

Contra-flow cycling (Two-way cycling in one-way streets)

THIS BRIEFING COVERS

Background; benefits for cyclists; principles of design; design options; safety issues; case studies.

HEADLINE MESSAGES

- Allowing cyclists to ride two-way in one-way streets makes cycling in town and cities more convenient by opening up the street network and providing short-cuts. It can also help make cycling safer by offering alternatives to busy roads, and may help stop people riding on the pavement.
- Contra-flow works perfectly safely in many other European countries, where it is already widespread.
- As it gives cycling an advantage over driving, contra-flow helps encourage a shift from cars to cycles for short local journeys.

KEY FACTS

Evidence from Belgium suggests that, compared to the road network, the risk of injury is lower in a one-way street with contra-flow cycling or at crossroads including such a street.

Cycling UK VIEW

- One-way systems put cyclists at a disadvantage, making their journeys longer and more stressful. Restoring two-way cycling on one-way streets can significantly improve the safety, convenience and attractiveness of cycling.
- Each local authority should review all its one-way streets, with the aim of progressively converting them either to two-way use (particularly for one-way systems on more major roads), or permitting contra-flow cycling (e.g. on narrower streets), unless it can be demonstrated that there are overriding hazards affecting cyclists.
- Contra-flow cycling should be facilitated through appropriate engineering treatments, depending on the traffic volumes, speeds and road widths involved.
- In many cases, e.g. on quieter roads, unsegregated two-way cycling on an unmarked road is an appropriate solution. More heavily trafficked one-way roads should be provided with contra-flow lanes.



BACKGROUND INFORMATION

Cycling UK view: One-way systems put cyclists at a disadvantage, making their journeys longer and more stressful. Restoring two-way cycling on one-way streets can significantly improve the safety, convenience and attractiveness of cycling.

1. Introduction

Originally, most roads were two-way for all traffic, but in recent years the rise in traffic levels and the desire to release more road-space for car parking, has meant that one-way working has been adopted more widely:

- **Main roads:** one-way systems have been introduced to maximise and regulate traffic flow. This makes conditions dangerous and intimidating for cyclists along the roads affected.
- **Back streets:** one-way working on residential roads is usually introduced in the interests of road safety and to prevent rat-running. These systems, however, are an unnecessary inconvenience and deterrent for local cyclists.

N.B. Main road one-way systems are often accompanied by one-way restrictions on adjoining side-roads, again to prevent rat-running. Failure to exempt cyclists from the latter may force them onto the main roads, which often carry dangerous multi-lane traffic flows.

The legislation that permits contra-flow cycling has been available for many years. However, whilst there are some excellent examples of schemes in the UK, contra-flow cycling is still far less common than in many other European countries where there is a presumption to permit two-way cycling in one-way streets unless there are very good reasons for not doing so.

Regulations: the DfT has indicated¹ that it intends to remove the need for a Traffic Regulation Order (TRO) to create contra-flow cycle routes.

2. Benefits of contra-flow

- Contra-flow improves the convenience and/or safety of cycling, thus helping to encourage a shift from car to cycle use.
- Contra-flow is popular with cyclists because it helps give them an advantage over other traffic.
- Being allowed to use a back street in both directions, unlike other traffic, often helps avoid a longer, busier and/or junction-filled journey on an alternative road.
- It is likely to reduce the number of cyclists riding on the pavement.²



3. Design

Cycling UK view

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- Contra-flow cycling should be facilitated through appropriate engineering treatments, depending on the traffic volumes, speeds and road widths involved.
- In many cases, e.g. on quieter roads, unsegregated two-way cycling on an unmarked road is an appropriate solution. More heavily trafficked one-way roads should be provided with contra-flow lanes.

a. Principles of design

On main road one-way systems and back streets where one-way working results in high traffic speeds, the preferred solution is to revert to two-way working. However, on narrower streets, or other situations where this is not possible, arrangements that permit cyclists to use one-way streets in both directions should be introduced.

Research by consultants TRL,³ which informs much of the current cycle design guidance (e.g. from the Dept for Transport (DfT), Transport for London (TfL) and the Scottish Government), has demonstrated that properly designed contra-flow schemes can be successfully provided at sites with adverse conditions including very narrow streets, very high and low cycle flows, high numbers of pedestrians, kerbside parking and considerable loading activity.

The form of provision necessary for contra-flow cycling will depend on local conditions. Where traffic speeds and flows are low, the physical work necessary will probably be less.

The options for providing two-way cycling in one-way streets are set out in national design guidance. Broadly, they are:

1. One-way street with a contra-flow cycle lane (separated either by a white line only or by a kerb or other physical barrier);
2. One-way street with contra-flow cycling, without a cycle lane;
3. False one-way street (i.e. a street with a 'no entry' restriction at one end, but with two-way flow permitted along the rest of its length).

