

Transport for London

Barclays Cycle Superhighways Evaluation of Pilot Routes 3 and 7

July 2011





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Chapter 1

Executive summary

Barclays Cycle Superhighways is one of three major programmes alongside the Barclays Cycle Hire Scheme and Biking Boroughs designed to help meet the Mayor's vision for cycling in London:

- ▶ **“To make the physical and cultural changes required for London to become a cyclised city: one where people can ride their bicycles safely, enjoyably and easily in an environment that embraces cycling.”¹**

The first two pilot Barclays Cycle Superhighways, launched in July 2010, enabled the concept of a cycle superhighway and its various elements to be tested, providing valuable lessons for future routes.

Barclays Cycle Superhighways aim to increase commuter cycling, breaking down barriers to commuting by bicycle through a unique package of measures.

This report provides a comprehensive assessment of the first two pilot Barclays Cycle Superhighways. It looks at the profile of cycling along the two routes and how and why the numbers of cyclists have changed since their introduction. The report also considers the general perception of the Barclays Cycle Superhighways and looks at the implementation, costs and impacts of the individual measures, and the impact on other modes of transport. The main findings of this report are summarised below.

¹ Cycling Revolution, London

► **There are more cyclists along the Barclays Cycle Superhighways**

Cycling has increased along the Barclays Cycle Superhighways. Overall the weighted increase in cycling along all count points has grown by 46 per cent along Barclays Cycle Superhighways 7 and 83 per cent along Barclays Cycle Superhighways 3. A number of sites along both routes experienced more than 100 per cent growth in the number of cyclists, including Elliotts Row (209 per cent) and Cable Street (169 per cent).

► **The Barclays Cycle Superhighways are predominantly used by commuters**

Over three quarters of cyclists on the Barclays Cycle Superhighways use them for travelling to or from work.

► **The number of new cyclists along the Barclays Cycle Superhighways has increased**

27 per cent of target market research² respondents identified as potential cyclists started cycling since the introduction of the Barclays Cycle Superhighways. Furthermore, 23 per cent of the scheme user survey³ respondents were new to cycling on the route, having previously made the trip that they were recruited on by another means of transport or not made the trip at all.

► **The Barclays Cycle Superhighways have increased the speed of journeys**

Journey times have decreased by 5 per cent on average along the two routes.

► **The Barclays Cycle Superhighways have improved the perception of safety of cycling**

80 per cent of all scheme user survey respondents agreed or strongly agreed that the Barclays Cycle Superhighways improve safety for cyclists.

► **The Barclays Cycle Superhighways have improved the perception of journey time reliability**

78 per cent of respondents using Barclays Cycle Superhighways 3 and 61 per cent using Barclays Cycle Superhighways 7 either agreed or strongly agreed that the Barclays Cycle Superhighways improve the predictability and reliability of journeys.

► **Overall, satisfaction with the Barclays Cycle Superhighways is high**

Over four out of five behavioural research respondents support the introduction of the Barclays Cycle Superhighways.

► **The Barclays Cycle Superhighways have improved the experience of cycling in London**

The provision of continuous blue surfacing has proved popular; nearly two thirds of respondents identified a greater feeling of safety from the surfacing. General traffic has been found to give cyclists more space, especially at junctions and conflict points. People were also found to be highly satisfied with the visibility and signage of the blue lanes.

²Target market research questioned potential users of the Barclays Cycle Superhighways

³Scheme user research questioned people actually using the Barclays Cycle Superhighways

When prompted almost all Heavy Goods Vehicle drivers said blindspot visibility mirrors would increase safety for cyclists.

The success of the supporting measures (such as the provision of cycle parking at the home and work end of the routes) will be evaluated in the light of business surveys being carried out and due to finish in March 2012.

► **There is insufficient data at present to analyse casualty data**

Safety analysis will be conducted once 3 years worth of post implementation casualty and collision statistics are available, as is the usual practice for casualty analysis. However, within the first year there have been no collisions resulting in fatal pedal cycle casualties along the Barclays Cycle Superhighways.

► **The detrimental impact on other modes has been mitigated where possible**

Three junctions were analysed where capacity was reduced. Traffic journey times at one of these routes, Kennington Park Road, increased by four minutes. Changes to signals mitigated the impacts at the other two routes. Bus journey time reliability was adversely impacted at one of five sites considered, Clapham South, where a lane of traffic was removed.

► **There are still barriers to cycling that the Barclays Cycle Superhighways can help address**

Safety and security remains an important barrier to cycling for both existing and potential cyclists in London generally. There was also concern identified around obstructions along the routes, such as pedestrians and parked vehicles.



Chapter 2

Setting the scene for Barclays Cycle Superhighways

The Mayor of London is committed to making London healthier, more environmentally friendly and less congested through a cycling revolution, and has set a target of a 400 per cent increase in cycling journeys (compared to a 2000 base) by 2026. Around 500,000 cycling journeys are currently made every day.⁴

To achieve this target, the Mayor's Cycling Revolution plans to maintain and improve levels of cycling, focus investment in areas of greatest potential and intensify measures to promote cycling. To ensure more people get on their bicycles, TfL has identified the need to tailor cycling programmes to people's current journey patterns:

- ▶ Central London needs a scheme that helps people get around town quickly and easily for short trips; nipping between work and the shops, the rail station and the cafe
- ▶ In Inner London, people who travel longer distances to work need a high-profile, safe solution to travel directly into central London
- ▶ Outer London requires an approach that addresses the variety of complex journeys made for education, leisure and commuting

Supporting each of these individual approaches for the different areas of London, TfL is providing three complementary pan-London programmes that support cyclists as they take to two wheels for the first time or more frequently. Barclays Cycle Hire helps people get around central London quickly and easily for short trips, the Biking Borough initiative encourages cycling in Outer London, and Barclays Cycle Superhighways are a solution to address the needs of people who cycle longer distances to work in central London.

⁴Travel in London 3

2.1 What are the Barclays Cycle Superhighways?

The Barclays Cycle Superhighways are a unique joined up package of measures that break down the barriers that stop people cycling by combining highway improvements and supporting measures.

They provide a safe, fast, direct, continuous and comfortable way of getting to central London by bicycle along recognised commuter routes. A number of key principles were followed in the design and implementation of the Barclays Cycle Superhighways, outlined below, and summarised in Figure 1.

- ▶ **Direct:** Routes chosen for the Barclays Cycle Superhighways are all direct links into central London.
- ▶ **Continuous:** The Barclays Cycle Superhighways introduced continuous coloured surfacing or signage along the length of the routes. Customer research carried out during the feasibility phase of the programme found that this was highly valued as it allowed people to focus their attention on traffic instead of route finding.
- ▶ **Clear:** The routes are clearly marked and easy to follow. There are new signs, road markings and information about journey time and links to other routes. New bespoke signs were developed with time to destination rather than distance, which show how convenient cycling can be compared to other modes.
- ▶ **Comfortable:** TfL have improved road surfaces and minimised obstructions along the routes so that it is more comfortable to cycle. Better surfaces also improve safety and comfort for all road users.
- ▶ **Easy to find:** Each Barclays Cycle Superhighway has a clear identity. While the blue surfaces increase driver awareness, the Barclays Cycle Superhighways' inclusion in the cycle guides and on journey planner, signage to the routes and the marketing around the routes ensure cyclists are aware of them.
- ▶ **Safe:** Coloured surfacing along the routes is at least 1.5m wide. The surfacing continues through junctions, a significant challenge to implement but one that was identified as extremely important. Advanced stop boxes at traffic lights help cyclists get ahead of traffic, and improved junction layouts provide more space. There was also training and education for HGV drivers, and engineering interventions such as blindspot visibility mirrors.

- ▶ **Supporting Measures:** Home and work end supporting measures designed to break down the barriers to cycling complement the Barclays Cycle Superhighways and maximise the number of cycling trips.
- ▶ **Stakeholder Engagement:** A wide range of stakeholders were consulted on the design and development of the Barclays Cycle Superhighways.

