 are from Leeds, Britain and involve commuting cycle trips. Unpublished research in New Zealand of commuting cyclist speeds gave an average cycling speed similar to the average given by Parkin and Rotheram for a gradient of 0%, therefore it seems reasonable to use Figure 9 as a base reference. If the cyclist speed at a gradient of zero does not accord with that expected from the chosen target audience of a particular facility, these values in the figure above could be adjusted proportionately. For example, a high proportion of interested but concerned cyclists would reduce the average speed experienced on a facility, whilst a high proportion of long-distance commuters would increase the speed. Uphill gradients have relatively little effect on e-bike users.

It is well known that contraflow cyclists experience a higher crash rate. As the speed of contraflow cyclists (i.e. on a two-way cycleway, or a one-way contraflow cycleway) increases, it becomes less appropriate to assign priority to the cycleway.

1.4 Deciding who gives way to whom

A number of different factors can influence the decision whether general traffic gives way to cycleway users at a crossing, or cycleway users give way to general traffic.

1.4.1 In relation to geometry

The choice of whether the cycleway users or general traffic gives way is strongly inter-related with geometric factors such as the crossing alignment, directional nature and gradient.

It may be that a strategic decision has been made that the general traffic on the roadway should give way to the cycleway users, in which case this dictates the type of layout that is acceptable, as per the considerations outlined for crossing alignments. Conversely, the site geometry may govern the type of layout that can be accommodated, which in turn directs the priority to be assigned. As noted regarding the directional nature of the cycleway, two-way cycleways have particular constraints on the appropriateness of different layouts.

Furthermore, there may be geometric constraints that limit the available options. The amount of land available for cycleway and crossing construction may be limited due to property boundaries, buildings or natural features. Vertical features such as trees, street furniture, buildings or the gradient of the side road may limit sight lines and therefore preclude certain options.
1.4.2 Relative user volumes / hierarchies
When one user group is required to give way to another, the situation should feel somewhat “natural” to users within the context of their experience of the road.

In most cases where an existing street has a priority control (give way or stop) at an intersection and a cycleway crossing is added across this street, it will be appropriate that the side road traffic gives way to cycleway traffic. As drivers on the side road are already expecting to give way to the main road, it will feel natural to them to give way to the cycleway, which is parallel to the main road. This is appropriate where traffic volumes on the road where the crossing is located are up to 3,000 veh/day, and may work up to 5,000 veh/day; beyond this, the volume of motor vehicles is likely to be excessively disproportionate to the volume of cycleway users, and this it no longer feels “natural” for the former group to give way to the latter.

The relative hierarchies of the side road and the cycleway could also be compared. This may not be a straightforward exercise, depending on the degree of linkage between the cycle network and the road network classification systems. It should be noted that a significant level of capital works is required to install separated cycleways, which suggests that any cycle route involving this type of infrastructure is of high importance and therefore the road traffic should give way to the cycleway users. In the short term, a separated cycleway may extend over the short distance only, and user volumes can be expected to be low. In that case, it may be appropriate to impose give way control against cycleway users. In the longer term, as the network is implemented, the same facility may form part of a much longer route, with user volumes thus much higher. If further physical changes can be implemented (e.g. put the cycleway on a raised platform across the side street), the give way control could then be changed, with drivers giving way to users of the cycleway.

1.4.3 Public familiarity with cycle crossings
At the present time (i.e. in 2016 when this interim guidance was developed) cycle crossings of the forms discussed here are rare in New Zealand, and separated cycleways are only just starting to be a prominent facility type in the cycle network toolkit. Transport users, motorists and cyclists alike, are not yet familiar with priority crossings for cyclists.

The cycle networks currently being planned and developed are expected to influence significant increases in the number of people choosing to cycle. This will induce a ‘safety in numbers effect’, whereby the crash risk per person cycling reduces due to an increased public awareness of people cycling. However, some time may be required to achieve this critical mass of cyclists.

Furthermore, the legal context is somewhat complicated; rule changes are being investigated in 2016 and may be progressed in 2017.

