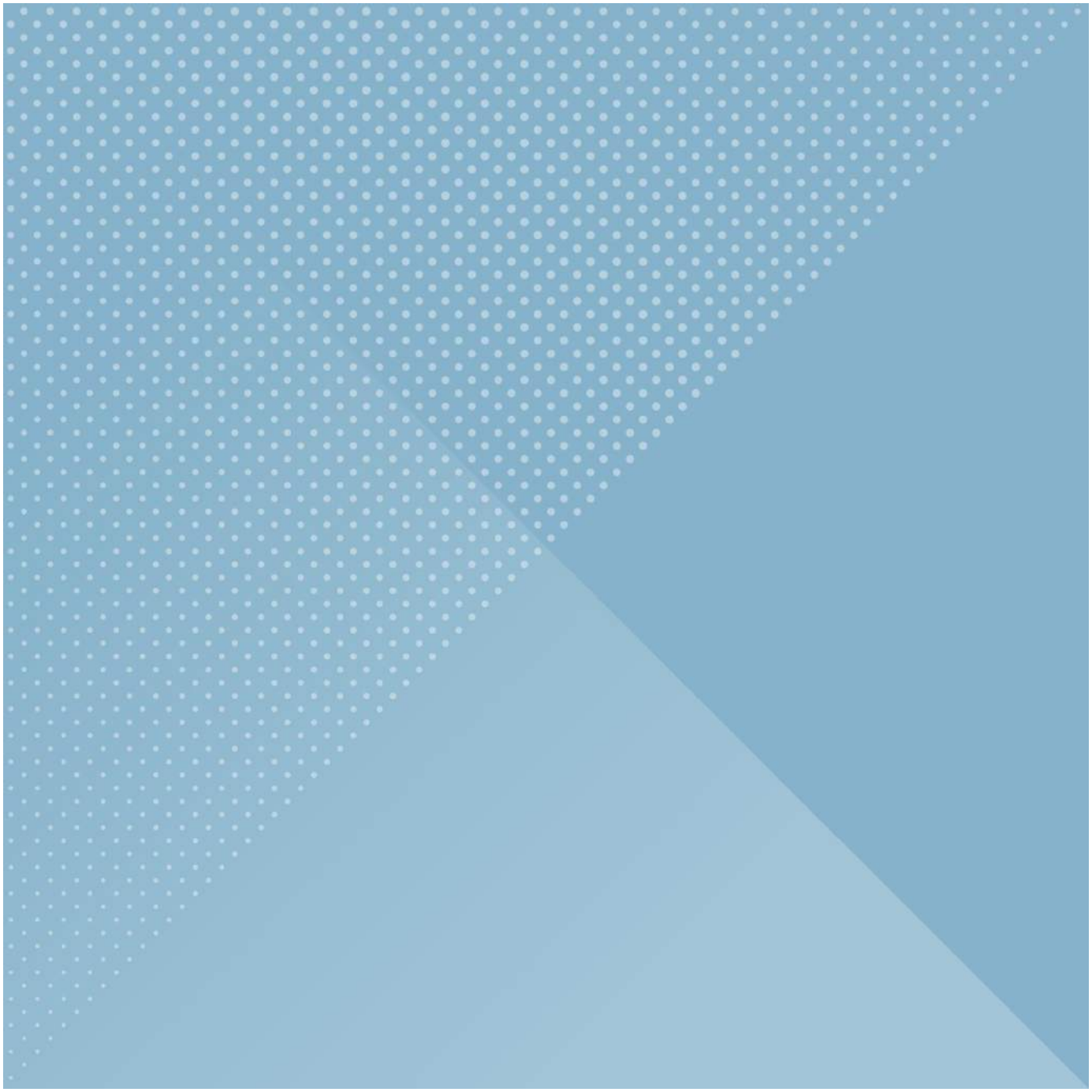
steer davies gleave

Borough Wide Two-Way Cycling in One-Way Streets Study

Report
May 2016

Lambeth Council

Our ref: 22935801
Client ref: -



steer davies gleave

Borough Wide Two-Way Cycling in One-Way Streets Study

Report
May 2016

Lambeth Council

Our ref: 22935801
Client ref: -

Prepared by:

Steer Davies Gleave
28-32 Upper Ground
London SE1 9PD

+44 20 7910 5000
www.steerdaviesgleave.com

Prepared for:

Lambeth Council
Phoenix House
10 Wandsworth Road
London SW8 2LL
United Kingdom

Contents

Figures

Tables

Appendices

1 Introduction

1.1 Lambeth is acknowledged as one of London's most cycle-friendly boroughs, encouraging people to cycle in and across the borough through initiatives that make cycling an attractive, safe and efficient option. Lambeth was among the first boroughs to partner with Transport for London on the delivery of the Cycle Hire, Cycle Superhighways and the Quietways.

1.2 To ensure that cycling remains a convenient choice of transport, Lambeth's network of streets "must provide as many direct cycle links as possible, with as few unnecessary detours as possible" (Lambeth Cycling Strategy, 2013).

1.3 In February 2016 Lambeth commissioned Steer Davies Gleave (SDG) to analyse the effectiveness of 10 one-way streets across the Borough where two-way cycling facilities have been introduced, and assess the feasibility of implementing two-way cycling within the Borough's remaining one-way streets. Lambeth provided SDG with a list of 107 one-way streets which have been considered as part of this assessment.

1.4 As part of SDG's initial review of the one-way street list, it was found that there were, in fact, 36 streets (including the 10 case studies) that already had two-way cycling facilities and a further 67 streets that were one-way but lacked two-way cycling facilities.

1.5 Additionally, it was found that 2 streets from the original list were actually two-way streets for general traffic and 2 streets were part of private estates. In agreement with Lambeth, these have been excluded from the study.

1.6 As discussed with the Borough, the findings of SDG's initial review have formed the basis of this study.[*]

1.7 The study concluded in May 2016 and culminated in this report which summarises current guidance and best practice, outlines our review of the existing one-way streets which have already had two-way cycling facilities implemented and summarises our assessment of the remaining one-way streets for their suitability for two-way cycling.

[*] Following the conclusion of the surveys and the submission of the final report Woodfield Grove was identified by Lambeth as another one way street but was found too late to be included as part of the analysis.

2 Review of Current Cycle Guidance

Lambeth Cycling Strategy

2.1 The Lambeth Cycling Strategy (2013) outlines the cycling aims and objectives for the borough. The first aim of this strategy is to create safe and attractive streets for cycling through a mix of cycling-related measures.

2.2 To ensure that cycling remains a convenient choice of transport, the strategy states that Lambeth's network of streets must provide as many direct cycle links as possible, with as few unnecessary detours as possible.

> "Many more local trips could be cycled by a greater range of people if the right facilities and infrastructure were put in place."

- Lambeth Cycling Strategy

2.3 To achieve this, the strategy recommends that all one-way streets be converted to two-way for cycling unless there are compelling safety reasons not to.

2.4 The strategy also recommended that a borough-wide Road Traffic Order be explored to achieve two-way cycling provisions.

London Cycling Design Standards, Transport for London

2.5 The London Cycling Design Standards (LCDS) were revised by Transport for London in 2014. The LCDS sets out guidance and best practice in building high quality cycling infrastructure that makes cycling a safe and efficient mode of transport.

> "Unless there are over-riding reasons not to, there should be a presumption that contraflow cycling should be provided for in any one-way street."

- Chapter 4 – London Cycling Design Standards

2.6 Cycle lanes enabling two-way cycling in one-way streets are a well-established measure and the importance of these in providing direct cycle links across an area is recognised through the LCDS.

2.7 Mandatory or advisory cycle lanes are recommended where carriageway width permits, however the updated LCDS now permits contraflow cycling without any lane markings at all.

2.8 This updated guidance now makes it possible to include contraflow cycling on many streets that were previously considered too narrow.

> "The rule-of-thumb is to avoid situations where motorised vehicles and cyclists are expected to move together through a width between 3.2 metres and 4 metres."

- Chapter 4 – London Cycle Design Standards

2.9 The LCDS further states that attention should be given to the design of cycle lane entry and exit points, side roads, accesses and parking bays to minimise conflict with other road users and movements.

2.10 If additional protection is needed due to conflicts with large vehicle movements, a protective island can be introduced with the diagram 955 on a bollard (see Figure 2.1). Diagram 995 demarcates that these routes are used by pedal cyclists only.

2.11 Section 6.1.3 discusses a series of area-wide authorisations issued to all local authorities in England from the Department for Transport (DfT) which covered a range of new signing measures. One of the area-wide authorisations included the ability to use the 'EXCEPT CYCLES' plate with the 'NO ENTRY' plate without seeking additional approval from the DfT.

Figure 2.1: Diagram 955

LTN 2/08 Cycle Infrastructure Design, Department for Transport

2.12 The Cycle Infrastructure Design (CID) Local Transport Note outlines guidance on designing and developing high-quality cycle infrastructure. Revised in 2008, the CID guidance sets a benchmark standard for cycle infrastructure.