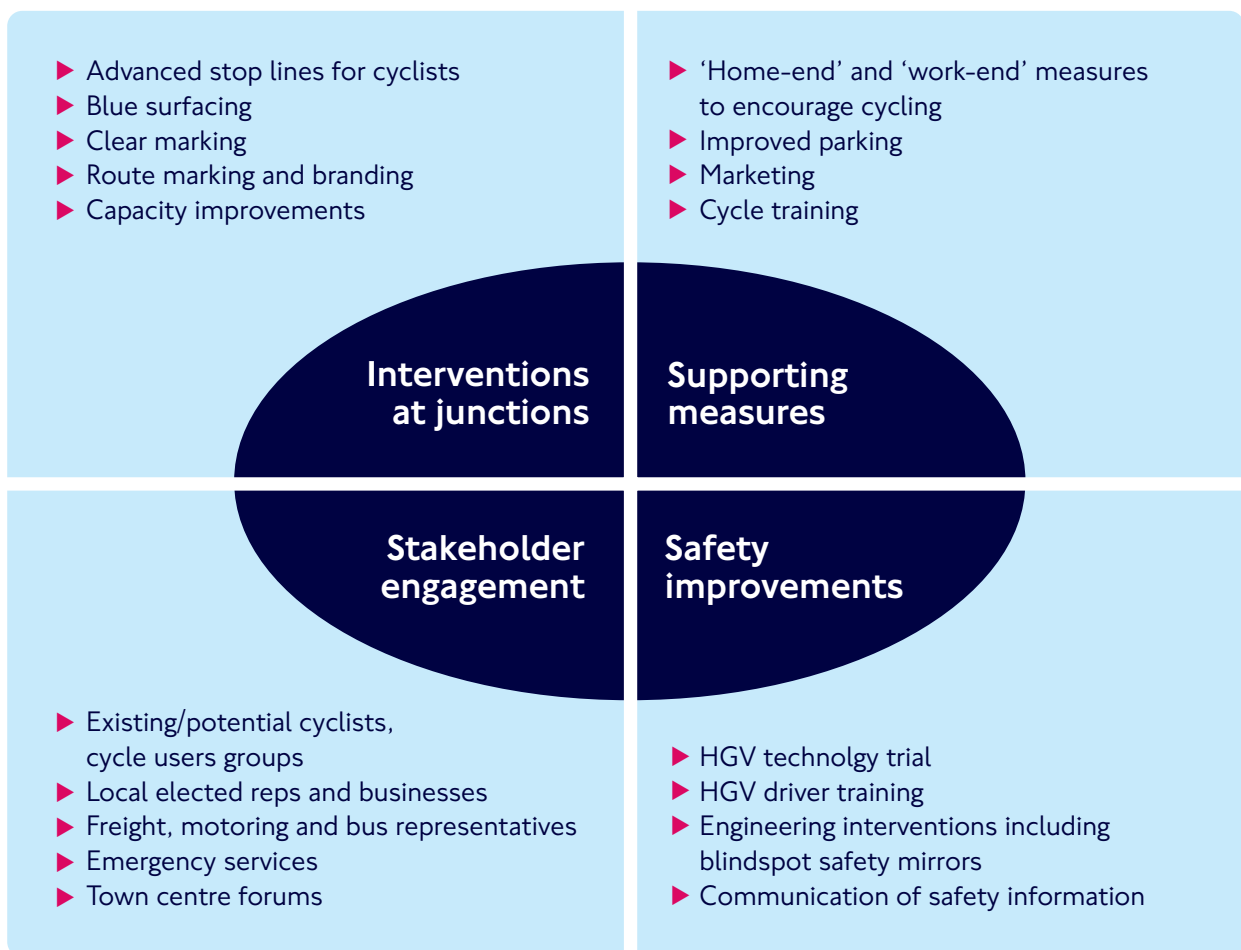


Figure 1: Barclays Cycle Superhighways combine a range of interventions

2.2 When were the routes launched?

In July 2010 the Mayor, through TfL, launched the first two pilot routes: Barclays Cycle Superhighway 7 from Merton to the City (referred to as BCS7) and Barclays Cycle Superhighways 3 from Barking to Tower Hill (referred to as BCS3).

BCS3 runs from Barking to Tower Gateway. Before the Barclays Cycle Superhighway the route had segregated cycle tracks in sections but it lacked continuity and profile. The Barclays Cycle Superhighway connected the existing infrastructure into a continuous route and provided a range of measures to encourage Londoners to travel by bicycle; including communications, cycle training, bicycle maintenance and new cycle parking.

BCS7 runs from Merton to the City. The route was selected following a study carried out by TfL's Smarter Travel Unit which found that many door-to-door journeys are quicker by bicycle than by Underground. The route includes major engineering interventions to improve permeability and safety for cyclists at Oval and Stockwell and bypasses the largest junctions like Elephant and Castle, enhancing safety along the route.

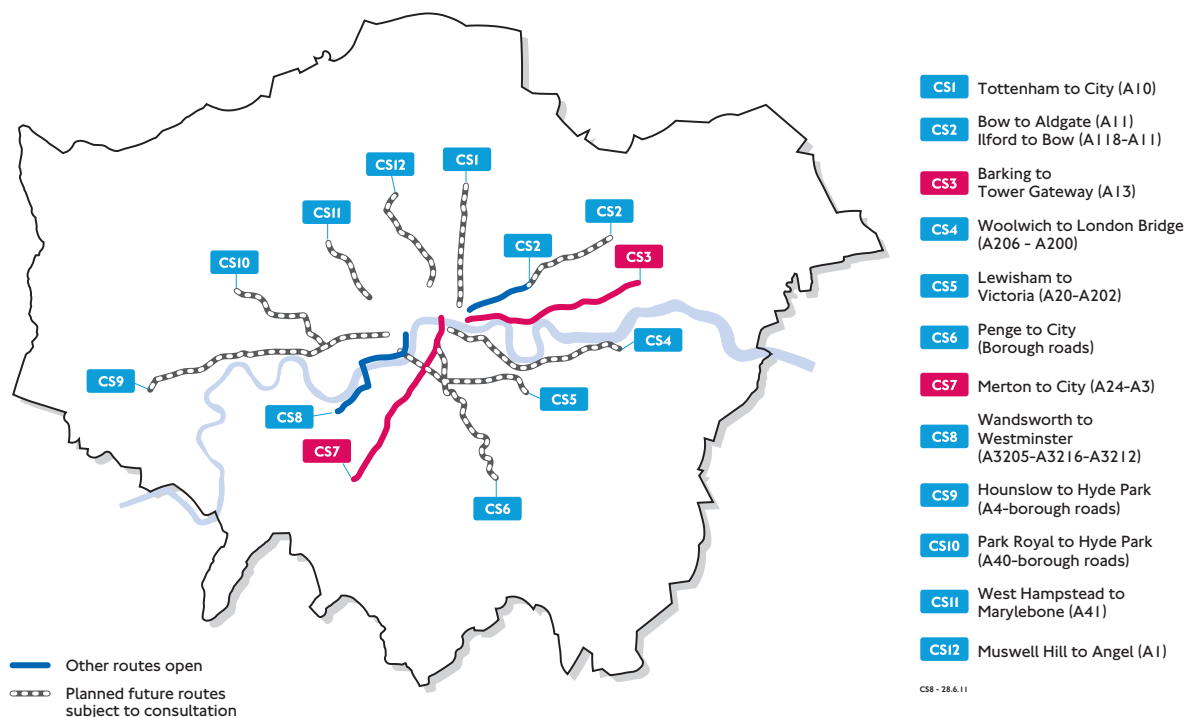


Figure 2: Barclays Cycle Superhighways routes

The superhighway routes were chosen to provide good geographical coverage in areas where there are many existing cyclists and where there is the greatest potential for people to cycle to work if provided with the right facilities. The routes have been established taking a number of factors into consideration, including:

- ▶ Current and potential cycling demand
- ▶ Engineering feasibility
- ▶ Availability of room on highway
- ▶ Opportunities to link to other initiatives and connectivity with local routes
- ▶ Directness of route
- ▶ Geographical spread of routes across London

The next phase of routes following the pilots, Routes 2 (inner) and 8, were launched in July 2011. The remaining eight routes are planned for delivery between 2013 and 2015, after the Olympics.

		2011	2012	2013	2014	2015
Phase 1	Route 2 (inner)	●				
	Route 8	●				
Phase 2	Route 5			●		
	Route 12			●		
Phase 3	Route 9			●		
	Route 11			●		
Phase 4	Route 4				●	
	Route 6				●	
Phase 5	Route 10					●
	Route 1					●
	Route 2 (outer)					●

Table 1: Expected delivery timescale for remaining Barclays Cycle Superhighways

2.3 What is the purpose of this report?

This report provides a balanced assessment of the Barclays Cycle Superhighways pilot routes, evaluating their success from a user's point of view, and their implementation from an operational point of view. The objectives of the Barclays Cycle Superhighways programme are to:

- ▶ Improve cycling conditions for existing cycling commuters with emphasis on enhancements that improve safety, therefore generating a critical mass along the route and making the route more attractive to others
- ▶ Encourage people to cycle to and from work by focusing on the home and work catchment areas around the proposed routes thereby attracting existing cyclists that do not cycle to work but could well do so
- ▶ Improve the image and perception of cycling amongst Londoners and attracting people that want to cycle, but have never tried it for some specific reason

In order to assess the Barclays Cycle Superhighways against its objectives, the report has been split into the following sections.

Section 4 explores whether the Barclays Cycle Superhighways have encouraged more cycling. It considers the profile and change in cycling along the two routes, and identifies where this change is coming from.

Section 5 presents how the general perception of the Barclays Cycle Superhighways has changed, evaluates the reasons behind the growth in cycling and the satisfaction with the various interventions. The implementation and maintenance costs of the Barclays Cycle Superhighways and the impacts upon traffic and buses are analysed. It concludes with an outline of how the Barclays Cycle Superhighways can further improve conditions for cyclists in London.

Section 6 presents recommendations for future Barclays Cycle Superhighways.

Section 7 concludes and presents the next steps.

2.4 What research has been completed?

A wide range of data has been collected to enable a full assessment of the Barclays Cycle Superhighways, as summarised in Table 2 and Table 3.

