Especially Authorised Signing Trial

'No Entry Except Cycles' Signing Review

Report for Transport for London, Cycling England, Department for Transport

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Primary Author:	Lorna Sewell
Other Author(s):	Mackenzie Nicholson
Reviewer(s):	Stuart Reid
Formatted by:	Lorna Sewell

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Executive Summary

Transport for London (TfL) commissioned MVA Consultancy to undertake research into the impact of changing the TSRGD 619 sign 'Flying Motorcycle' sign to a 616 and 954.4 sign 'No Entry Except Cycles' signing combination on user behaviour at especially authorised monitoring sites where cycle contra-flow systems are currently in operation.

Currently the 'No Entry Except Cycles' signing regime is not permitted by the DfT and therefore required special one-off authorisation by the DfT to monitor the effects of this signing combination at agreed monitoring sites. This report summarises the findings of the research.

The aim of this study is to help inform decisions on the wider application of the proposed new combination of signs: 'No Entry Except Cycles' and generate evidence to respond to safety concerns, which include the following:

- the DfT considers the 'No Entry' sign to be a safety critical sign, which may be devalued by becoming conditional on supplementary information. Although there is precedent for exemption from 616, for example buses, it is hypothesised that this devaluation may lead to undesirable effects;
- the signs may lead to a greater tendency among cyclists to violate 'No Entry' signs at sites where no exemptions exist;
- the signs may lead to a greater tendency among other road users to violate the 'No Entry' signs; and
- the scope for conflict between cyclists making contra-flow movements and other road users is increased. This potential is thought to be particularly great at the junction of one-way links where cyclists are turning against, and potentially across, emerging vehicles.

Literature Review

There is limited literature that addresses contra-flow entrance points, with most literature and observations being made on European schemes. A review of previous studies showed that in the UK, the 'No Entry' sign is considered one of the most abided by signs. Signs prohibiting motorised traffic, similar to Sign 619 'Flying Motorcycle' have been applied at locations in Denmark, Netherlands and Germany, which has shown that the signing is less widely accepted than a No Entry with a specific cycle exemption.

Other Studies

The **Royal Borough of Kensington and Chelsea** undertook trials to observe user behaviour following the change from the 616 'No Entry' sign to the 619 'Flying Motorcycle' sign and then changed again to the 616 and 954.4 'No Entry Except Cycles' signs. Initially, following the change from the 'No Entry' sign to the 'Flying Motorcycle' sign compliance reduced, with approximately a 50% increase of motorised vehicles violating the 'Flying Motorcycle' sign. Following the change from the 'Flying Motorcycle' sign to the 'No Entry Except Cycles', there was a significant increase in sign compliance, better than simply with the 'No Entry' sign.

STATS 19 Analysis

Interrogation of the **STATS 19 personal injury collision** database showed that between the period of 1999 to 2007 collisions involving cyclists in one-way streets made up a very small proportion of all injuries and that injuries associated with illegal turns (i.e. those directly relevant to the question of compliance with signs, were even less frequent (23 injuries of all severities in London in the three years from 2005 to 2007) and those incidents involving cyclists have largely declined in the period 1999 to 2007 both nationally and London-wide.

Study Methodology

As part of this research study, through discussion with TfL, Cycling England and the DfT suitable **monitoring locations** were identified to examine the effects of changing the 'Flying Motorcycle' sign to 'No Entry Except Cycles' sign combinations at two sites within London and two sites outside London.

The monitoring locations were chosen based on a number of criteria including: signing regime; landuse and location; junction layout and dimensions; cycle contra-flow provision; cycle volumes speed restrictions; and collision record. The following locations were agreed upon by TfL, Cycling England and approved by the DfT as suitable monitoring sites:

Chosen Monitoring Sites

Trial Sites	Associated Sites	Local Authority
Osbaldeston Road / Cazenove Rd	Leweston Place / Portland Ave	LB Hackney
Stockwell Avenue / Bellefields Rd	Bellefields Road / Stockwell Ave	LB Lambeth
Mawson Road / Mill Rd	Willis Rd / Mill Rd	Cambridge City Council
Campbell Rd / Argyle Rd	Argyle Rd / Campbell Rd	Brighton & Hove Council

Each of the monitoring sites was formed by a 'trial' site and an 'associated' site.

Trial sites were identified for the conversion of the 'Flying Motorcycle' to the 'No Entry Except Cycles' signs. Trial sites were used to evaluate any change in motorised vehicle compliance associated with the 'Flying Motorcycle' sign and the 'No Entry Except Cycles' combination. In addition, they were used to determine changes in behaviour and assess conflict due to the signing modifications.

The associated sites were identified close to the trial site and contained a 'No Entry' sign. The associated sites were used to determine whether the compliance with the signs at associated sites changed to any statistically significant degree, potentially representing a devaluing of the No Entry sign.

Video surveys were undertaken at the trial sites and associated sites for both before and after the change of the signs at the trial site. The video cameras captured movement and behaviour for a period of 12 hours between 7am and 7pm on one neutral weekday.

There were five aspects to data collection and analysis: volume assessment; compliance; behaviour assessment; interaction; and conflict scoring.

The Results

A comprehensive review and assessment of the video footage at the monitoring sites showed:

- There is a greater compliance by motorised vehicles with the 'No Entry Except Cycles' combination than the 'Flying Motorcycle' sign, which supports the findings of the RBK&C trials.
- There was an increase in the number of cyclists travelling in contra-flow following installation of the 'No Entry Except Cycles' sign combination, suggesting a greater understanding of the 'No Entry Except Cycles' signing regime than that of the 'Flying Motorcycle' sign.
- Few interactions between vehicles were recorded in both the 'before' and 'after' signing scenarios. There was no significant association between the signing changes and number or severity of interactions.
- As the cyclists using the network tended to be commuters, they (presumably) possessed familiarity with the signing and road restrictions and showed no hesitation in their contra-flow movements.
- Motorised vehicles were less likely to hesitate when presented with the 'No Entry' sign, relative to the 'Flying Motorcycle', suggesting better understanding, although further observations are required to prove significance.
- Contra-flow cyclists behaved and positioned themselves similarly regardless to the signing present at one-way streets.
- Cyclists tended to use contra-flow lanes when present, otherwise they utilised the kerbside of the carriageway.
- Motorised vehicles were more likely to reverse contra-flow down a one-way street when 'No Entry' signing was present, whereas they were more likely to go in the forward direction (opposite one-way designated direction) with the 'Flying Motorcycle' sign.

Conclusions and Recommendations

This study has revealed that the 'No Entry Except Cyclists' sign combination is more widely respected than the 'Flying Motorbike' sign and has suggested that the combination is more readily understood by cyclists.

There is no evidence that compliance with 'No Entry' signs by motorised vehicles is reduced at associated sites, in fact compliance slightly improved. There was a slight increase in violations by cyclists at some associated sites but this was not statistically significant. There was no statistically significant change in conflict between road users at sites with the new combination.

This analysis indicates that, for the sites studied, the safety concerns raised about the 'No Entry Except Cyclists' combination are not supported by the evidence. Indeed, the improved compliance by motorised vehicles is likely to result in a net risk reduction to all users.

Accordingly there seems no immediately obvious reason not to use this combination of signs. We recommend that the use of this combination be more widely permitted and monitored over a longer period at a wider variety of sites.

1 Introduction

1.1 Introduction

1.1.1 Transport for London (TfL) commissioned MVA Consultancy to undertake research into the impact of changing the TSRGD 619 sign 'Flying Motorcycle' sign to a 616 and 954.4 sign 'No Entry Except Cycles' signing combination on user behaviour at especially authorised monitoring sites where cycle contra-flow systems currently are in operation.

1.1.2 Currently the 'No Entry Except Cycles' signing regime is not permitted by the DfT and therefore required special one-off authorisation by the DfT to monitor the effects of this signing combination at agreed monitoring sites. This report summarises the findings of the research.

1.2 Study Background

1.2.1 One-way streets in urban road networks can provide less favourable conditions for cyclists for a number of reasons:

- reducing the network permeability for cycling;
- increasing the distance required to travel between two points; and
- tending to increase traffic speeds.

1.2.2 There is anecdotal evidence that where one-way streets and one-way accesses make networks sufficiently impermeable, some cyclists will elect to use them illegally, putting themselves and other road users at risk. Where cyclists can be exempted from one-way restrictions, convenience can be increased and travel time can be reduced, which can help make cycling a more attractive travel choice.

1.2.3 At present the convention for signing cyclists' exemption from one-way restrictions is to use the TSRGD 619 sign, known as the 'Flying Motorcycle' sign, which indicates that motorised vehicles are prohibited. The use of this sign has been questioned as it does not specifically indicate that cyclists are permitted and in addition TfL, London Boroughs and other local authorities have identified that this sign is generally not well understood by road users of all classes.

1.2.4 An alternative signing option would be to use a combination of the 616 'No Entry' sign and 954.4 'Except Cycles' plate (**Figures 1.1 and 1.2**). However this combination is currently not permitted and therefore required special authorisation from the Department for Transport (DfT) to undertake this study.

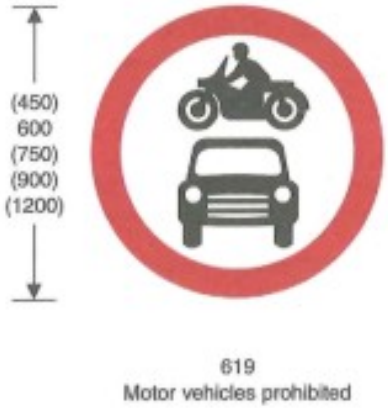


Figure 1.1 'Flying Motorcycle' Sign

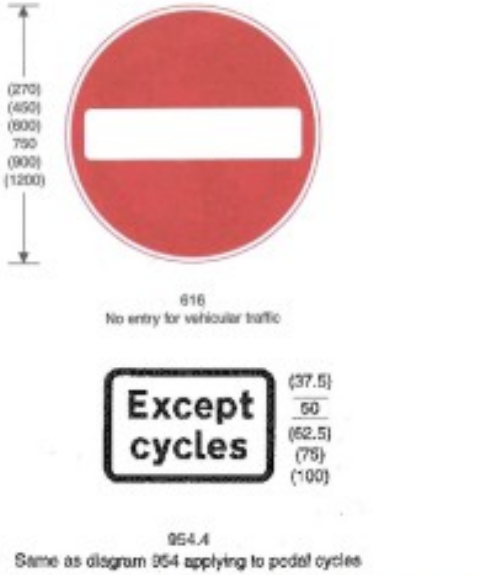


Figure 1.2 'No Entry Except Cycles' sign

1.2.5 The DfT has expressed some concerns regarding the use of the 'No Entry Except Cycles' signing combination. In particular:

- the DfT considers the 'No Entry' sign to be a safety critical sign, which may be devalued by becoming conditional on supplementary information. Although there is precedent for exemption from 616, for example buses, it is hypothesised that this devaluation may lead to undesirable effects;
- it is suggested that there may be a greater tendency among cyclists to violate 'No Entry' signs at sites where no exemptions exist;
- it is suggested that there may be a greater tendency among other road users to violate the 'No Entry' sign; and
- the scope for conflict between cyclists making contra-flow movements and other road users is increased. This potential is thought to be particularly great at the junction of one-way links where cyclists are turning against, and potentially across, emerging vehicles.

1.3 Study Objectives

1.3.1 The objective of this study is to help inform decisions on the wider application of the proposed new combination of signs: 'No Entry Except Cycles' by generating evidence around their effect on behaviour and compliance.

1.3.2 The structure of the study has been as follows:

- Literature review of published and unpublished 'grey' literature on how the design of contra-flow streets affects its use and the behaviour of users and a summary of the Royal Borough of Kensington and Chelsea (RBK&C) 'Flying Motorcycle' sign trials.
- STATS 19 review of personal injury collisions database to determine national and London trends for collisions involving cyclists on one-way roads and the severity of these collisions.

- Discussions with TfL, Cycling England and the DfT to identify suitable monitoring locations, each formed by a 'trial' site and an 'associated' site, to monitor the effects of changing from the 'Flying Motorcycle' sign to 'No Entry Except Cycles' sign combinations at two sites within London and two sites outside of London.
- STATS 19 collision analysis for the proposed monitoring sites.
- 'Before' and 'after' video surveys at the 'trial' and 'associated' sites to record and analyse volumes and user behaviour, and to undertake a conflict assessment at each monitoring location to establish compliance and understand safety performance.
- Reporting main findings and make recommendations regarding the signing of 'No Entry Except Cycles'.

1.4 Structure of this Report

1.4.1 Following this introductory chapter the report is structured as follows:

- Chapter 2 - **Previous Studies**: includes a literature review of previous studies/research and summarises the findings of recent signing trials in the Royal Borough of Kensington and Chelsea.
- Chapter 3 – **STATS 19 Data Analysis**: summarises STATS 19 data analysis of National and London trends for collisions involving cyclists on one-way roads and on streets where currently the 'No Entry Except Cycles' signing combination is in operation.
- Chapter 3 - **Study Methodology**: summarises the methodology applied to the monitoring sites.
- Chapter 4 - **Monitoring Locations**: summarises the site characteristics and STATS 19 collision records for each of the monitoring sites.
- Chapter 5 - **Volume and Compliance Results**: summarises the 'before' and 'after' volumes and signing compliance by cyclist and vehicles at the monitoring locations.
- Chapter 6 - **Behavioural Assessment**: assesses cyclist and vehicle behaviour during the 'before' and 'after' surveys at the monitoring locations.
- Chapter 7 - **Interaction Assessment**: assesses the interaction between cyclist and vehicles during the 'before' and 'after' surveys at the monitoring locations.
- Chapter 8 – **Conclusions**: summarises the overall findings of the study and includes recommendations.
- **Appendix D** to **F** contains the datasets from the video surveys.

2 Literature Review / Previous Studies

2.1 Introduction

2.1.1 This chapter is divided into two sections:

- a literature review of published and unpublished 'grey' literature on how the design of contra-flow streets affects its use and the behaviour of users; and
- a summary of the Royal Borough of Kensington and Chelsea (RBK&C) signing trials.

2.2 Literature Review

2.2.1 The aim of the literature review was to collate evidence on how the design of contra-flow streets affects their use and the behaviour of users. This section summarises the literature and is divided into the following themes:

- user behaviour of vehicles and cyclists at contra-flow junctions;
- collisions and measures to increase safety;
- recognition of signs; and
- attitudes associated with contra-flow infrastructure or signs.

2.2.2 The literature review included a detailed examination of published and unpublished 'grey' literature which was provided by stakeholders, a Transport Research Laboratory library search, electronic journals and from comprehensive internet searches for literature originating both within the UK and continental Europe. A bibliography can be found in **Appendix A**.

User behaviour of vehicles and cyclists at contra-flow junctions

2.2.3 There is limited research surrounding cyclist behaviour at contra-flow entry points at junctions. Most of what is available examines schemes in continental Europe, where formalised contra-flow cycling has been permitted since the 1960s (Morgan, 1995). No literature was available that focussed on motorised vehicle response due to the presence of a contra-flow scheme and its associated signs.

2.2.4 Werle (1993) evaluated user behaviour of cyclists on one-way streets in Saarbrücken, Germany following the implementation of 90 one-way streets with cycle exemptions in the 1990s. Werle observed the following problem:

- When the cyclist is travelling in the contra-flow lane, a car turning left (assuming driving on the right) into a side street will have to cross the path of the cyclist. If the motorists do not expect to have a cyclist contra-flow, it may turn on the cyclist path and cause a collision.

2.2.5 When a cyclist enters a one-way street in the contra-flow direction, the cyclist targets the left side of the street where oncoming drivers will expect the opposing vehicles to be. If the cyclist weaves too far to the right (cuts the corner), the risk of collision may be increased. Therefore the turning cyclist must perform a trajectory with a reasonable entry radius and at

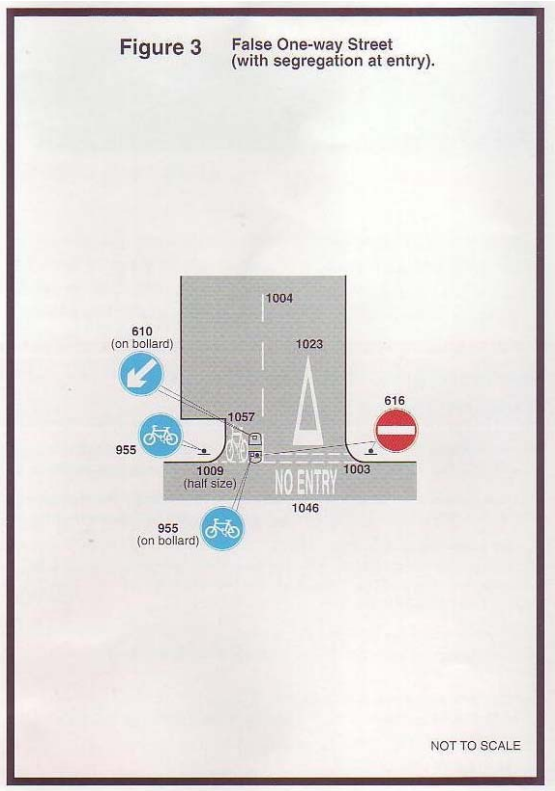
a reasonable speed so that motorists can see the cyclist enter. This manoeuvre can be obstructed by stationary vehicles or other visibility constraints.

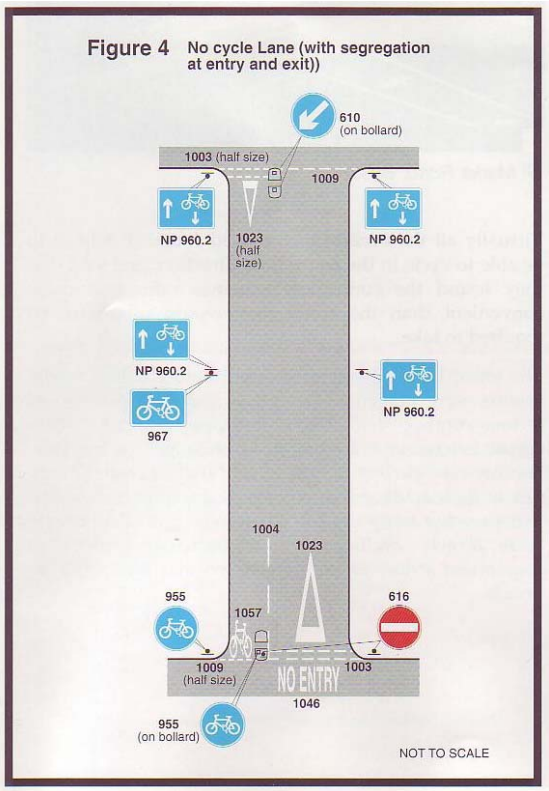
2.2.6 In continental Europe, physical separation to reduce interactions is less common and is largely found on heavily trafficked routes or where speed limits are higher than normal. Instead, on the Continent they consider streets as being effectively two-way except that the traffic in one of the directions is restricted to cyclists only. This is usually achieved by signing only (Morgan, 1995). Morgan however, noted that unlike in the UK, on the Continent, drivers are more familiar with cyclists turning into and travelling in contra-flow on 'No Entry' streets, regardless of whether or not they were exempted.

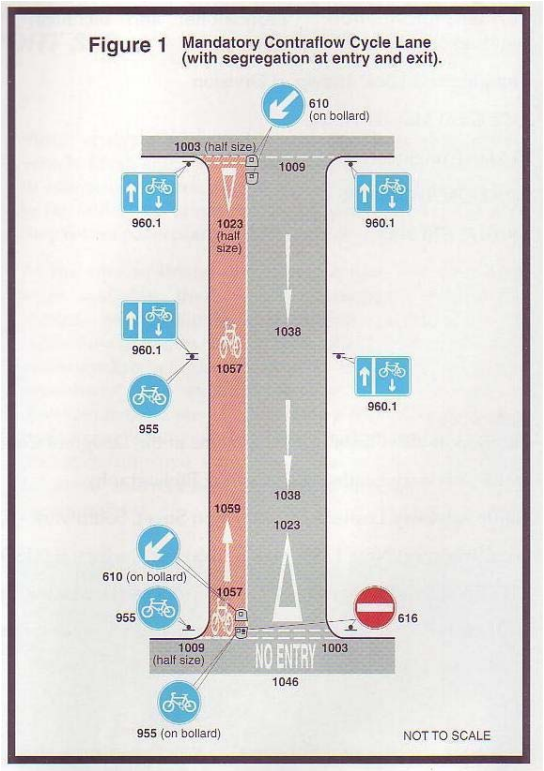
2.2.7 In the UK, currently the Department for Transport and Cycling England recommend that segregation at the exit and entry points maybe preferable in order to mitigate the risk of motorists not anticipating the cyclist's movements; however they recognise that the form of provision necessary may vary, depending on the traffic environment and street layout (Department for Transport (TAL 6/98), Cycling England, 2006).

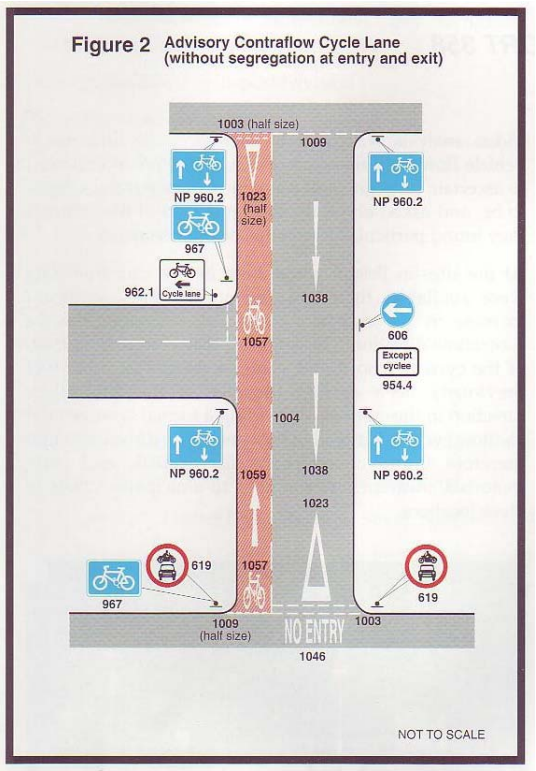
2.2.8 Figures 1 to 4 below, taken from the DfT's Traffic Advisory Leaflet 6/98 on Contra-flow Cycling (1998) show recommended layouts and signing requirements for contra-flow cycling schemes and false one-way streets in the UK. These layouts are indicative only and may need to be varied, or elements of different figures combined, to suit local circumstances. **Under no circumstances should plates exempting cycles be placed under the 'No Entry' sign (diag. no 616).**

2.2.9 Currently, where a local authority wishes to introduce a scheme in the absence of any such cycle lane, this requires special DfT authorisation. The DfT advise that where no cycle lane is proposed and that the following site conditions are met: 85^{Th} percentile speeds are less than 25mph; and vehicle flows are less than 1000 vehicles per day; or the street forms part of a 20mph zone (DfT, TAL 6/98).









Figures 1 to 4 above are taken from the DfT's Traffic Advisory Leaflet 6/98 on Contra-flow Cycling (1998) show typical layouts for contra-flow cycling schemes and false one-way streets in the UK.

Collisions and measures to increase safety

2.2.10 As part of this study, STATS 19 data was interrogated to establish collision trends involving cyclists on one-way streets both nationally and London-wide, which is summarised in Chapter Three.

2.2.11 In Europe, there is little evidence to suggest that contra-flow schemes result in increased collisions. There is also a lack of data/research available on whether collisions increase at the entrance/exit points to these schemes.

2.2.12 Some collision analysis was undertaken as part of the localised implementation (1983 to 2000) and generalisation to all one-way streets in 2000 of Strasbourg's contra-flow schemes, France. From 1997 to 1999, out of 1,677,000 trips on all modes, 4,004 road collisions occurred of which 452 involved a cyclist. Out of these 452 collisions, only five occurred whilst a cyclist was going contra-flow. All of the five collisions occurred at junctions (Héran F, Asencio S. Giess Y. CADR, 2006).

2.2.13 Additionally, in reviewing data from various European centres with existing contra-flow schemes, Morgan (1995) concluded the collision potential at junctions was found not to be statistically relevant. Werle concluded the reason for this result was that cyclists are highly aware of the risks and generally anticipate danger at intersections (Werle, 1993).

2.2.14 In addition, some of the documents identified measures that could reduce the risk of collisions. To increase safety of cyclists, these measures include:

- installing road markings to indicate the cyclist's position on the road;
- reducing street clutter to reduce the distraction to the driver and cyclist (Werle, 1993);
- providing flat road humps/entry treatments at junctions to reduce driver's speeds (Morgan, 1995); and
- providing segregation if traffic flows are important, (Morgan, 1995) especially if a large number of lorries are likely to use the street (ISBR, 2006).