2.13 The CID guidance does not directly cover the conversion of one-way cycle lanes to two-way cycle provision, however, it outlines how and when contraflow cycle lanes should be used and the benefits of doing so. The information summarised below is appropriate when introducing two-way cycling in existing one-way streets.

Contraflow cycle lanes

2.14 The CID guidance states that contraflow cycle lanes may provide permeability for cyclists when the movement of other traffic is restricted by one-way systems and that where one-way systems are introduced, consideration should always be given to maintaining two-way cycle lanes through contraflow provisions.

2.15 The CID guidance recognises the importance of contraflow cycle lanes for the safety of cyclists, as well as offering more direct links. Contraflow cycle lanes can offer a higher level of cycling convenience as cyclists do not have to travel longer distances or take a detour when travelling to the destination.

2.16 Contraflow schemes can function and be implemented in the following instances, when the correct regulatory measures are in place:

- Narrow streets
- Streets with high levels of pedestrian flow
- Street with high levels of kerbside parking / loading activities

2.17 When designing or implementing contraflow lanes, it is important to consider ongoing street activities, such as loading / unloading bays. As such, mandatory contraflow cycle lanes are generally accompanied by waiting and loading restrictions to in order to prevent the lanes from being obstructed. It is important to outline and include these restrictions in the Traffic Regulation Order, which is needed to create a mandatory lane.

2.18 When introducing two-way cycle provision in one-way streets, the CID guidance advises that advisory lanes may be an appropriate option when oncoming vehicles need to pass through the cycle lane (i.e. to park or pass obstructions).

2.19 It may be possible to dispense with marked cycle lanes if either of the following conditions is satisfied:

- 85th percentile speed is less than 25mph and vehicle flows are below 1,000 per day, or
- Street forms a part of a 20mph zone

2.20 In designing two-way cycle lanes in one-way streets, segregated cycle entry and exit points from opposing flow are recommended. Where segregation is provided, the ‘no entry’ sign for motorists is required.

2.21 In instances where contraflow cycle lane markings are not present, a short section of each lane should be coloured. This coloured surfacing will help make pedestrians and motorists aware of the possibility of cyclists traveling in contraflow.

2.22 In Lambeth many of the one-way streets are in residential areas and incorporate kerbside parking facilities. The CID guidance states that parallel parking bays do not pose any more of a hazard for cyclists in contraflow than they do elsewhere. Indeed, drivers waiting to pull out of the bays usually face oncoming cyclists, and, if a cyclist should collide with a carelessly opened vehicle door, contact will generally be with its panel rather than its edge. As such, it may be acceptable to reduce or omit the buffer zone sometimes provided between parking bays and cyclists.

Traffic Signs Regulations and General Directions 2016 (TSRGD 2016)

2.23 The revised TSRGD came into force on 22nd April 2016 and was the first major update since 2003.

2.24 One of the major changes concerning cycling facilities is the option to install with-flow mandatory cycle lanes without the need to obtain a traffic order. However it is our understanding that contraflow cycling facilities still require a traffic order before they can be installed.

Case studies: two-way cycling in one-way streets

City of London contraflow cycling programme

2.25 The City of London has seen a 100% increase in cycling in the last ten years, with cycling on some streets representing 50% modal share.

2.26 To further encourage cycling throughout the borough, the City implemented contraflow cycling in one-way streets, including Chancery Lane and Liverpool Street. The primary aims of the programme were to:

- Improve safety by providing alternative routes;
- Improve local access for cyclists;
- Reduce journey distances and times for cyclists; and
- Provide additional route choice.

2.27 Following the cycle design guidance, as highlighted above, the City identified and designed sites based on speed, traffic flows and cyclist use. Narrow streets were identified as opportune locations, given their local access, low traffic flows and usefulness in providing direct links.

2.28 The City actively communicated the existence of contraflow cycle lanes through various campaigns, including Traffic Management Order (TMO) advertisements in the press, letters to local businesses, TMO street notices and informal posters (A4 and A-boards) adjacent to the cycle route. The City of London's website also promoted the contraflow cycle lanes.

2.29 An informal consultation was done with the local community, local police, the Department for Transport and cycling groups to determine the feasibility of two-way cycling provision along narrow roads. To further ensure the success of the contraflow lanes, the parking and loading were restricted at some sites and temporary footpath stickers alerting pedestrians to the new contraflow lanes were added.

2.30 Through a vigorous monitoring programme at various sites, it was determined that total cycle flow increased by 33%, with the average contra-flow proportion constituting 37% of this increase.

3 Review of One-Way Streets Incorporating Two-Way Cycling Facilities

Site Visit

3.1 Between the 24th February and the 8th March 2016, SDG undertook site visits at each of the 36 one-way streets that incorporated two-way cycling facilities (10 originally identified by Lambeth plus an additional 26 from the wider list of one-way streets).

Assessment

3.2 The assessment took into account the following key attributes:

- Kerb to kerb carriageway width, measured at both ends of the street and on a typical cross section
- Minimum footway width available on each side of the carriageway
- Type of cycling facilities in place (on road, segregated, shared use path, etc.) in each direction
- Notes on particular features in the road geometry (local narrowings, raised treatments, narrow bends, visibility constraints, etc.)
- General condition of the highway surface
- Typical number of cyclists at peak time, in both directions, based on a single 15 minute observations
- Waiting and loading restrictions along the road
- On-street parking facilities
- Bus routes along the street
- Nearby attractors such as parks, schools, sport centres, railway/underground stations, commercial activities.
- Pedestrian crossing facilities (both formal and informal)

3.3 In addition, photos of the streets were also taken on the day of the inventory, in order to show the current state of the highway.

3.4 This information is summarised in Table 3.1 whilst the complete inventory is included in Appendix A.

Traffic Survey

3.5 To complement the on-site assessment, traffic surveys were conducted using Automated Traffic Counters (ATCs) at each one way street. The survey was undertaken for 7 days between 19th and 25th February. However, in locations where the survey was disrupted due to cars

parked on the tubes, for instance, the survey duration was extended to ensure a full seven days' data was collected.

3.6 Some key figures extracted from the ATC surveys have been included in the inventory in order to provide a brief summary of the traffic attributes along the street. In particular:

- Daily vehicular traffic volume
- Daily commercial vehicle volume (ARX classes 4 to 12, smallest vehicle type LGV)
- Average general traffic speed

3.7 Appendix D includes the full traffic survey results and a brief report on any issues encountered.

Accident Data

3.8 Accident data for the entire Borough of Lambeth for the 36 months between 1st October 2012 and 30th September 2015 was provided by Transport for London on the 3rd March 2016. Any accident occurring on or in the vicinity of the one way streets are included in Table 3.1 and collisions involving cyclists have been specifically noted.

Analysis

3.9 The sample of one-way streets analysed covers the most widely used contraflow cycling facilities, from segregated lanes to mandatory lanes, advisory lanes and unconfined two-way cycling.

3.10 SDG understands that Lambeth is currently introducing a 20mph limit throughout the borough. It is worth noting that approximately 52% of the one-way streets with two way cycling have mean speeds in excess of this limit. Most of the streets where numbers of cyclists have been surveyed fall within a range of 50-120 cyclists/hour). Ferndale Road, however, has significantly more, at 230 cyclists/hour. This one way street is the last section of a busy cycle route to/from Brixton Station and the adjacent shop parade. At the signalised junction with Brixton Road, the two-way cycle flows along Ferndale Road merges with the two-way cycle flow along the shared space on Stockwell Avenue. The shared facility provided at the junction, with opposite flows mixing with significant volumes of pedestrians, is often neglected or misused by cyclists. Cyclist volumes and the nature of the provision in this location may be linked in some way with the high number of collisions in this location.

3.11 Old Town (Clapham) is the only road with bus routes running along the street. Sufficient width for two-way cycling is retained around the bus stop, and appropriate lane marking is put in place.

3.12 Eight streets show contraflow facilities not suitable for the traffic volumes and speed profiles recorded (e.g. no lane provided in streets with traffic volumes above 1000 veh/day or 85th percentile speed above 25 mph). In two of these cases, namely Aristotle Road and Newburn Street, a high level of collisions involving cyclists is observed, suggesting the potential for a revision of the cycling infrastructure provision.