Resource	Detail and purpose	Date(s) collected
Manual cycle counts	Two way 12 hour (07:00 – 19:00) count. Eleven locations along BCS7 and seven locations along BCS3.	2009: May, June, August, October / 2010: May, August, October / 2011: June
Screenline counts	Two way 12 hour (07:00 – 19:00) count. Three screenlines along BCS7 and two along BCS3, each with up to eight additional survey points to detect if the provision of a superhighway encourages cyclists to divert from adjacent routes.	2009: May, June, August, October / 2010: May, August, October / 2011: June
Automatic cycle counts	Automatic monitoring data recorded at three points along BCS7 and three points along BCS3 to determine if the manual counts are representative of traffic and cycle counts along the superhighway.	June 2009 to October 2010
Cycle speeds and journey reliability	Two cyclists equipped with GPS devices travel along the superhighway on five consecutive days, complimented with surveyors recording times the cyclists pass them.	2009: May, August, October 2010: May, August, October
Casualty statistics	Police accident data (ACCSTATs)	Monthly
Traffic journey time reliability	Three automatic camera pairs along BCS7 and six along BCS3	June 2009 to October 2010
Bus journey time reliability	iBus GPS tracking for three routes along BCS7	September 2009 and September 2010

Table 2: Cycle counts, reliability data and casualty statistics

Research	Detail and purpose	Date
Target market	The target market research was focussed on people in the target market for the Barclays Cycle Superhighways – those who have the potential to cycle or cycle more. Two waves of research were commissioned, the first to understand behaviour, attitudes and awareness of the new Barclays Cycle Superhighways before their launch with 904 interviews. The second to identify any changes in behaviour, attitudes and awareness of the new Barclays Cycle Superhighways following their launch. 508 of those interviewed in wave one were interviewed for wave two.	Wave 1: 6 July to 18 July 2010 Wave 2: 21 September and 10 October 2010
Scheme user survey	The scheme user research was conducted with people using the routes. 501 interviews to understand the characteristics of cycle trips made on the routes and of the people making them; the nature of any change generated by the scheme; the reasons for that change; the experiences/ satisfaction of those using the route; and the attitudes of cyclists on the route.	1 October to 1 November 2010
Qualitative research	20 in depth telephone interviews with users of the Barclays Cycle Superhighways.	May 2011

Table 3: Behavioural research

Note: behavioural research was undertaken using an internet computer assisted telephone interviews.



Chapter 3

Who is using the Barclays Cycle Superhighways?

The Barclays Cycle Superhighways were designed for commuters – 85% of users along the routes cycle to or from work. The routes are used predominantly by young males, following the trend of cycling in London. Future routes must continue to target this market, but also look to extend into the ‘harder to reach’ groups.

The Barclays Cycle Superhighways behavioural research asked about age, gender, and journey purpose. The age profile compared to cyclists on average across London is shown in Figure 3.

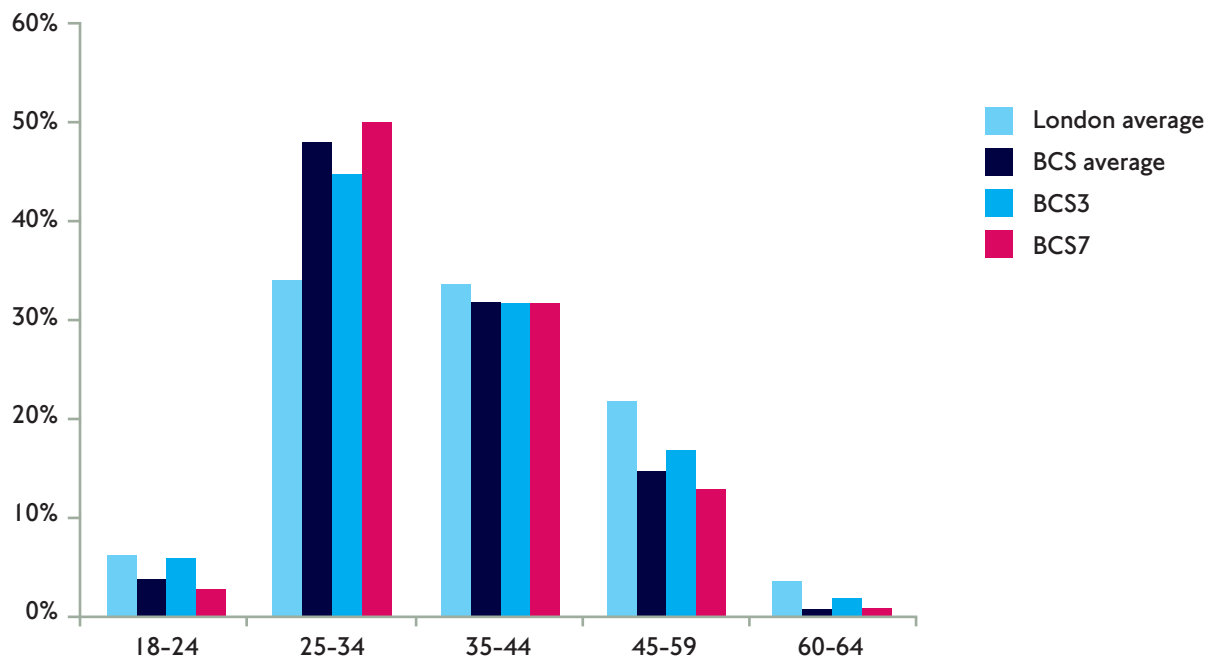


Figure 3: Age profile of Barclays Cycle Superhighways users against average for London cyclists

Base: BCS3: 200 respondents and BCS7: 301 respondents

Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010, and LTDS 2009/10.

Cycling in London is dominated by 25 to 44 year age groups (shown by the London Travel Demand Survey data, 2009/10). Cyclists using the Barclays Cycle Superhighways replicate this trend, with a particularly high number of 25 to 34 year old cyclists. There is little difference in age profile between the two Barclays Cycle Superhighways; BCS3 has a slightly higher number of riders in the 45-59 and 60-64 age bracket.

Cycling in London is male dominated – two thirds of cycling trips are made by men. This characteristic is even more marked with the Barclays Cycle Superhighways, where 77 per cent of trips are made by males.

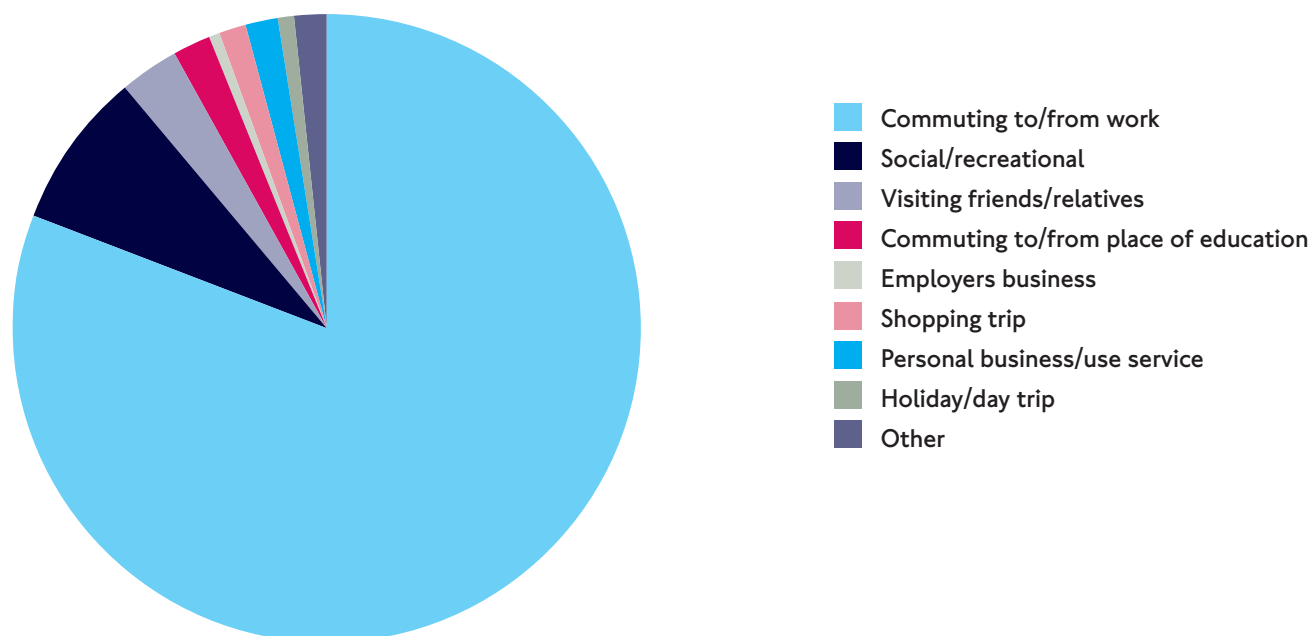


Figure 4: Main journey purpose of Barclays Cycle Superhighways users (weighted average of BCS3 and BCS7)

Base: BCS3: 200 respondents and BCS7: 301 respondents

Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010, and LTDS 2009/10.

As shown by Figure 4, commuting is the main reason for making a journey on the Cycle Superhighway, identified by 85 per cent of scheme user survey respondents. The Barclays Cycle Superhighways were designed and marketed for commuting trips, so this trend is expected. Across London in general, an average of 37 per cent of cycle trips are to or from work, with a much higher number of leisure and recreational journeys.