TRL research recommends that where average motor vehicle speeds are above 30 mph or where motor vehicle flows are much in excess of 1,000 vehicle per day, option 1 will generally be required. Where speeds are below 30 mph and traffic flows are not high, alternative contra-flow designs may be preferable for a variety of reasons, including cost, aesthetics and practicality.

b. Design options

i) Contra-flow cycle lanes

Where contra-flow cycling is enabled by a cycle lane, it should preferably be *mandatory* (i.e. it should be marked with a solid white line, indicating that motor vehicles are not permitted to enter it). This provides protected space for cyclists at all times and highlights the need for drivers to anticipate cyclists travelling in the opposite direction. Waiting and loading is prohibited in a mandatory cycle lane during its period of operation, and there must be sufficient width for motor vehicles to use the street without encroaching into the cycle lane.

In some circumstances, the use of an *advisory* contra-flow cycle lane (i.e. marked with a dashed white line) may be appropriate. This might be where occasional motor vehicular encroachment in the cycle lane is difficult or impossible to avoid due to the narrowness of a street or particular parking and loading activity along it. In any event, the safety of cyclists must not be compromised by the vehicular activity.

Parking in mandatory cycle lanes: Parking enforcement in mandatory cycle lanes can be problematic as this is usually carried out by police rather than local authority traffic wardens. In many areas, local authorities have taken over responsibility from the police for enforcing parking regulations. However, DfT has yet to implement powers in the *Traffic Management Act 2004* to enable local authorities to enforce parking in mandatory cycle lanes. The solution may be to add double yellow lines, thus avoiding the need for the police to enforce the lanes in an area where they have no other parking responsibilities



If regular obstruction of the lane is expected, a contra-flow lane may not be the best solution anyway, and other options (such as unsegregated contra-flow cycling) should be explored. This is because once a 'cycling facility' has been created, drivers expect cyclists to stay within it, even when it is obviously impossible to do so, and may complain when cyclists leave the cycle lane to ride around a parked van. In turn, cyclists also feel angry that somebody has blocked 'their' facility.

Lane widths: A contra-flow cycle lane should be at least 2m wide, but where road widths are restricted this can be reduced to 1.5m. It is, however, better to have a wide (2m) advisory lane than a narrow mandatory lane. Choice of the width should take into account traffic volumes and speeds, and the proportion of large vehicles. Greater volume and speed of traffic requires more protection and separation for cyclists, and therefore wider cycle lanes, not the other way around. Where parking or loading is permitted between the contra-flow lane and the kerb, a 1m wide (0.5 min) buffer strip should be provided to protect cyclists from being hit by car doors.

The appropriate with-flow lane width depends on traffic volume, speed and proportion of large vehicles, but may be as little as 2.5m, provided speeds are below 20 mph and flows are light. Where speeds are higher, such that drivers are expected to pass cyclists in the with-flow direction, additional width is required. However, this must not be at the expense of squeezing contra-flow cyclists. If it is impossible to make a contra-flow lane wide enough, then it is still better to permit contra-flow cycling, but without a dedicated lane, plus speed-reducing measures as required.

Contra-flow bus lanes can be of great value to cyclists, who should be permitted to use them wherever possible.

ii) No cycle lane

In many cases, e.g. quieter residential roads, two-way cycling without a marked contra-flow cycle lane may be appropriate, as is common in many other European countries.

The appropriate width depends on traffic volume, speed and proportion of large vehicles. The TRL research included schemes that functioned safely in some streets with sections as little as 2.5m wide over short distances, although greater widths are normally desirable. With this design, drivers may only be warned of the presence of oncoming cyclists by the road signs, which may be supplemented by the use of cycle markings on the carriageway.

In narrow streets, cyclists can feel intimidated by oncoming motor vehicles (and indeed by following vehicles) and reducing speeds to 20 mph or less will help. This may be achieved through the layout of car parking, junction design or other traffic calming measures.



iii) False one-way streets

In a false one-way street, two-way traffic is permitted along most of the street, except for a one-way 'plug' at one end. Cyclists are exempted from this restriction by means of a segregated cycle gap, and so have full use of the road in both directions, whereas motorised through-traffic can only use the street in one direction (two-way flows within the street are for access only). This arrangement can avoid the need for parking restrictions. False one way streets are often accepted much more readily by non-cyclists than measures that benefit cyclists alone.



Photo: Alasdair Massie

iv) Entry and exit arrangements

The design of the junction at each end of the street must reflect the turning manoeuvres likely to be undertaken by cyclists, which will differ from general traffic. Traffic signals will normally need to be re-phased to reflect this.