Table 3.1: Summary of existing two-way cycling in one-way streets

Street Name and ID	Typical kerb to kerb carriageway width (m)	Kerb to kerb carriageway width at entry (m)	Kerb to kerb carriageway width at exit (m)	Total vehicular traffic volume (veh/day)[1]	Commercial vehicle volume (veh/day)	Cyclist volume (peak hour)[2]	85th percentile speed (daily)	Recorded collisions	Cycle facilities
003 - Albion Avenue	11.0	12.3	8.3	1403	115	16 with flow, 24 contraflow	17 mph	0	Segregated contraflow entry; cycle friendly cycle hump along the road; cycle route 3 runs along adjoining Larkhall Rise.
004 - Aristotle Road	8.1	9.3	9.8	2099	193	46 with flow, 78 contraflow	23 mph	4 slight collisions, all 4 involving cyclists	Advisory contraflow cycle lane section marked at the road exit and at the end of the one-way section (partly on build out); contraflow cycle marks are present along the road; CSH runs along adjoining Clapham High Street.
010 - Bowling Green Street	5.4	5.3	4.3	612	17	20 with flow, 8 contraflow	14 mph	2 slight collisions, 1 involving cyclist	Segregated contraflow entry; cycle road marking in both directions along the street; Cycle hire facilities at the corner with Kennington Road.
013 - Brixton Station Road	5.8	6.1	8.5	1533	124	0 with flow, 24 contraflow	14 mph	4 collisions, 3 slight and 1 serious incident	Advisory contraflow cycle lane at exit on Gresham Road and contraflow cycle road marking alogn the street.
017 - Cambria Road	5.0	6.5	7.5	356	68	64 with flow, 48 contraflow	15 mph	2 slight collision	Contraflow cycle road marking along the street; speed humps on carriageway.
018 - Cardigan Street	7.7	9.4	7.2	465	59	32 with flow, 52 contraflow	25 mph	2 slight collision 1 involving cyclists	Segregated contraflow entry at signalised junction, with island and illuminated bollard; adivsory contraflow lane at junction.
019 - Carlisle Lane	7.6	5.5	3.6	680	109	32 with flow, 16 contraflow	22 mph	0	Contraflow cycle road marking along the street.
035 - Ferndale Road	8.8	8.1	8.2	1422	368	104 with flow, 128 contraflow	24 mph	15 incidents, 2 serious, 13 slight (3 involving cyclists)	Contraflow segregated lane at entrance, same level as footway, with signal for contraflow cyclists only; cycle road marking in both directions. Advisory cycle lane at exit; cycle stands along the road.
037 - Frazier Street	9.5	4.8	6.9	1132	246	4 with flow, 32 contraflow	17 mph	2 slight collisons, 1 involving a cyclist	Contraflow cycle lane at entry and exit; cycle road marking along the street (in the section between Lower Marsh and Baylis Road).
038 - Gateley Road	7.6	8.8	8.7	221	17	44 with flow, 36 contraflow	22 mph	0	Advisory contraflow lane at entry and exit; contraflow cycle road marking along the street.
041 - Hartington Road	8.7	9.3	6.2	1861	240	4 with flow, 32 contraflow	18 mph	0	Contraflow advisory lane at exit; contraflow cycle road marking along the street; sinusoidal speed humps along the street; cycle stands at exit.
046 - Killyon Road	7.2	7.7	7.5	383	59	4 with flow, 4 contraflow	21 mph	2 slight collisions, 1 involving cyclist	Segregated contraflow lane at road exit; cycle route 3 runs along adjoining Larkhall Rise.
048 - Larkhall Lane	7.8	9.8	9.5	2313	207	36 with flow, 52 contraflow	26 mph	2 slight collisions	LCN Route 3 runs along Larkhall Lane; segregated contraflow lane at entry and cycle road marking along the street, both contraflow and in same direction.

[1] Total vehicular traffic volume includes commercial vehicles

[2] Cyclists volume calculated by extrapolating counts undertaken for 15 minutes during peak period (07:00 – 10:00)

Street Name and ID	Typical kerb to kerb carriageway width (m)	Kerb to kerb carriageway width at entry (m)	Kerb to kerb carriageway width at exit (m)	Total vehicular traffic volume (veh/day)[1]	Commercial vehicle volume (veh/day)	Cyclist volume (peak hour)[2]	85th percentile speed (daily)	Recorded collisions	Cycle facilities
051 - Lower Marsh	8.9	8.8	8.7	815	83	44 with flow, 64 contraflow	18 mph	7 collisions, 6 slight (1 involving cyclist), 1 serious	Advisory contraflow lane marking at entrance, exit and Frazier street junction; Cycle stands and cycle hire facilities available.
052 - Lyham Road + Crescent Ln	6.7	9.2	7.3	2271	213	28 with flow, 16 contraflow	26 mph	4 slight collisions all involving cyclists	These two sections of Lyham Road and Crescent Lane are part of the London Cycle Route 25. Fully segregated contraflow lane on Lyham Road, mandatory contraflow cycle lane along Crescent Lane. ASL at signalised junction with Kings Avenue.
055 - Morley Street	6.1	9.3	7.2	390	76	24 with flow, 16 contraflow	17 mph	0	Segregated mandatory contraflow cycle lane with refuge islands at entry and exit.
060 - Newburn Street	6.2	8.1	7.4	1165	153	8 with flow, 8 contraflow	25 mph	2 slight collisions, 1 involving cyclist	Advisory contraflow lane at exit on Vauxhall Street; cycle road marking on street between Vauxhall Street and Sandcroft Street; segregated contraflow cycle lane starting at junction between Newburn and Sandcroft street and ending at junction between Newburn street and Black Prince road.
061 - Normandy Road	8.7	8.0	8.3	1312	93	8 with flow, 32 contraflow	20 mph	2 slight collisions	Contraflow mandatory lane 50 m from entrance, with island, illuminated bollard and signs at junction; cycle road marking along the street.
063 - Old South Lambeth Road	7.8	5.7	5.6	768	90	4 with flow, 4 contraflow	18 mph	2 slight collisions, 1 involving cyclist	Cycle road marking on carriageway.
064 - Old Town[3]	6.6	6.3	4.5	3978	538	20 with flow, 36 contraflow	24 mph	0	Advisory contraflow cycle lane along the road; segregated contraflow cycle track at the entrance and dropped kerb for contraflow access at exit; cycle stands and cycle pump available near parklet.
069 - Popes Road	7.5	7.4	8.4	1894	136	4 with flow, 36 contraflow	14 mph	0	Cycle road marking on carriageway.
076 - Royal Street	8.3	7.8	7.8	884	141	24 with flow, 28 contraflow	22 mph	1 slight collision involving cyclist	Cycle road marking in both directions along the street; paved island at exit to separate contraflow cyclists; Cycle hire station on Lambeth Palace Road.
077 - Sancroft Street	9.7	7.0	8.0	479	41	36 with flow, 32 contraflow	30 mph	0	Contraflow lane and localised narrowing at junction with Cardigan Street and at the entrance from Vauxhall Street: Cycle road marking in both directions along the street; Cycle hire facilities at entrance from Kennington Road on the right side and at the junction with Cardigan Road.
083 - Stockwell Avenue	9.0	6.7	0.0	781	33	32 with flow, 28 contraflow	15 mph	1 slight collision	Contraflow lane at exit onto Bellefields road; cycle marks along the section accessible to vehicles. Stockwell Avenue is the preferred shortcut used by cyclists travelling north/south to avoid the gyratory between Brixton Road and Stockwell Road.
085 - Strathleven Road	5.8	9.7	6.5	1848	153	16 with flow, 4 contraflow	21 mph	4 slight collisions, 1 involving cyclist	Segregated contraflow lane with segregation island; modal filter at the junction with Mandell Road, joining route 25.
089 - Trinity Gardens	7.6	8.2	6.2	1434	119	0 with flow, 12 contraflow	21 mph	3 slight collisions, 1 involving cyclist	Segregated contraflow lane at exit.
090 - Tyers Street	8.5	6.4	8.2	708	96	24 with flow, 28 contraflow	22 mph	3 slight collisions + 3 slight collisions on Kennington Ln	Contraflow advisory lane approaching entry and exit and in correspondence with main junctions; contraflow marks on street.

[3] This street is along a bus route

Street Name and ID	Typical kerb to kerb carriageway width (m)	Kerb to kerb carriageway width at entry (m)	Kerb to kerb carriageway width at exit (m)	Total vehicular traffic volume (veh/day)[1]	Commercial vehicle volume (veh/day)	Cyclist volume (peak hour)[2]	85th percentile speed (daily)	Recorded collisions	Cycle facilities
092 - Vauxhall Street	7.1	8.2	11.1	1025	98	12 with flow, 156 contraflow	23 mph	13 collisions, 2 serious, 11 slight (3 involving cyclists)	Segregated cycle lane between Kennington Lane and Kennington Oval; advisory cycle lane on approach to Black Prince Road and pedestrian refuge at the junction.
097 - Webber Street	9.0	8.6	8.9	1483	163	108 with flow, 16 contraflow	16 mph	0	Contraflow segregated entrance at signalised junction; cycle road marking in both directions along the street
098 - Western Road	7.6	7.8	7.4	346	36	12 with flow, 24 contraflow	22 mph	0	Advisory contraflow lanes at entry and exit; Contraflow cycle road marking along the street.
103 - Wynyard Terrace	6.0	8.7	9.2	158	23	4 with flow, 0 contraflow	19 mph	0	Contraflow cycle road marking along the street; advisory cycle lane at both ends on Brangton Road.
104 - Wincott Street	8.1	8.1	7.5	663	73	0 with flow, 8 contraflow	25 mph	1 slight collision involving cyclist	Advisory cycle lane at entry and exit of one way section.
105 - Glasshouse Walk	6.6	14.6	7.5	-	-	12 with flow, 0 contraflow	-	0	Advisory contraflow cycle lane along the entire one-way section.
106 - Landsowne Gardens	8.7	9.3	6.2	-	-	20 with flow, 56 contraflow	-	0	Contraflow segregated lane at exit; contraflow cycle road marking along the street.
107 - Guildford Road	8.7	9.3	6.2	-	-	8 with flow, 4 contraflow	-	0	Contraflow segregated lane at exit; contraflow cycle road marking along the street.