Therefore, when assigning priority, Road Controlling Authorities may choose to err on the side of caution and, during this time of growth and familiarisation, require cycleway users to give way to road traffic at priority crossings. If such a staged approach is chosen, though, it must be recognised that road users will have become familiar with the intermix control. Therefore, a change of give way control needs to be supported by physical changes to the crossing point.

1.4.4 Speed environment
In situations where there are high volumes of motor vehicles travelling at high speeds without much opportunity for drivers to slow down, it is more appropriate that the crossing has an offset sufficient enough to allow vehicles to slow before arriving at the crossing. A slower approach speed is required in the situation where the road traffic gives way to the cycleway users at a crossing compared with cycleway users giving way (see physical crossing treatments). Therefore, if a sufficient offset cannot be achieved, it may be more appropriate to require the cycleway traffic to give way.

1.5 Physical crossing treatments
It is also important that the physical design influences users to travel at the intended speeds and supports the chosen give way designation.

To ensure that both motorists and people on bikes travel at appropriate speeds when approaching and travelling across a crossing point, speed reduction measures should be used on the approaches. Vertical elements are the most effective in reducing speeds and it is recommended that a raised platform should be used.

Where it is expected that drivers give way to cycleway users the platform should be designed so that motor vehicles must negotiate it at 20 km/h or lower. Where it is expected that cycleway users give way to road traffic, the speed of motor vehicles should still be considered; if motor vehicles are travelling too fast, it can be difficult for people on bikes to judge crossing opportunities appropriately and the consequences of crashes that do occur are more severe at higher impact speeds. Thus, even where the cycleway gives way, it is beneficial to highlight the conflict location and use speed-reduction treatments on the road as well, to achieve a suitable approach speed for motor vehicles.

It is also important to control the speed of people on bikes. The best method is to raise the cycleway across the side street, with ramps that can be seen in advance and obviously require slower negotiation speeds. It is important that these ramps are comfortable to ride over when travelling at the intended slow negotiation speed. Chicanes, central bollards, and path...
narrowings are not suitable treatments to slow people on bikes at road crossings. While drainage channels may have a slowing effect, they may be difficult for approaching cyclists to see.

Schepers (2013) found that even where road traffic is expected to give way to cycleway users, the cycle crash rate can increase if cyclists are able to approach the crossing point at speed. Therefore, these crossings should also involve ramps for cyclists.

As both give way scenarios involve a similar physical treatment (i.e. ramps for cyclists and motorists), other treatments should be employed to avoid ambiguity and give distinction between the two scenarios. Green surfacing should be painted across the cycle crossing in locations where the road traffic gives way to the cycleway users, but not in the situation where the cycleway users give way to the road traffic. Use of the appropriate traffic control devices will also emphasise the intended give way message.

1.6 Traffic Control Devices for indicating who gives way

1.6.1 Road traffic gives way to cycleway users

In the current legal context, traffic turning across a cycle lane is required to give way to cyclists. Therefore, there are no complications in terms of prioritising cyclists on a one-way cycleway that transitions to a cycle lane over turning traffic.

Where the cycleway separation continues right up to the side street (i.e. for bent-in cycleways that do not transition to a cycle lane, straight cycleways and bent-out cycleways) cycleway users are not legally considered to be on the 'roadway', and the legal situation is less clear. Technically, cycleway users ‘enter the roadway’ at the side street, and under the Road User Rule and common law, they would be required to give way to all traffic entering the intersection, even if that traffic is coming from a side road controlled by a give way sign. This is despite the general expectation that turning traffic should give way to cyclists travelling straight ahead.