Recognition of Signs

2.2.15 The London Cycling Design Standards state that following the resurgence of interest in cycling as a transport mode during the 1990s, some earlier cycling schemes included inappropriate, inconsistent or confusing traffic signing and road markings, stating 'now, instead of being of assistance, the cycling signing itself is part of the problem, reinforcing fears of getting lost and conveying negative messages about cycling." As such, The London Cycling Design Standards state that signs should be "coherent, consistent and easy to follow." This is best achieved through the use of recognizable and straightforward signs.

2.2.16 Morgan (1995) also notes the importance of ensuring signing and road markings are carefully arranged to ensure that all road users are aware that contra-flow cycling is permitted.

The 'No Entry' Sign

2.2.17 Debates on the type of signs associated with contra-flow schemes have been ongoing in Germany since the 1960s (Werle, 1993). The legality of 'No Entry' signs with exception plates has been contested, although it is now the most widespread combination in use in continental Europe (Morgan, 1995). Both French (CERTU, 2008) and Belgian (IBSR, 2004) guidance promote the use of this arrangement.

2.2.18 In the UK, the 'No Entry' sign is considered one of the most abided by signs (Morgan, 1995). Building upon this understanding, Department for Transport (2005) has noted that 'No Entry' signs have the advantage of sending a clear message to both cyclists and motorists.

Motorised Traffic Prohibited Sign

2.2.19 Signs prohibiting motorised traffic, similar to the 'Flying Motorcycle' sign, have been applied at locations in Denmark, Netherlands and Germany (Morgan, 1995). However, Werle points out in his 1993 report, that this signing is "less widely accepted and therefore tends to be disregarded by motor vehicles."

2.2.20 Similar findings have been highlighted in the UK by the RBK&C signing trials, in which the number of cars violating the entry restriction (travelling the wrong way down a one-way street) doubled following the replacement of 'No Entry' signs with the 'Flying Motorcycle' sign at five trial sites (Sherman, 2009). Further details on this study are provided in Section 2.3.

2.2.21 To increase understanding of the 'Flying Motorcycle' sign, the London Cycling Design Standards recommend that the 'Flying Motorcycle' sign be incorporated with cycle route signs, such as sign 967 'Route recommended for Pedal Cycles' to increase understanding, however this can contribute to 'clutter' on the street.

Cyclist Attitudes

2.2.22 No formal research has been undertaken in the UK to evaluate cyclist or driver attitudes regarding infrastructure or sign provision at contra-flow entry points. Cycling England and the Camden Cycling campaign have prepared documents in overall support for contra-flow cycling; however few propose alternative signs treatments to the current DfT standards.

2.2.23 In Groningen, Netherlands cyclists were asked their opinion on the safety of contra-flow cycling. Those questioned were "amused" by the query as they felt that the measure was only a formalisation of their existing behaviour (Morgan 1995).

2.3 Royal Borough of Kensington and Chelsea (RBK&C) Signing Trials

2.3.1 Between 2008 and 2009 RBK&C undertook trials (authorised by the DfT) to review user behaviour following the replacement of the "No Entry" sign with the "Flying Motorcycle" sign. A further trial was undertaken recently (January 2010) to observe user behaviour when the 'No Entry Except Cycles' signing combination was installed at trial sites.

Thackeray Street

2.3.2 As part of the study simplified one-way streets were observed including: Thackeray Street; Holland Street; Old Court Place; as well as Gilston Road and Hollywood Road, which both had conventional contra-flow cycle facilities.

Holland Street

2.3.3 Thackeray Street, Holland Street and Old Court Place were chosen because of requests by the cycling lobby group and evidence that cyclists were already using these streets in the wrong direction. Also the condition of the roads was deemed appropriate i.e. vehicle flows; and speeds.

2.3.4 All roads have a daytime peak one-way flow of about 100 vehicles per hour or less.

Old Court Place

2.3.5 The "No Entry" signs were replaced with the 619 "Flying Motorcycle" sign, no cycle lane was provided and the non-prescribed 960.2 'Contra-flow Cycle Lane' sign (authorised by the DfT) was used to inform drivers of cyclists coming in the opposite direction. A picture of the 960.2 sign is shown overleaf.

Gilston Road

2.3.6 In Gilston Road and Hollywood Road, the "Flying Motorcycle" signs replaced the build outs and splitter islands and the "No Entry" signs but the contra-flow cycle lanes and associated signing were retained.

Results

2.3.7 **Table 2.1** shows the average weekday vehicle flows recorded between 7am and 7pm across the study sites.

2.3.8 The results show that signing violations increased following the change from the 'No Entry' sign to the 'Flying Motorcycle' sign, with an approximately 50% increase in vehicles disregarding the 'Flying Motorcycle' sign.

2.3.9 The data showed that following the change to the 'No Entry Except Cycles' signing combination, signing non-compliance decreased. Average non-compliance levels were notably lower for this signing combination than when simply using the 'No Entry' signs.

Hollywood Road

TSRGD 960.2 Sign

Table 2.1 Average weekday flows recorded between 7am -7pm

Road	Going through No Entry signs before trial (June 08)	Going through 619 signs (average of two surveys in March and June 09)	Going through current No Entry signs with Except Cycles' (Jan 10)
Gilston Road	25	59	15
Holland Street	13	36	7
Old Court Place	38	77	25
Thackeray Street	30	35	10
Hollywood Road	21	55	2

2.3.10 At the time of writing, RBK&C had not undertaken driver/cycle behaviour analysis to observe if there were any operational issues.

2.4 Summary

- Overall there is limited literature that addresses contra-flow entrance points, with most literature and observations being made surrounding European schemes.
- In observing behaviour at contra-flow junctions, motorists may not expect the cyclist's trajectory to enter a one-way street in the opposing direction. As a result, cyclists often place themselves on the left side of the road and manoeuvre with a reasonable radius for their presence to be detected by the motorist.
- In continental Europe, physical separation to reduce interactions is less common and is largely found on heavily trafficked routes or where speed limits are higher than normal. In the UK it is recommended that segregation at the exit and entry points is preferable in order to mitigate the risk of motorists not anticipating cyclists movements.
- The potential increase of collisions at entry points for contra-flow schemes is not well documented but STATS 19 casualty records suggest that cyclist injuries resulting from illegal turns (by any user) into one-way streets are not a significant proportion of overall casualties.
- The 'No Entry' sign is well understood by both motorists and cyclists; as such many continental European countries use this sign in combination with an exception plate to permit contra-flow cycling.
- European motorists and those observed in the Kensington & Chelsea trials often do not abide by Sign 619 'Flying Motorcycle' or their continental equivalent that prohibit motorised traffic.
- The RBK&C trial found that replacing the 'No Entry' sign with the 'Flying Motorcycle', was associated with notably higher numbers of violations by motorists, where as there were fewer observed violations when the 'No Entry Except Cycles' signing combination was installed.

3 STATS 19 Collision Data Analysis

3.1 Introduction

3.1.1 This chapter summarises personal injury data for incidents involving cyclists nationally and London-wide and reflects the extent to which non-compliance with signed restrictions results in casualties.

3.2 Methodology

3.2.1 The Department for Transport STATS19 database was interrogated as part of this analysis. This is a dataset of personal injury collisions which occur on public highways and become known to the police within 30 days. MVA's iteration of the database contains collision records for the period 1999 to 2007.

3.2.2 There were several amendments to the database in 2005, including the reclassification of slip roads and one-way streets and changes to the definition of contributory factors, meaning that data is generally presented separately for the periods before and after 2005.

3.2.3 The database was filtered for all collisions where at least one of the vehicles was a pedal cycle (vehicle type 1). The following criteria were then used to perform the analysis:

- Road type: either 12 – 'one way street/slip road (1979-2004) or 2 – 'one way street (from 2005)'; and
- Collision Severity: 1 – Fatal, 2 – Serious, 3 – Slight.

3.2.4 GIS was used to map the resulting dataset and to analyse all collisions within the London administrative boundary. **Appendix B** contains Casualty Plans for collisions recorded for London.

3.2.5 Since 2005, contributory factors are also recorded in the database. Collisions where at least one contributory factor is: 305 - 'Illegal turn or direction of travel' were analysed. Therefore, the available data allowed for the comparison of collisions that took place nationally and in London, and more specifically, collisions on one-way streets as well as collisions where one of the vehicles was making an illegal turn or travelling in an illegal direction.

3.2.6 It must be noted that locations with legal contra-flow cannot be readily identified from the database. In this note the contributory factor 305, which indicates that one of the parties in the collision has travelled or turned illegally on a one-way street, was applied to determine those who wilfully or otherwise has failed to comply with signed restrictions.

3.2.7 The data sets resulting from the analysis are relatively volatile due to the small sample sizes, therefore small year on year fluctuations should not be regarded as continuing trends.

3.3 STATS 19 Data Analysis Summary

3.3.1 **Table 3.1** below presents the data findings from the exercise. CF305: Contributory Factor 305 - 'Illegal turn or direction of travel'. CF305 data is only available between the years: 2005 and 2007.

Table 3.1 Collisions Involving Cyclists

Severity	Location	Type of Accident	Year								
			1999	2000	2001	2002	2003	2004	2005	2006	2007
Slight	National	All Accidents	20131	18118	16674	14949	14928	14668	14542	14027	13909
		One-Way Roads	695	620	543	513	511	462	446	358	373
		One-Way with CF305							43	37	31
	London	All Accidents	3744	3133	2891	2676	2685	2673	2595	2639	2570
		One-Way Roads	251	208	197	183	144	125	102	63	69
		One-Way with CF305							12	8	1
Serious	National	All Accidents	3164	2796	2678	2442	2420	2272	2339	2421	2552
		One-Way Roads	86	85	76	74	67	67	54	65	45
		One-Way with CF305							3	11	7
	London	All Accidents	502	432	470	422	436	352	375	394	487
		One-Way Roads	31	27	28	29	25	20	12	13	10
		One-Way with CF305							0	2	0
Fatal	National	All Accidents	187	141	145	141	124	144	158	163	146
		One-Way Roads	2	2	1	1	2	2	6	2	2
		One-Way with CF305							0	0	0
	London	All Accidents	10	15	21	20	19	8	22	19	19
		One-Way Roads	1	0	0	0	1	1	2	1	1
		One-Way with CF305							0	0	0

3.3.2 It is clear from the data above that, nationally, the number of collisions involving cyclists has steadily declined from 1999 to 2007. London also saw a steady decline in collisions involving cyclists, however there was a rise after 2005. This rise could be attributed to the increased number of cyclists on London roads and not to increased risk; however, a further study is required to find numeric evidence for this.

3.3.3 For the purpose of further analysis and as serious and fatal incidents are a small proportion of all collisions, they have been grouped into one category – Killed or Seriously Injured (KSI). **Table 3.2** below presents the results with the new groupings.

Table 3.2 KSI Collisions Involving Cyclists

Severity	Location	Type of Collision	Year								
			1999	2000	2001	2002	2003	2004	2005	2006	2007
All	National	All Collisions	23482	21055	19497	17532	17472	17084	17039	16611	16607
		All One-Way Roads	783	707	620	588	580	531	506	425	420
		All One-Way with CF305							46	48	38
	London	All Collisions	4256	3580	3382	3118	3140	3033	2992	3052	3076
		All One-Way Roads	283	235	225	212	170	146	116	77	80
		All One-Way with CF305							12	10	1
KSI	National	KSI Collisions	3351	2937	2823	2583	2544	2416	2497	2584	2698
		KSI One-Way Roads	88	87	77	75	69	69	60	67	47
		KSI One-Way with CF305							3	11	7
	London	KSI Collisions	512	447	491	442	455	360	397	413	506
		KSI One-Way Roads	32	27	28	29	26	21	14	14	11
		KSI One-Way with CF305							0	2	0

3.3.4 Nationally, there is a steady decline in KSI collisions until 2004 and a rise thereafter. KSI collisions in London follow the same pattern as nationally. In fact, an average of 50% of the rise in National KSI collisions between 2005 and 2007 can be attributed to a rise in London KSI collisions.

3.3.5 Collisions in one-way roads have declined steadily from 1999 to 2007 both in London and nationally. Only London saw a small rise of three collisions between 2006 and 2007. Nationally, KSI collisions in one-way roads have also been declining from 1999 to 2007, with only a small rise between 2005 and 2006. In London KSI collisions have followed a similar trend to national rates, but without the rise in collisions in 2006.

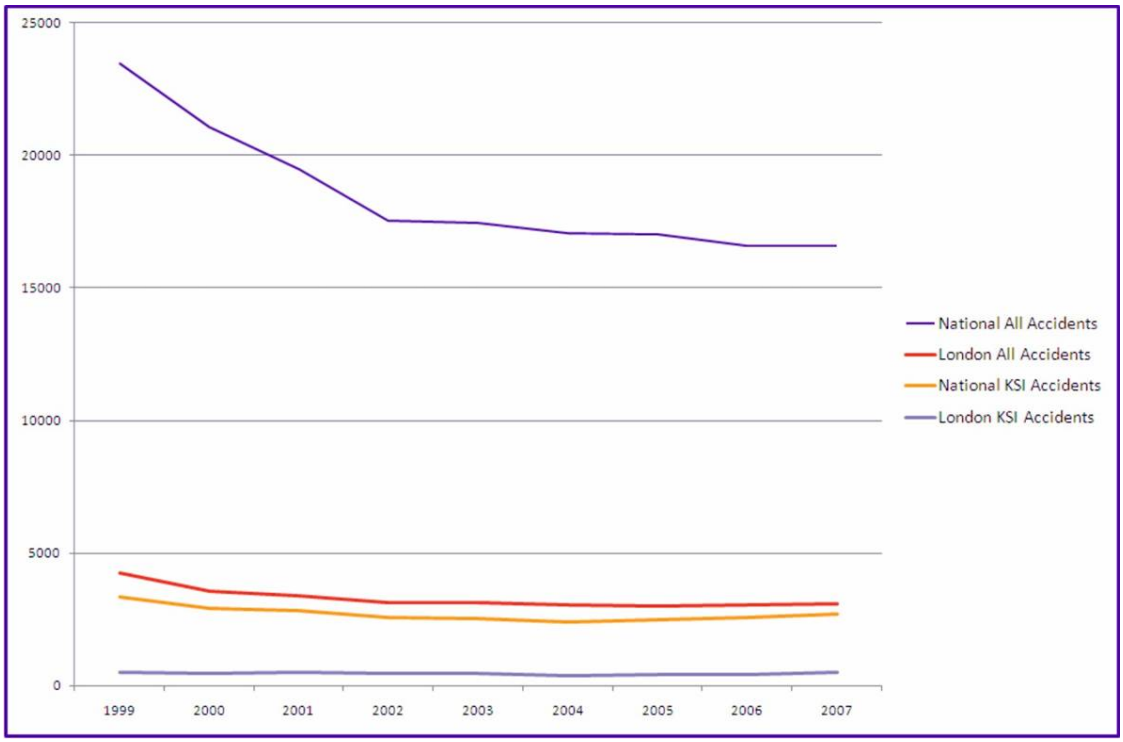


Figure 3.1 Collisions Trends Involving Cyclists

3.3.6 **Figure 3.1** above presents all and KSI collisions involving cyclists nationally and in London. It is clear that the number of collisions has steadily declined since 1999. However there has been a small increase in collisions involving cyclists in London and both National and London KSI collisions have increased slightly since 2005.

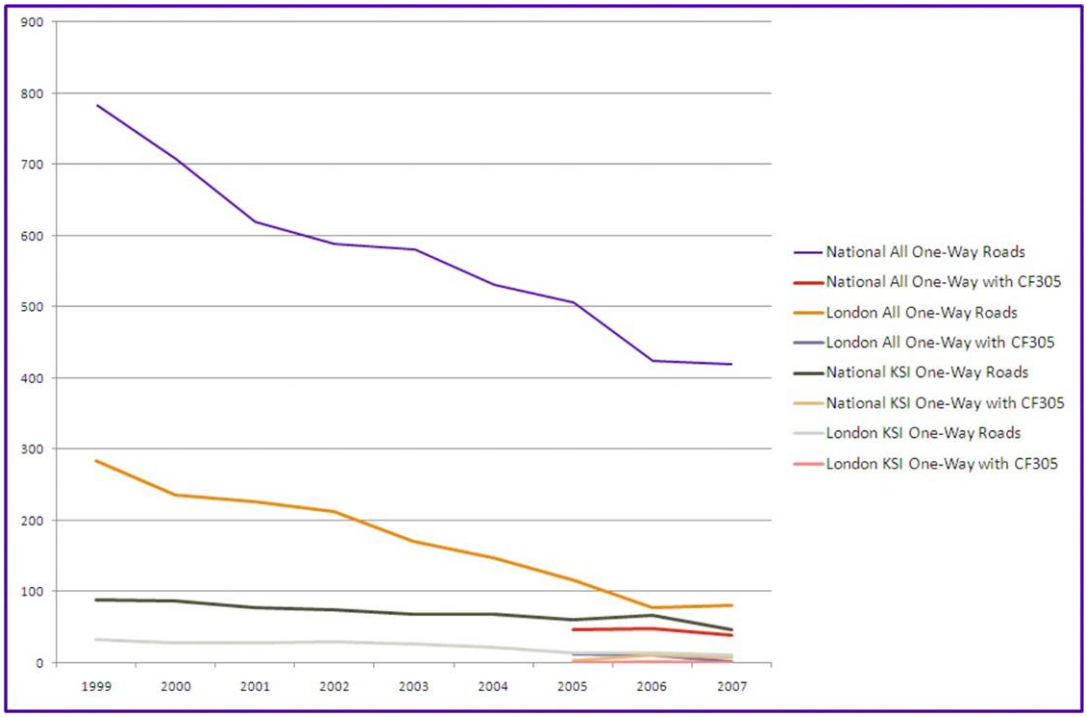


Figure 3.2 Collisions Involving Cyclists in One-Way Streets

3.3.7 **Figure 3.2** shows the trend in the number of collisions involving cyclists in one-way streets. Again, as with all collisions, the trend has declined over the analysed period. There has been a small increase in collisions taking place in one-way roads in London from 2006 to 2007. KSI collisions have also seen a small increase in 2006.

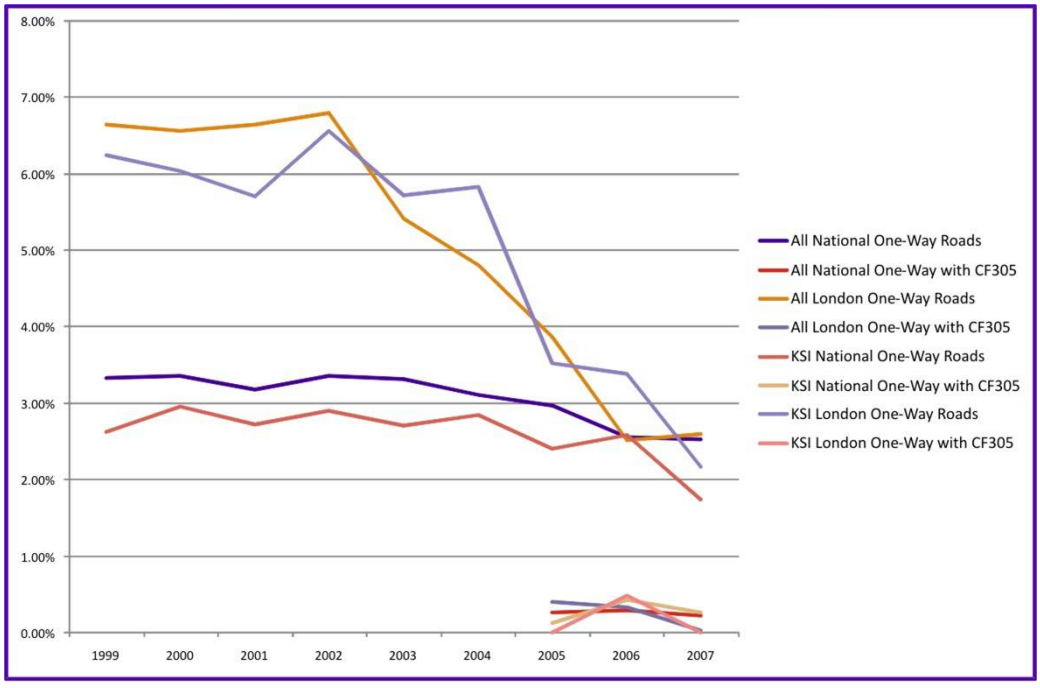


Figure 3.3 Collisions Involving Cyclists (Proportion of Collisions in One-Way Roads)

3.3.8 **Figure 3.3** displays collisions in one-way roads as a proportion of all collisions. There has been a sharp decline in the proportion of all collisions taking place on one-way roads in London. There is similar trend for KSI collisions in London.

3.3.9 National collisions on one-way streets have fluctuated at around 3%, with a small decrease in their proportion in 2005. Collisions as a result of illegally going down a one-way street are a very small proportion of the total collisions, less than half a percent.

London Accident Plans

3.3.10 **Appendix B** contains two plans, which show the location of the collisions involving cyclists that took place in one-way streets and where one of the contributory factors was 305 within London. It is clear that a majority of the collisions take place in central London, with the two KSI incidents taking place in West London. This is likely attributed to the greater number of one-way roads in central London.

3.4 STATS 19 Data Analysis of Streets with "No Entry Except Cycles" Plates

3.4.1 A limitation with the primary research described in this study is the short 'after' period that means that analysis of recorded casualties cannot be undertaken. To address this topic, collision rates were reviewed at sites where unauthorised signing combinations exist to determine their longer term safety performance. Two sites where identified where the 'No Entry Except Cycles' combination is currently in operation, which are as follows:

Cardigan Street/Kennington Lane (London)

3.4.2 This is a signalised junction in the London Borough of Lambeth, London which features a contra-flow lane and segregation island.

3.4.3 No incidents occurred at the junction of Cardigan Street and Kennington Lane during the three year period between 2006 and 2008. Most of the collisions in the area occurred along Kennington Road, primarily at the complex gyratory of Kennington Road and Kennington Lane.

Geneva Street (Peterborough)

3.4.4 This is a non-signalised junction in Peterborough which features a contra-flow lane.

3.4.5 One incident occurred at the study junction between a car turning right from Geneva Street and a cyclist going ahead along Park Road. No incidents could be attributed to the street layout or signing regime at the junction. **Figure 3.4** summarises the collision data for a three year period between 2006 and 2008 for this site.

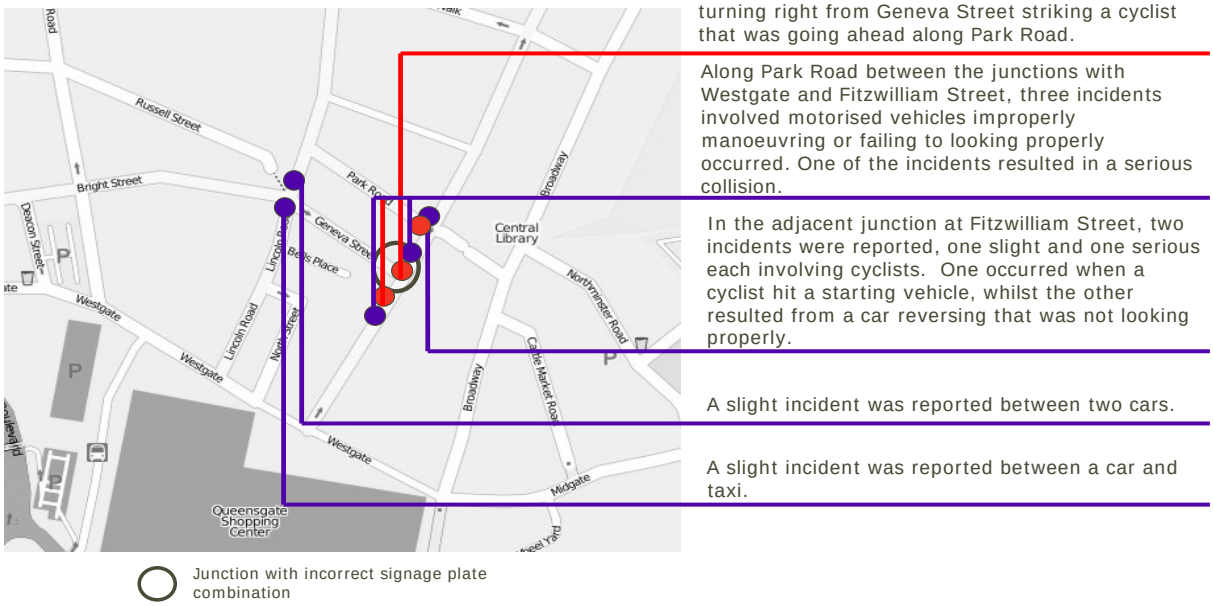


Figure 3.4 Geneva St STATS 19 Data Analysis

Malcolm Street (Cambridge)

3.4.6 Variations on the 'No Entry Except Cycles' signs were found in Cambridge.

Malcolm Street/Jesus Lane

Malcolm Street/King Street

3.4.7 At the Malcolm Street/Jesus Lane junction a combination of the 'No Entry Except Cycles' and sign 955 'Pedal Cycles only' is used.