Chapter 4

Have the Barclays Cycle Superhighways encouraged more cycling?

The Barclays Cycle Superhighways have helped change the landscape of cycling in London. Analysis of cycle counts recorded before and after the launch of the pilot routes provides a clear picture of the profile of cycling and the change in the number of cyclists along the routes. The behavioural research provides an insight into this change in behaviour.

4.1 Has cycling increased along the two routes?

Cycling has increased along the Barclays Cycle Superhighways. Overall the weighted increase in cycling along all count points has grown by 46 per cent along Barclays Cycle Superhighways 7 and 83 per cent along Barclays Cycle Superhighways 3. A number of sites along both routes experienced more than 100 per cent growth in the number of cyclists, including Elliotts Row (209 per cent) and Cable Street (169 per cent).

4.1.1 Profile of cycling along Barclays Cycle Superhighways 7

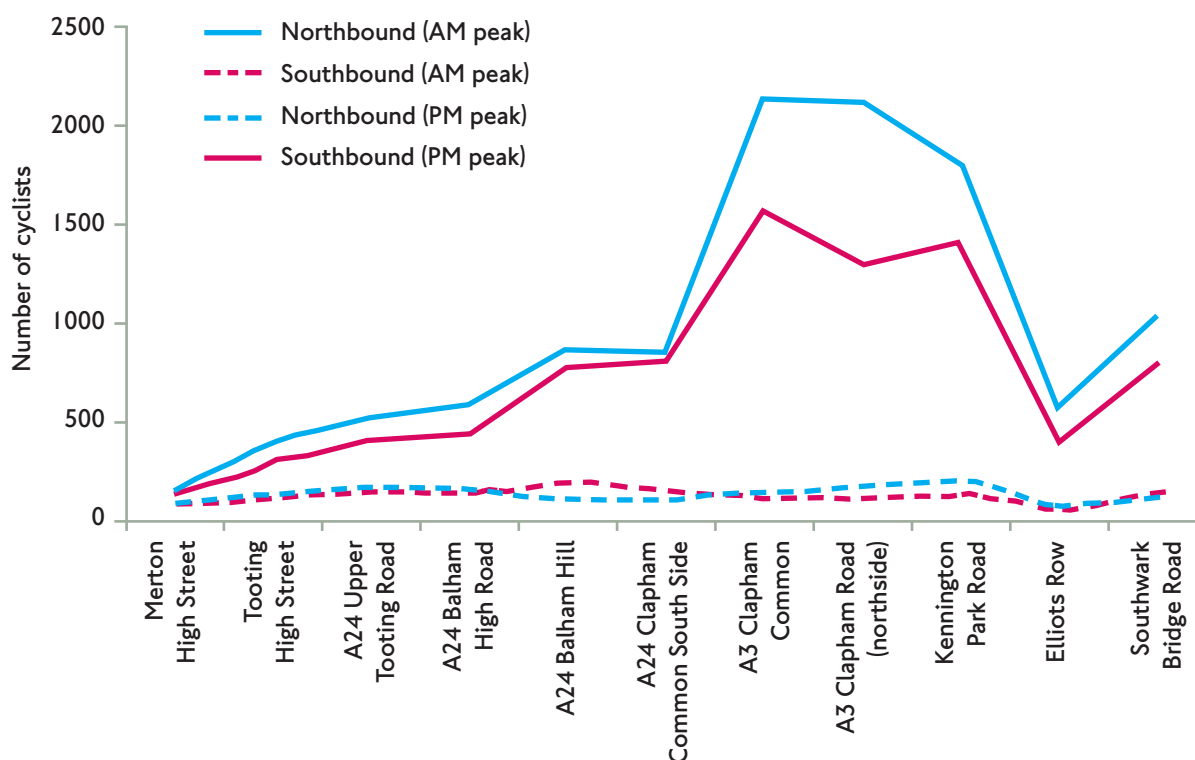


Figure 5: Peak period cycle counts (post BCS7 introduction)

Note: AM Peak is 07:00 – 10:00; PM Peak is 16:00 – 19:00

Along the length of BCS7 there were 11 locations where the numbers of cyclists was recorded before and after introduction of the Barclays Cycle Superhighway. The profile of journeys since the introduction of the Barclays Cycle Superhighway is shown in Figure 5.

The profile of cyclists along BCS7 reflects the heavy commuter use, with highest numbers of cyclists towards central London in the AM peak (07:00-10:00) and towards the suburbs in the PM peak (16:00-19:00). Numbers are greatest at Clapham Common, which suggests that, with both the A205 and A3 joining the A24, the area acts as a funnel for cyclists heading into the centre of London. The average journey distance for cycling in London is around 5km, equivalent to the section between Clapham North and Stockwell to the northern end of the superhighway – the area with the greatest demand. This area is also identified as having a high density of ‘potentially cyclable trips’. Potentially cyclable trips are defined as trips currently made by other modes which could reasonably be cycled all the way (based on London Travel Demand Survey data).

The number of cyclists then decrease further north on BCS7, from Stockwell (A3 Clapham Road northside) up to Elephant and Castle (Elliot's Row). Employment in central London is spread over

a large area (see Appendix 1). Cyclists must therefore disperse and follow various routes to their destination. The A203 for example crosses BCS7 at Stockwell, providing a route to Vauxhall Bridge for those working west of the City.

Finally, there is a large dip in cyclists at Elliots Row near Elephant and Castle, compared to points immediately south, followed by an increase at Southwark Bridge Road. The Elliots Row manual count point was located on the diversion around Elephant and Castle. There are no obvious egress points between count sites, so it can be assumed that although cycling on the bypass has trebled since launch (see Figure 6), a large number of cyclists are continuing over the Elephant and Castle gyratory instead of taking the Elliots Row diversion. This observation, combined with the dominance of commuter trips, suggests that journey time is a key driver and that the Barclays Cycle Superhighways users like linear routes, even where a less heavily trafficked alternative with good navigation and route branding is in place.

4.1.2 Increase in cycling along Barclays Cycle Superhighway 7

Manual counts collected in June, August and October 2009, August and October 2010 and June 2011 have enabled the comparison of the number of cyclists passing each count point before and after the introduction of the Barclays Cycle Superhighways. June 2010 could not be collected due to the building of the Barclays Cycle Superhighways during this time.

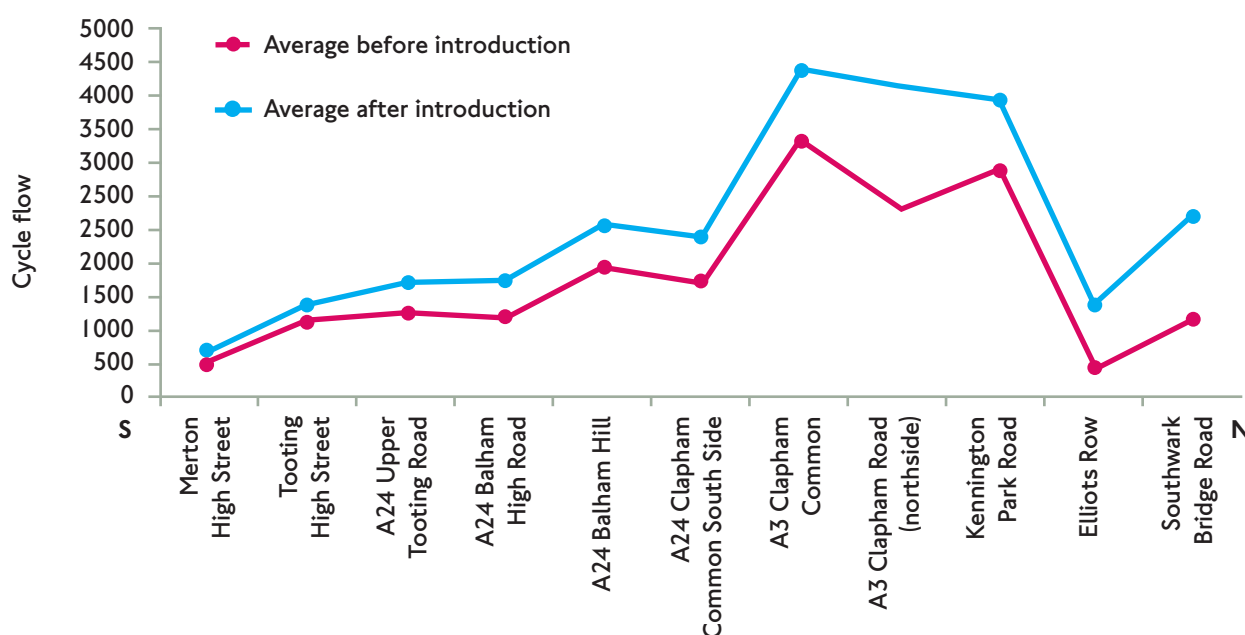


Figure 6: Average two-way 07:00-19:00 cycle counts along BCS7 before and after introduction

Figure 6 shows the clear growth in cycling along Barclays Cycle Superhighway 7 following its introduction, with the greatest levels of growth in absolute terms between A3 Clapham Road and Kennington Park Road. The Elliotts Row cycle count witnessed the greatest percentage increase in cyclists (209 per cent); albeit on a relatively low base. This increase does suggest that the Elliotts Row diversion provides good value for money as more cyclists are using it, opening up access to Southwark Bridge Road, and thus linking existing infrastructure together. Southwark Bridge Road and A3 Clapham Road also experienced significant growth, with a 134 per cent and 65 per cent increase in cyclists respectively. The overall weighted average increase in cyclists passing all count points along the route is 46 per cent. Full graphical representation of all cyclist flow data is provided in Appendix 2.