Potential approach to resolve ambiguity on cycleway crossings

Note that the following material is awaiting official approval:

If it is intended that motor traffic give way to cycleway users, this ambiguity can be overcome by ensuring that each conflicting motor vehicle movement has a give way (or stop) sign with an appropriate supplementary plate to include cycleway users in the group that must be given way to. There are three main possibilities of supplementary plates:

a) For side road approaches to a crossing where traffic also gives way to main road traffic – use the supplementary plate “INCLUDING TO CYCLEWAY USERS”, as per Figure 10. This applies therefore to bent-in crossings or straight crossings where there is no (or minimal) offset between the crossing and the main road.

b) For approaches to a crossing that is offset from the main road – use the supplementary plate “TO CYCLEWAY USERS”, as per Figure 11. This applies to bent-out crossings, or straight crossings with a suitable offset to allow a second limit line for side road traffic to give way to main road traffic.

c) For traffic coming from the road parallel to the cycleway and turning across the cycleway, where there is no offset involved (and therefore no limit line for traffic that must give way, and the sign itself must be placed on the main road, in view of traffic travelling through and not turning across the cycleway) – use a supplementary plate “TURNING TRAFFIC” above the give way sign, as well as another plate below “TO CYCLEWAY USERS”, as per Figure 12. This applies to bent-in layouts.

Note that, under the New Zealand Road User Rule, drivers are not obliged to stop for people cycling across (or waiting to cycle across) a zebra crossing. Therefore, it should not be expected that a zebra crossing can also function as a crossing for cyclists. If a cycle crossing is required in conjunction with a zebra crossing, it should be located to the side of the zebra.
crossing. Furthermore, a Belisha Beacon as used for a zebra crossing is not sufficient; the cycle crossing requires the Give Way signs (as outlined above).

1.6.2 Cycleway users give way to road traffic

Where cycleway users are expected to give way to traffic on the road before using the crossing, give way signs of suitable size and placement should be used on the cycleway, along with limit lines.

Note that, while the New Zealand Road User Rule does not require drivers to stop for cyclists at zebra crossings (see Prioritising cycleway users section), it does not technically prohibit people from cycling across a zebra crossing when the way is clear. However, it is not recommended to attempt to address this situation by simply installing “Cyclists Give Way” signs on the cycleway approaches to a zebra crossing. This situation would be ambiguous for all users involved.

2. Considerations at driveways

A cycleway crossing a driveway has similar conflicts to a side road crossing. Whilst the law is clear that drivers entering or leaving a driveway must give way to cycleway users, the context still relies heavily on human judgement and involves potential for conflict. Koorey and McCrostie (2015) found that 35% of drivers are not aware that they must give way to pedestrians on the footpath when entering or exiting driveways. Therefore, driveways must be designed with care. The following considerations for separated cycleways at driveways build on from those discussed for side road crossings:

2.1 Driveway crossing alignment

Any of the three alignments discussed for side roads could be applied for a separated cycleway crossing a driveway. However, in most cases a straight alignment will be the most practical and will suffice. It may be appropriate to consider busy commercial driveways as side roads and therefore explore the possibility of using a bent-in layout transitioning to a cycle lane.

2.2 Directional nature of cycleway

Cycling in the contraflow direction is more hazardous for separated cycleways at driveways, especially for cycleways located close to the roadway, where drivers base their expectations for cyclists' direction of travel on the adjacent traffic lane. The decision whether to enable contraflow cycling should not be treated lightly, and careful consideration be given to all the possible alternatives.

2.3 Gradient

Contraflow cycling is not appropriate where contraflow cyclists travel on a downhill gradient steeper than approximately 3% - see Figure 9 for an indication of the effect of gradient on cyclist speed.
2.4 Type of driveway

Different types of driveways have different levels of risk for people on bikes.

2.4.1 Base case driveway

The base case to consider is described as follows:

- A residential driveway,
- With-flow cycling only,
- light vehicle movement only, and
- a separated cycleway without adjacent parking.

For the base case, it is recommended to restrict vehicle turning speeds by minimising the width of the opening in the cycleway separation device. In addition, a cycle symbol may be painted on the road / driveway surface facing drivers entering the driveway from the road.

2.4.2 Increased risks

The separated cycleway options tool (SCOT) has been developed as an input to deciding between having a pair of one-way cycleways or a single two-way cycleway. SCOT includes a series of 'risk factors', i.e. aspects that involve a higher risk of conflict compared to the base case. The risk factors included in SCOT are:

- Occupancy of adjacent parking;
- If the facility includes contraflow cycling;
- If the driveway is non-residential (a proxy for more drivers being less familiar with the cycleway); and
- The extent to which it is used by heavy vehicles (i.e. trucks or buses).