4 Assessment of Remaining One-Way Streets

Site Visits

4.1 During the same period, between the 24th February and the 8th March 2016, SDG undertook site visits at each of the other 67 one-way streets included in the study, in order to evaluate the feasibility of implementing two-way cycling and assess the most appropriate measures to support this strategy.

Assessment

4.2 The assessment took into account the same key attributes to those in Section 3, namely:

- Kerb to kerb carriageway width, measured at both ends of the one-way street and on a typical cross section
- Minimum footway width available on each side of the carriageway
- Type of cycling facilities in place (on road, segregated, shared use path, etc.) in each direction
- Geometry of the road (local narrowings, raised treatments, narrow bends, visibility constraints, etc.)
- General Condition of the highway surface
- Waiting and loading restrictions along the road
- On-street parking facilities
- Bus routes running along the street
- Nearby attractors such as parks, schools, sport centres, railway/underground stations, commercial activities.
- Pedestrian crossing facilities (both formal and informal)

4.3 In addition, photos of the streets were taken on the day of the inventory, in order to show the current state of the highway.

4.4 This information is summarised in Table 4.1 whilst the complete inventory is included in Appendix B.

Traffic Survey

4.5 To complement the on-site assessment, traffic surveys were conducted using Automated Traffic Counters (ATCs) at each one way street. The survey was undertaken for 7 days between 19th and 25th February. However, in locations where the survey was disrupted due to cars parked on the tubes, for instance, the survey duration was extended to ensure a full seven days' data was collected.

4.6 Some key figures extracted from the ATC surveys have been included in the inventory in order to provide a brief summary of the traffic attributes along the street. In particular:

- Daily vehicular traffic volume
- Daily commercial vehicle volume (ARX classes 4 to 12, smallest vehicle type LGV)
- Average general traffic speed

4.7 Appendix D includes the full traffic survey results and a brief report on any issues encountered.

Accident Data

4.8 Accident data for the entire Borough of Lambeth for the 36 months between 1st October 2012 and 30th September 2015 was provided by Transport for London on the 3rd March 2016. Any accidents occurring on or in the vicinity of the one way streets are included in Table 4.1 and collisions involving cyclists have been specifically noted.

Table 4.1: Summary of assessed one-way streets

Street Name and ID	Typical kerb to kerb carriageway width (m)	Kerb to kerb carraigeway width at entry (m)	Kerb to kerb carriageway width at exit	Total vehicular traffic volume (veh/day)[4]	Commercial vehicle volume (veh/day)	85th percentile speed (daily)	Recorded collisions	Cycle facilities
001 - Carnforth + Abercairn Rd	7.3	7.3	8.3	252	15	21 mph	0	No cycle facilities except for modal filter at junction with Abercairn Road.
002 - Akerman Road	7.9	13.6	7.2	4890	406	25 mph	1 slight collision	No cycle facilities.
005 - Astoria Walk	3.5	7.0	5.8	89	21	19 mph	1 slight collision	No cycle facilities.
006 - Bavent Road	7.9	9.0	10.3	493	23	17 mph	0	No cycle facilities.
007 - Bellefields Road	7.8	8.5	5.5	1810	149	18 mph	1 slight collision involving cyclist	Cycle road marking along the street; cycle stands at entry and exit.
008 - Bessemer Road	Street not analysed as part of private property							
009 - Bondway + Miles Street	7.0	13.4	7.8	309	61	22 mph	4 slight collisions, 3 involving cyclists	No cycle facilities.
011 - Branksome Road	6.7	7.9	8.0	2221	175	19 mph	6 slight collisions 3 involving cyclists	No cycle facilities; the road meets cycle network route 25 on Lambert Road.
012 - Brighton Terrace	8.1	10.7	8.1	1674	133	23 mph	9 collisions, 8 slight (1 involving a cyclist) and 1 fatal	No cycle facilities.
014 - Broad Wall[5]	5.4	5.4	5.9	2356	435	19 mph	0	No cycle facilities.
015 - Bromell's Road	Street not analysed as already part of Quietway scheme							
016 - Buckner Rd + Porden Rd	8.1	12.7	13.2	325	30	19 mph	0	No cycle facilities.
020 - Carnforth Road	7.5	8.1	7.3	6390	448	17.4	2 slight collisions	No cycle facilities except for modal filter at junction with Abercairn Road.
021 - Centaur Street	5.7	6.3	8.1	921	219	22 mph	0	No cycle facilities.
022 - Chantrey Road	7.6	4.2	8.6	0	0	0	2 slight collisions	No cycle facilities.
023 - Chester Way	8.0	12.4	8.2	438	52	20 mph	0	Cycle hangar on the left side; cycle stands next to raised treatment at the end of the street; adjoining Kennington Lane has shared bus and cycle lanes.
024 - Caldecot Road	7.3	5.9	8.5	3060	227	20 mph	2 slight collisions, 1 involving a cyclist + 2 slight collisions on Coldharbour Ln	No cycle facilities; cycle friendly sinusoidal speed humps along the street.
025 - Cleaver Street	5.7	5.4	6.2	599	49	17 mph	0	Cycle hire facilities and cycle stands in the vicinity.
026 - Cosser Street	7.2	10.0	9.9	478	89	24 mph	1 slight collision involving a cyclist	No cycle facilities.
027 - Courtenay Street	5.8	5.6	9.7	255	28	23 mph	2 slight collisions	Cycle stands near raised entry treatment; cycle road marking on carriageway (same direction).
028 - Crescent Lane	7.7	9.3	9.4	1245	65	18 mph	3 slight collisions all involving cyclists	No cycle facilities; CSH7 along adjoining Clapham Common South Side.
029 - Cubitt Terrace	5.0	6.6	4.6	271	257	20 mph	1 slight collision	No cycle facilities; Cycle route 3 runs along adjoining Larkhall Rise
030 - Cutcombe Road	7.9	9.0	9.2	2369	182	17 mph	2 collisions, 1 slight and 1 serious collision involving a cyclist	No cycle facilities.
031 - Dalyell Road	7.6	9.2	11.6	2649	195	20 mph	0	No cycle facilities.

[4] Total vehicular traffic volume includes commercial vehicles

[5] This street is along a bus route

Street Name and ID	Typical kerb to kerb carriageway width (m)	Kerb to kerb carraigeway width at entry (m)	Kerb to kerb carriageway width at exit	Total vehicular traffic volume (veh/day)[4]	Commercial vehicle volume (veh/day)	85th percentile speed (daily)	Recorded collisions	Cycle facilities
032 - Denny Street	7.6	8.6	5.3	97	7	19 mph	1 slight collision	Cycle racks near at junction with Kennington Lane
033 - Dorset Road	7.4	8.1	8.4	1626	176	20 mph	2 collisions, 1 slight and 1 serious	Cycle road marking on carriageway.
034 - Fenwick Place	5.0	6.1	5.2	1238	113	18 mph	0	Cycle stands along the road; CSH7 runs along Clapham High Street, in close proximity.
036 - Flaxman Road	7.8	8.2	7.1	428	27	23 mph	3 slight collisons, 1 involving a cyclist	No cycle facilities.
039 - Gibson Road	Street not analysed as part of private property							
040 - Gleneldon Road	7.8	8.3	11.3	643	55	19 mph	6 collisions, 4 slight (with 1 involving a cyclist) and 2 fatal	ASL at signalised junction.
042 - Hayter Road	7.8	6.4	8.4	145	10	21 mph	4 slight collisions, 2 involving cyclists	No cycle facilities.
043 - Heyford Avenue	8.3	11.7	6.7	471	41	18 mph	1 serious collision	Cycle stands on footway.
044 - Hopton Road	7.6	7.7	7.5	682	49	15 mph	12 slight collisions	No cycle facilities. Cycle friendly sinusoidal humps along the road.
047 - Langton Road	6.6	6.6	9.5	2453	190	19 mph	0	Cycle hangar along the road.
049 - Leigham Avenue	5.6	10.7	9.6	2119	135	28 mph	3 slight collisions	Cycle stands at junction, cycle hangar along the road.
050 - Lothian Road	7.3	8.3	8.0	2790	245	21 mph	1 slight collision on Lothian Rd + 10 collisions on Camberwell New Rd, 4 involving cyclists	ASL at junctions; cycle road marking along the street.
053 - Mepham Street	Street not analysed as already part of Quietway scheme							
054 - Methley Street	7.9	5.6	8.1	651	93	13 mph	0	No cycle facilities.
056 - Mostyn Road	8.2	7.9	11.4	3508	396	24 mph	7 slight collisions, 2 involving cyclists	Cycle road marking on approach to two-way section.
057 - Murphy Street	4.1	9.9	4.9	113	30	22 mph	0	No cycle facilities.
058 - Myatt Road	6.8	9.9	5.7	1552	134	16 mph	0	No cycle facilities.
059 - Nelsons Row	7.8	7.1	7.4	751	49	17 mph	10 collisions, 2 serious (1 involving cyclist) and 8 slight (1 involving cyclists)	Cycle stands; road links to CSH7 along Clapham High Street.
062 - Ockley Road	7.0	7.0	7.0	1364	1290	23 mph	0	No cycle facilities.
065 - Palfrey Place	5.1	6.0	5.2	166	19	22 mph	2 slight collisions	No cycle facilities.
066 - Patmos Road[6]	7.2	8.1	9.9	4376	464	23 mph	0	Cycle road marking on street.
067 - Pearman Street	8.3	5.5	8.6	531	76	23 mph	1 slight collision	Advisory cycle markings at beginning and end of one way section of Wincott Street, the bus lane on Kennington Road has cycle access which cyclist can use to turn onto Wincott Street.
068 - Polworth Road	7.6	8.9	8.4	1117	65	22 mph	0	Cycle friendly sinusoidal humps along the road.
070 - Prentis Road	7.0	8.7	5.7	2508	128	22 mph	2 slight collisions, 1 involving cyclist	Cycle stands at junction.
071 - Priory Grove	4.4	8.0	9.3	330	17	19 mph	0	Segregated lane at entrance for cycles in same direction as general traffic and cycle road marking along the street.
072 - Randall Row	3.7	5.4	3.2	97	27	20 mph	0	No cycle facilities.
073 - Reedworth Street	7.7	8.1	7.2	861	115	24 mph	3 collisions, 2 slight collisions and 1 serious collision all involving cyclists	No cycle facilities.