4.1.3 Profiling of cycling along Barclays Cycle Superhighways 3

There were seven locations along the length of BCS3 where the numbers of cyclists was recorded before and after introduction of the Barclays Cycle Superhighway. The profile of journeys since the introduction of the Barclays Cycle Superhighway is shown in Figure 7.

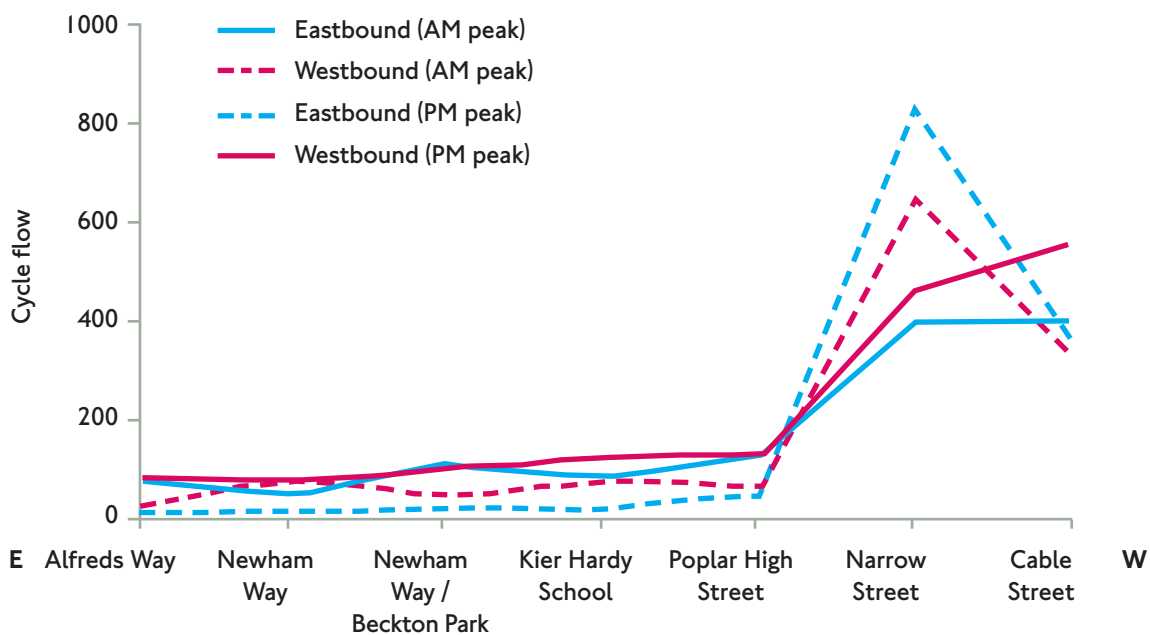


Figure 7: Peak period cycle counts (post BCS3 introduction)

Note: AM Peak is 07:00 – 10:00; PM Peak is 16:00 – 19:00

Cyclists at Narrow Street heading eastbound in the AM peak and westbound in the PM Peak (the two dashed lines in Figure 7) are likely to be commuters heading to and from Canary Wharf. The more typical inbound commuter trips are still apparent, with a gradual increase in cyclists through the outer sections of the route, followed by a more pronounced increase closer into the centre. There is no 'distribution effect' as witnessed with BCS7, as the route is bounded on one side by the river and the road network provides fewer obvious egress points to access key destinations.

4.1.4 Increase in cycling along Barclays Cycle Superhighway 3

As with BCS7, every count point along BCS3 witnessed an increase in the number of cyclists, shown in Figure 8.

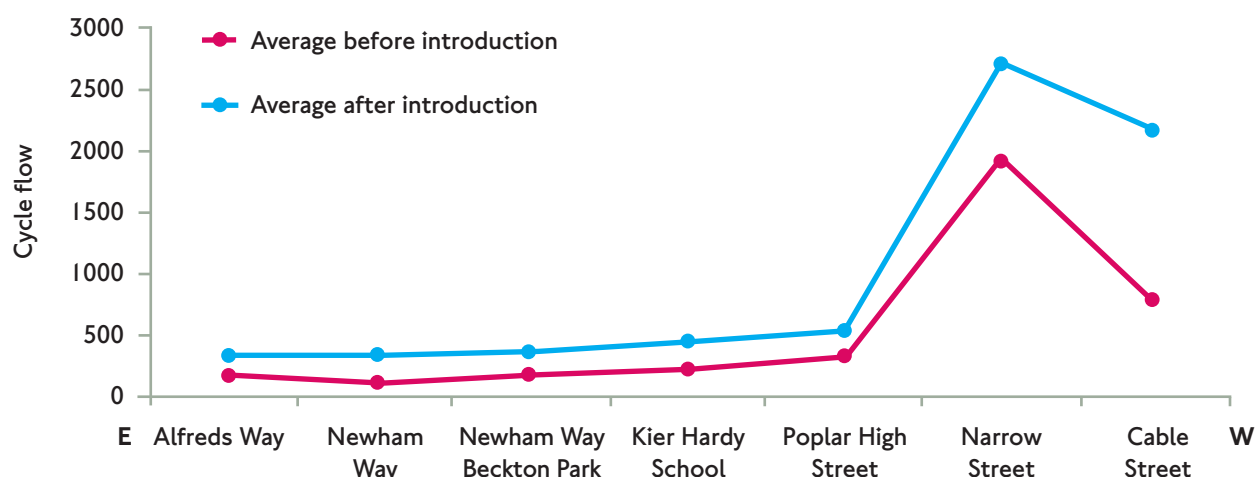


Figure 8: Average two way 07:00-19:00 cycle counts along BCS3 before and after introduction

Cycling has more than doubled at a number of count sites along the BCS3 route, including Newham Way and Newham Way Beckton Park with a growth in cyclists of 174 per cent and 111 per cent respectively, albeit on a relatively low base, and Cable Street with a growth in cyclists of 169 per cent. The absolute growth in cycling is greatest towards the western end of the route, at Cable Street and Narrow Street. The overall weighted average increase in cyclists along all count points along the BCS3 route is 83 per cent. Full graphical representation of all cyclist flow data is provided in Appendix 3.

4.2 Where is this growth in cyclists coming from?

The Barclays Cycle Superhighways targeted both existing cyclists, to encourage them to cycle more, and new cyclists, to encourage them to take up cycling. The Barclays Cycle Superhighways have been successful in reaching both groups; a quarter of behavioural research respondents are new to cycling, while the percentage of those cycling five or more times a week has increased by over two percentage points. Cycling on parallel routes has increased. Cyclists must therefore be switching route to the Barclays Cycle Superhighway and being replaced by new cyclists on their previous routes; or they are switching from routes other than those covered in the counts.

4.2.1 Existing cyclists along the two pilot routes

Encouraging existing cyclists to cycle more is crucial in increasing the mode share of cycling. Relatively easy to target, existing cyclists are already accustomed to road conditions and are generally equipped with the basics. Existing cyclists were defined in the behavioural research as those who cycle for at least 1 km on or near the route of the Barclays Cycle Superhighway.

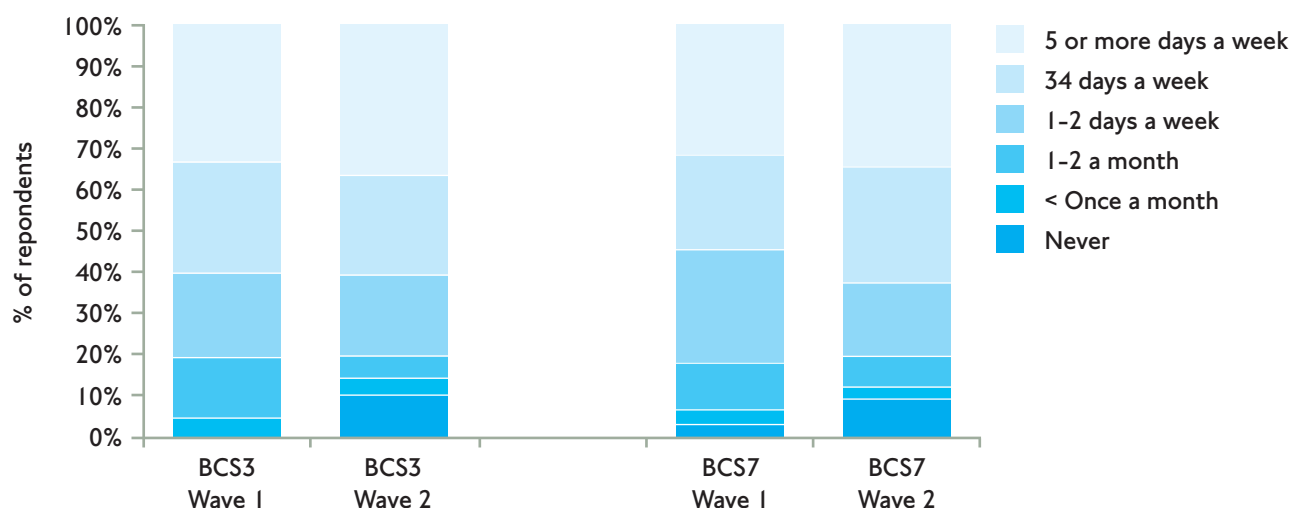


Figure 9: Frequency of use of cycle along the corridor for 1 km+ for existing cyclists

Base: BCS3 Wave 1 – 153, Wave 2 – 89; BCS7 Wave 1 – 202, Wave 2 – 128

Source: Barclays Cycle Superhighways Target Market Survey, TfL 2010

The frequency of cycling increased for both BCS3 and BCS7, with the number of respondents cycling five or more times a week increasing from 34 per cent to 36 per cent and from 31 per cent to 34 per cent respectively, as shown in Figure 10.