The operating speed of the cycleway, which is a function of gradient, is an additional risk factor not currently included in SCOT. As cycling speeds increase, so do the likelihood and consequences of conflict. If a layout involves any of this or other factors, it is necessary to compensate for the increased risks.

Also, whilst SCOT includes traffic volumes, it does not go as far as to account for congestion. People cycling to the left of a slow moving or stationary queue of traffic can be exposed to dangerous situations. This is because drivers may leave a gap to allow opposing right turning vehicles to turn through the queue and these turning drivers may not think to look for cyclists, and their intervisibility is restricted by the vehicles in the queue.

2.5 Parked vehicles

Parked vehicles between a cycleway and the general traffic lane can significantly restrict intervisibility between cycleway users and motorists turning across the cycleway from the roadway to access a driveway. It is very difficult to compensate for this lack of intervisibility other than by restricting parking on the approach to a driveway. The more critical case for this is cyclists and motorists travelling in the same direction, i.e. the motorist turning left into the driveway. The effect of parking on visibility for traffic turning right into the driveway is less critical. It is not simply the setback of parked vehicles from the driveway that must be considered, but also the parking occupancy on the approach to the driveway. The following setbacks based on the parking provision on the approach to the driveway apply:

<table>
<thead>
<tr>
<th>Number of effective parking spaces on approach to driveway*</th>
<th>Required setback of first parking space from driveway</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>3 m **</td>
</tr>
<tr>
<td>3-4</td>
<td>5 m</td>
</tr>
<tr>
<td>&gt; 4</td>
<td>8 m</td>
</tr>
</tbody>
</table>

* Note that there must be a gap of at least 5 m to any previous vehicles parked upstream, with it not being possible to park there because of the presence of a driveway or a kerb extension.

** Note also that the specification of 3 m for the case where only 1 or 2 parking spaces are provided is based on the space required to manoeuvre without crossing the centre of the roadway.

For a one-way cycleway with cycling in the with-flow direction, the setback of parking on the downstream side of the driveway is less critical, but still important to avoid conflict – a minimum setback of 3 m is recommended.

Figure 13 illustrates the various parameters discussed above.
2.6 Other mitigation measures

Other mitigation measures that can be employed work on the basis that they either increase drivers’ awareness, or they reduce their operating speed, or both. Those measures include:

- Apply a vertical element in line with the cycleway separator (preferred) or the property boundary, or both. Figure 14 and Figure 15 show vertical elements of different degrees of severity.
- Apply coloured surfacing (see Figure 14), either along the whole facility, or just at the driveway.
- Adding arrows either side of the cycle symbol so that drivers are reminded to look in both directions. The direction(s) of the arrows should be according to the possible cycling direction(s). Figure 16 gives an example for a two-way cycleway and Figure 17 shows how this can be positioned on the driveway.
- Increase the offset between the cycleway and the roadway - see the discussion on offsets in 1.1.2. In particular this can help improve visibility of heavy vehicle drivers making left turns from the roadway across the cycleway, provided that there is also a suitable length of straight cycleway on the approach to the driveway, so that cyclists are not approaching from behind the driver’s field of vision.
- Reduce the width of the gap in the separator. This will limit the speed at which vehicles can turn into or out of the driveway. In some cases, it may be necessary to restrict the type of vehicle that can enter the driveway. For example, it may be suitable to assume that residential driveways only need to provide for the 95th percentile car; larger vehicles that access the driveway occasionally (for example furniture removal trucks) may have to cross the centre line to undertake the turning manoeuvre, and this is acceptable if it happens only on a rare basis.
Figure 14: Vertical speed control elements in line with the physical separators (photo: Kevan Fleckney)

Figure 15: Semi-mountable kerb at driveway (photo: Axel Wilke)
Figure 16: Symbol for two-way cycleway at driveway

Figure 17: Driveway symbol positioning