[6] This street is along a bus route

Street Name and ID	Typical kerb to kerb carriageway width (m)	Kerb to kerb carraigeway width at entry (m)	Kerb to kerb carriageway width at exit	Total vehicular traffic volume (veh/day)[4]	Commercial vehicle volume (veh/day)	85th percentile speed (daily)	Recorded collisions	Cycle facilities
074 - Rookery Road	6.9	12.2	6.7	7556	919	29 mph	3 slight collisions, 2 involving cyclists	Advanced stop line at signalised junction; Cycle superhighway CS7 on Clapham Common South Side,
075 - Roupell Street	5.7	8.4	7.0	210	25	17 mph	0	Cycle stands available on street.
078 - S Island Place	7.0	7.5	4.1	1491	144	20 mph	3 collisions, 2 slight (1 involving cyclist), 1 serious	Cyclie road marking in carriageway; cycle stands in various locations and cycle hangar; cycle hire station on Clapham Road.
079 - St.Faiths Road	8.3	7.1	9.4	604	57	24 mph	2 collisions, 1 serious involving a cyclist and 1 slight	No cycle facilities.
081 - Stansfield Road	7.26	6.601	8.542	1109	83	20 mph	6 slight collisions, 3 involving cyclists	Cycle Hangar and cycle stands located along the road.
082 - Stanthorpe Road	9.449	7.388	8	4619	360	26 mph	4 slight collisions, 1 involving cyclist	Advanced stop line at signalised junction.
084 - Stockwell Green[7]	6.232	7.187	10.041	1464	225	25 mph	1 slight collision involving cyclist	Cycle stands at entrance to street.
086 - Sudbourne Road	8.123	6.861	8.278	224	19	26 mph	6 collisions, 5 slight, (1 involving cyclist) 1 serious	Cycle hangar on the right at the end of the road.
087 - Teversham Lane	5.33	5.432	7.749	199	25	15 mph	0	No cycle facilities.
088 - Tindal Street	6.789	8.576	8.253	409	25	25 mph	0	Cycle hangar located along the road.
091 - Upper Marsh	3.929	7.06	6.061	825	123	18 mph	2 slight collisions	No cycle facilities.
093 - Vauxhall Walk	5.332	5.979	7.114	683	108	20 mph	1 slight collision involving cyclists	Cycle hire station at the southern end near Vauxhall Pleasure Gardens.
094 - Venetian Road	7.464	9.056	9.167	956	50	20 mph	0	No cycle facilities.
095 - Venn Street	7.697	7.863	7.631	390	31	14 mph	3 collisions, 2 slight, 1 fatal	Cycle stands along the road; CSH7 along adjoining Clapham High Street.
096 - Virgil Street	4.709	5.615	4.585	162	39	19 mph	0	Cycle road marking along the street (same direction).
099 - Woodbourne Avenue	7.118	11.971	5.735	1391	84	20 mph	2 slight collisions	No cycle facilities.
100 - Woodland Road	6.718	6.94	6.388	896	51	18 mph	0	No cycle facilities.
101 - Magee Street	5.343	11.046	9.381	480	52	22 mph	2 slight collisions involving cyclists	Cycle superhighway route CS7 after exit junction with Kennington Park Lane.
102 - Sandell Street	5.648	9.016	8.043	700	129	17 mph	3 collisions, 1 serious, 2 slight (1 involving cyclist)	LCN Route 3 runs along Cornwall Road; cycle stands and tyre pump at junction.

[7] This street is along a bus route

5 Categorisation of one-way streets

Definition of categories

5.1 There are a variety of options available for introducing two-way cycling facilities in one-way streets ranging from simple signage to minor civils interventions. The most appropriate treatment will depend upon a variety of attributes including available carriageway width, traffic volume, mean vehicle speed and the street's geometry, among others.

5.2 Based on the attributes outlined in Table 4.1 and by reviewing case studies, design guidance and best practice we have categorised all of Lambeth's one-way streets into four groups each with its own contraflow cycling treatment.

5.3 In some instances unfavourable conditions within the street mean that we have been unable to propose a suitable treatment and have recommended that no contraflow cycling facilities are installed.

5.4 The five groups are:

- Group 1 – No formal cycle lane required;
- Group 2 – Segregated contraflow cycle lane advisable;
- Group 3 – Mandatory contraflow cycle lane advisable;
- Group 4 – Advisory contraflow cycle lane advisable; and
- Group 5 – Two-way cycling not advisable.

5.5 The following sections outline the criteria adopted in defining each group, and detail the suggested treatment for the implementation of two-way cycling along the streets. Figure 5.1 overleaf shows the location and proposed treatment for all one way streets within the borough.*

5.6 Appendix E also contains a map highlighting the location of all existing 20mph zones within the borough.

* Excluding Woodfield Grove which was identified after the conclusion of the surveys.