4.2.2 New cyclists along the two pilot routes

The Barclays Cycle Superhighways also targeted the large 'near market' in cycling, identified in the target market research as potential cyclists who make a 'cycle appropriate trip' between 1km and 8km in length along the route of the Barclays Cycle Superhighway. These people were defined as having access to a cycle they could use and be under 65 years old.

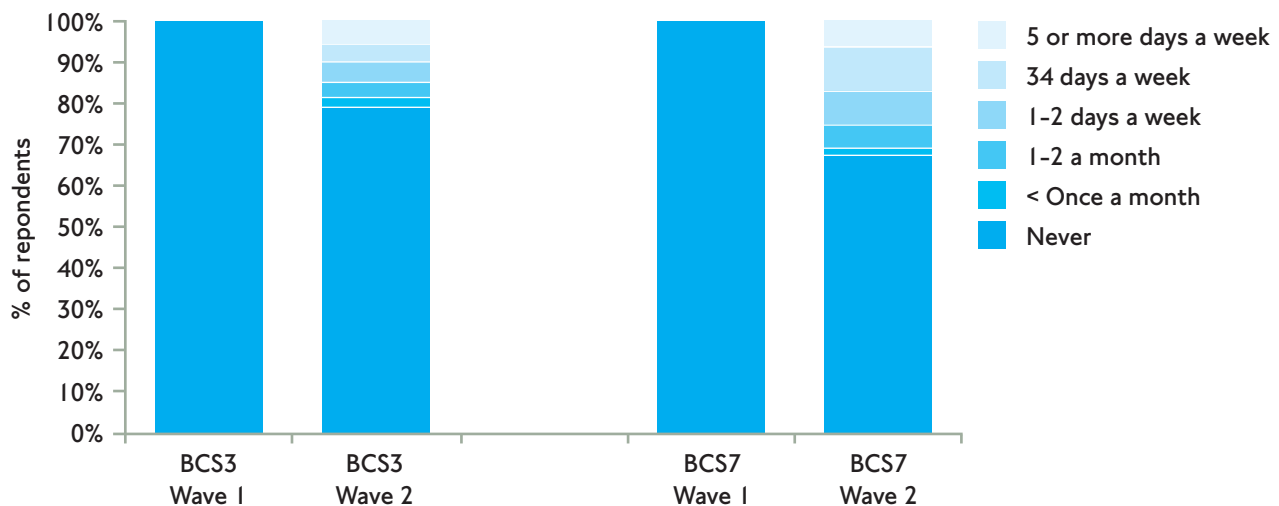


Figure 10: Frequency of use of cycle along the corridor for 1km+ for potential cyclists

Base: BCS3 Wave 1 – 276, Wave 2 – 133; BCS7 Wave 1 – 273, Wave 2 – 156

Source: Barclays Cycle Superhighways Target Market Survey, TfL 2010

Figure 10 shows the proportion of target market respondents identified as the 'near market' who have started cycling as a result of the Barclays Cycle Superhighways; 20 per cent for BCS3 and 32 per cent for BCS7.

The Scheme User Survey asked respondents how they made the trip they were on before the introduction of the Barclays Cycle Superhighways (Figure 11).

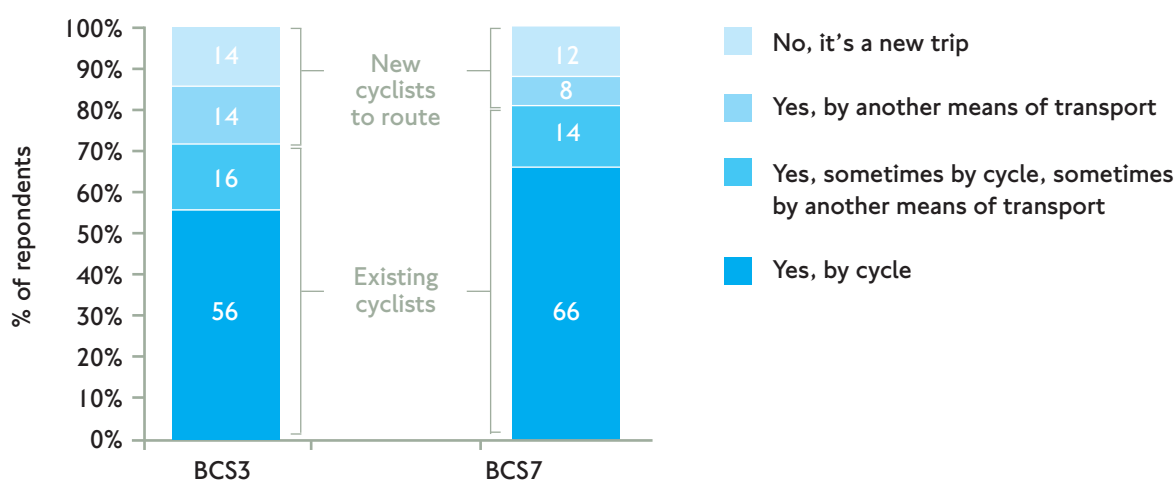


Figure 11: Whether respondents cycled the route prior to the Barclays Cycle Superhighways opening

Base: BCS3: 200 respondents and BCS7: 301 respondents
Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010

28 per cent of BCS3 and 20 per cent of BCS7 respondents were new to the route, and either made the trip previously by another means of transport (14 per cent and 8 per cent for BCS3 and BCS7 respectively) or did not make the trip at all (14 per cent and 12 per cent for BCS3 and BCS7 respectively). Of those respondents who made the trip by another means of transport, the mode they previously used is shown in Figure 12.

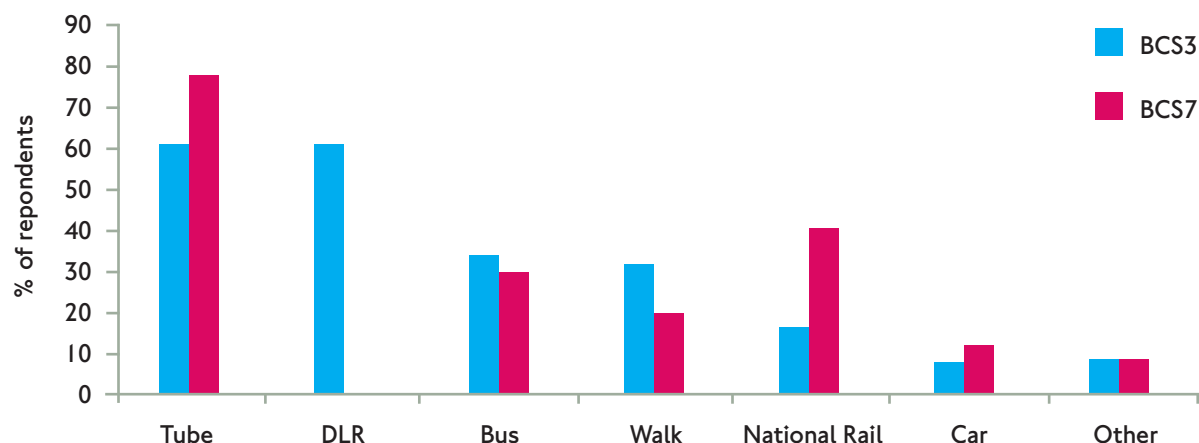


Figure 12: Other modes used to make trip prior to the introduction of the Barclays Cycle Superhighways

Base: all who previously used another mode – BCS3: 93; BCS7: 94

Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010

The Underground was the most common mode of choice for those who previously made the trip by a means of transport other than by bicycle, with the DLR also registering highly for BCS3.

The screen line counts show that in general cycling has increased on parallel routes as well as the Barclays Cycle Superhighways. However there is considerable variation in the data (see Appendix 4) which suggests that either cyclists are switching route to cycle on the Barclays Cycle Superhighways and are being replaced by new cyclists on their previous routes, or cyclists are switching from routes other than those covered by the counts.

4.3 How long do people spend cycling on the Barclays Cycle Superhighways?

The average time spent cycling on the Barclays Cycle Superhighways was 17 minutes on BCS3 and 23 minutes on BCS7. The average time spent travelling for the whole journey including time spent travelling to and from the Barclays Cycle Superhighways, was 39 minutes (weighted average).