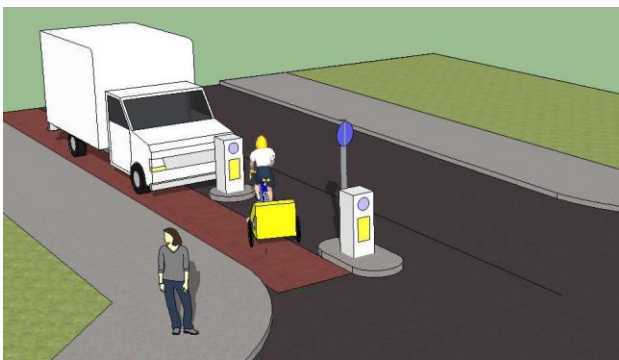
Photo: www.cyclestreets.net

Where circumstances allow, segregation for cyclists at the entry to and exit from the one-way street should be provided. This highlights the presence of cyclists and can improve their safety. It is essential that the design of such segregation prevents it being obstructed by parked cars.

This can be achieved by introducing a build-out to the side of the cycle gap. The cycle gap must be designed to accommodate all types of cycle, including tandems, trailers, trikes etc. Narrow gaps with sharp changes in direction should be avoided.



Where road widths, parking requirements or aesthetic factors do not easily allow physical segregation at entry to or exit from the contra-flow section, alternative, unsegregated design options may be suitable, provided the vehicle speeds are sufficiently low and visibility adequate.



This arrangement is impossible to block completely.

Details of all options are given in the DfT Traffic Advisory Leaflet 06/98 *Contra-flow Cycling*
http://tna.europarchive.org/20090316203319/http://www.dft.gov.uk/adobepdf/165240/244921/244924/TAL_6-98




4. Signing and lining



Plates exempting cyclists from *No Entry* signs are permitted in Scotland, and are standard in most European countries. Until recently, English and Welsh local authorities had to apply for special authorisation from the DfT to use *Except cycles* plates underneath *No Entry* signs, but this requirement has been relaxed following years of lobbying on the grounds that the addition of the plate makes it clear to all road users that cyclists are exempt from the one-way arrangement.⁴

A *Cycles Only* sign is also permissible (diag. 955, see below).

Along the contra-flow link, general traffic should be advised of the contra-flow route by means of sign diagram number 960.1 where a mandatory lane is provided. With an advisory lane, or without a cycle lane, 960.2 should be used (N.B. following changes to the regulations⁵ in 2012, this sign no longer requires authorisation from DfT).

		
Sign 955: Route for use by pedal cycles only	Sign 960.1: Contra-flow cycle lane	Sign 960.2: One-way traffic with contra-flow pedal cycles

The marking of contra-flow cycle lanes is generally by white lines and the lanes can be highlighted using coloured surfacing. In historic town centres and other sensitive areas, alternative means of delineating the cycle lane have been successfully developed, e.g. by contrasting block-work.

White lining v physical separation: As previously noted, contra-flow lanes can be separated from the oncoming traffic either physically (e.g. by a kerb) or by white lining only. The former may be preferable on one-way major roads, especially with high speed or multi-lane traffic, or where motor vehicle encroachment is expected to be a particular issue. However, kerbs prevent cyclists from leaving the lane (e.g. to avoid obstacles) and they are harder to keep clear of debris such as broken glass and obstructions. Also, drivers may be less aware of cyclists in a lane that is segregated by kerbs and this may exacerbate the hazard at side road junctions. They should therefore generally be avoided on minor one-way streets.



Where kerbs are installed, plenty of width should be provided to allow passing within the lane, and care should be taken to ensure that the entry and exit cannot be blocked.

5. Safety

The safety record of contra-flow lanes is generally good as there is good intervisibility between cyclists and oncoming vehicles. Indeed, video film taken by TRL for their 1998 report showed 'no examples of situations where cyclists were judged to have been put in a position of serious conflict'.⁶ Also, evidence from Belgium suggests that, compared to the road network, the risk of injury is lower in a one-way street with contra-flow cycling or at crossroads including such a street.⁷

There is no reason to believe that cyclists are exposed to greater danger from oncoming traffic (which they can see) than from following traffic (which they cannot). In addition, they frequently provide the opportunity to take cyclists away from longer, more hazardous alternative routes.

Vehicles emerging from side roads or accesses are probably the greatest potential hazard to contra-flow cyclists. Here, good signing is important, reinforced by a coloured cycle lane.

Safety audits: concern about cyclists' safety is one of the reasons why contra-flow is rarely used in most UK local authorities. Schemes regularly fall victim to safety audit procedures that fail to make an objective assessment of risk, or to acknowledge the wider safety benefits of diverting cyclists from more heavily trafficked alternative routes.

Safety audits of such schemes need to take into account the true level of risk to people cycling the route both with and against the flow, as well as broader considerations of convenience and safety that influence cyclists' choice of route, and choice of mode. They should also weigh up any concerns over the safety of a proposed contra-flow scheme against the exposure to risk of cyclists using the alternative route(s) if contra-flow cycling is not permitted. The latter may be more hazardous than using the proposed contra-flow scheme and may well be longer, thus increasing cyclists' exposure to risk.