3.4.8 At the Malcolm Street/King Street junction the 'No Entry Except Cycles' is used in combination with a variation of the sign 955 'Pedal Cycles only' and 967 'Route recommended for Pedal Cycles' as shown opposite.

3.4.9 STATS 19 data were interrogated for these two locations. Three incidents occurred at or close to the junctions, however; the contributory factors could not be attributed to the current street layout or signing regime. **Figure 3.5** summarises the collision data for the two junctions.

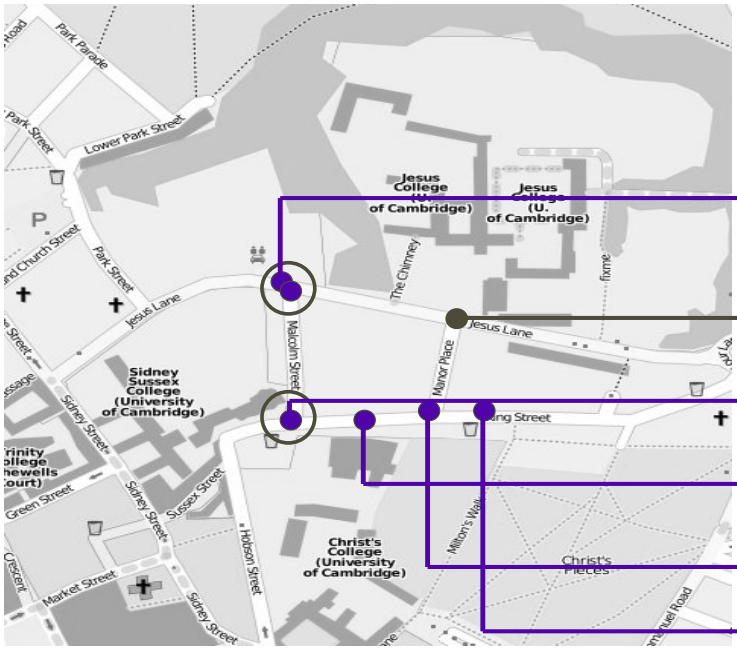


Figure 3.5 Malcolm Street STATS 19 Data Analysis

3.5 Conclusions

3.5.1 In summary, the STATS 19 data analysis has shown the following:

- Collisions involving cyclists in one-way streets made up a very small proportion of all injuries and that injuries associated with illegal turns (i.e. those directly relevant to the question of signing, were even less frequent (23 injuries of all severities in London in the three years from 2005 to 2007).
- Those incidents involving cyclists have largely declined in the period 1999 to 2007 both nationally and London-wide.
- Consideration of casualties at sites that are currently signed with 616 and some form of cycle exemption do not suggest that conflict between cyclists turning into the street and vehicles on the street is a source of injury, nor is conflict between vehicles illegally turning into the street and other vehicles.

4 Study Methodology

4.1 Introduction

4.1.1 This chapter summarises the methodology applied to the monitoring of sites and data analysis.

4.2 Site Selection

4.2.1 To monitor the effects of changing the signing from the 616 'Flying Motorcycle' sign to the 619/954 'No Entry Except Cycles' signs, two monitoring sites were identified in London and two sites outside of London, which were agreed by TfL, Cycling England and authorised by the DfT.

4.2.2 The monitoring sites were filtered from a long list of sites recommended by the project team. The criteria used as part of site selection included:

- landuse and location;
- signing regime;
- junction layout, dimensions and traffic management measures;
- street furniture;
- cycling measures including contra-flow provision;
- pedestrian measures;
- perceived and actual permitted traffic speeds;
- cycle volumes; and
- collision record.

4.2.3 The shortlisted sites were presented to the project team for discussion, following which site visits were undertaken with the associated Local Authority. The site visits gave an opportunity to double-check the suitability of junctions as study sites and establish the commitment from the Local Authority to partake in the trials. During the site visits some additional information was recorded including:

- sampled peak hour cycle/vehicle flows;
- availability, location and appropriateness of an associated 'No Entry' site;
- immediate cycle/road network;
- availability of appropriate locations to position video cameras;
- other observations such as observed balance of commuting versus leisure/visiting users).

4.2.4 Each of the monitoring sites included a 'trial' site and an 'associated' site. Trial sites were identified for the conversion of the 'Flying Motorcycle' to the 'No Entry Except Cycles' signs. The associated sites were identified close to the trial site and contained a 'No Entry' sign.

4.2.5 Trial sites were used to evaluate any change in vehicle and cycling compliance associated with the 'Flying Motorcycle' sign and the 'No Entry Except Cycles' combination. In addition, they were used to determine changes in behaviour and conflict due to the signing modifications.

4.2.6 The associated sites were critical to ascertain behavioural changes related to various factors such as: junction layout; traffic speeds; traffic volume; parking patterns; and weather. Given the proximity of the trial and associated sites to one another, behavioural changes were also observed at the associated signs due to the signing modifications.

4.2.7 **Table 4.1** shows the monitoring sites as identified following discussion with TfL, DfT and Cycling England.

Table 4.1 Trial and Associated Sites

Trial Sites	Associated Sites	Local Authority
Osbaldeston Road / Cazenove Rd	Leweston Place / Portland Ave	LB Hackney
Stockwell Avenue / Bellefields Rd	Bellefields Road / Stockwell Ave	LB Lambeth
Mawson Road / Mill Rd	Willis Rd / Mill Rd	Cambridge City Council
Campbell Rd / Argyle Rd	Argyle Rd / Campbell Rd	Brighton & Hove Council

4.3 Video Surveys

4.3.1 Video surveys were undertaken at the trial sites and associated sites 'before' and 'after' the changing of the signs at the trial site. The video cameras captured flows and behaviour for a period of 12 hours between 7am and 7pm on one neutral weekday.

4.3.2 There was a 'settling in' period of approximately one month for each site from the day the 'Flying Motorcycle' sign was changed to the 'No Entry Except Cycling' sign, with the exception of the Lambeth site, which due to delays in changing the signs had no settling in period before the after survey commenced. This was in order that the after survey could be completed before the change to British summertime.

4.4 Video Survey Dates

4.4.1 **Table 4.2** shows the dates in which the 'before' and 'after' surveys were conducted. We aimed for consistency on the days of the week selected for observation in the before/after periods. All the video surveys were undertaken on a Wednesday.

4.4.2 Both before and after surveys took place prior to British Summertime.

Table 4.2 Video Survey Dates

Sites	Before	After
London	20 January 2010	24 March 2010
Outside of London	27 January 2010	10 March 2010

4.4.3 There were no abnormal weather conditions during all video surveys. **Table 4.3** summarises the weather conditions during the surveys. Note that although some site visits took place in icy conditions and these are visible in photos in Chapter Five, the sites were not icy at the time of monitoring.

Table 4.3 Survey Weather Conditions

Sites	Before Survey	After Survey
London – Hackney	Cloudy and dry	Rain
London – Brixton	Partly cloudy / rain in afternoon	Rain
Brighton	Partly cloudy / rain in afternoon	Sunny
Cambridge	Partly cloudy / rain in afternoon	Sunny

4.5 Camera Locations and Viewing Positions

4.5.1 **Appendix C** contains 'screen shots' of camera locations and viewing positions relative to the junctions under review to illustrate the camera footprint.

4.6 Data Collection and Analysis

4.6.1 There were four aspects to data collection and analysis:

- volume assessment;
- compliance;
- behaviour assessment; and
- interaction and conflict scoring.

Volume Assessment

4.6.2 Every cyclist and motorised vehicle entering or exiting the trial/associated site was recorded and observed. Volume changes were measured and compared to total junction flows to account for seasonal and weather variability.

Compliance

4.6.3 The level of compliance with the signs during the 'before' and 'after' surveys was analysed and compared with the global trend of vehicle and cycle compliance across the sites.

Behavioural Assessment

4.6.4 For each cyclist or motorised vehicle entering the one-way street, our analysts undertook a behavioural assessment and recorded the data shown in **Table 4.4**.

Table 4.4 Behavioural Assessment

Category	Options Available
Date of Entry	DD/MM/YY
Time of Entry	Hr:Mins:Sec
Weather Conditions	Sunny, overcast, raining etc. Provide description
Light Conditions	Light / dark
Road Conditions	Wet / dry
Type of Vehicle	Car/Pick-up, LGV, HGV, Bus, Motorcycle, other (if other please specify)
Type of Cyclist	Commuter / Leisure / Child Cyclist
Using the Contra-flow lane?	Yes / No
Preferred Manoeuvre	Going ahead but held up, Illegal manoeuvre, Overtaking moving vehicle offside, Overtaking nearside, Parked, Reversing, Riding on footway, Starting, Stopping
Description of Movement	Description of the type of movement made by vehicle/cyclist e.g. smooth, hesitant, sudden change of direction etc. including if the cyclist 'cut the corner' of one-way lane.
Trajectory of the Movement	Right turning, through, left turning, reversing.
Observed Obstructions	Please describe activity during this movement. Are there any other obstructions on the path, i.e. parked/waiting vehicles, pedestrians waiting etc.

Interaction Assessment and Conflict Scaling

4.6.5 Where there was an observed interaction between a vehicle (including a cyclist) entering the contra-flow arrangement and another user travelling in competing direction (such as opposing, crossing, etc.), our analysts undertook an Interaction Assessment and recorded the information shown in **Table 4.5**.

Table 4.5 Interaction Assessment Data Collection

Category Data	Record
Date of Interaction	DD/MM/YY
Time of Interaction	Hr:Min:Sec
Weather Conditions	Sunny, overcast, raining etc.
Light Conditions	Light / dark
Road Conditions	Wet / dry
Type of vehicle turning into the contra-flow	Car/Pick-up, LGV, HGV, Bus, Motorcycle, Commuter, Leisure or Child Cyclist
Type of vehicle travelling with flow	Car/Pick-up, LGV, HGV, Bus, Motorcycle, Commuter, Leisure or Child Cyclist
Was there a Conflict?	Yes / No
Who was the Conflict between?	Vehicle / Cyclist, Vehicle / Pedestrian, Cyclist / Pedestrian, Other
Location of Conflict	Using contra-flow lane or with flow lane, or at the right side, middle or left side of carriageway
Cyclist Trajectory	Right turning, through, left turning, reversing
Vehicle Trajectory	Right turning, through, left turning, reversing
Vehicle Response	No response required, stops suddenly, stops in advance, manoeuvres suddenly, manoeuvres in advance, light contact, full contact.
Cyclist Response	No response required, stops suddenly, stops in advance, manoeuvres suddenly, manoeuvres in advance, light contact, full contact.
Obstructions	Are there any other obstructions on the path, i.e. parked/waiting vehicles, pedestrians waiting, etc?
Conflict Scale	See below
Comments	Any other comments / description of event

Interaction Scoring

4.6.6 Our Analysts recorded the scale of interaction between participants. The scale is shown in **Table 4.6** and is based on the Collision Severity Index (CSI).

4.6.7 We analysed the level of interaction at each site, including:

- overall 'before' and 'after' conflict levels;
- proportion and rate of conflict of each level of interaction depending signing and relative to the 'associated' site; and
- different types of interaction (such as trajectory, manoeuvre and with whom).

Table 4.6 Interaction Scale Scoring

Score	Description
0	No response required by either cyclist or vehicle
1	Precautionary or anticipatory braking or lane change when risk of collision is minimal
2	Controlled braking or lane change to avoid collision (but with ample time for manoeuvre)
3	Rapid deceleration, lane change or stopping to avoid collision, resulting in a near miss situation
4	Emergency braking or violent swerve to avoid collision resulting in a near miss situation
5	Emergency action followed by collision

5 Monitoring Sites

5.1 Introduction

5.1.1 This chapter describes the trial and associated sites monitored as part of the study, their site characteristics and STATS 19 accident record for a three year period between 2006 and 2008.

5.1.2 The photographs depicted in this chapter where taken during a site visit prior to the before surveys being undertaken and therefore in the case of the trial sites, these photographs may not show changes made to site layout prior to the surveys commencing.

5.2 Hackney Monitoring Sites

Trial Site: Osbaldeston Road

Associated Site: Leweston Place

Site Characteristics

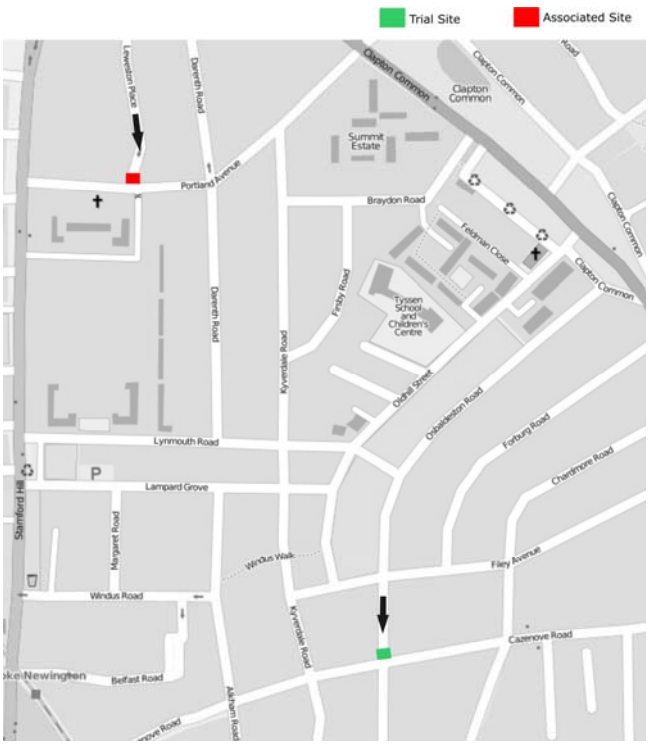
Land Use
Residential, close to busy Stamford Hill (A10)

Road entrance widths
Osbaldeston Rd: 9m.
Leweston Place: 9m.

Street Layout

Trial Site: 'No entry' road markings are present on the eastern side and contra-flow entry cycle markings are provided on the western edge of Osbaldeston Rd.

Associated Site: A cycle contra-flow segregation island is present on 'No entry' road markings on the eastern side of Leweston Place.



Parking
Residential parking bays are provided on both sides of Osbaldeston Rd and Leweston Place.

Permitted Speed Limit: 30mph

mvaconsultancy

5.3 Lambeth Monitoring Sites

Trial Site: Stockwell Avenue*

Associated Site: Bellefields Road

Site Characteristics

Land Use
Residential, close to busy Stockwell Rd (A203)

Road entrance widths
Stockwell Avenue: 12m.
Bellefields Road: 6m.

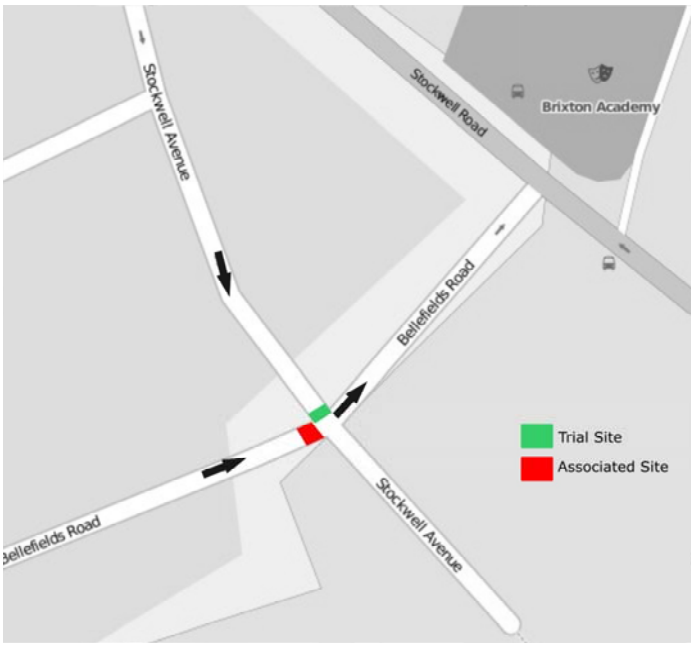
Street Layout

Trial Site: 'No entry' road markings are present on the eastern side and contra-flow entry cycle markings are provided on western edge of Stockwell Avenue.

Associated Site: A build-out and raised table provides an at-grade crossing at the Bellefields Rd/Stockwell Ave junction.

Parking: Residential parking bays are provided on both sides of Stockwell Ave and Bellefields Rd.

Permitted Speed Limit: 30mph.



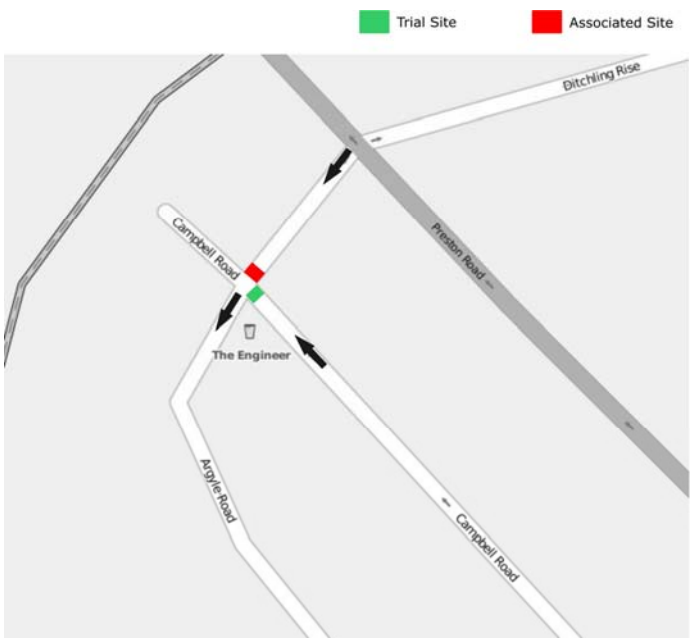
* At the time of the trial the barrier (as depicted in the photo) was removed and contra-flow cycle markings installed.

5.4 Brighton Monitoring Sites

Trial Site: Campbell Rd

Associated Site: Argyle Rd

Site Characteristics



Land Use
Residential. A garage and pub are located on either side of Campbell Road at the junction with Argyle Rd. Located close to the busy Preston Rd (A23).

Road entrance widths
Campbell Rd: 8m.
Argyle Rd: 7m.

Street Layout

Trial Site: 'No entry' road markings are present on the western side and contra-flow entry cycle markings on the eastern edge of Campbell Road.

Associated Site: 'No Entry' line markings are present at the Argyle Rd/Campbell Rd junction. On-footway shared use facilities are provided on the northwest footway on Argyle Rd.

Parking: Residential parking is provided on the eastern side of Campbell Rd. Illegal parking activity was observed at the Campbell Rd/Argyle Rd junction, which is believed to be associated with the garage at this junction. Residential parking bays are provided on both sides of Argyle Rd.

Permitted Speed Limit: 30mph.

5.5 Cambridge Monitoring Sites

Trial Site: Mawson Road

Associated Site: Willis Road

Land Use
Commercial/residential

Road entrance widths
Mawson Rd: 6m.
Willis Rd: 7m.

Street Layout

Trial Site: 'No entry' road markings are present on the eastern side and cycle markings with a red contra-flow cycle lane for approximately 20m on the western edge of Mawson Rd.

Associated Site: A build-out with raised planter is provided on the northwest side of Willis Rd.

Parking
Parking is not permitted on Mawson Rd. Residential parking bays are provided on both sides of Willis Rd.

Permitted Speed Limit: 30mph.

5.6 Monitoring Site STATS 19 Data Analysis

5.6.1 STATS 19 data was interrogated to understand the casualty records of the monitoring sites prior to the implementation of the new signing as part of the trials.

LB Hackney STATS 19 Data Analysis

5.6.2 In a three year period between 2006 and 2008, five collisions were reported at the junctions adjacent to the trial site along Cazenove Road. None of the incidents involved cyclists or took place at the trial site.

5.6.3 **Figure 5.1** summarises the STATS 19 data analysis for the 'trial' site at the Osbaldeston Road/Cazenove Rd junction and surrounding streets. No collisions were recorded at the 'associated' site (Leweston Place junction) or in the surrounding streets.

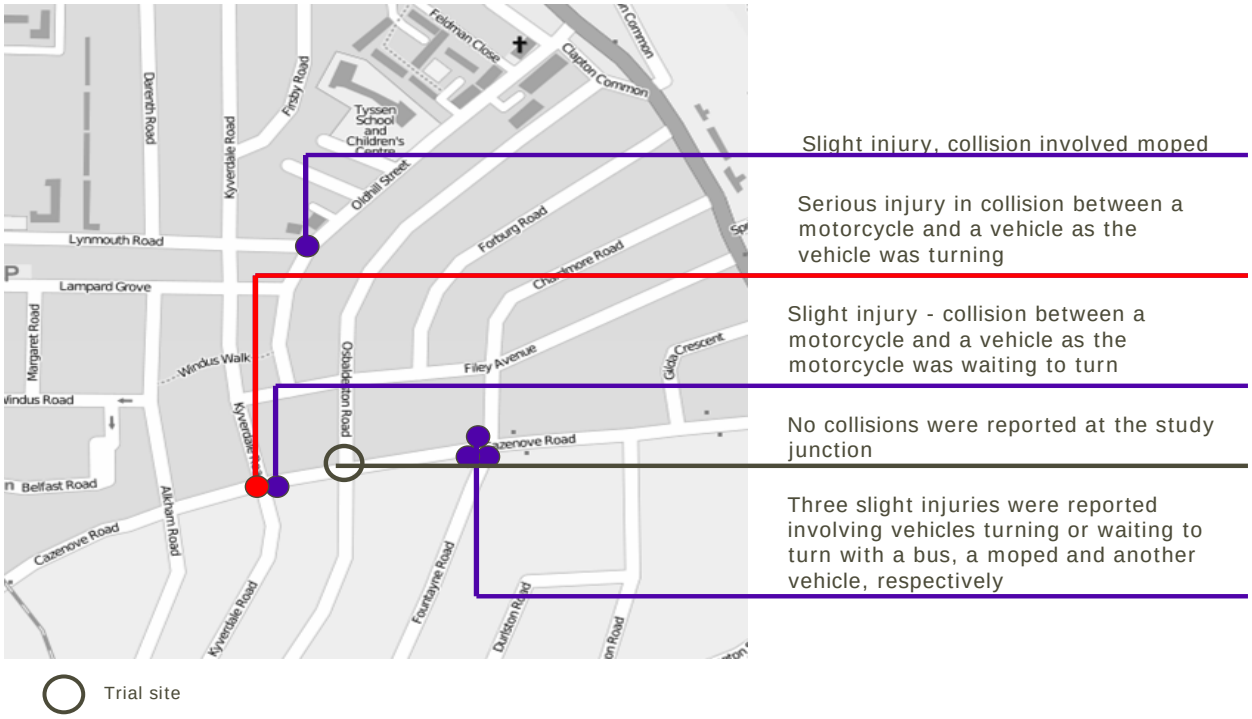


Figure 5.1 Hackney Trial Site STATS 19 Data Analysis

Lambeth STATS 19 Data Analysis

5.6.4 No collisions were recorded at the study junction. Few collisions were reported in the area immediately surrounding the monitoring sites in a three year period between 2006 and 2008. Of those collisions, all injuries were slight and one involved a cyclist on Stockwell Road..

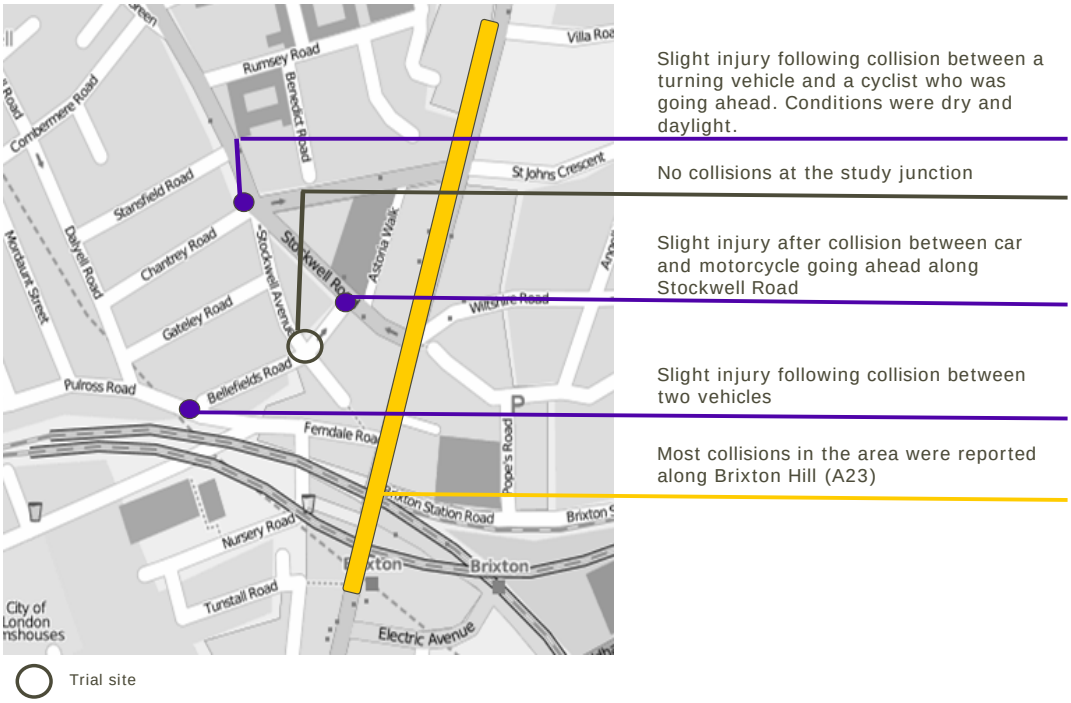


Figure 5.2 Lambeth Monitoring Site STATS 19 Data Analysis

Brighton STATS 19 Analysis

5.6.5 No collisions were recorded at the study area. Few collisions were reported in the area immediately surrounding the trial site between 2006 and 2008.