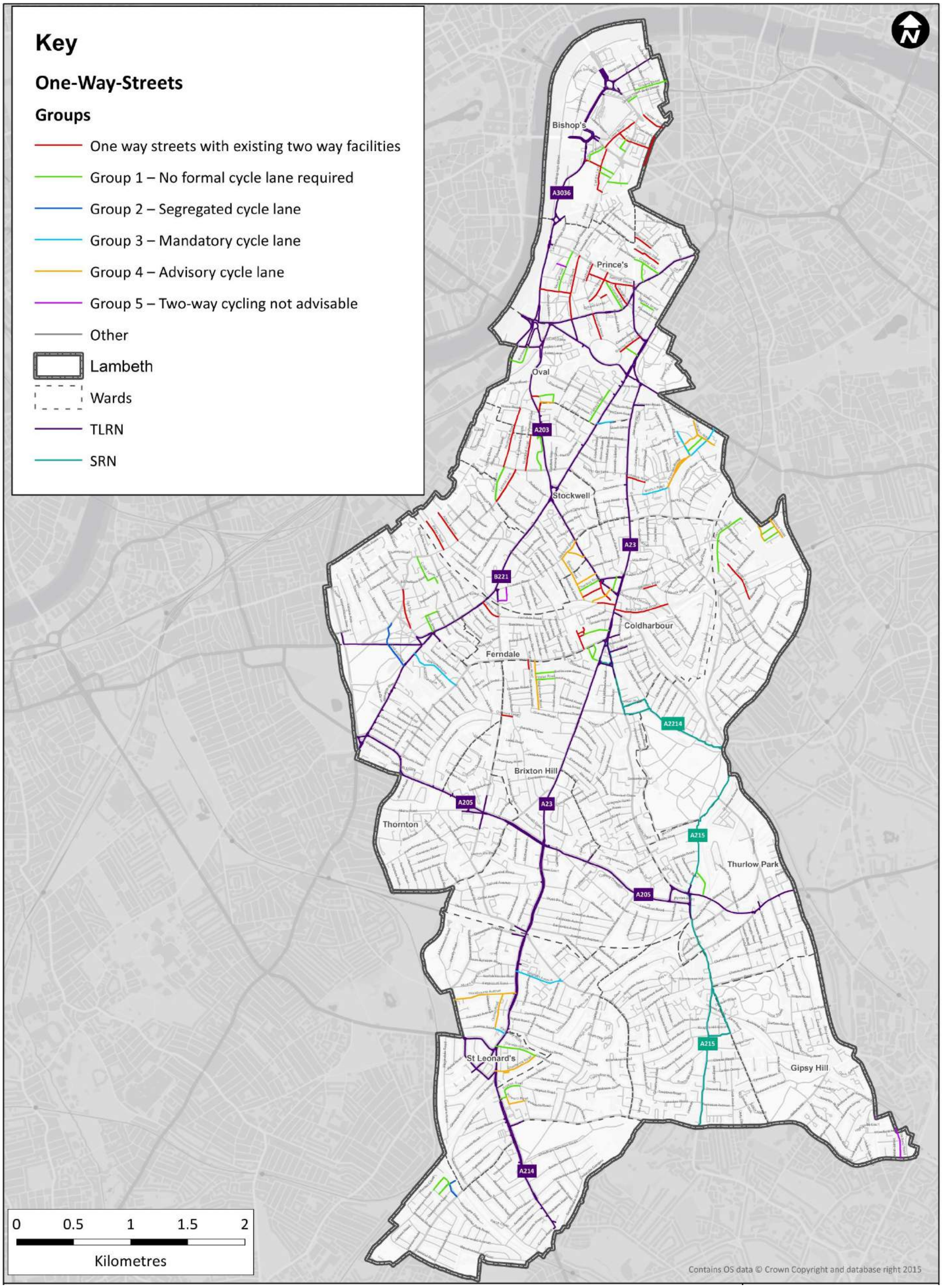


Figure 5.1: Location and Treatment of One Way Streets in Lambeth

Group 1 – No formal cycle lane required

5.7 The streets included in this group meet either of the following criteria included in LTN 2/08 Cycle Infrastructure Design for Streets:

- 85th percentile speed is less than 25mph and vehicle flows are below 1,000 per day, or
- Street forms part of a 20mph zone

5.8 In these instances it is possible to implement contraflow cycling without the need for marked lanes. The main benefits of dispensing of a marked cycle lane, are:

- Maintaining flexibility of use along the carriageway, minimising the impact of cycle infrastructure on kerbside activities and general traffic capacity
- Reducing implementation costs and timescales
- Avoiding unnecessary road works and consequential impacts on traffic and residents

5.9 Figure 5.2 shows Sancroft Street in Lambeth, one of the streets provided with contraflow cycling facilities, showing cycle marks in both directions.

Figure 5.2: Contraflow cycle marks with arrows along Sancroft Street

5.10 Along the streets that are included in this group, necessary complementary measures in support of the roll-out programme include:

- Diagram 1057 contraflow cycle marks with optional arrows along the road, particularly in correspondence with incoming side roads/busy accesses
- Diagram 960.2 sign on road entrance (see Figure 5.3)
- Diagram 616 'no entry' sign with 'except cycles' plate on exit (see Figure 5.3)
- Two TSRGD diagram 1004 advisory lane marking on entrance and exit

5.11 Additional advisable measures can include:

5.12 Diagram 1038 straight arrows along the road to raise cyclists' awareness on opposite general traffic direction, particularly if the road is partly two-way or has different one-way sections Table 5.1 includes a list of the streets included in this group.

Figure 5.3: Diagram 960.2 and 616 signs

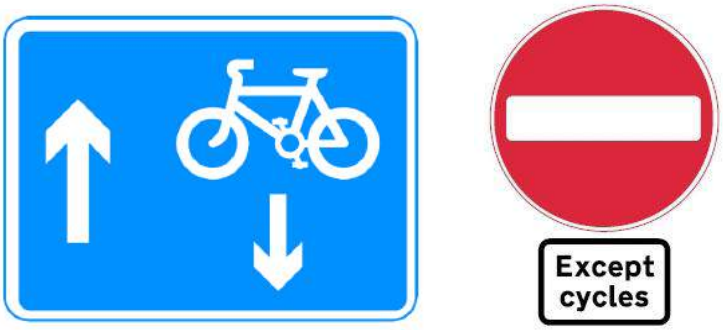


Table 5.1: List of streets where no cycle lane is required

Street	Comments
001 - Carnforth + Abercairn Rd	
005 - Astoria Walk	
006 - Bavent Road	
009 - Bondway + Miles Street	Tight bends may require additional treatment to enhance cyclist protection
016 - Buckner Rd + Porden Rd	Tight bends may require additional treatment to enhance cyclist protection
021 - Centaur Street	
022 - Chantrey Road	
023 - Chester Way	
025 - Cleaver Street	Narrow entrance with buildout – potential room for splitter island
026 - Cosser Street	
027 - Courtenay Street	Wide exit with low visibility – potential room for splitter island
029 - Cubitt Terrace	Very narrow exit
032 - Denny Street	
036 - Flaxman Road	Narrow entrance with buildout – potential room for splitter island
040 - Gleneldon Road	
042 - Hayter Road	Buildout at entrance and low visibility at exit - potential for segregation
043 - Heyford Avenue	
044 - Hopton Road	
054 - Methley Street	
057 - Murphy Street	Tight bends may require additional treatment to enhance cyclist protection
059 - Nelsons Row	Tight bends and exit may require additional treatment to enhance cyclist protection
065 - Palfrey Place	Narrow carriageway may require additional treatment to enhance cyclist protection in conjunction with narrow exits/junctions
067 - Pearman Street	
071 - Priory Grove	Good visibility and low flows but narrow carriageway - parking restrictions to be reviewed (possibly allowing gaps for cyclists to pull in)
075 - Roupell Street	Narrow carriageway - may require additional treatment to enhance cyclist protection at entry/exit
079 - St.Faiths Road	
086 - Sudbourne Road	
087 - Teversham Lane	

088 - Tindal Street	
091 - Upper Marsh	May require additional treatment to enhance cyclist protection in correspondence with bends and could potentially benefit from physical enforcement of waiting and loading restrictions
093 - Vauxhall Walk	
094 - Venetian Road	
095 - Venn Street	Shared Space
096 - Virgil Street	Narrow exit and entrance
101 - Magee Street	
102 - Sandell Street	Potential room for splitter island at entrance

Programme Considerations

Typical Durations

5.13 Typically, a Road Safety Audit (RSA) will take two weeks to complete and a further two weeks to prepare designer's and client's responses. For the purposes of this programme of works, these timescales are irrespective of the individual size of the projects.

5.14 We have assumed that Lambeth will want to undertake a 12 month monitoring programme of each location, regardless of the type of intervention, for the sake of consistency. This process will start at the same time as the Stage 3 RSA.

5.15 We have assumed that Lambeth will advertise traffic orders for four weeks and provide a similar length of time for statutory and public consultation. Addressing any responses will be dependent upon impact of the specific proposals.

Group Specific Durations

5.16 The negligible impact on waiting and loading restrictions and residential parking means that it is unlikely to face strong objection from those consulted. We conservatively estimate that no more than one week will be required to respond to any comments.

5.17 This type of intervention requires very little design and no construction with the exception of line marking and street signs and hence we have allowed approximately one week for construction. The design is likely to take approximately three weeks; one week for the design and two weeks to seek authority to consult.

5.18 As the road safety audit does not rely on the authority to consult it is shown as overlapping the design stage.

5.19 For these reasons we have estimated a 20 week programme (excluding monitoring) to implement this type of treatment which has been broken down into the various activities as shown in Figure 5.4 below.

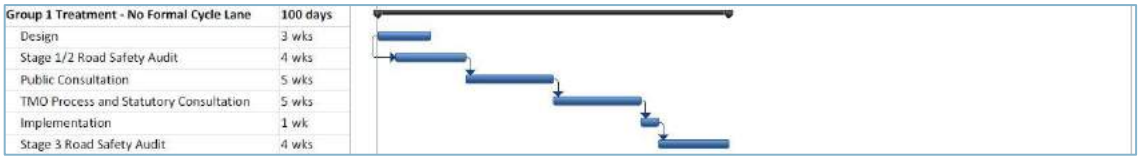


Figure 5.4: Group 1 Programme

Cost Considerations

Typical Costs

5.20 Officer time has been estimated based on the rates shown in Table 5.2.

Table 5.2: Officer rates

Officer	Cost per Hour
Engineer	£70
Principal	£90
CAD Technician	£40

5.21 The cost of a road safety audit does not vary considerably from site to site and can typically be commissioned for approximately £1,000 per stage.

5.22 During the monitoring period an engineer would be expected to spend approximately 30 minutes getting to and reviewing each site per month equating to approximately £420 over the entire 12 month monitoring period.

5.23 The procurement of Traffic Management Orders (TMOs) will cost approximately £2,000 each inclusive of advertising costs however there is scope to include a number of sites within a single TMO which will help to keep costs down. Assuming one TMO per council ward that has at least one one-way street there will be 16 TMOs required for a total cost of approximately £32,000 proportioned to approximately £510 per site.