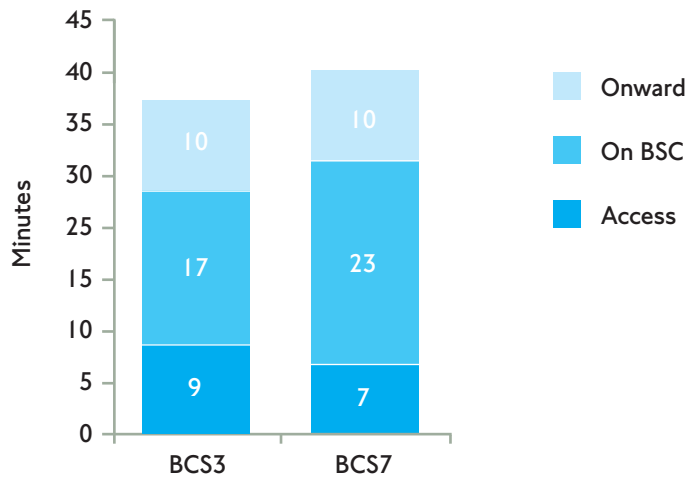


Figure 13: Average total journey times

Base: BCS3: 200 respondents and BCS7: 301 respondents
 Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010.

The access and onward journey times point to wide catchment areas around the Barclays Cycle Superhighways, highlighting the importance of complementary access, onward links and connections.

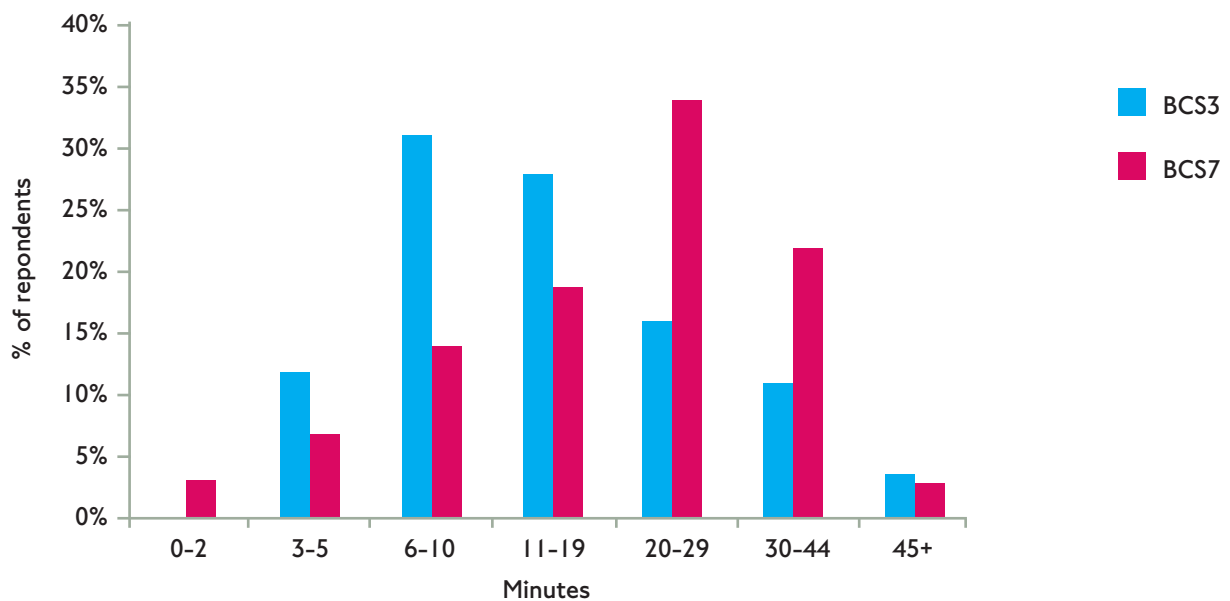


Figure 14: Average journey duration on the Barclays Cycle Superhighways

Base: BCS3: 200 respondents and BCS7: 301 respondents
 Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010.

There is significant variation in average journey duration between the two Barclays Cycle Superhighways, shown in Figure 14. Approximately 71 per cent of cyclists use BCS3 for less than 20 minutes, while 59 per cent of cyclists spend over 20 minutes on BCS7. This difference serves as a reminder that each route is unique.

4.4 How have journey times and safety for cyclists improved through the Barclays Cycle Superhighways?

Journey times for cyclists have decreased along both Barclays Cycle Superhighways on average by five minutes. There is however insufficient data to draw conclusions on journey time reliability or the rate of casualties (perceptions of reliability and safety are covered in Section 5), however within the first year there have been no collisions resulting in fatal pedal cycle casualties along the Barclays Cycle Superhighways.

A further measure of the success of the Barclays Cycle Superhighways is the impact upon cyclist's speeds and journey time reliability. Lower journey times improve connectivity of areas, improving access to employment and services.

- **“Ensuring good door-to-door journey time and facilitating local movement in town centres, residential areas, and to local employers, services and leisure opportunities is essential for London's economy, and for the maintenance and improvement of people's quality of life.”⁵**

All journey time counts along the Barclays Cycle Superhighways show an improvement (see Appendix 5), with a weighted average of 5 per cent reduction in journey time (slightly below the forecast of 7 per cent). This suggests that the two Barclays Cycle Superhighways have been successful in reducing journey times.

Safety analysis is only possible with at least three years worth of statistics. When the full three year dataset is available, casualty analysis will be completed to see if the Barclays Cycle Superhighways have reduced the casualty rate and the severity of collisions for all road users including non-cyclists. Within the first year there have however been no collisions resulting in fatal pedal cycle casualties along the Barclays Cycle Superhighways. See Section 5 for information on the change in the perception of journey time reliability and safety.

⁵Mayor's Transport Strategy



Chapter 5

What do people think of Barclays Cycle Superhighways?

Section 4 identified a large growth in cycling along both Barclays Cycle Superhighways, and that both new cyclists are being attracted to the Barclays Cycle Superhighways and existing cyclists are cycling more regularly. Understanding people's perception of the Barclays Cycle Superhighways programme and the reasons behind decisions to cycle along the routes will contribute to the evaluation of their success and help identify areas that could be improved for future routes.

5.1 What is the general level of support for the Barclays Cycle Superhighways?

There is a high level of support for the Barclays Cycle Superhighways, with four out of five people in both the target market and scheme user surveys supporting their introduction.

The question about the general level of support for the Barclays Cycle Superhighways was asked in both the target market and the scheme user surveys.

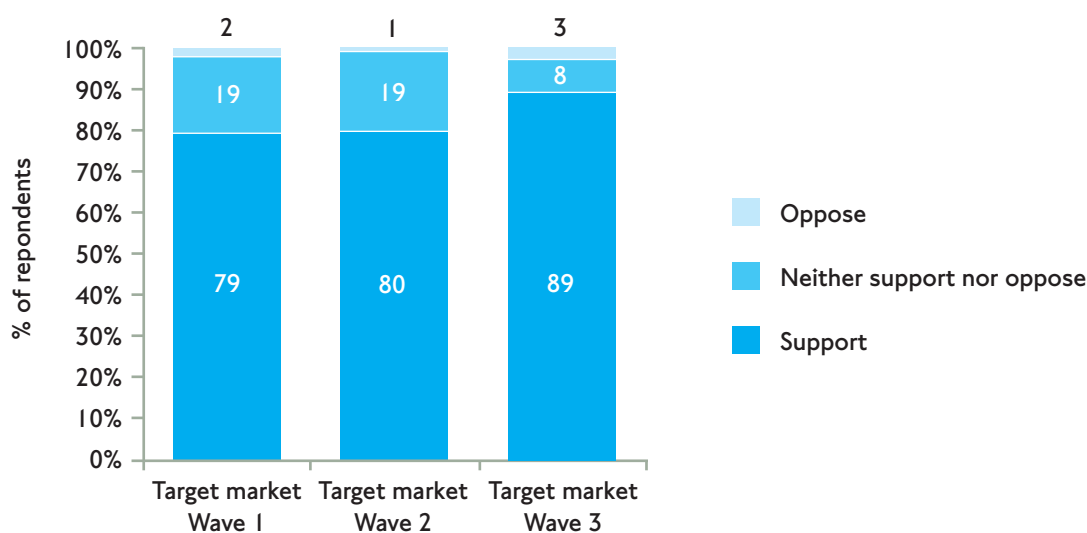


Figure 15: Support for the Barclays Cycle Superhighways

Base: Wave 1 904 respondents; Wave 2 506 respondents (Source: Barclays Cycle Superhighways Target Market Survey, TfL 2010)

Base: 501 respondents (Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010)

The first wave of target market research, in July 2010, showed that 79 per cent of people support the Barclays Cycle Superhighways (Figure 15). These opinions changed little by the second wave in September. However, people taking part in the scheme user survey at around the same time showed a greater level of support. Very few people opposed the Barclays Cycle Superhighways.

5.2 Why have people new to Barclays Cycle Superhighways started using them?

Fitness, saving money and journey time reliability were key factors in encouraging people to switch modes to cycling, while safety and ease of following the route were identified by people who previously cycled a different route. Speed and pleasantness of journey were identified both by people who switched modes and by those who switched routes they cycled. Research also showed that the Barclays Cycle Superhighways have been highly successful in improving people's perceptions of journey time reliability and safety.