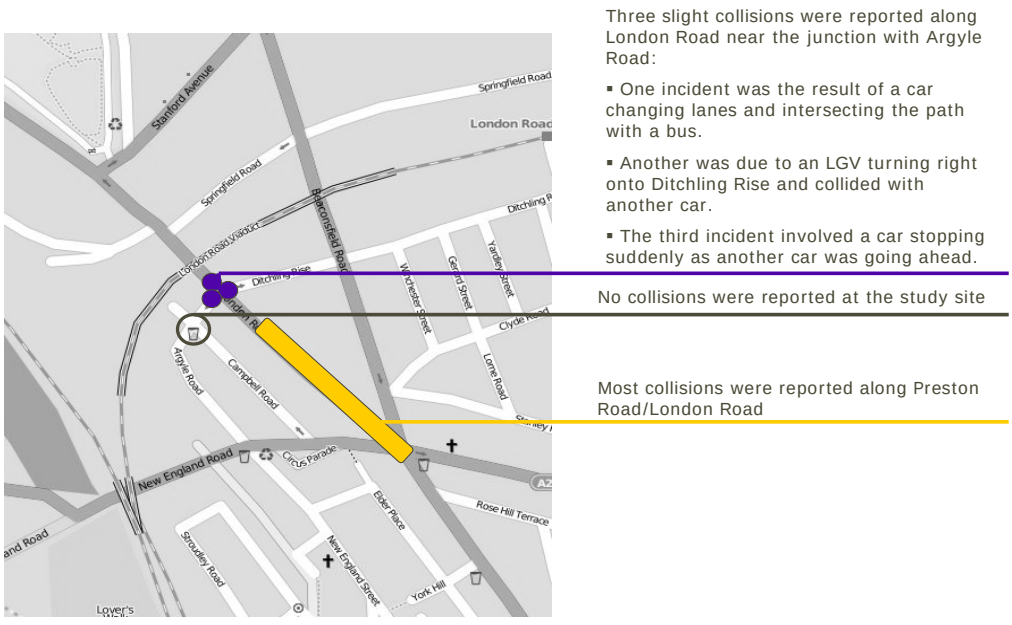


Figure 5.3 Brighton Monitoring Site STATS 19 Data Analysis

Cambridge STATS 19 Analysis

5.6.6 Four incidents occurred near the junction of Mawson Road and Mill Road. These incidents however were not attributed to street layout or signing regime. At the associate site junction (Willis Road and Mill Road) no incidents were reported.

5.6.7 **Figure 5.4** summarises the STATS 19 data for the Cambridge 'trial' and 'associated' sites.

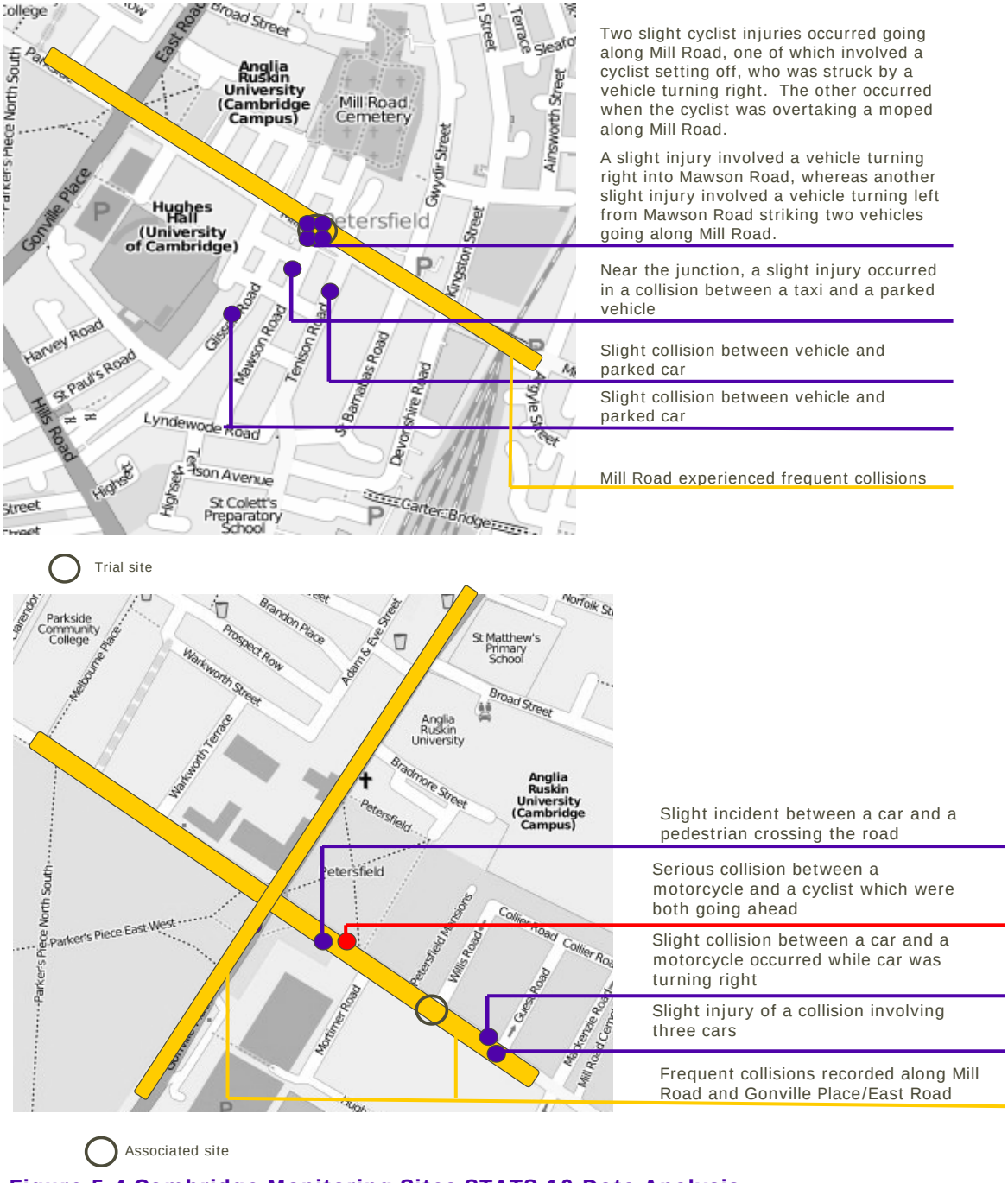


Figure 5.4 Cambridge Monitoring Sites STATS 19 Data Analysis

5.7 Summary

- Through discussion with TfL, DfT and Cycling England, a cross section of monitoring sites was identified, which had varying cycle/vehicle volumes, land uses, street layouts and cycle facilities. These sites were authorised by the DfT prior to undertaking the signing changes and video surveys.
- Analysis of STATS 19 data shows that where collisions occurred, these were largely detached from the monitoring sites, did not involve cyclists and could not be attributed to conflicts caused by the current street layout or signing regime.

6 Volumes and Signing Compliance

6.1 Introduction

6.1.1 This chapter summarises volume and signing compliance data for the monitoring sites. The aim of the analysis was to:

- Review the number of vehicles and cyclists currently entering the junctions monitored to establish the statistical significance of the data.
- Establish if there is a change in volume of cyclists entering the junctions when the 'Flying Motorcycle' sign was in operation and when the 'No Entry Except Cycles' signs were installed.
- Determine the level of signing compliance of the 'Flying Motorcycle' sign versus the 'No Entry Except Cycles' signing combinations.
- Determine if there was a change in signing compliance at the associated site, where the 'No Entry' signs were in operation following the change of the 'Flying Motorcycle' sign to the 'No Entry Except Cycles' signing combinations at the trial sites.

6.1.2 **When reviewing this chapter please examine Appendix D, which includes junction diagrams of volumes and compliance at all monitoring sites.**

6.2 Seasonal/Weather Factors

6.2.1 The design of this study had no control as the associated sites were chosen for their proximity to the trial sites and the potential for the trial sites to influence behaviour at associated sites. In assessing the effect of the trials on behaviour, analysis of absolute change in flow might conflate behavioural change resulting from the trial with other sources of change, particularly seasonal or weather variation.

6.2.2 Although the 'before' and 'after' monitoring periods were relatively close together (January and March) and hence seasonal effects might be minimal, we have attempted to control for seasonal variation in this analysis.

6.2.3 National data collected by the NTS on total seasonal variation in cycling is overly aggregate to represent potential local variations and hence was not considered suitable to develop a common seasonality factor between January and March that was applicable across all sites.

6.2.4 Accordingly we have estimated the seasonal influence in our analysis by calculating the absolute percentage change in contra-flow movements at each of the sites, minus the percentage change in total junction movements at each site. Total junction movements for each site are shown in **Figure 6.1.**

6.2.5 It is considered unlikely that the signing trial would have significantly altered overall junction flows, consequently changes in these flows stand as a proxy for seasonal or other background trends in helping isolate the influence of the signing trial.

6.3 Total Junction Volume Data

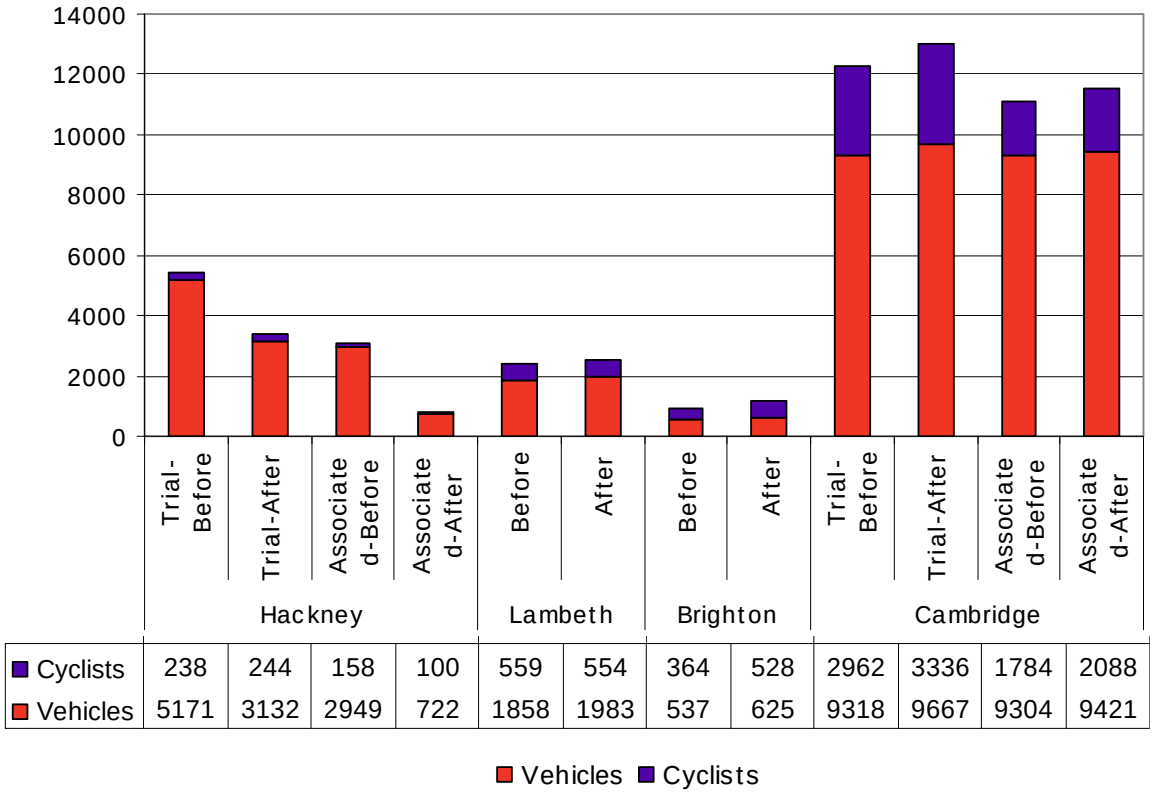


Figure 6.1 Total Junction Volumes

6.3.1 As can be seen in **Figure 6.1** the more substantial decrease in volumes at the Hackney sites was attributed to a considerable seasonal/weather variation observed at the London sites. Outside of London sites experienced a minor seasonal variation.

6.4 Cycle Volumes at Trial Sites

6.4.1 **Table 6.1** presents contra-flow cycle volumes along the one-way junction arm at the trial sites.

Table 6.1 Contra-Flow Cycle Volumes % Change

	No. of Cycles		% Absolute Change	% Change less Seasonal Variation
	Before	***After***		
London sites	342	362	5.8%	5.7%
Outside of London sites	251	314	25.1%	8.9%

6.4.2 Overall there was an increase in the number of contra-flow cyclists travelling through junctions with 'No Entry Except Cycles' signs versus the 'Flying Motorcycle' sign.

6.4.3 In Lambeth, an increase in contra-flow cyclists was observed following the implementation of the 'No Entry Except Cycles' signing (7.4%). A negligible change was observed at the Hackney monitoring sites.

6.4.4 The increase in cyclists is particularly apparent at the Cambridge site where there was a more substantial change in those travelling through junctions with the 'No Entry Except Cycles' signs (approximately 15%). Whereas in Brighton, a 20% decrease in cyclists relative to the overall seasonal trend was observed. This is likely due to the substantial seasonal cycling increase experienced at the site (nearly 50% more cyclists travelling in March relative to January). The seasonal factors at Brighton influence the overall percentage change less seasonal variation, reducing the change due to 0.9%.

6.4.5 The increase in cycle volumes has been determined to be statistically significant within a 95% confidence level.

6.5 Motorised Vehicle Non-Compliance at Trial Sites

6.5.1 **Table 6.2** summarises the total number and the percentage change in non-compliance by motorised vehicles with entry restrictions before and after the replacement of the 'Flying Motorcycle' with 'No Entry Except Cycles' signs.

Table 6.2 Motorised Vehicle Non-Compliance at the Trial Sites

	No. of Vehicles		% Absolute Change	% Change less Seasonal Variation
	Before	*After*		
London sites	39	9	-76.9%	-49.7%
Outside of London sites	36	19	-47.2%	-51.7%
Total	75	28	-62.6%	-53.9%

6.5.2 Overall, the number of motorised vehicles which violated the 'Flying Motorcycle' sign was more than halved after the installation of the 'No Entry Except Cycles' signing combination. This was highest at the Cambridge trial site with 20 fewer vehicles (equivalent to 72% decrease) using the one-way street following signing implementation. Brighton experienced an additional three vehicles illegally using the one-way arm (equivalent to a 26% increase); this may be attributed to the increase in garage activity at the junction.

6.5.3 Both London trial sites experienced a comparable decline in non-compliance (53% fewer vehicles illegally using the one-way street).

6.5.4 The decrease in number of vehicles who illegally go down the one-way streets at the trial sites has been determined to be statistically significant with 90% confidence.

6.6 Associated Site 'No Entry' Signing Non-Compliance

Cyclist Non-Compliance

6.6.1 **Table 6.3** summarises cyclist non-compliance at associated sites in Lambeth and Cambridge. Cycling was permitted at the Hackney and Brighton sites via a contra-flow cycle island and shared use facility at the respective sites and are therefore not included in the table below.

Table 6.3 'No Entry' Signing Non-compliance by Cyclists at the Associated Sites

	No. of Cycles		% Absolute Change	% Change less Seasonal Variation
	Before	*After*		
Lambeth	25	38	52.0%	52.9%
Cambridge	30	41	36.6%	19.6%
Total	55	79	43.6%	30.9%

6.6.2 Cyclist non-compliance increased by approximately a third across the Lambeth and Cambridge sites. At the Lambeth site, an additional 13 cyclists used the 'No Entry' arm of the associated site junction. In Cambridge, 11 additional cyclists did not abide by the signing. However, the increase in the number of cyclists going down the one-way street at the associated site is not statistically significant.

Motorised Vehicle Non-Compliance

6.6.3 **Table 6.4** summarises 'No Entry' signing non-compliance by motorised vehicles at the associated sites.

Table 6.4 No Entry' Signing Non-Compliance by Motorised Vehicles at the Associated Sites

	No. of Vehicles		% Absolute Change	% Change less Seasonal Variation
	Before	*After*		
London sites	13	1	-92.3%	-48.6%
Outside of London sites	13	11	-15.4%	-17.5%
Total	26	12	-53.8%	-40.9%

6.6.4 **Table 6.5** shows there was a decrease in the number of motorised vehicles travelling through the 'No Entry' sign at the associated sites. This is most notable at the London sites where a larger decline occurred, as both the Lambeth and Hackney sites nearly eliminated all illegal vehicle activity. A decrease was also observed in those sites outside of London, with Brighton and Cambridge experiencing a 16% and 1% decrease in non-compliance, respectively.

6.6.5 Given the volumes, this decrease in motorised vehicles illegally using the one-way street is not statistically significant.

6.7 Summary

6.7.1 In summary a review of the data has shown:

- Although located at or near busy main roads, the total junction flows were relatively low at the monitoring sites. Cycle volumes were the highest in Cambridge (approximately 3000 at the trial site junction and 2000 at the associated site junction), followed by Lambeth and Brighton (approximately 550 and 500, respectively). They were relatively low at the Hackney monitoring sites (approximately 240 and 140 at the trial and associate site junctions).
- Following the signing change from the 'Flying Motorcycle' to the 'No Entry Except Cycles' signing combinations, there was a statistically significant increase with 95% confidence in the number of cyclists travelling through the junction with the 'No Entry Except Cycles' signing combination (an increase of 83 cyclists across the four trial sites).
- Overall there was a statistically significant increase with 90% confidence in vehicle compliance following the change of the 'Flying Motorcycle' sign to the 'No Entry Except Cycles' sign (decrease of 47 vehicles across the four associated sites).
- At the associated 'No Entry' signing sites, following the change at the trial sites, there was an increase in cyclists violating the 'No Entry' sign (24 additional non-compliant cyclists at the associated sites) but this was not found to be statistically significant.

7 Behavioural Assessment

7.1 Introduction

7.1.1 This chapter summarises the results of the behavioural assessment of the monitoring sites. The aim of the assessment was to understand the impact of contra-flow cycling on road user behaviour.

7.1.2 Each of the sites was reviewed to determine behaviour relating to:

- Cyclists positioning and reaction when using one-way streets; and
- Vehicle manoeuvres and reaction when using one-way streets.

7.1.3 **When reviewing this chapter please examine Appendix E, which includes junction diagrams illustrating cycle behaviour at each monitoring site.**

7.1.4 **Figures 7.1** and **7.2** illustrate the categories used to record location and movement at the junctions and are useful for interpreting the graphs in this chapter.

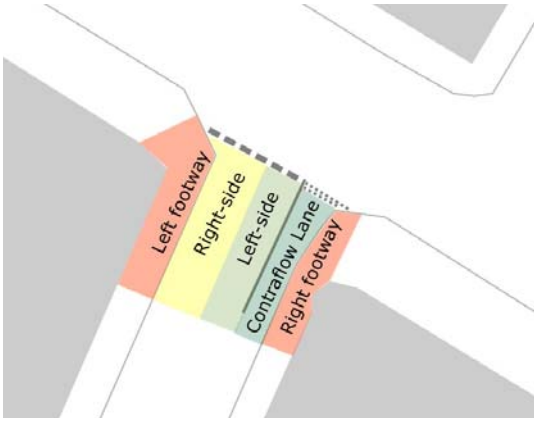


Figure 7.1 Contra-flow Movement Location

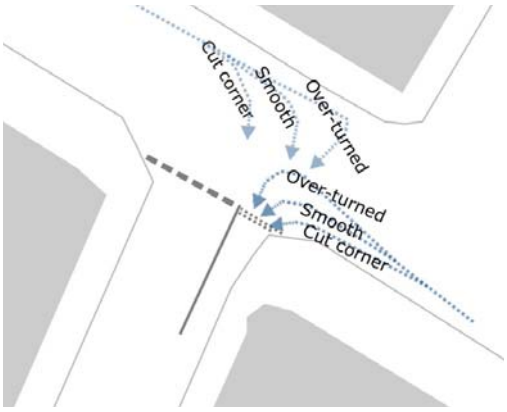


Figure 7.2 Contra-flow Movement Manoeuvre

7.2 User Type and Behavioural Assessment

7.2.1 At each of the study sites, most cyclists were considered to be commuters (although this was based on the visual estimate by analysts). Those sites situated within the residential network were likely to have a larger proportion of frequent users, relative to those sites that intersect with major roadways.

7.2.2 Users cutting the corner or over-turning were used to characterise those users who manoeuvred within or outside, respectively, of the natural trajectory available.

7.2.3 Hesitation by a user was indicated when a cycle or vehicle, stopped or slowed prior to entering the one-way street without an apparent cause or obstruction, but rather to interpret the sign or judge if the path is safe.

7.3 Cyclist Behaviour

7.3.1 There was minimal change in cyclist behaviour observed in the 'before' and 'after' survey periods. Overall trends detected include:

- Most cyclists utilised the contra-flow lane (67%) at the trial sites studied.
- Most cyclists performed relatively smooth manoeuvres to enter a one-way street (95%), with few cyclists cutting the corner (4%) or over turning (1%).
- At the associated sites without contra-flow designation, cyclists tended to utilise the left-side (58%) of the carriageway.
- Most cyclists (98%) did not hesitate or slow to interpret/read the signing.

Positioning

7.3.2 **Figure 7.3** summarises overall positioning amongst contraflow cyclists at the sites.

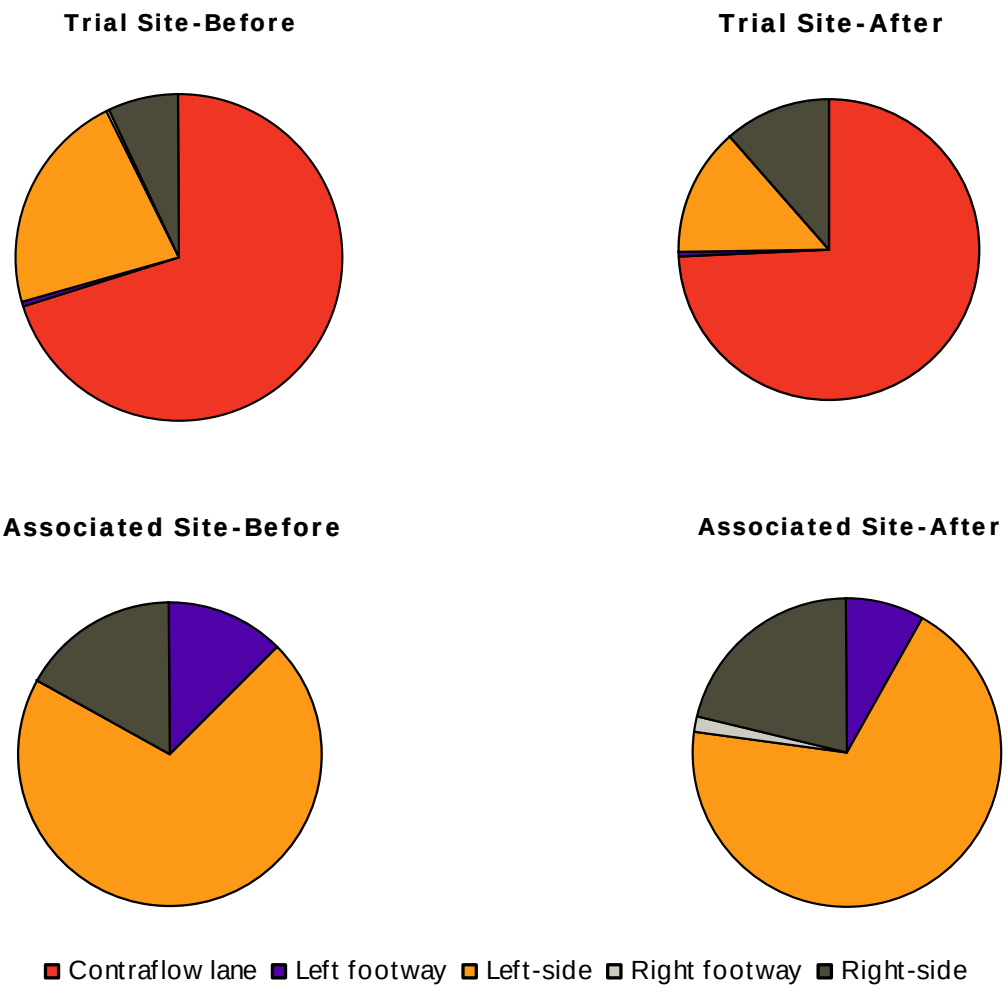


Figure 7.3 Cyclist Positioning

7.3.3 Where a contra-flow lane was available, most cyclists elected to use it. At the associated sites, where no contra-flow lane was an option, cyclists tended to use (their) left-side of the carriageway, with some cyclists using the footway where a narrowed entrance was in place or if a vehicle was exiting the one-way study arm. There was no statistically significant difference in cyclist positioning due to the signing modifications.