Where there are doubts about the safety of a proposed scheme, then the hazards should be designed out e.g. by clear signing and marking across side turnings. If need be, consideration should be given to its introduction using an experimental Traffic Regulation Order (TRO), allowing the scheme to be revised or removed should the concerns prove founded.

CASE STUDIES

Paris: In 2008, the law changed and now all 30 km/h zones in France MUST be made two-way for cycles unless conditions are impossible. Until then, Paris had only 40 kms of contra-flow; but following the new legislation, this rose 6-fold in one year.

Belgium: Since 1991, road managers in Belgium have been allowed to authorise contra-flow cycling in one-way streets to provide cyclists with shortcuts, help them avoid big roads or dangerous junctions, improve road safety for them and to encourage cycling. A few cities implemented contra-flow cycling schemes and a first assessment in 1998 was positive. Despite this, most municipalities were still hesitant, so in 2004 the Minister of Transport made contra-flow cycling in one-way streets mandatory, unless there was a legitimate reason not to do so. Analysis from the Belgium Road Safety Institute concludes that contra-flow cycling "... does not constitute a road safety problem but rather a road safety solution".

FURTHER READING

- *Contra-flow cycling*. Cycling England.
www.ciltuk.org.uk/Portals/0/Documents/The%20Hub/Design%20Toolkit/A06_Design_portfolio_contraflow_cycling.pdf
- *Cycle Infrastructure Design*. DfT, 2008
www.gov.uk/government/uploads/system/uploads/attachment_data/file/3808/ltm-2-08.pdf
- *Cycle Friendly Infrastructure*. IHT, 1996
- *Sustrans design guidance*:
 - www.sustrans.org.uk/our-services/infrastructure/route-design-resources/technical-guidelines
 - www.sustrans.org.uk/sites/default/files/file_content_type/sustrans_handbook_for_cycle_friendly_design_11_04_14.pdf
- *London Cycling Design Standards* (currently in draft)
<https://consultations.tfl.gov.uk/cycling/draft-london-cycling-design-standards>
- *Cycling by Design*. Scottish Executive 2010.
www.transportscotland.gov.uk/system/files/uploaded_content/documents/tsc_basic_pages/Environment/Cycling_by_Design_2010_Rev_1_June_2011_.pdf (Chapter 5)
- *TRL Report 358: Further Developments in the Design of Contra-flow Cycling Schemes*. TRL, 1998. www.trl.co.uk
- *Traffic Advisory Leaflet 6/98: Contra-flow Cycle Lanes*. DfT, 1998.
http://tna.europarchive.org/20090316203319/http://www.dft.gov.uk/adobepdf/165240/244921/244924/TAL_6-98
- *Traffic Signs Regulations and General Directions 2002* (SI 2002 No 3113)
<http://tsrgd.co.uk/documents/traffic-signs-manual> / <http://m.tsrgd.co.uk/regs.html> (Note: TSRGD is undergoing revision: www.gov.uk/government/consultations/traffic-signs-regulations-and-general-directions-2015)

FOOTNOTES AND REFERENCES

¹ DfT. *Briefing on the Government's ambition for cycling*. Aug 2013.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229473/briefing-governments-ambition-cycling.pdf (p12)

² Fietsberaad news. *Oslo: cycling in the opposite direction is not much of a problem*. 25/6/2013.

<http://www.fietsberaad.nl/index.cfm?lang=en§ion=nieuws&mode=newsArticle&repository=Oslo:+cycling+in+the+opposite+direction+is+not+much+of+a+problem>

³ Ryley, TJ; Davies, DG. *Further developments in the design of contra-flow cycling schemes*. TRL. 1998. www.trl.co.uk

⁴ See DfT *Signing the Way*. October 2011. Section 5.37 (p34)

<https://www.gov.uk/government/publications/signing-the-way-traffic-signs-policy-review>. Where no segregation on entry is provided, DfT used to recommend the *Motor Vehicles Prohibited* sign (diag. 619, or the 'flying motorbike').

⁵ These changes were announced in *Signing the Way 2011* (see note above).

⁶ DfT. *Contra-flow Cycle Lanes*. TAL 6/98. 1998.

http://tna.europarchive.org/20090316203319/http://www.dft.gov.uk/adobepdf/165240/244921/244924/TAL_6-98

⁷ Dupriez, Benoît Mobility and Infrastructure Department, Belgian Road Safety Institute. *Contra-flow cycling in Belgium and the Brussels Region*. Paper to Velo-city 2009. www.velo-city2009.com/assets/files/paper-Dupriez-sub1.4.pdf