Group Specific Costs

5.24 Given the low impact of the proposals on residents, public consultation could take the form of a simple leaflet drop to surrounding properties which would incur minor printing costs and officer's time in delivering the leaflets. It is expected that this will cost no more than £200 per site.

5.25 The design of this type of treatment is relatively straightforward and should take no more than 15hrs of an engineer's time and 5 hrs CAD time including dealing with consultation and RSA responses. Based on this the cost of this activity is expected to be approximately £1,700.

5.26 The construction of the proposals is expected to be undertaken by Lambeth's service provider whose rates are unknown to SDG. However based on our experience working in London we expect that this type of treatment should cost no more than £3,500 per site.

5.27 Therefore the total estimated cost for this type of treatment is approximately £8,500 per site.

Assumptions

5.28 When preparing the above programme and budgetary estimates we have made the following general assumptions:

- No allowance for service diversions that may be required.

- No allowance for any permits that may be required.
- No allowance for any electrical connections that may be required.
- No allowance for any surveys that may be required.
- The design will be undertaken in house by Lambeth.
- The construction will be undertaken by a service provider and will not be tendered out.
- The construction will be undertaken using standard low specification materials.
- It is not required to find alternative locations for displaced parking facilities.

Group 2 – Segregated cycle lane

5.29 The streets included in this group do not meet the criteria included in LTN 2/08 Cycle Infrastructure Design for Streets for contraflow cycling provision without a marked cycle lane.

5.30 In addition to the key requirement of providing sufficient width to allow for the introduction of a segregated facility without compromising functionality of general traffic, these streets showed one or more of the following key attributes:

- The geometry of the road, the recorded flows or the composition of the vehicular traffic suggest that a physical segregation between the general traffic lane and the contraflow lane would be a benefit.
- The narrowing provided by the segregated lane can also act as traffic calming measure
- The interaction with kerbside activities such as bus stops, loading and parking is absent/minimal, or street layout can be re-arranged to minimise disruptions and re-provide parking and servicing facilities in alternative locations
- The proximity with similar segregated cycle facilities create an effective network

The higher costs and timescales of this option help to limit the application to streets where the proximity of attractors demands for higher level of safety (such as schools, parks, leisure centres).

5.31 Along these streets, necessary complementary measures in support of the roll-out programme include:

- Implementation of a segregated contraflow cycle lane, provided with physical barriers such as kerb stands (as implemented along Strathleven Road, Figure 5.5), paved or painted buffer, armadillos, planters
- Splitter islands on entrance with optional illuminated bollards
- Diagram 1057 cycle marks with optional arrows along the cycle lane
- Diagram 960.2 sign on road entrance
- Diagram 616 ‘no entry’ sign with ‘except cycles’ plate on exit

5.32 Other advisable measures can include:

- Optional facilities to allow formal/informal crossing
- Traffic calming measures such as raised treatments at junctions

Figure 5.5: Segregated cycle lane along Strathleven Road

5.33 Table 5.3 includes a list of the streets included in this group.

Table 5.3: List of streets where a segregated cycle lane can be implemented

Street	Proposed Intervention
020 - Carnforth Road	Segregation between Abercairn Rd and signalised junction
028 - Crescent Lane	Segregation possible along most of the street (wide footways and carriageway, no kerbside activities) – continuity with CSH7 and Route 25
074 - Rookery Road	Wide carriageway and very high flows – Segregation possible along most of the street (wide footways and carriageway, no kerbside activities); continuity with CSH7

Programme Considerations

5.34 The introduction of a traffic island along the road is likely to affect waiting and loading restrictions and potentially resident's parking at some locations and therefore this type of treatment could attract considerable objections from local residents. We therefore recommend that a longer consultation period of 10 weeks is allowed for this type of treatment.

5.35 Due to the introduction of a raised kerb along the street a significantly greater design period will be required to allow the designer to consider issues such as drainage implications, crossing locations, surfacing materials, etc. It is likely that surveys of existing utilities as well as topographical surveys will also be required which will add long lead in times to the design process. We estimate that this type of treatment will take approximately nine weeks to complete; four weeks to procure surveys, three weeks to design and two weeks to seek authority to consult.

5.36 The construction period will be dependent upon the length of the street however a competent contractor should be able to install approximately 10m of island per day plus one week either side for mobilising and demobilising. On average this type of treatment should take between four to eight weeks.

5.37 For these reasons we have estimated a 35 week programme (excluding monitoring) to implement this type of treatment which has been broken down into the various activities as shown in Figure 5.6 below.

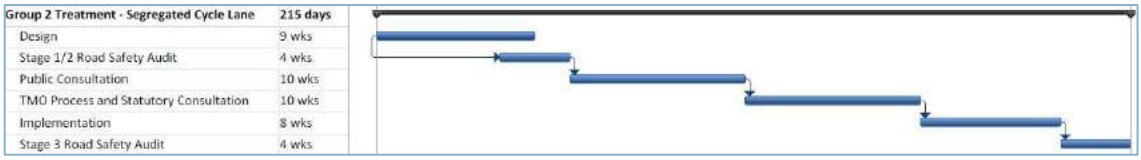


Figure 5.6: Group 2 Programme

5.38 We have assumed that the Stage 1/2 RSA can commence approximately one week after design has started as the road safety auditor will not require the fully detailed design to undertake the audit.

Cost Considerations

5.39 Due to potential objections from residents for this type of treatment a leaflet drop may not be sufficient and it may be necessary to hold a consultation drop in session which will take up more officer time and require more detailed drawings / graphics for support. Depending on the level of detail an allowance of £1,000 should be made for undertaking consultation for this type of treatment.

5.40 This type of treatment is likely to require the greatest amount of design due to the amount of civils involved and the careful level and drainage design that may be required. It is expected that an engineer will require approximately two weeks to complete the design and address any consultation responses. The cost for this activity will be approximately £5,500.

5.41 Based on our experience working in London we expect that this type of treatment should cost between £10,000 to £40,000 depending on the length of the street.

Group 3 – Mandatory cycle lane

5.42 The streets included in this group do not meet the criteria included in LTN 2/08 Cycle Infrastructure Design for Streets for contraflow cycling provision without a marked cycle lane. In addition, these streets showed some of the following key attributes:

- Available width does not allow the introduction of a segregated facility without compromising functionality of the street for general traffic
- The geometry of the road, the recorded flows or the composition of the vehicular traffic suggest there would be benefits to a marked segregation between the general traffic lane and the contraflow lane
- The interaction with kerbside activities such as bus stops, loading and parking is absent/minimal, or street layout can be re-arranged to minimise disruptions and re-provide parking and servicing facilities in alternative locations
- The proximity with similar mandatory cycle facilities might increase the benefits of extending a similar treatment

5.43 This solution is applied to a limited number of streets, due to minimal of kerbside activities required in order to provide continuity along the lane. Few of the cases included in the group are narrow carriageways with parking on both sides; the only possibility to allow contraflow cycling along those roads is by revising parking arrangements.

5.44 Along these streets, necessary complementary measures in support of the roll-out programme include:

- Implementation of a mandatory contraflow cycle lane, provided with diagram 1049 line marking

- Splitter islands on entrance with/without illuminated bollards (as in Figure 5.7)
- Diagram 1057 cycle marks with optional arrows along the cycle lane
- Diagram 960.2 sign on road entrance
- Diagram 616 'no entry' sign with 'except cycles' plate on exit

5.45 Other advisable measures can include:

- Optional facilities to allow formal/informal crossing
- Traffic calming measures such as raised treatments at junctions, cycle friendly sinusoidal speed humps

Figure 5.7: Splitter island at junction between Morley Street and Westminster Bridge Road

5.46 Table 5.4 includes a list of the streets included in this group, with few additional comments.

Table 5.4: List of streets where a mandatory cycle lane can be implemented

Street	Proposed Intervention
049 - Leigham Avenue	Unrestricted parking along carriageway; will require 'no parking' enforcement on one side of the carriageway in order to implement cycle lane.
050 - Lothian Road	Unrestricted parking along carriageway; will require 'no parking' enforcement on one side of the carriageway in order to implement cycle lane.
056 - Mostyn Road	Wide carriageway with unrestricted parking along left side of the carriageway – opportunities for mandatory lane on the right side and segregation at both ends
066 - Patmos Road	Unrestricted parking along narrow carriageway; will require 'no parking' enforcement on one side of the carriageway in order to implement cycle lane
070 - Prentis Road	Narrow carriageway with regulated parking on both sides; it will require parking restriction revision in order to implement cycle lane
078 - S Island Place	Wide carriageway with regulated parking along both sides of the carriageway – it will require parking restriction revision in order to implement cycle lane

Programme Considerations

5.47 Mandatory cycle lanes will affect waiting and loading restrictions and potentially resident's parking in a similar way to segregated cycle lanes therefore this type of treatment could also

attract objections from local residents. We therefore recommend that a similar period of 10 weeks is allowed for consultation for this type of treatment.