7.3.4 In the instances where the contra-flow lane was obstructed or if a car parked too close to the junction, a cyclist often did not use the contra-flow lane and instead elected to use the carriageway to the right of the contra-flow lane. This situation occurred during various periods at the trial sites in Lambeth and notably in Brighton, due to activity associated with the garage next to the trial site junction.

Hesitation

7.3.5 **Table 7.1** summarises the number of cycles who hesitated prior to entering a one-way street.

Table 7.1 Cyclist Hesitation at a one-way street

	Before		After		Change in % of Movements
	No. of cyclists	% of movements	No. of cyclists	% of movements	
Trial	4	0.8%	3	0.5%	**0.03%**
Associated	0	0.0%	2	2.1%	**2.1%**

7.3.6 The change of cyclist's hesitating in the 'before' and 'after' studies is negligible and is not statistically significant.

7.4 Motorised Vehicle Behaviour

7.4.1 Motorised vehicles who did not comply with the signing were often observed to be cutting through the network or parking/accessing a site along the one-way street. General trends include:

- On average, 27% of vehicles that violated the signing did so by reversing down the one-way street.
- Overall, nearly 20% of drivers hesitated before illegally entering the one-way street.
- Most motorised vehicles (98%) performed a smooth manoeuvre, not cutting corners or over turning when accessing the one-way street.

Manoeuvring

7.4.2 **Table 7.2** summarises the proportion of movements associated with reversing in the 'before' and 'after' surveys.

Table 7.2 Motorised Vehicles reversing along one-way streets

	Before		After		Change in % of Movements
	No. of vehicles	% of movements	No. of vehicles	% of movements	
Trial	10	11.9%	10	35.7%	**23.9%**
Associated	16	57.1%	3	100%	**42.2%**

7.4.3 The motorised vehicles observed reversing sought a parking space or to access a destination along the one-way street. Reversing behaviour was more common at those sites with the 'No Entry' sign (approximately 80% across associated and trial sites following signing change) relative to the 'flying motorcycle sign' (12% at trial sites prior to signing change).

7.4.4 The increased reversing manoeuvres as a result of the signing change have been determined to be statistically significant within the 95% level. This behaviour is interpreted as a conscious violation, with the increase potentially representing a greater recognition of the No Entry sign than the Flying Motorcycle.

Hesitation

7.4.5 **Table 7.3** summarises the proportion of motorised vehicles who hesitated when entering a one-way street in the opposing direction.

Table 7.3 Motorised Vehicle Hesitation

	Before		After		Change in % of Movements
	No. of vehicles	% of movements	No. of vehicles	% of movements	
Trial	21	25%	5	17%	**-8%**
Associated	1	4%	0	0%	**-4%**

7.4.6 As evident from **Table 7.3**, the modification in signing from a 'Flying Motorcycle' to a 'No Entry' sign, the number of motorised vehicles hesitating decreased. There was a less substantial change for those sites which are situated in an area that feature a large number of 'Flying Motorcycle' signs, such as in Hackney and Cambridge.

7.4.7 Given the limited number of observations in the after study, the change has been determined not to be statistically significant.

7.5 Summary

7.5.1 In summary the data has shown:

- Contra-flow cyclists behaved and positioned themselves similarly regardless of the signing present at one-way streets.
- Cyclists tended to use contra-flow lanes when present (74% of cyclists), otherwise if no cycle lane was present they utilised (their) left side of the carriageway (64% of cyclists).
- Motorised vehicles were more likely to reverse down a one-way street when 'No Entry' signs were present, whereas they were more likely to go in the forward direction (opposite one-way designated direction) with the 'Flying Motorcycle' sign (88%). This may suggest that those reversing were making a conscious violation. This finding was determined to be statistically significant.
- Motorised vehicles were less likely to hesitate when presented with the 'No Entry' sign, relative to the 'Flying Motorcycle' (17% versus 25%), suggesting better understanding, although further observations are required to prove significance.

8 Interaction Assessment

8.1 Introduction

8.1.1 Following a review of behaviour of cyclists and vehicles, interactions between users was investigated. The frequency, severity, who was involved and manoeuvre were analysed. The assessment included the following:

- cyclist positioning and manoeuvre during interactions;
- motorised vehicle manoeuvres during interactions;
- location on carriageway where interactions occurred; and
- reactions by parties involved in interactions.

8.1.2 This chapter summarises the results of the interaction assessment. **Appendix F** contains the interaction data for each monitoring site.

8.1.3 **Figures 8.1** and **8.2** illustrate the categories used to record location and movement at the junctions and are useful for interpreting the graphs in this chapter.

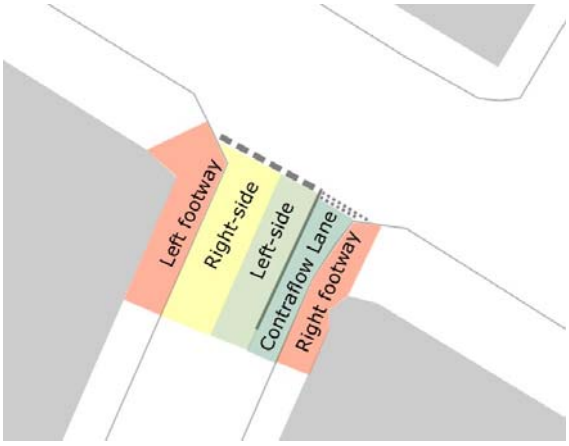


Figure 8.1 Contra-flow Movement Location

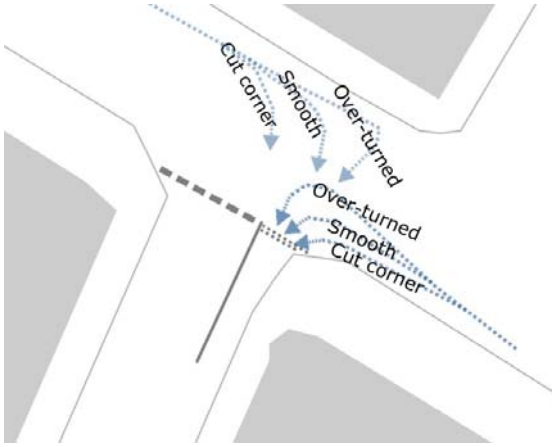


Figure 8.2 Contra-flow Movement Manoeuvre

8.1.4 Level of conflicts at each site was analysed using our Interaction Severity Index, as summarized in **Table 8.1**.

Table 8.1 Interaction Scale Scoring

Score	Description
0	No response required by either cyclist or vehicle
1	Precautionary or anticipatory braking or lane change when risk of collision is minimal
2	Controlled braking or lane change to avoid collision (but with ample time for manoeuvre)
3	Rapid deceleration, lane change or stopping to avoid collision, resulting in a near miss situation
4	Emergency braking or violent swerve to avoid collision resulting in a near miss situation
5	Emergency action followed by collision

8.1.5 It should be noted that interactions occur at different levels of severity and, in extreme cases, can result in personal injury. It should be noted that conflicts by nature have a high degree of variability, with a significant dependence on the actions of a particular user or driver.

8.2 Frequency and Severity of Interaction

8.2.1 **Table 8.2** summarises the proportion of vehicles (including cyclists) who interacted with another cyclist, motorised vehicle or pedestrian and the associated severity.

Table 8.2 Frequency and Severity of Interaction

Interaction Score	Before		After		% Change
	No.	% of contra-flow volume	No.	% of contra-flow volume	
Trial					
0	46	7.4%	34	5.4%	-2.0%
1	12	1.9%	7	1.1%	-0.8%
2	4	0.6%	2	0.3%	-0.3%
Total	**62**	**9.9%**	**43**	**6.8%**	**-3.1%**
Associated					
0	5	2.1%	5	5.0%	2.8%
1	2	0.9%	5	5.0%	4.1%
2	1	0.4%	0	0.0%	-0.4%
Total	**8**	**3.4%**	**10**	**9.9%**	**6.5%**

8.2.2 No scores of three or above were recorded. Scores of 0, 1 and 2 were observed across the monitoring sites, with most of the incidents not requiring any response by the user.

8.2.3 Controlled braking (Severity level 2), was applied only on rare occasions at the trial site, with only one instance observed at the associated site in the 'before' survey period.

8.2.4 A reduction of nearly 20 incidents at the trial sites between the 'before' and 'after' survey periods (equivalent to a reduction of 3% of all contra-flow movements interacting with another user) was observed. The change between the 'before' and 'after' was found not be statistically significant.

8.2.5 At the associated site two additional incidents were recorded, however the increase was found not to be statistically significant.

8.3 Cyclist Interaction Characteristics

8.3.1 **Figure 8.3** characterises cyclist interaction with other users.

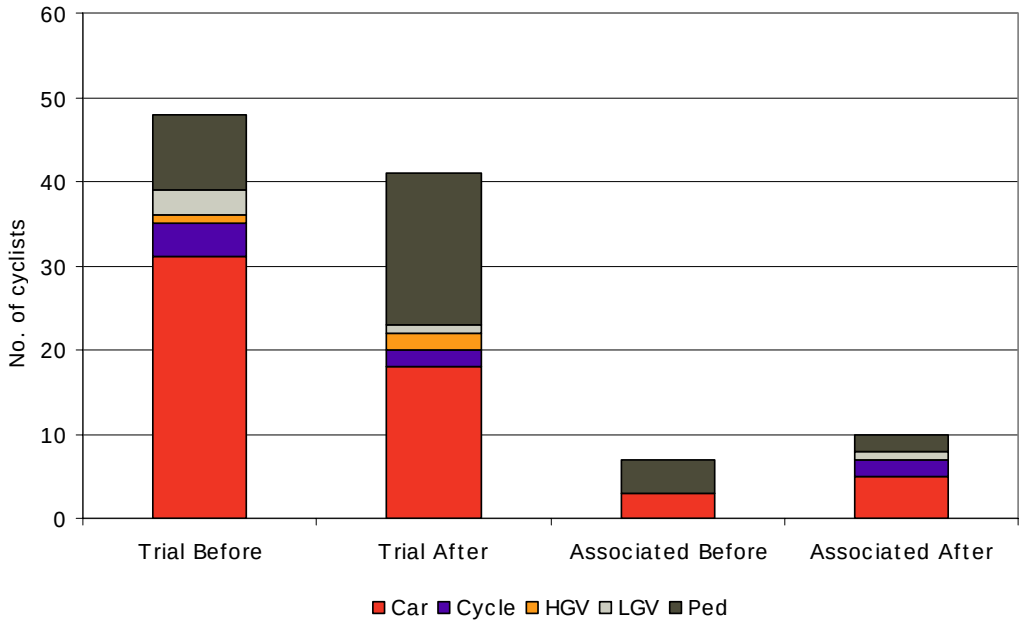


Figure 8.3 Cyclist Interaction with Other Users

8.3.2 As indicated in **Figure 8.3**, most of the interactions involved either a car or a pedestrian. Following the signing change to 'No Entry Except Cycles', the proportion of interactions with motorised vehicles decreased due to the reduction in motorised vehicles illegally going down the one-way street. The increase in pedestrian interactions is not statistically significant, nor is the increase in cyclist incidents at the associated sites following the signing change.

Figure 8.4 summarises where on the carriageway/footway an interaction occurred with a cyclist.

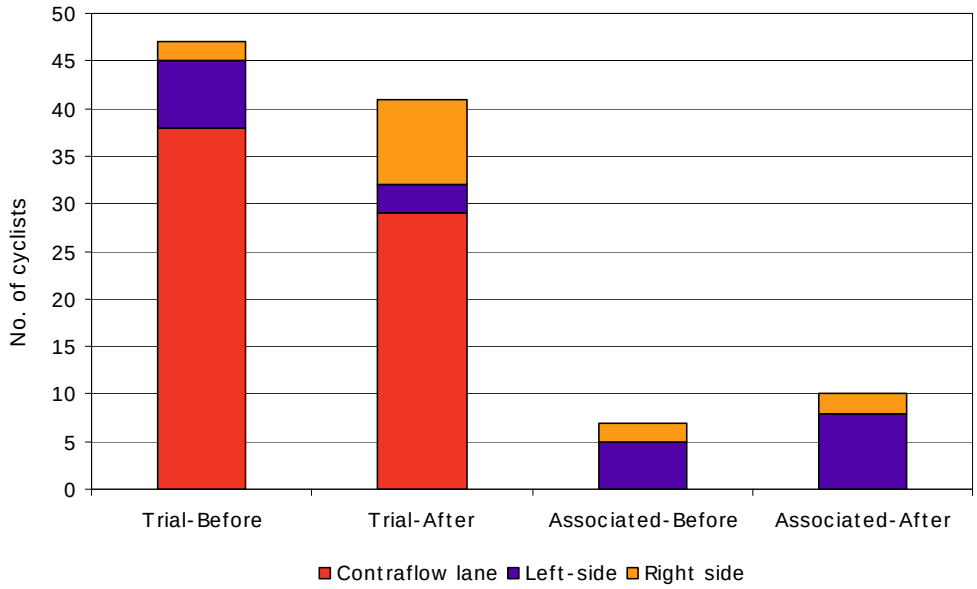


Figure 8.4 Cyclist Interaction Location

8.3.3 The majority of interactions were observed at either the contra-flow lane or the left-side of the carriageway at the trial and associated sites. Few incidents occurred at the right side of the carriageway, however a notable increase in interactions at the right-side was observed at the trial sites in the 'after' period; however this is not statistically significant.

8.3.4 **Figure 8.5** summarises what manoeuvre a cyclists was performing when an interaction with another user occurred.

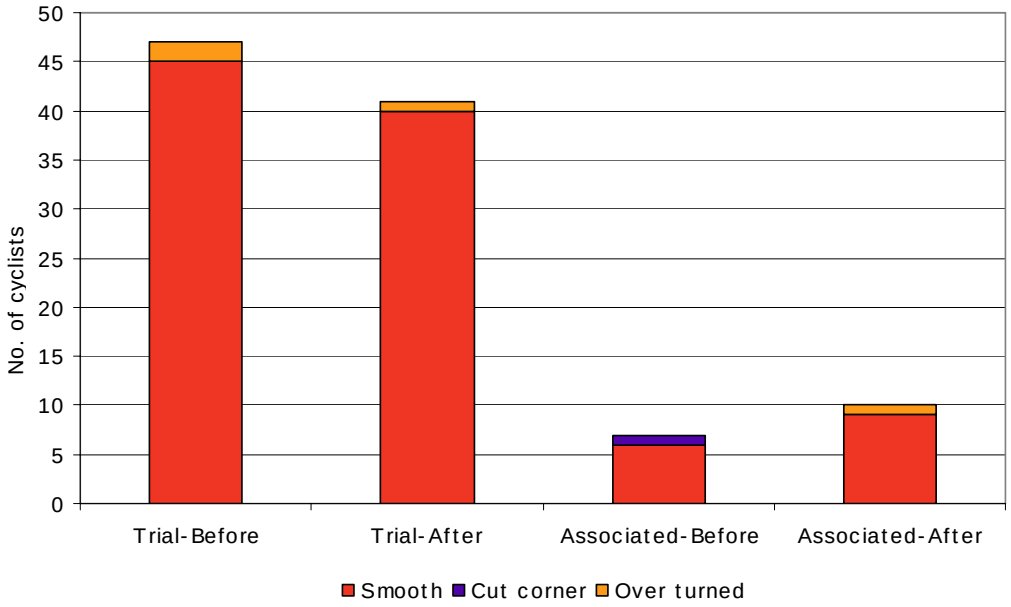


Figure 8.5 Cyclist Manœuvres and Interaction

8.3.5 **Figure 8.5** shows most cyclists were performing a smooth manoeuvre when they encountered another user at the one-way arm entrance. In certain instances, the most

common behaviour associated with increased levels of interaction was when a cyclist turned beyond the anticipated trajectory (over turned) when entering a one-way street, although it may be that this trajectory was a response by cyclists to deliberately avoid the other user approaching.

8.4 Motorised Vehicle Interaction Characteristics

8.4.1 Nearly all motorised vehicle interactions occurred between a motorised vehicle entering the one-way street and encountering another vehicle exiting the one-way street. Only one pedestrian incident was observed at the trial site following the signing change and this was not severe in nature.

8.4.2 **Figure 8.6** summarises what manoeuvre a vehicle was performing when an interaction occurred with another user as it entered the one-way arm.

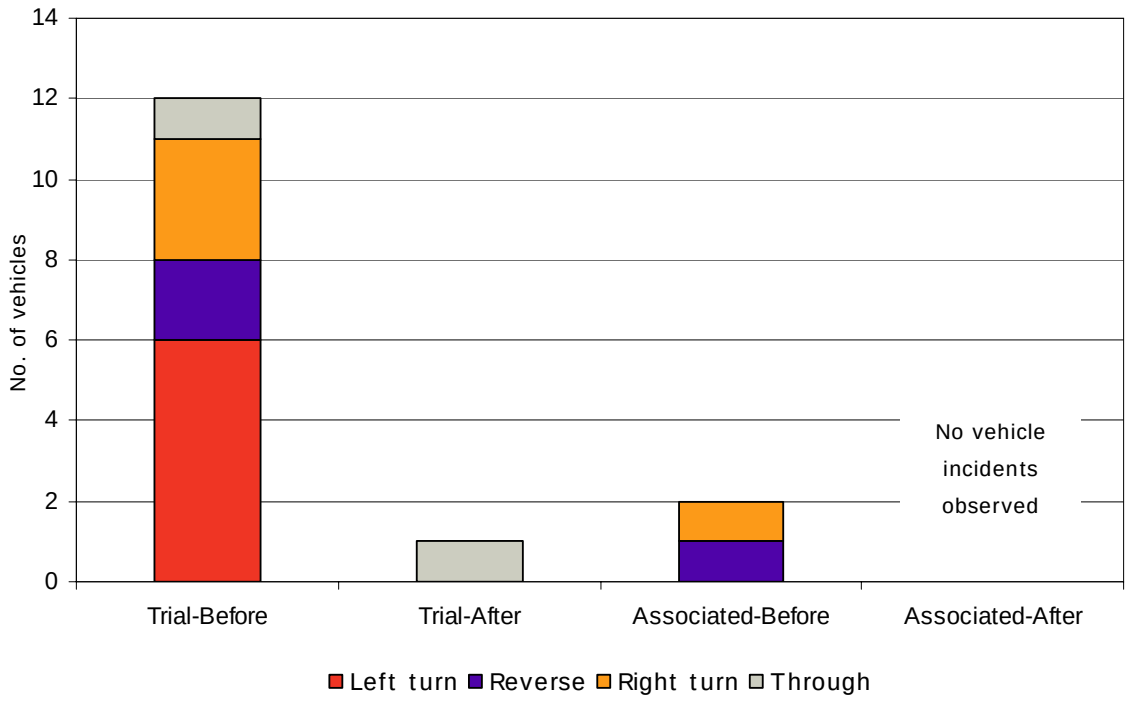


Figure 8.6 Motorised Vehicle Manoeuvres and Interaction

8.4.3 **Figure 8.6** shows there is no particular trend in motorised vehicle manoeuvres that led to increased potential for interaction at the junction entrances.

8.4.4 **Figure 8.7** summarises the location of interaction when a motorised vehicle is involved in the incident.

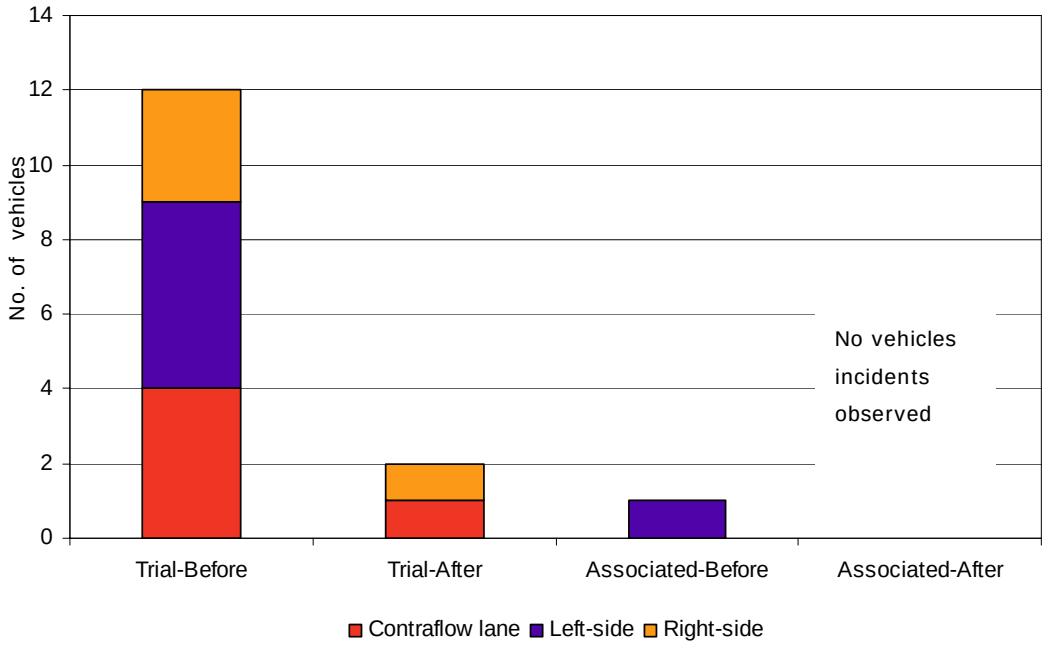


Figure 8.7 Location of Interaction

8.4.5 **Figure 8.7** shows there is no apparent trend detected in the location of an interaction when a motorised vehicle is involved in an incident while entering the one-warm arm, with a slight increase in the number of interactions occurring when a contra-flow lane is available.

8.5 User Response

8.5.1 **Figure 8.8** summarises user response when an interaction with another user.

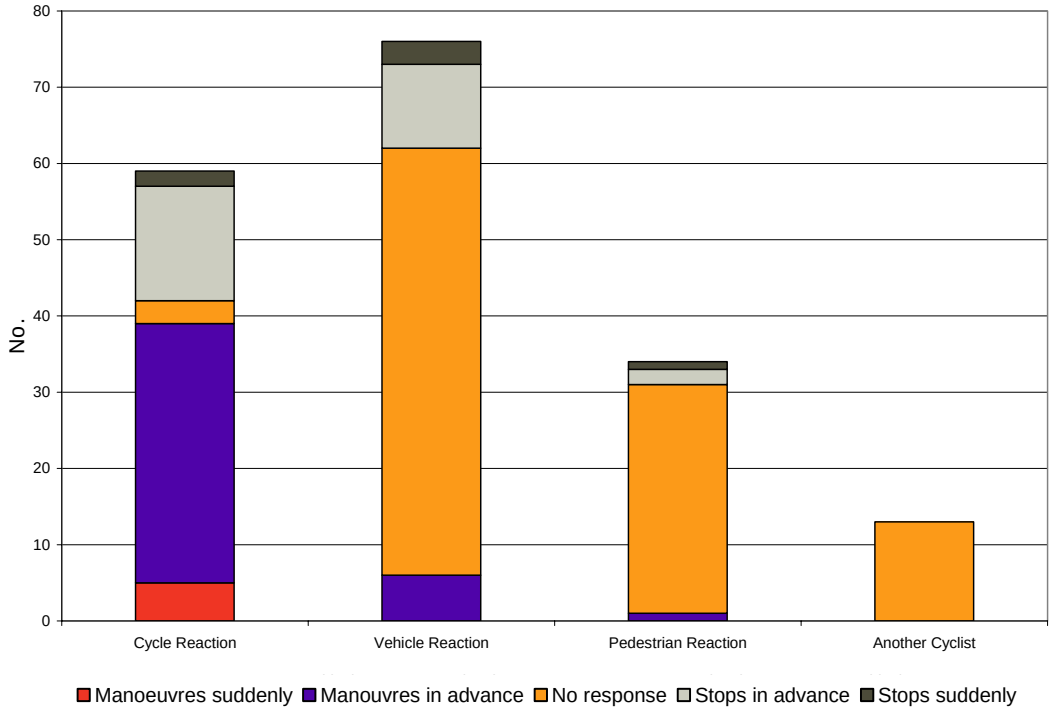


Figure 8.8 Motorised Vehicle Interaction Responses

8.5.2 In most cases, no response was required by motorised vehicles, pedestrians or another cyclist travelling with flow. However a contra-flow cyclist generally manoeuvred in advance to avoid conflict. In select circumstances, a cyclist, vehicle or pedestrian was required to stop in advance. The proportion of users that were required to stop or manoeuvre suddenly was minimal.

8.6 Summary

8.6.1 In summary the data has shown:

- At the study sites, interactions between users were generally infrequent. If an interaction took place, generally neither party needed to take an action.
- Interactions were largely between a cyclist or motorised vehicle and another motorised vehicle. Less than a third of all incidents involved a pedestrian, but these were not severe, nor did they require the pedestrian to respond in most cases.
- As a result of signing modification, no statistically significant changes in frequency and severity of interaction were observed.
- Although the signing change did increase more risky behaviour of vehicles reversing, this did not lead to any additional interactions.

9 Conclusions

9.1 Introduction

9.1.1 The objective of this study was to help inform decisions on the wider application of the 'No Entry Except Cycles' plates and the generate evidence to respond to safety concerns, which include the following:

- the DfT considers the 'No Entry' sign to be a safety critical sign, which may be devalued by becoming conditional on supplementary information. Although there is precedent for exemption from 616, for example buses, it is hypothesised that this devaluation may lead to undesirable effects;
- there may be a greater tendency among cyclists to violate 'No Entry' signs at sites where no exemptions exist;
- there may be a greater tendency among other road users to violate the 'No Entry' sign; and
- the scope for conflict between cyclists making contra-flow movements and other road users is increased. This potential is thought to be particularly great at the junction of one-way links where cyclists are turning against, and potentially across, emerging vehicles.

9.1.2 This chapter summarises the evidence collected through a literature review, previous studies and video surveys at monitoring sites as part of this study.

9.2 Overall Conclusions

- There is a greater compliance by motorised vehicles with the 'No Entry Except Cycles' signing combination than the 'Flying Motorcycle' sign, which is in line with the findings of the RBK&C trials.
- There was an increase in the number of cyclists travelling in contra-flow following installation of the 'No Entry Except Cycles' sign combination, suggesting a greater understanding of the 'No Entry Except Cycles' signing regime than that of the 'Flying Motorcycle' sign.
- Few interactions were recorded in both the 'before' and 'after' signing scenarios. There was no significant association between the signing changes and severity of interactions.
- As the cyclists using the network tended to be commuters, they were assumed to be familiar with the signing and road restrictions and showed no hesitation in their contra-flow movements.
- Vehicles were less likely to hesitate when presented with the 'No Entry' sign, relative to the 'Flying Motorcycle', suggesting better understanding, although further observations are required to prove significance.
- Contra-flow cyclists behaved and positioned themselves similarly regardless to the signing presented at the one-way streets.

- Cyclists tended to use contra-flow lanes when present, otherwise they utilised (their) left-side of the carriageway.
- Vehicles were more likely to reverse down a one-way street when 'No Entry' signing was present, whereas they were more likely to go in the forward direction (opposite one-way designated direction) with the 'Flying Motorcycle' sign.

9.3 Recommendations and future research

9.3.1 This study has revealed that the 'No Entry Except Cyclists' sign combination is more widely respected than the 'Flying Motorcycle' sign and has suggested that the combination is more readily understood by cyclists.

9.3.2 There is no evidence that compliance with 'No Entry' signs by motorised vehicles is reduced at associated sites, in fact compliance slightly improved. There was a slight increase in violations by cyclists at some associated sites but this was not statistically significant. There was no statistically significant change in conflict between road users at sites with the new combination.

9.3.3 This analysis indicates that, for the sites studied, the safety concerns raised about the 'No Entry Except Cyclists' combination are not supported by the evidence. Indeed, the improved compliance by motorised vehicles is likely to result in a net risk reduction to all users.

9.3.4 Accordingly there seems no immediately obvious reason not to use this combination of signs. We recommend that the use of this combination be more widely permitted and monitored over a longer period at a wider variety of sites.

Appendices

Appendix A – Literature Review Bibliography

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Appendix B – Casualty Plans

Location of Accidents in One Way Roads Involving Cyclists with at Least One Contributory Factor Being 'Illegal Turn or Direction of Travel'

N

Slight

Serious

Fatal

mvaconsultancy

Location of Accidents in One Way Roads Involving Cyclists with at Least One Contributory Factor Being 'Illegal Turn or Direction of Travel'

N

- Slight
- Serious
- Fatal

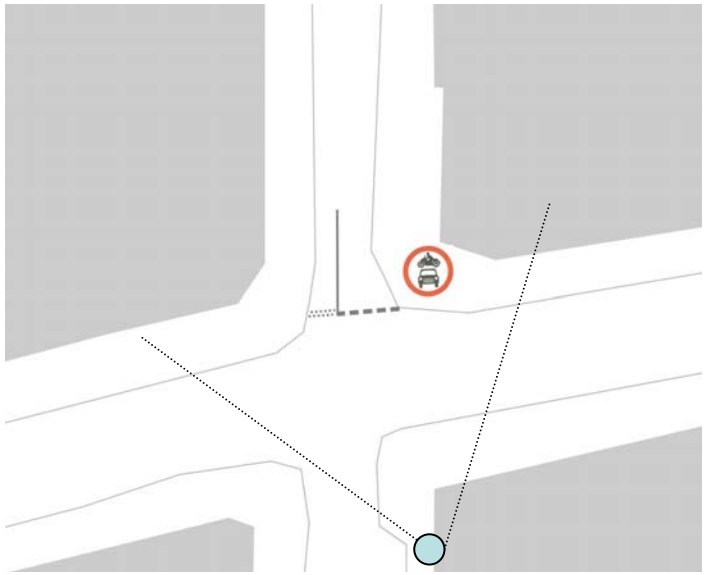
mvaconsultancy

Appendix C - Monitoring Sites Camera Locations and Viewing Positions

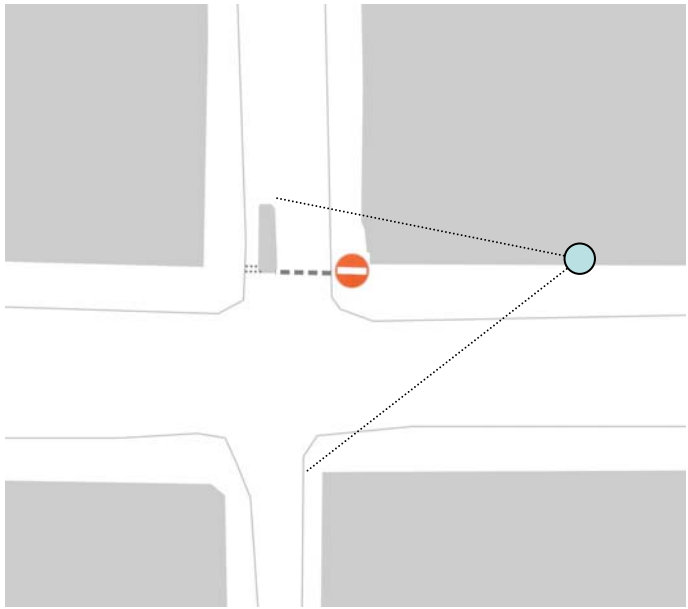
Hackney Monitoring Sites Camera Locations and Viewing Positions

mvaconsultancy

OsbaldestonRoad / Cazenove Road



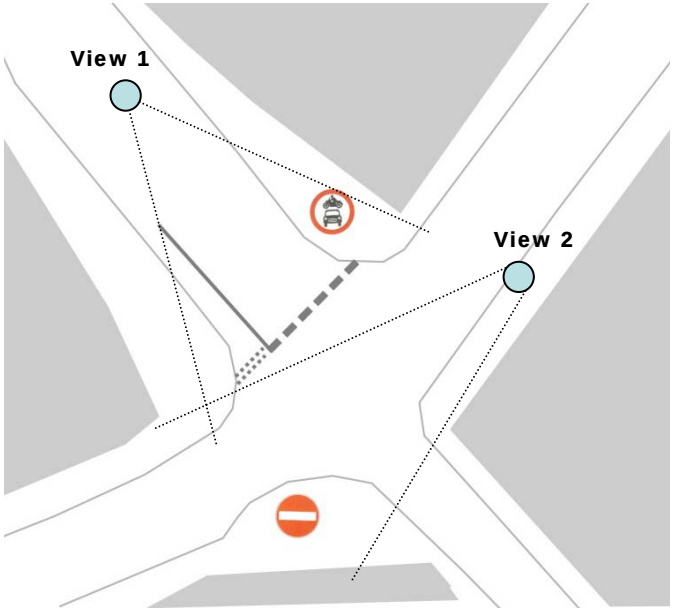
Portland Avenue / Leweston Place



Lambeth Monitoring Sites Camera Locations and Viewing Positions

mvaconsultancy

Stockwell Avenue / Bellefields Road Junction



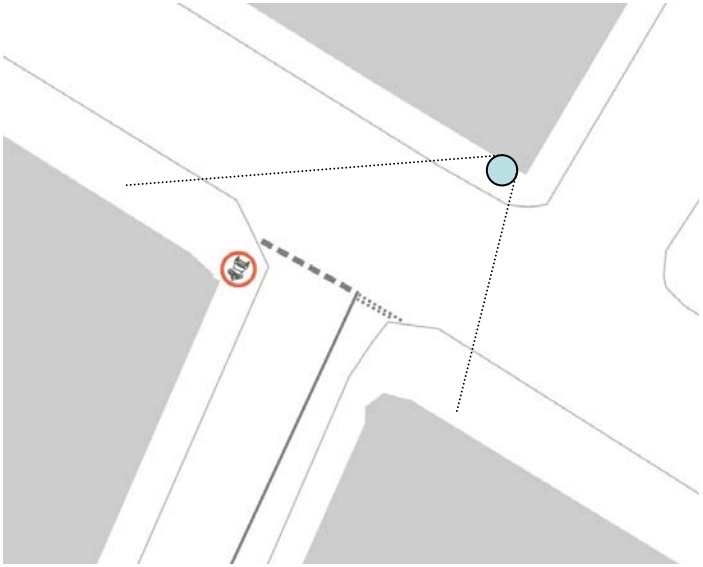
View 1

View 2

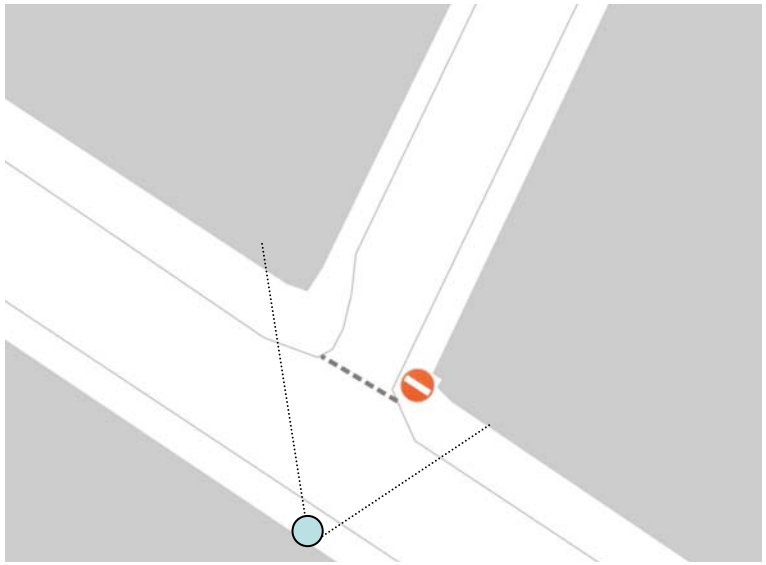
Cambridge Monitoring Sites Camera Locations and Viewing Positions

mvaconsultancy

Mawson Road / Mill Road Junction



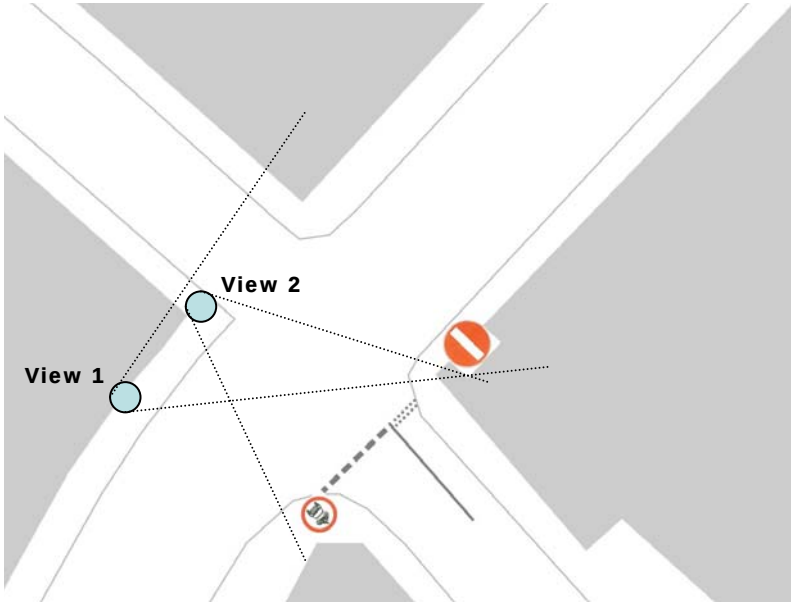
Willis Road / Mill Road Junction



Brighton Monitoring Sites Camera Locations and Viewing Positions

mvaconsultancy

Argyle Road / Campbell Road Junction



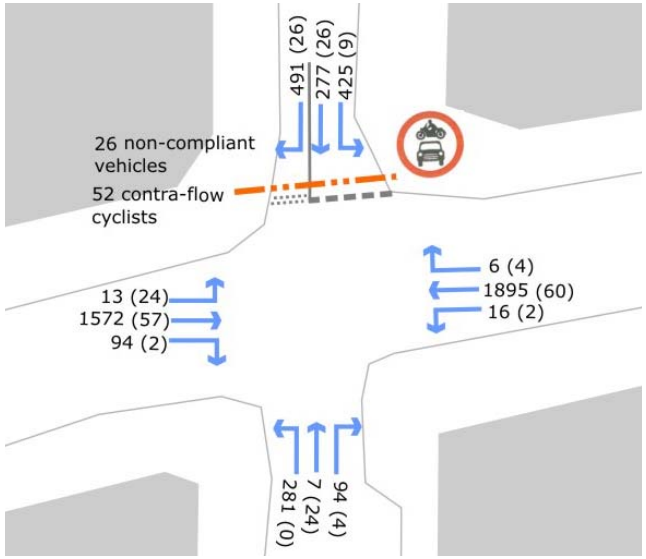
View 1

View 2

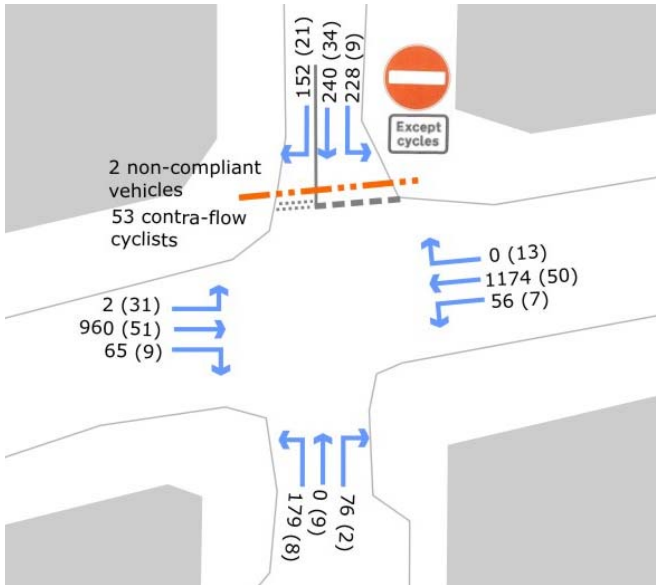
Appendix D – Volume and Compliance Data

Hackney Volume and Compliance Data

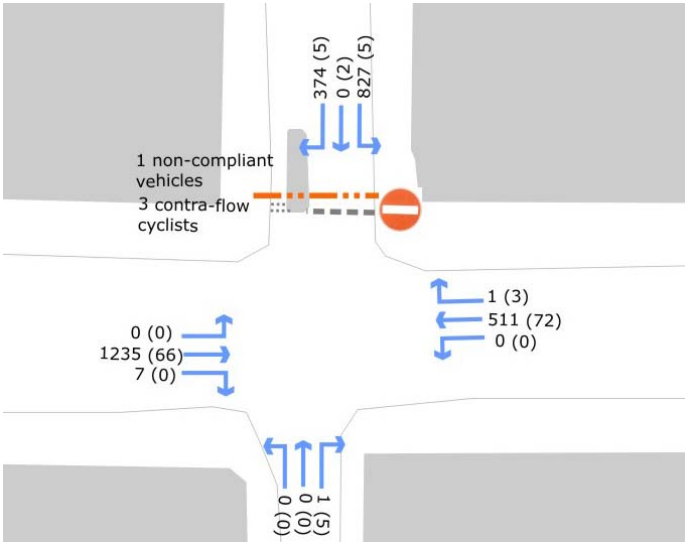
mvaconsultancy



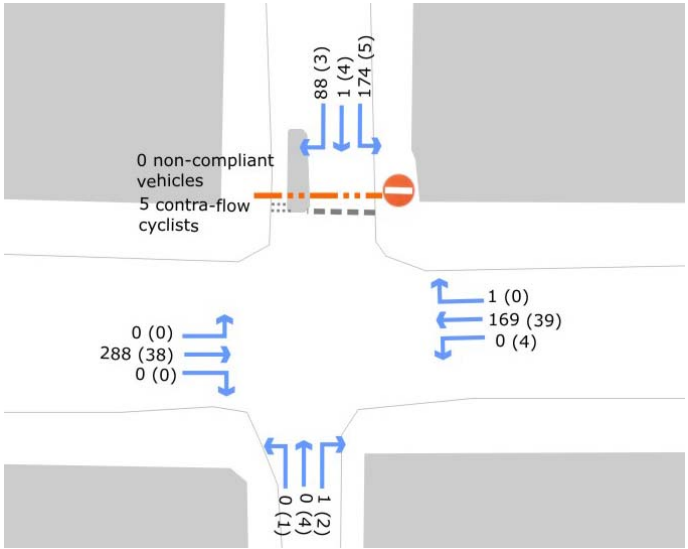
OsbaldestonRoad / Cazenove Road Junction-Before



OsbaldestonRoad / Cazenove Road -After



Portland Avenue / Leweston Place Junction-Before



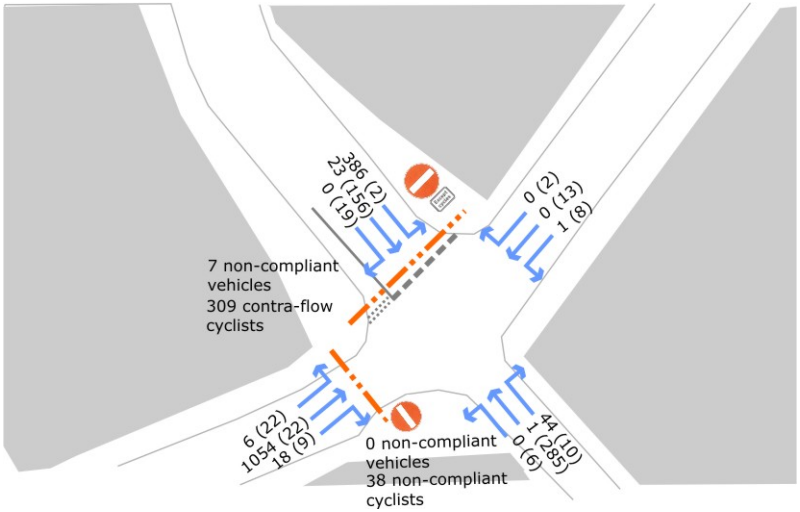
Portland Avenue / Leweston Place Junction-After

Total 12-hour weekday flows

Key: Motorised Vehicle volumes (Cycle Volumes)

Lambeth Volume and Compliance Data

Stockwell Avenue / Bellefields Road Junction - Before



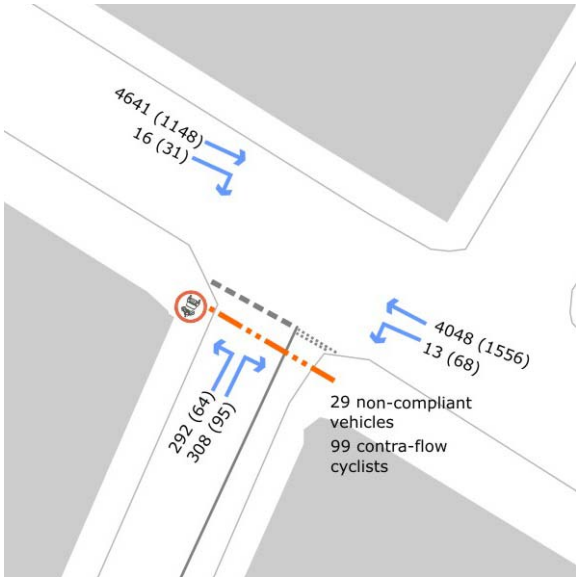
Stockwell Avenue / Bellefields Road Junction - After

Total 12-hour weekday flows

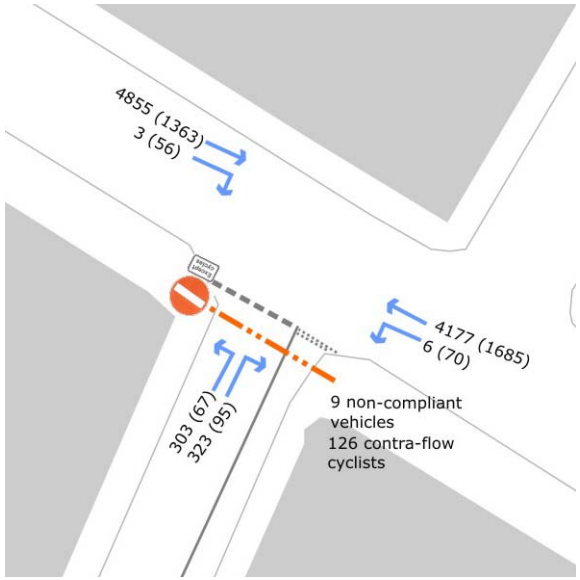
Key: Motorised Vehicle volumes (Cycle Volumes)