5.48 As with group 1, the design for this type of treatment is relatively simple and in most cases involves only line marking. However in some cases, where space permits, it may be beneficial to include splitter islands at the access and egress from the street to provide greater protection to cyclists. The design of these islands is unlikely to affect drainage and so should be fairly straightforward. A period of four weeks should be sufficient for most streets within this group which allows two weeks for the design and two weeks to seek approval to consult.

5.49 This type of intervention requires modest construction where splitter islands are proposed and hence we have allowed approximately three weeks for construction.

5.50 We have therefore estimated a 28 week programme (excluding 12 month monitoring) to implement this type of treatment which has been broken down into the various activities as shown in Figure 5.8 below.

Figure 5.8: Group 3 Programme

5.51 We have assumed that the Stage 1/2 RSA can commence approximately one week after design has started as the road safety auditor will not require the fully detailed design to undertake the audit.

Cost Considerations

5.52 Due to potential objections from residents for this type of treatment a leaflet drop may not be sufficient and it may be necessary to hold a consultation drop in session which will take up more officer time and require more detailed drawings / graphics for support. Depending on the level of detail an allowance of £1,000 should be made for undertaking this activity which will allow for approximately 10 hrs of an engineer's time and materials for the drop in session.

5.53 The level of design required for this type of treatment is relatively minor and should require no more than two weeks for an engineer to produce. This will contribute approximately £5,500 to the total cost of the scheme.

5.54 Based on our experience working in London we expect that this type of treatment should cost between £3,500 and 10,000 depending on whether or not splitter islands are included at the entry and exit of the street.

Group 4 – Advisory cycle lane

5.55 The streets included in this group do not meet the criteria included in LTN 2/08 Cycle Infrastructure Design for streets where it is possible to dispense with marked cycle lanes. In addition, these streets showed some of the following key attributes

- Available width does not allow the introduction of a segregated facility without compromising functionality of the street for general traffic

- The geometry of the road, the recorded flows or the composition of the vehicular traffic suggest the benefits of a marked segregation between the general traffic lane and the contraflow lane
- The interaction with kerbside activities such as bus stops, loading and parking is regular and significant, or street layout cannot be re-arranged to minimise disruptions and re-provide parking and servicing facilities in alternative locations
- Time of enforcement of waiting/loading restrictions can be arranged to correspond with advisable hours of operations of cycle lane (eg. Peak times, school times, etc.)
- The proximity with similar advisory cycle facilities might increase the benefits of extending a similar treatment

5.56 The streets included in this category showed medium to high vehicle flows and significant kerbside activity (parking, waiting/loading, bus stops, crossovers).

5.57 Along these streets, advisable complementary measures in support of the roll-out programme include:

- Implementation of an advisory contraflow cycle lane, provided with diagram TSRGD 1004 line markings (as implemented along Tyers Street, adjacent to parking bays, Figure 5.9)
- Diagram 1057 cycle marks with optional arrows along the cycle lane
- Diagram 960.2 sign on road entrance
- Diagram 616 'no entry' sign with 'except cycles' plate on exit

5.58 Other advisable measures can include:

- Splitter islands on entrance with/without illuminated bollards or TSRGD diagram 1004 advisory lane marking on entrance and exit wherever allowed by carriageway width
- Optional facilities to allow formal/informal crossing
- Traffic calming measures such as raised treatments at junctions, cycle friendly sinusoidal speed humps
- Diagram 1038 straight arrows along the road to raise cyclists' awareness on opposite general traffic direction, particularly if the road is partly two-way or has different one-way sections

Figure 5.9: Advisory lane in front of parking bays along Tyers Street

5.59 Table 5.5 includes a list of the streets included in this group.

Table 5.5: List of streets where an advisory cycle lane can be implemented

Street	Proposed Intervention
002 - Akerman Road	
007 - Bellefields Road	
011 - Branksome Road	
012 - Brighton Terrace	
014 - Broad Wall	
024 - Caldecot Road	Potential for segregation at entrance
030 - Cutcombe Road	Potential for segregation at exit
031 - Dalyell Road	Potential for segregation at exit
033 - Dorset Road	Potential for segregation at exit
047 - Langton Road	Potential for segregation at entrance and exit
058 - Myatt Road	Requires segregation at tight bend
062 - Ockley Road	
068 - Polworth Road	Requires segregation at tight bend and corresponding review of parking restriction
081 - Stansfield Road	Potential for segregation at entrance and exit
082 - Stanthorpe Road	Potential for segregation at exit
084 - Stockwell Green	Potential for segregation at entrance and exit
099 - Woodbourne Avenue	Requires revision of parking restrictions in proximity of narrow exit

Programme Considerations

5.60 While similar in appearance to mandatory cycle lanes, advisory cycle lanes allow vehicles to cross which leaves resident's parking facilities unaffected and is therefore less likely to receive strong objection. We suggest that a period of 6 weeks is allowed for the consultation period for this type of treatment.

5.61 The design of advisory cycle lanes is identical to mandatory and therefore the duration will be very similar. A period of four weeks should be sufficient for most streets within this group which allows two weeks for the design and two weeks to seek approval to consult.

5.62 This type of intervention requires modest construction where splitter islands are proposed and hence we have allowed approximately three weeks for construction.

5.63 We have therefore estimated a 24 week programme (excluding monitoring) to implement this type of treatment which has been broken down into the various activities as shown in Figure 5.10 below.

Group 4 Treatment - Advisory Cycle Lane	125 days
Design	4 wks
Stage 1/2 Road Safety Audit	4 wks
Public Consultation	6 wks
TMO Process and Statutory Consultation	6 wks
Implementation	3 wks
Stage 3 Road Safety Audit	4 wks

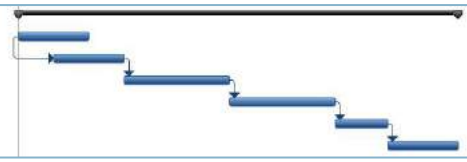


Figure 5.10: Group 4 Programme

Cost Considerations

5.64 As these proposals leave resident's parking unaffected, a leaflet drop similar to Group 2 should be sufficient for this type of treatment at a cost of approximately £200.

5.65 The level of design required for this type of treatment is relatively minor and should require no more than two weeks for an engineer to produce. This will contribute approximately £5,500 to the total cost of the scheme.

5.66 Based on our experience working in London we expect that this type of treatment should cost between £3,500 and 10,000 depending on whether or not splitter islands are included at the entry and exit of the street.

Group 5 – Two-way cycling not advisable

5.67 The streets included in this group are not suggested to be included in the roll-out programme of two-way cycling in one-way streets. This evaluation is based on the following observations:

- Street geometry does not allow suitable forward visibility to enable safe contraflow cycling. For example, the tight bend and narrow carriageway as shown in Figure 5.11
- Available width does not allow contraflow cyclists to safely cycle along the street without potentially conflicting with vehicles
- Available width at the junction does not allow contraflow cyclists to safely turn in/out of the street without conflicting with vehicles
- An significant impact on parking and waiting/loading arrangements would be required to implement contraflow cycling

5.68 Table 5.6includes a list of the streets included in this group.

Table 5.6: List of roads where two way cycling is not advisable

Street	Proposed Intervention
034 - Fenwick Place	High traffic flows, narrow carriageway and tight bends
072 - Randall Row	Very narrow bypass road, suggest not encouraging contraflow cycling along the street
100 - Woodland Road	Contraflow cycling provision would require extensive revision of parking facilities

Figure 5.11: Example of geometry constraint along Fenwick Place

6 Conclusion

6.1 SDG was commissioned by Lambeth in February 2016 to assess the feasibility of implementing two-way cycling within the Borough's one-way street network.

6.2 After a desktop review of relevant standards and guidance as well as case studies for nearby City of London, detailed traffic surveys were commissioned which captured the volume and classification of vehicular traffic flow. These were complemented with site visits that identified key features such as carriageway width and waiting and loading facilities.

6.3 This information was collated to provide a full inventory of Lambeth's one way street network and revealed that there were a total of 36 one way streets that had two way cycling facilities with a further 67 streets that were one-way but did not cater for contraflow cycling.

6.4 The 67 streets were then assessed for their suitability of implementing contraflow cycling facilities. The option selected depended upon a variety of attributes including available carriageway width, traffic volume, mean vehicle speed and the street's geometry, among others.[*]

6.5 Based on these attributes, design guidance and best practice the streets were categorised into four groups each with its own contraflow cycling treatment.

6.6 In some instances unfavourable conditions within the streets meant that it was not possible to propose a suitable treatment and no contraflow cycling facilities were recommended.

6.7 The study concluded in May 2016 and culminated in this report which was accepted by the London Borough of Lambeth in May 2016.

[*] Following the conclusion of the surveys and the submission of the final report Woodfield Grove was identified by Lambeth as another one way street but was found too late to be included as part of the analysis.