Cambridge Volume and Compliance Data

mvaconsultancy

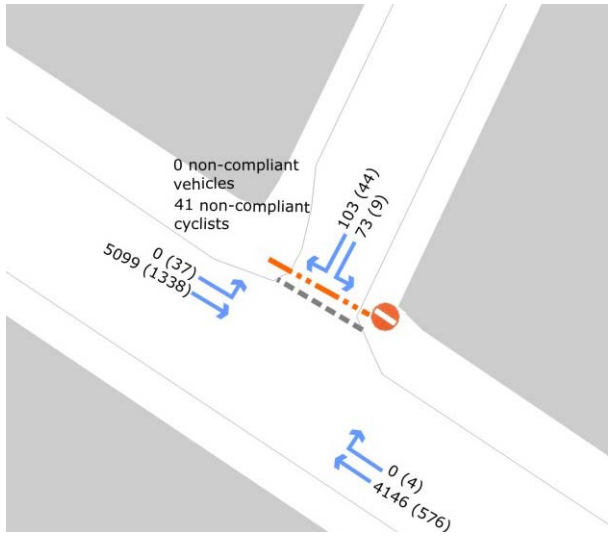


Mawson Road / Mill Road Junction-Before



Mawson Road / Mill Road Junction -After

Willis Road / Mill Road Junction-Before

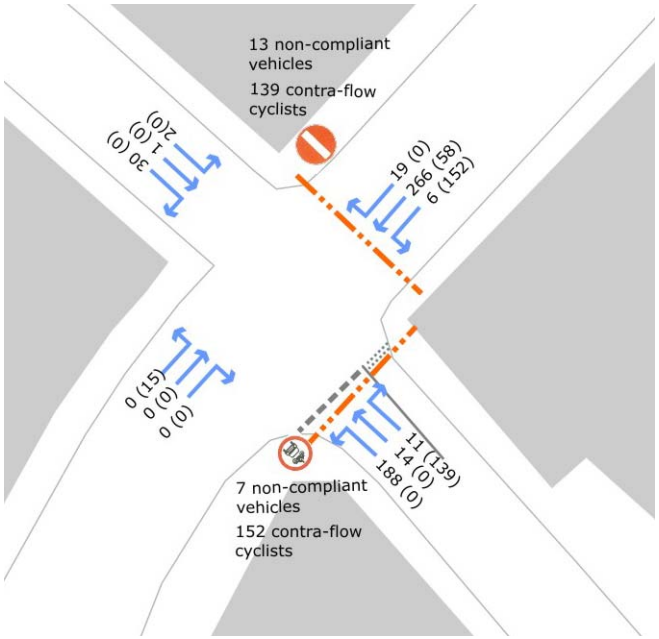


Willis Road / Mill Road Junction-After

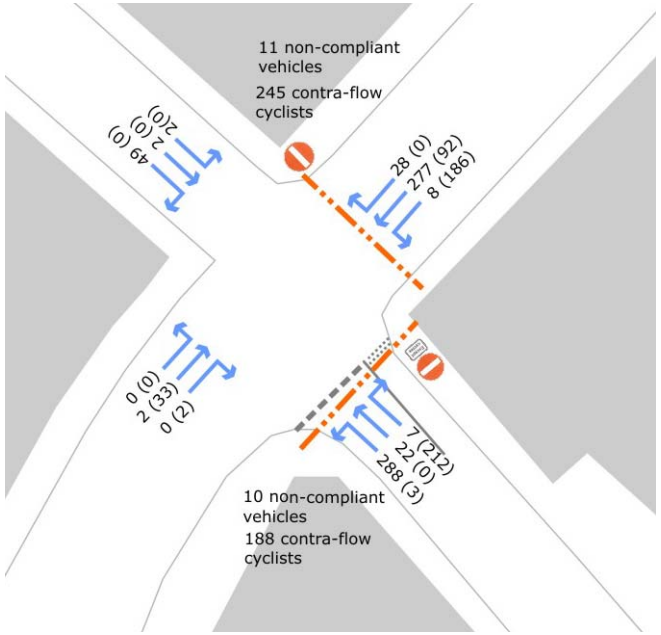
Total 12-hour weekday flows

Key: Motorised Vehicle volumes (Cycle Volumes)

Brighton Volume and Compliance Data



Argyle Road / Campbell Road Junction - Before



Argyle Road / Campbell Road Junction - After

Total 12-hour weekday flows

Key: Motorised Vehicle volumes (Cycle Volumes)

Appendix E – Behavioural Data

All Behaviour

			Action				Hesitate			Location of Entry					
			Cut corner	Over turned	Smooth	**Total**	No	Yes	**Total**	Contraflow lane	Left footway	Left-side	Right-side	Right footway	**Total**
Left Turn	Hackney Trial	Before	0	0	39	**39**	35	4	**39**	25	0	5	9	0	**39**
Left Turn	Hackney Trial	After	1	1	31	**33**	33	0	**33**	16	0	6	11	0	**33**
Left Turn	Hackney Associated	Before	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Left Turn	Hackney Associated	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Left Turn	Lambeth Trial	Before	9	3	13	**25**	22	3	**25**	10	0	10	5	0	**25**
Left Turn	Lambeth Trial	After	6	5	8	**19**	19	0	**19**	11	0	4	4	0	**19**
Left Turn	Lambeth Associated	Before	8	0	5	**13**	13	0	**13**	0	5	7	1	0	**13**
Left Turn	Lambeth Associated	After	5	0	2	**7**	7	0	**7**	0	2	3	2	0	**7**
Left Turn	Brighton Trial	Before	4	3	144	**151**	150	1	**151**	78	0	56	17	0	**151**
Left Turn	Brighton Trial	After	0	0	180	**180**	177	3	**180**	148	0	15	17	0	**180**
Left Turn	Brighton Associated	Before	0	0	1	**1**	1	0	**1**	0	0	0	1	0	**1**
Left Turn	Brighton Associated	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Left Turn	CambridgeTrial	Before	3	1	58	**62**	56	6	**62**	42	1	4	15	0	**62**
Left Turn	CambridgeTrial	After	2	0	54	**56**	55	1	**56**	47	0	1	8	0	**56**
Left Turn	Cambridge Associated	Before	0	0	24	**24**	24	0	**24**	0	0	23	1	0	**24**
Left Turn	Cambridge Associated	After	0	0	21	**21**	19	2	**21**	0	0	20	1	0	**21**
Total			38	13	580	**631**	611	20	**631**	377	8	154	92	0	**631**

			Action				Hesitate			Location of Entry					
			Cut corner	Over turned	Smooth	**Total**	No	Yes	**Total**	Contraflow lane	Left footway	Left-side	Right-side	Right footway	**Total**
Through	Hackney Trial	Before	0	0	22	**22**	20	2	**22**	11	0	0	11	0	**22**
Through	Hackney Trial	After	0	0	4	**4**	4	0	**4**	2	0	0	2	0	**4**
Through	Hackney Associated	Before	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Through	Hackney Associated	After	0	0	4	**4**	4	0	**4**	0	0	1	3	0	**4**
Through	Lambeth Trial	Before	0	0	249	**249**	249	0	**249**	196	2	50	1	0	**249**
Through	Lambeth Trial	After	0	0	278	**278**	278	0	**278**	214	2	56	6	0	**278**
Through	Lambeth Associated	Before	0	0	3	**3**	3	0	**3**	0	1	0	2	0	**3**
Through	Lambeth Associated	After	2	2	7	**11**	11	0	**11**	0	1	9	1	0	**11**
Through	Brighton Trial	Before	0	0	3	**3**	3	0	**3**	0	0	2	1	0	**3**
Through	Brighton Trial	After	0	0	3	**3**	3	0	**3**	1	0	0	2	0	**3**
Through	Brighton Associated	Before	0	0	17	**17**	17	0	**17**	0	5	8	4	0	**17**
Through	Brighton Associated	After	0	0	2	**2**	2	0	**2**	0	1	1	0	0	**2**
Through	CambridgeTrial	Before	0	0	1	**1**	1	0	**1**	1	0	0	0	0	**1**
Through	CambridgeTrial	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Through	Cambridge Associated	Before	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Through	Cambridge Associated	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Total			2	2	593	**597**	595	2	**597**	425	12	127	33	0	**597**

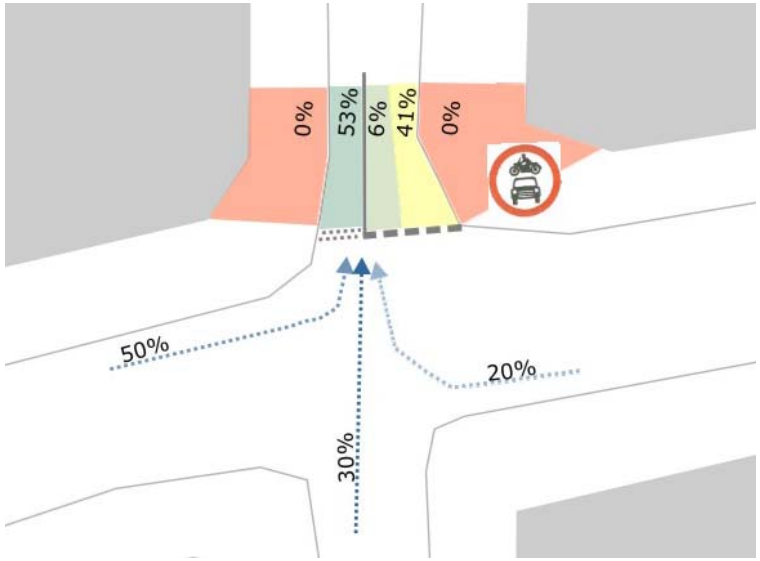
All Behaviour

			Action				Hesitate			Location of Entry					
			Cut corner	Over turned	Smooth	**Total**	No	Yes	**Total**	Contraflow lane	Left footway	Left-side	Right-side	Right footway	**Total**
Right Turn	Hackney Trial	Before	0	0	15	**16**	11	5	**16**	3	0	0	12	0	**16**
Right Turn	Hackney Trial	After	0	3	7	**10**	10	0	**10**	3	1	2	4	0	**10**
Right Turn	Hackney Associated	Before	0	1	3	**4**	4	0	**4**	1	0	0	2	1	**4**
Right Turn	Hackney Associated	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Right Turn	Lambeth Trial	Before	3	1	5	**9**	9	0	**9**	2	0	4	2	1	**9**
Right Turn	Lambeth Trial	After	2	1	0	**3**	3	0	**3**	2	0	0	1	0	**3**
Right Turn	Lambeth Associated	Before	4	2	1	**7**	7	0	**7**	0	2	3	2	0	**7**
Right Turn	Lambeth Associated	After	10	2	5	**17**	17	0	**17**	0	2	9	5	1	**17**
Right Turn	Brighton Trial	Before	0	0	1	**1**	1	0	**1**	0	0	1	0	0	**1**
Right Turn	Brighton Trial	After	1	0	1	**2**	2	0	**2**	0	0	0	2	0	**2**
Right Turn	Brighton Associated	Before	35	3	103	**141**	141	0	**141**	0	46	47	48	0	**141**
Right Turn	Brighton Associated	After	0	0	31	**31**	31	0	**31**	0	19	9	3	0	**31**
Right Turn	CambridgeTrial	Before	4	0	31	**35**	32	3	**35**	12	0	1	22	0	**35**
Right Turn	CambridgeTrial	After	7	0	28	**35**	33	2	**35**	10	0	1	24	0	**35**
Right Turn	Cambridge Associated	Before	0	0	9	**9**	8	1	**9**	0	0	1	8	0	**9**
Right Turn	Cambridge Associated	After	0	0	5	**5**	5	0	**5**	0	0	1	4	0	**5**
Total			66	13	245	**325**	314	11	**325**	33	70	79	139	3	**325**

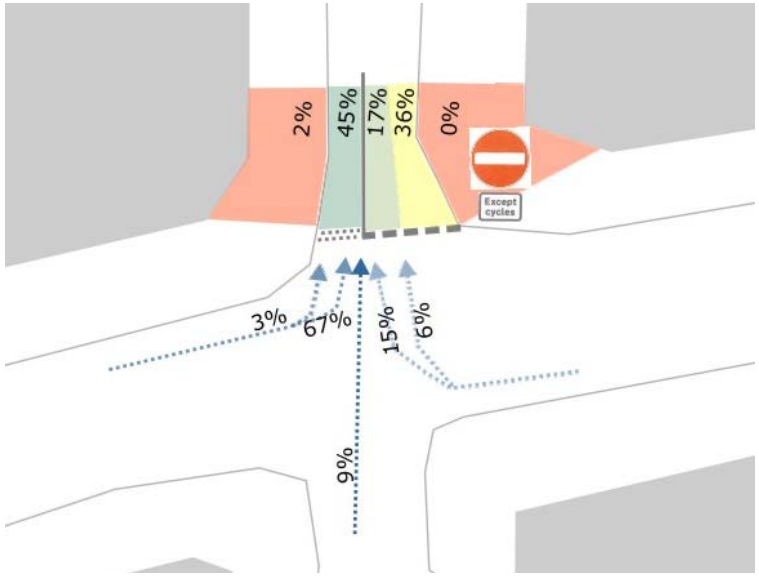
			Action				Hesitate			Location of Entry					
			Cut corner	Over turned	Smooth	**Total**	No	Yes	**Total**	Contraflow lane	Left footway	Left-side	Right-side	Right footway	**Total**
Reverse	Hackney Trial	Before	0	0	2	**2**	2	0	**2**	2	0	0	0	0	**2**
Reverse	Hackney Trial	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Reverse	Hackney Associated	Before	0	0	9	**9**	9	0	**9**	0	0	0	9	0	**9**
Reverse	Hackney Associated	After	0	0	1	**1**	1	0	**1**	0	0	0	1	0	**1**
Reverse	Lambeth Trial	Before	0	0	5	**5**	4	1	**5**	1	0	2	2	0	**5**
Reverse	Lambeth Trial	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Reverse	Lambeth Associated	Before	0	0	3	**3**	3	0	**3**	0	0	0	3	0	**3**
Reverse	Lambeth Associated	After	0	0	1	**1**	1	0	**1**	0	0	0	1	0	**1**
Reverse	Brighton Trial	Before	0	0	4	**4**	4	0	**4**	1	0	0	3	0	**4**
Reverse	Brighton Trial	After	0	0	9	**9**	8	1	**9**	1	0	0	8	0	**9**
Reverse	Brighton Associated	Before	0	0	4	**4**	4	0	**4**	0	0	0	4	0	**4**
Reverse	Brighton Associated	After	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Reverse	CambridgeTrial	Before	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Reverse	CambridgeTrial	After	0	0	1	**1**	0	1	**1**	0	0	0	1	0	**1**
Reverse	Cambridge Associated	Before	0	0	0	**0**	0	0	**0**	0	0	0	0	0	**0**
Reverse	Cambridge Associated	After	0	0	1	**1**	1	0	**1**	0	0	0	1	0	**1**
Total			0	0	40	**40**	37	3	**40**	5	0	2	33	0	**40**

Hackney Cyclist Behaviour

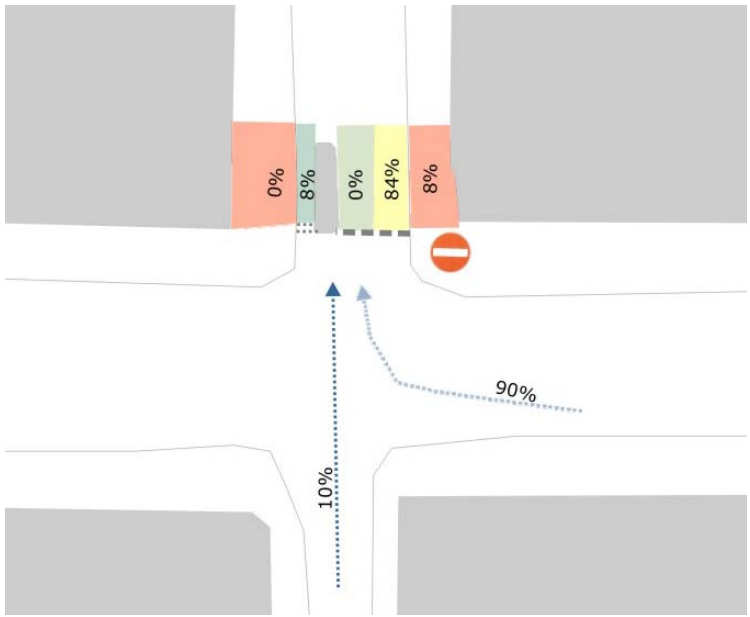
mvaconsultancy



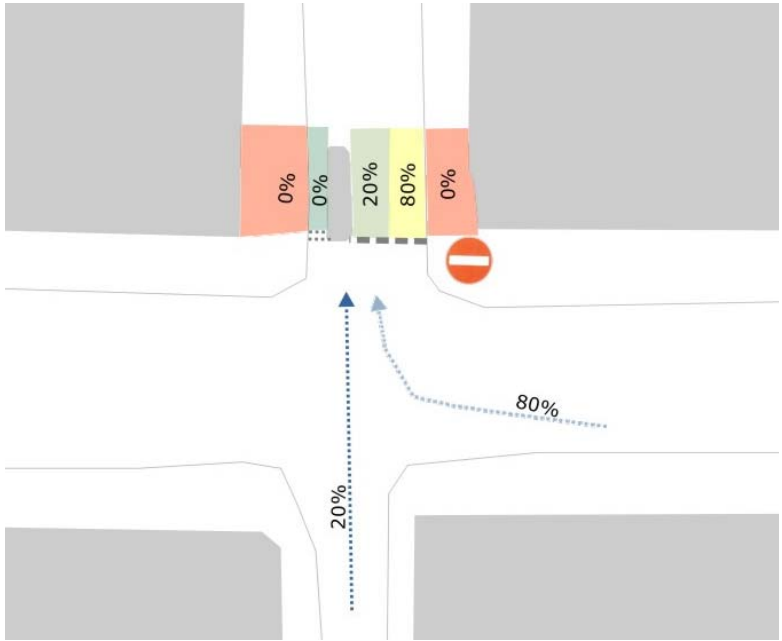
OsbaldestonRoad / Cazenove Road Junction-Before



OsbaldestonRoad / Cazenove Road -After



Portland Avenue / Leweston Place Junction-Before



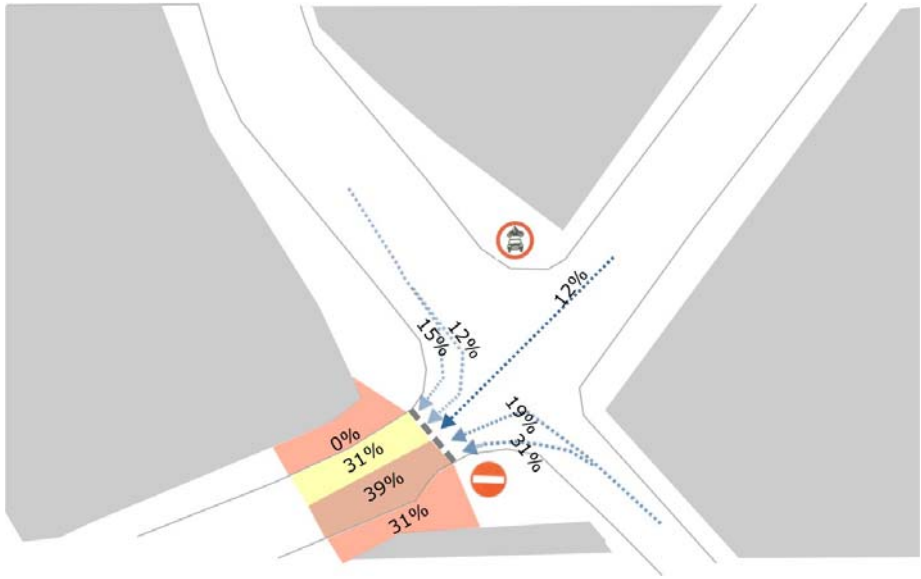
Portland Avenue / Leweston Place Junction-After

Lambeth Cyclist Behaviour

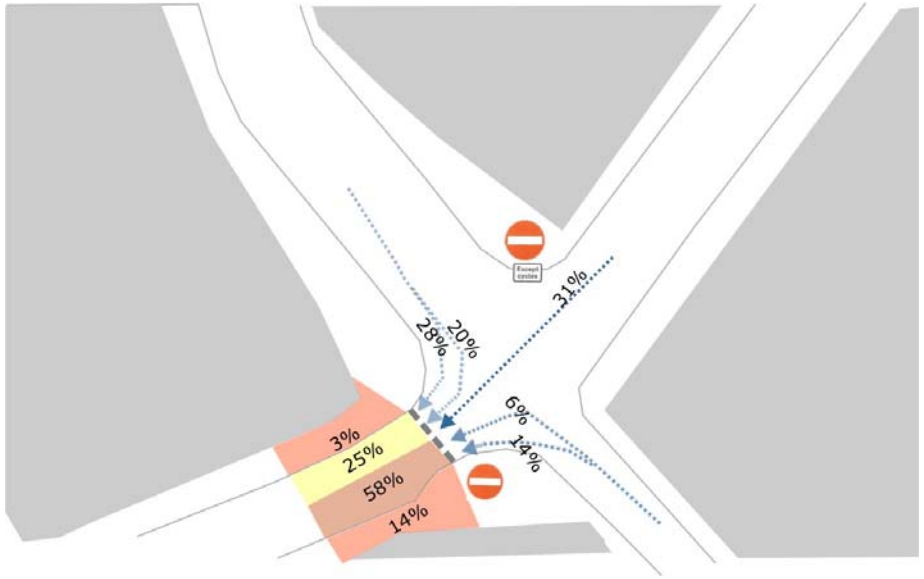
mvaconsultancy

Stockwell Avenue / Bellefields Road Junction - Before

Stockwell Avenue / Bellefields Road Junction - After

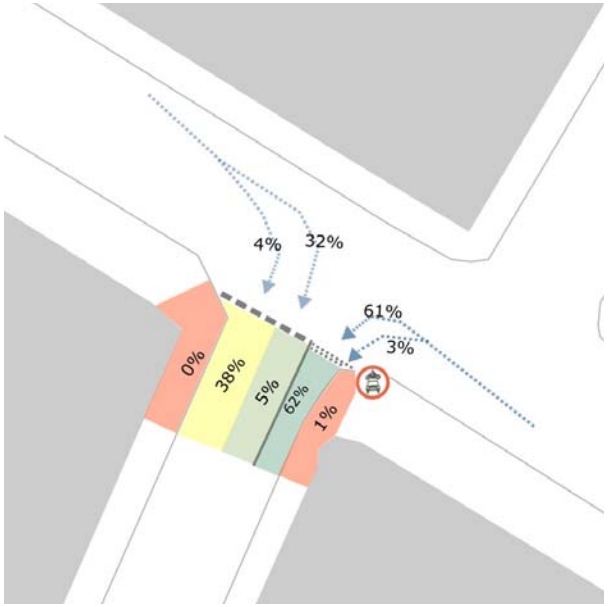


Stockwell Avenue / Bellefields Road Junction - Before

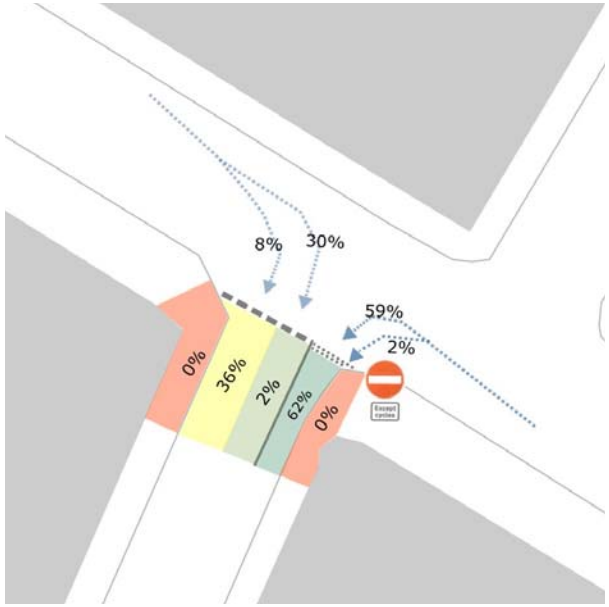


Stockwell Avenue / Bellefields Road Junction - After

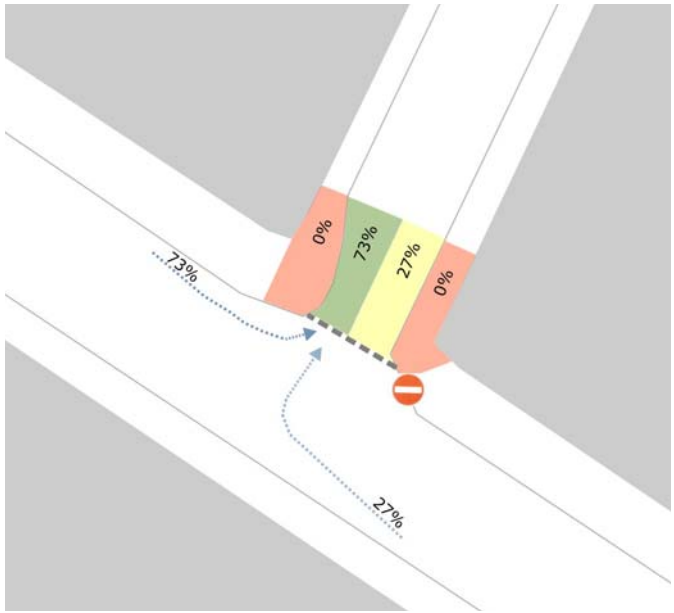
mvaconsultancy



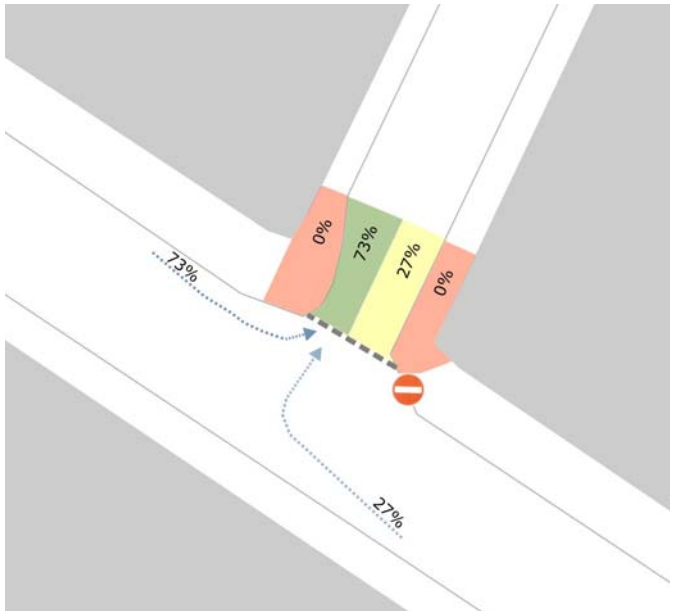
Mawson Road / Mill Road Junction-Before



Mawson Road / Mill Road Junction -After

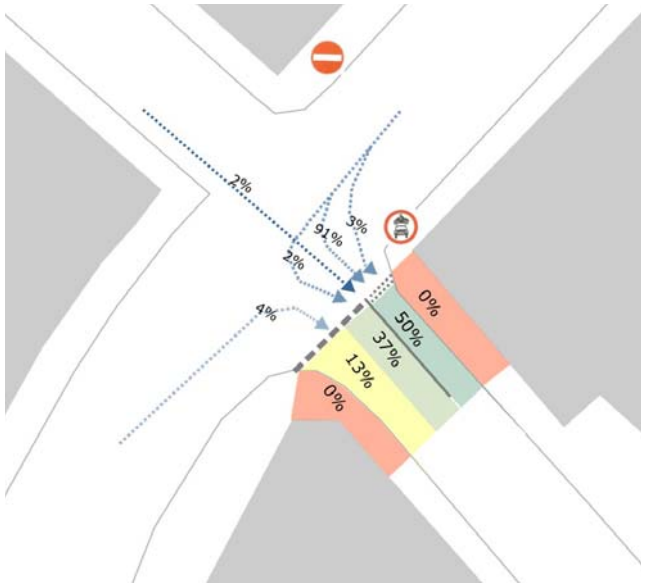


Willis Road / Mill Road Junction-Before

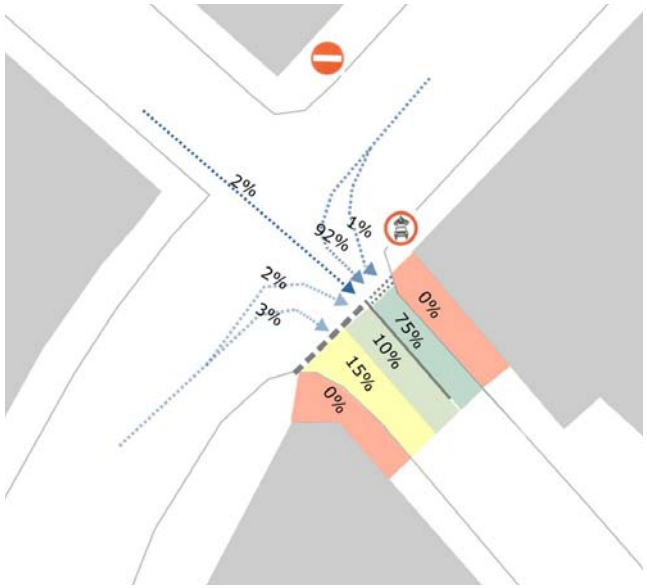


Willis Road / Mill Road Junction-After

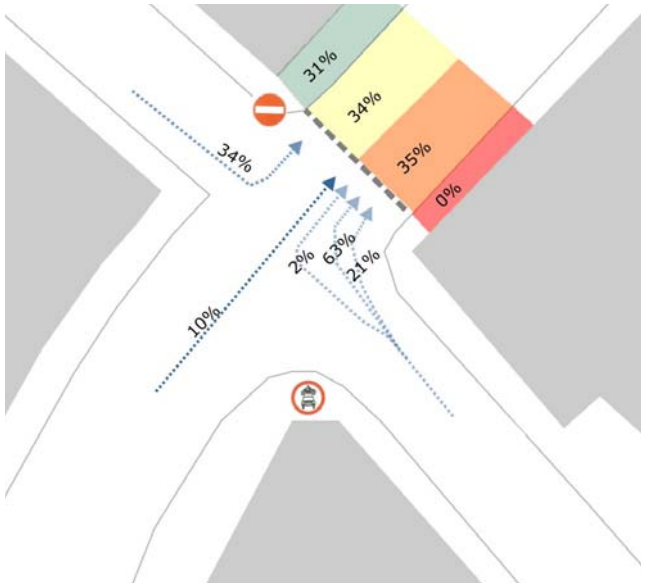
mvaconsultancy



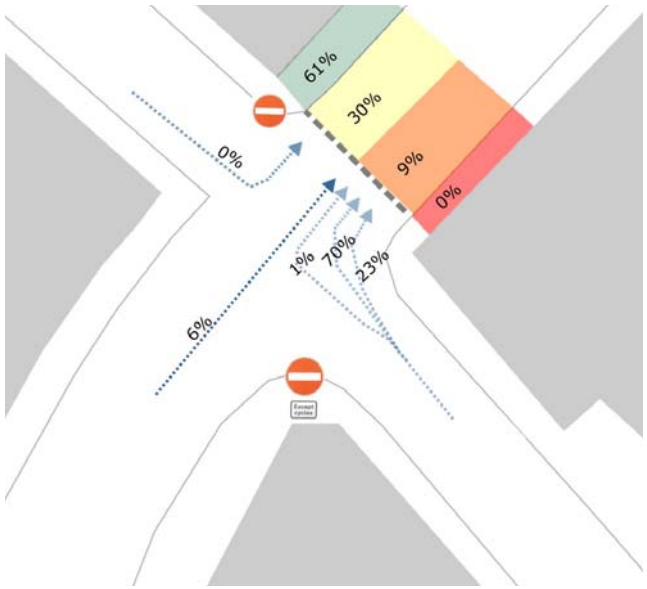
Argyle Road / Campbell Road Junction –Before



Argyle Road / Campbell Road Junction - After



Argyle Road / Campbell Road Junction - Before



Argyle Road / Campbell Road Junction - After

Motorised Vehicle Behaviour			Manoeuvre					Hesitate			Turning Action		
			Left turn	Through	Right turn	Reverse	**Total**	No	Yes	**Total**	Cut corner	Smooth	**Total**
All	Hackney Trial	Before	13	11	11	2	**37**	27	10	**37**	0	37	**37**
All	Hackney Trial	After	1	0	0	0	**1**	1	0	**1**	0	1	**1**
All	Hackney Associated	Before	0	0	0	9	**9**	9	0	**9**	0	9	**9**
All	Hackney Associated	After	0	0	0	1	**1**	1	0	**1**	0	1	**1**
All	Lambeth Trial	Before	5	0	0	5	**10**	6	4	**10**	0	10	**10**
All	Lambeth Trial	After	1	0	0	0	**1**	1	0	**1**	0	1	**1**
All	Lambeth Associated	Before	0	0	0	3	**3**	3	0	**3**	0	3	**3**
All	Lambeth Associated	After	0	0	0	1	**1**	1	0	**1**	0	1	**1**
All	Brighton Trial	Before	3	3	1	3	**10**	9	1	**10**	0	10	**10**
All	Brighton Trial	After	5	3	0	9	**17**	14	3	**17**	0	17	**17**
All	Brighton Associated	Before	1	1	3	4	**9**	9	0	**9**	0	9	**9**
All	Brighton Associated	After	0	0	0	0	**0**	0	0	**0**	0	0	**0**
All	CambridgeTrial	Before	11	0	16	0	**27**	21	6	**27**	2	25	**27**
All	CambridgeTrial	After	4	0	4	1	**9**	7	2	**9**	0	9	**9**
All	Cambridge Associated	Before	1	0	6	0	**7**	6	1	**7**	0	7	**7**
All	Cambridge Associated	After	0	0	0	1	**1**	1	0	**1**	0	1	**1**
Total			45	18	41	39	**143**	116	27	**143**	2	141	**143**

Appendix F – Interaction Data

Overall Interaction Summary

			Interaction with another user						Interaction Score			
			Car/Pick-up	HGV	LGV	Pedestrian	Another Cyclist	Total	0	1	2	Total
Overall	Hackney Trial	Before	9	1	0	1	0	**79**	10	0	0	**10**
Overall	Hackney Trial	After	1	0	0	1	0	**47**	1	1	0	**2**
Overall	Hackney Associated	Before	0	0	0	0	0	**13**	0	0	0	**0**
Overall	Hackney Associated	After	0	0	0	0	0	**5**	0	0	0	**0**
Overall	Lambeth Trial	Before	12	0	1	5	0	**288**	10	7	1	**18**
Overall	Lambeth Trial	After	2	0	0	5	1	**300**	4	3	1	**8**
Overall	Lambeth Associated	Before	1	0	0	0	0	**26**	1	0	0	**1**
Overall	Lambeth Associated	After	2	0	0	1	0	**36**	0	3	0	**3**
Overall	Brighton Trial	Before	7	0	0	2	3	**159**	7	3	2	**12**
Overall	Brighton Trial	After	6	1	1	3	1	**194**	12	0	0	**12**
Overall	Brighton Associated	Before	3	0	0	1	0	**163**	1	2	1	**4**
Overall	Brighton Associated	After	0	0	1	0	1	**33**	1	1	0	**2**
Overall	CambridgeTrial	Before	13	1	3	1	1	**98**	19	2	1	**22**
Overall	CambridgeTrial	After	8	1	0	11	1	**92**	17	3	1	**21**
Overall	Cambridge Associated	Before	0	0	0	3	0	**33**	3	0	0	**3**
Overall	Cambridge Associated	After	3	0	0	1	1	**27**	4	1	0	**5**
Total			67	4	6	35	9	**1593**	90	26	7	**123**

Interaction Level 0

			Interaction with another user						Manoeuvre				
			Car/Pick-up	HGV	LGV	Pedestrian	Another Cyclist	**Total**	Left turn	Reverse	Right turn	Through	**Total**
Level 0	Hackney Trial	Before	8	1	0	1	0	**10**	6	1	2	1	**10**
Level 0	Hackney Trial	After	1	0	0	0	0	**1**	0	0	1	0	**1**
Level 0	Hackney Associated	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 0	Hackney Associated	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 0	Lambeth Trial	Before	6	0	1	3	0	**10**	0	0	0	10	**10**
Level 0	Lambeth Trial	After	0	0	0	3	0	**4**	0	0	0	4	**4**
Level 0	Lambeth Associated	Before	1	0	0	0	0	**1**	0	0	0	1	**1**
Level 0	Lambeth Associated	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 0	Brighton Trial	Before	2	0	0	2	3	**7**	7	0	0	0	**7**
Level 0	Brighton Trial	After	6	1	1	3	1	**12**	12	0	0	0	**12**
Level 0	Brighton Associated	Before	0	0	0	1	0	**1**	0	0	1	0	**1**
Level 0	Brighton Associated	After	0	0	0	0	1	**1**	0	0	0	1	**1**
Level 0	CambridgeTrial	Before	13	1	2	0	1	**19**	15	0	4	0	**19**
Level 0	CambridgeTrial	After	8	1	0	7	1	**17**	9	1	7	0	**17**
Level 0	Cambridge Associated	Before	0	0	0	3	0	**3**	2	0	1	0	**3**
Level 0	Cambridge Associated	After	3	0	0	0	1	**4**	4	0	0	0	**4**
Total			49	4	4	23	8	**90**	55	2	16	17	**90**

Interaction Level 1

			Interaction with another user						Manoeuvre				
			Car/Pick-up	HGV	LGV	Pedestrian	Another Cyclist	**Total**	Left turn	Reverse	Right turn	Through	**Total**
Level 1	Hackney Trial	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 1	Hackney Trial	After	0	0	0	1	0	**1**	0	0	1	0	**1**
Level 1	Hackney Associated	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 1	Hackney Associated	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 1	Lambeth Trial	Before	5	0	0	2	0	**7**	0	1	0	6	**7**
Level 1	Lambeth Trial	After	1	0	0	1	1	**3**	1	0	0	2	**3**
Level 1	Lambeth Associated	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 1	Lambeth Associated	After	2	0	0	1	0	**3**	1	0	0	2	**3**
Level 1	Brighton Trial	Before	3	0	0	0	0	**3**	3	0	0	0	**3**
Level 1	Brighton Trial	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 1	Brighton Associated	Before	2	0	0	0	0	**2**	0	0	1	1	**2**
Level 1	Brighton Associated	After	0	0	1	0	0	**1**	0	0	1	0	**1**
Level 1	CambridgeTrial	Before	0	0	0	1	0	**2**	2	0	0	0	**2**
Level 1	CambridgeTrial	After	0	0	0	3	0	**3**	1	0	2	0	**3**
Level 1	Cambridge Associated	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 1	Cambridge Associated	After	0	0	0	1	0	**1**	1	0	0	0	**1**
Total			13	0	1	10	1	**26**	9	1	5	11	**26**

Interaction Level 2

			Interaction with another user						Manoeuvre				
			Car/Pick-up	HGV	LGV	Pedestrian	Another Cyclist	**Total**	Left turn	Reverse	Right turn	Through	**Total**
Level 2	Hackney Trial	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Hackney Trial	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Hackney Associated	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Hackney Associated	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Lambeth Trial	Before	1	0	0	0	0	**1**	0	0	1	0	**1**
Level 2	Lambeth Trial	After	0	0	0	1	0	**1**	0	0	0	1	**1**
Level 2	Lambeth Associated	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Lambeth Associated	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Brighton Trial	Before	2	0	0	0	0	**2**	2	0	0	0	**2**
Level 2	Brighton Trial	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Brighton Associated	Before	1	0	0	0	0	**1**	0	0	1	0	**1**
Level 2	Brighton Associated	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	CambridgeTrial	Before	0	0	1	0	0	**1**	1	0	0	0	**1**
Level 2	CambridgeTrial	After	0	0	0	1	0	**1**	1	0	0	0	**1**
Level 2	Cambridge Associated	Before	0	0	0	0	0	**0**	0	0	0	0	**0**
Level 2	Cambridge Associated	After	0	0	0	0	0	**0**	0	0	0	0	**0**
Total			4	0	1	2	0	**7**	4	0	2	1	**7**

Interaction Level 0

			Cyclist Reponse						Vehicle Response					
			Manouvers suddenly	Manouvres in advance	Stops in advance	ops Sudder	No response	**Total**	Manouvers suddenly	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**
Level 0	Hackney Trial	Before	0	1	1	0	2	**4**	0	0	1	0	8	**9**
Level 0	Hackney Trial	After	0	0	0	0	1	**1**	0	0	0	0	1	**1**
Level 0	Hackney Associated	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 0	Hackney Associated	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 0	Lambeth Trial	Before	0	3	0	0	7	**10**	0	0	0	0	7	**7**
Level 0	Lambeth Trial	After	0	0	0	0	4	**4**	0	0	0	0	1	**1**
Level 0	Lambeth Associated	Before	0	0	0	0	1	**1**	0	0	0	0	1	**1**
Level 0	Lambeth Associated	After	0	0	0	0		**0**	0	0	0	0	0	**0**
Level 0	Brighton Trial	Before	0	1	0	0	6	**7**	0	1	0	0	1	**2**
Level 0	Brighton Trial	After	0	5	0	0	7	**12**	0	0	0	1	7	**8**
Level 0	Brighton Associated	Before	0	1	0	0	0	**1**	0	0	0	0	0	**0**
Level 0	Brighton Associated	After	0	0	0	0	1	**1**	0	0	0	0	0	**0**
Level 0	CambridgeTrial	Before	0	0	2	0	9	**11**	0	0	3	0	11	**14**
Level 0	CambridgeTrial	After	0	7	3	0	5	**15**	0	0	2	0	8	**10**
Level 0	Cambridge Associated	Before	0	0	3	0	0	**3**	0	0	0	0	0	**0**
Level 0	Cambridge Associated	After	0	0	0	0	4	**4**	0	0	0	0	3	**3**
Total			0	18	9	0	47	**74**	0	1	6	1	48	**56**

Interaction Level 1

			Cyclist Reponse						Vehicle Response					
			Manoeuvres suddenly	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**	Manouvers Suddenly	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**
Level 1	Hackney Trial	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 1	Hackney Trial	After	0	1	0	0	0	**1**	0	0	0	0	0	**0**
Level 1	Hackney Associated	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 1	Hackney Associated	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 1	Lambeth Trial	Before	0	7	0	0	0	**7**	0	1	2	0	2	**5**
Level 1	Lambeth Trial	After	0	3	0	0	0	**3**	0	0	0	0	1	**1**
Level 1	Lambeth Associated	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 1	Lambeth Associated	After	0	2	1	0	0	**3**	0	0	0	0	2	**2**
Level 1	Brighton Trial	Before	0	1	1	0	1	**3**	0	1	1	1	0	**3**
Level 1	Brighton Trial	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 1	Brighton Associated	Before	1	0	0	0	1	**2**	0	1	0	0	1	**2**
Level 1	Brighton Associated	After	0	1	0	0	0	**1**	0	0	1	0	0	**1**
Level 1	CambridgeTrial	Before	0	0	0	1	1	**2**	0	0	0	0	0	**0**
Level 1	CambridgeTrial	After	2	0	0	0	1	**3**	0	0	0	0	0	**0**
Level 1	Cambridge Associated	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 1	Cambridge Associated	After	0	0	1	0	0	**1**	0	0	0	0	1	**1**
Total			3	15	3	1	3	**26**	0	3	4	1	7	**15**

Interaction Level 2

			Cyclist Reponse						Vehicle Response					
			Manoeuvres suddenly	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**	Manouvers Suddenly	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**
Level 2	Hackney Trial	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Hackney Trial	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Hackney Associated	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Hackney Associated	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Lambeth Trial	Before	0	1	0	0	0	**1**	0	0	1	0	0	**1**
Level 2	Lambeth Trial	After	0	0	0	1	0	**1**	0	0	0	0	0	**0**
Level 2	Lambeth Associated	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Lambeth Associated	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Brighton Trial	Before	0	0	2	0	0	**2**	0	0	0	0	0	**0**
Level 2	Brighton Trial	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Brighton Associated	Before	1	0	0	0	0	**1**	0	0	0	1	0	**1**
Level 2	Brighton Associated	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	CambridgeTrial	Before	0	0	1	0	0	**1**	0	0	0	0	1	**1**
Level 2	CambridgeTrial	After	1	0	0	0	0	**1**	0	0	0	0	0	**0**
Level 2	Cambridge Associated	Before	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Level 2	Cambridge Associated	After	0	0	0	0	0	**0**	0	0	0	0	0	**0**
Total			2	1	3	1	0	**7**	0	0	1	1	1	**3**

Interaction Level 0

			Other Cyclist Reaction		Pedestrian Reaction				
			No Response	**Total**	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**
Level 0	Hackney Trial	Before	0	**0**	0	0	0	1	**1**
Level 0	Hackney Trial	After	0	**0**	0	0	0	0	**0**
Level 0	Hackney Associated	Before	0	**0**	0	0	0	0	**0**
Level 0	Hackney Associated	After	0	**0**	0	0	0	0	**0**
Level 0	Lambeth Trial	Before	0	**0**	0	0	0	3	**3**
Level 0	Lambeth Trial	After	0	**0**	0	0	0	3	**3**
Level 0	Lambeth Associated	Before	0	**0**	0	0	0	0	**0**
Level 0	Lambeth Associated	After	0	**0**	0	0	0	0	**0**
Level 0	Brighton Trial	Before	3	**3**	0	0	0	2	**2**
Level 0	Brighton Trial	After	0	**0**	0	0	0	3	**3**
Level 0	Brighton Associated	Before	0	**0**	0	0	0	1	**1**
Level 0	Brighton Associated	After	0	**0**	0	0	0	0	**0**
Level 0	CambridgeTrial	Before	0	**0**	0	0	0	0	**0**
Level 0	CambridgeTrial	After	1	**1**	0	0	0	6	**6**
Level 0	Cambridge Associated	Before	0	**0**	0	0	0	3	**3**
Level 0	Cambridge Associated	After	1	**1**	0	0	0	0	**0**
Total			5	**5**	0	0	0	22	**22**

Interaction Level 1

			Other Cyclist Reaction		Pedestrian Reaction				
			No Response	**Total**	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**
Level 1	Hackney Trial	Before	0	**0**	0	0	0	0	**0**
Level 1	Hackney Trial	After	0	**0**	0	0	0	1	**1**
Level 1	Hackney Associated	Before	0	**0**	0	0	0	0	**0**
Level 1	Hackney Associated	After	0	**0**	0	0	0	0	**0**
Level 1	Lambeth Trial	Before	0	**0**	0	0	0	2	**2**
Level 1	Lambeth Trial	After	1	**1**	0	0	0	1	**1**
Level 1	Lambeth Associated	Before	0	**0**	0	0	0	0	**0**
Level 1	Lambeth Associated	After	0	**0**	0	0	0	1	**1**
Level 1	Brighton Trial	Before	0	**0**	0	0	0	0	**0**
Level 1	Brighton Trial	After	0	**0**	0	0	0	0	**0**
Level 1	Brighton Associated	Before	0	**0**	0	0	0	0	**0**
Level 1	Brighton Associated	After	0	**0**	0	0	0	0	**0**
Level 1	CambridgeTrial	Before	0	**0**	0	0	1	0	**1**
Level 1	CambridgeTrial	After	0	**0**	0	1	0	2	**3**
Level 1	Cambridge Associated	Before	0	**0**	0	0	0	0	**0**
Level 1	Cambridge Associated	After	0	**0**	1	0	0	0	**1**
Total			1	**1**	1	1	1	7	**10**

Interaction Level 2

			Other Cyclist Reaction		Pedestrian Reaction				
			No Response	**Total**	Manouvres in advance	Stops in advance	Stops suddenly	No response	**Total**
Level 2	Hackney Trial	Before	0	**0**	0	0	0	0	**0**
Level 2	Hackney Trial	After	0	**0**	0	0	0	0	**0**
Level 2	Hackney Associated	Before	0	**0**	0	0	0	0	**0**
Level 2	Hackney Associated	After	0	**0**	0	0	0	0	**0**
Level 2	Lambeth Trial	Before	0	**0**	0	0	0	0	**0**
Level 2	Lambeth Trial	After	0	**0**	0	1	0	0	**1**
Level 2	Lambeth Associated	Before	0	**0**	0	0	0	0	**0**
Level 2	Lambeth Associated	After	0	**0**	0	0	0	0	**0**
Level 2	Brighton Trial	Before	0	**0**	0	0	0	0	**0**
Level 2	Brighton Trial	After	0	**0**	0	0	0	0	**0**
Level 2	Brighton Associated	Before	0	**0**	0	0	0	0	**0**
Level 2	Brighton Associated	After	0	**0**	0	0	0	0	**0**
Level 2	CambridgeTrial	Before	0	**0**	0	0	0	0	**0**
Level 2	CambridgeTrial	After	0	**0**	0	0	0	1	**1**
Level 2	Cambridge Associated	Before	0	**0**	0	0	0	0	**0**
Level 2	Cambridge Associated	After	0	**0**	0	0	0	0	**0**
Total			0	**0**	0	1	0	1	**2**

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Abu Dhabi
AS Business Centre, Suite 201, Al Ain Road, Umm al Nar, P.O. Box 129865, Abu Dhabi, UAE
T: +971 2 510 2402 F: +971 2 510 2403

Birmingham
Second Floor, 37a Waterloo Street
Birmingham B2 5TJ United Kingdom
T: +44 (0)121 233 7680 F: +44 (0)121 233 7681

Dublin
First Floor, 12/13 Exchange Place
Custom House Docks, IFSC, Dublin 1, Ireland
T: +353 (0)1 542 6000 F: +353 (0)1 542 6001

Edinburgh
Second Floor, Prospect House, 5 Thistle Street,
Edinburgh EH2 1DF United Kingdom
T: +44 (0)131 220 6966 F: +44 (0)131 220 6087

Glasgow
Seventh Floor, 78 St Vincent Street
Glasgow G2 5UB United Kingdom
T: +44 (0)141 225 4400 F: +44 (0)141 225 4401

London
Second Floor, 17 Hanover Square
London W1S 1HU United Kingdom
T: +44 (0)20 7529 6500 F: +44 (0)20 7529 6556

Lyon
11, rue de la République, 69001 Lyon, France
T: +33 (0)4 72 10 29 29 F: +33 (0)4 72 10 29 28

Manchester
25th Floor, City Tower, Piccadilly Plaza
Manchester M1 4BT United Kingdom
T: +44 (0)161 236 0282 F: +44 (0)161 236 0095

Marseille
76, rue de la République, 13002 Marseille, France
T: +33 (0)4 91 37 35 15 F: +33 (0)4 91 91 90 14

Paris
12-14, rue Jules César, 75012 Paris, France
T: +33 (0)1 53 17 36 00 F: +33 (0)1 53 17 36 01

Woking
Dukes Court, Duke Street, Woking
Surrey GU21 5BH United Kingdom
T: +44 (0)1483 728051 F: +44 (0)1483 755207

Email: info@mvaconsultancy.com

Offices also in
Bangkok, Beijing, Hong Kong, Shenzhen and Singapore

mvaconsultancy