Figure 11 showed the breakdown of scheme user survey respondents or previously made the trip by cycle, by another mode or didn't previous make the trip. Of those who previously made the trip by cycle, 16 per cent cycled a different route. The research provides insight into the reasons behind this changes in behaviour.

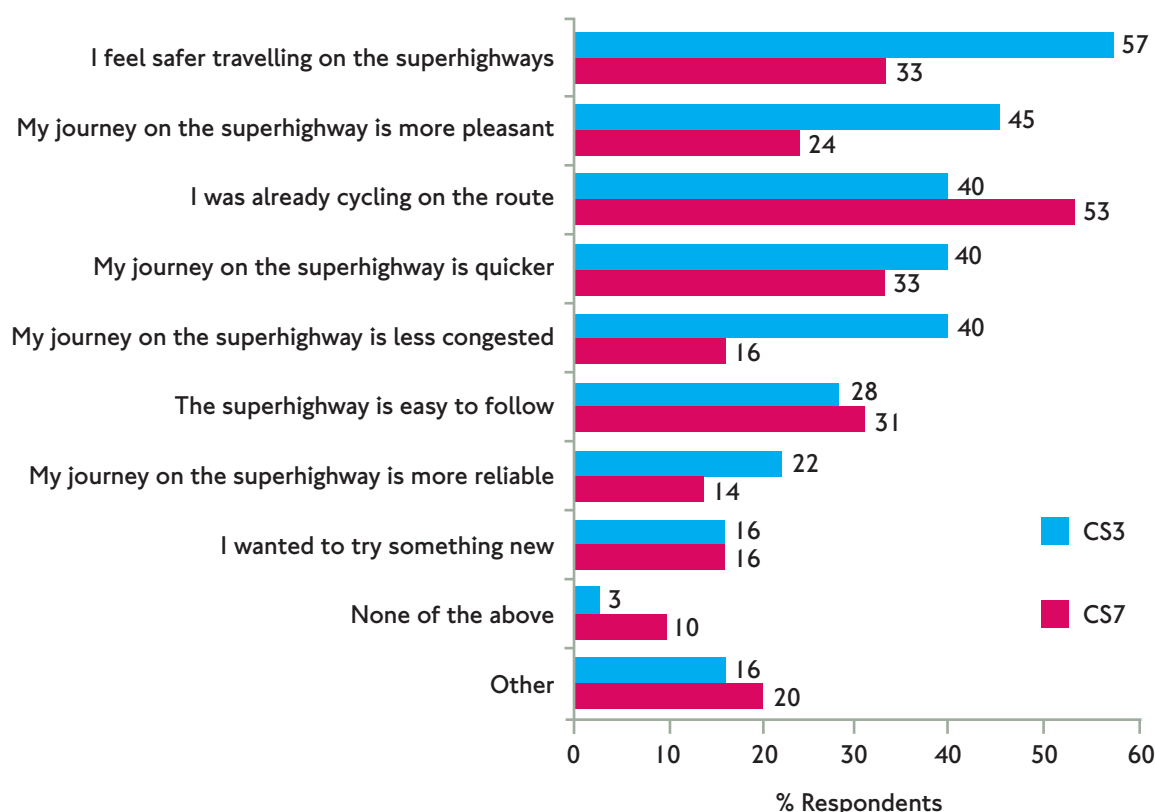


Figure 16: Reasons for choosing the Barclays Cycle Superhighways instead of cycling their normal route (prompted)

Base: those who previously cycled a different route – BCS3: 58; BCS7: 51

Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010.

Amongst those who previously cycled on a different route, the key reasons for choosing to use the Barclays Cycle Superhighway varied by route (Figure 16). For those using BCS3 the choice was principally driven by a feeling of greater safety and the journey being more pleasant. For those using BCS7 the main reason was that they were already cycling on the route for some or all of their journeys.

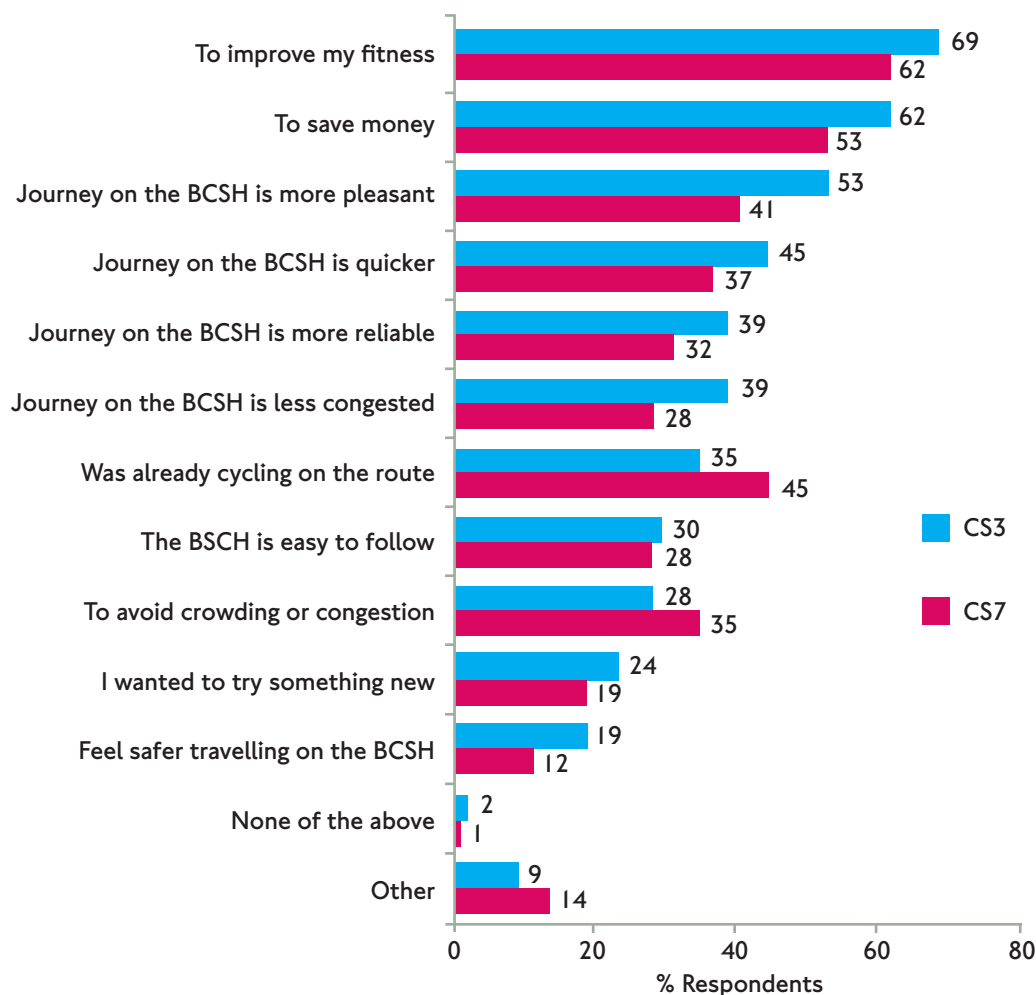


Figure 17: Reasons for choosing the Barclays Cycle Superhighways instead of another mode of transport (prompted)

Base: those who previously used another means of transport – BCS3: 93; BCS7: 95

Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010.

For those that used to travel by another means of transport, getting fit and saving money were the main reasons for switching to cycling, followed by characteristics of the journey, such as reliability, pleasantness and speed (Figure 17).

5.2.1 Journeys are perceived to be more reliable

The target market research showed the impact of the Barclays Cycle Superhighways on the perception of journey time reliability, with 61 per cent in wave 1 and 70 per cent in wave 2 (of all respondents) agreeing or strongly agreeing that the Barclays Cycle Superhighways improve the predictability and reliability of journeys. The scheme user survey further showed the importance of journey time reliability to users. 78 per cent of respondents using BCS3 either agreed or

strongly agreed that the Barclays Cycle Superhighways improve the predictability and reliability of journeys, with less than 10 per cent disagreeing. The improvements in reliability were less profound for BCS7, where 61 per cent agreed or strongly agreed, and 18 per cent disagreed.

Journey time was found to be an important factor in influencing people's choice to use the Barclays Cycle Superhighways. Of those who previously used other modes of transport in the scheme user survey, 45 per cent and 37 per cent for BCS3 and BCS7 respectively stated speed of journey was a key reason for choosing to travel the route. For those who previously cycled a different route, 40 per cent and 33 per cent for BCS3 and BCS7 respectively identified speed as a key reason for choosing the Barclays Cycle Superhighways instead of their normal cycle route.

5.2.2 Journeys are perceived as safer and more secure

Safety concerns are a significant factor in affecting people's decisions to cycle in London (see Figure 22). 65 per cent of all respondents in wave 1, 71 per cent in wave 2 and 80 per cent in the scheme user survey agreed or strongly agreed that Barclays Cycle Superhighways improve safety for cyclists. The qualitative research found that the space, separation from other road users and high visibility of the Barclays Cycle Superhighways were key factors in improving how safe cyclists feel.

The "safety in numbers" effect (Figure 18) demonstrates the impact the Barclays Cycle Superhighways can have on safety and perceptions of safety.

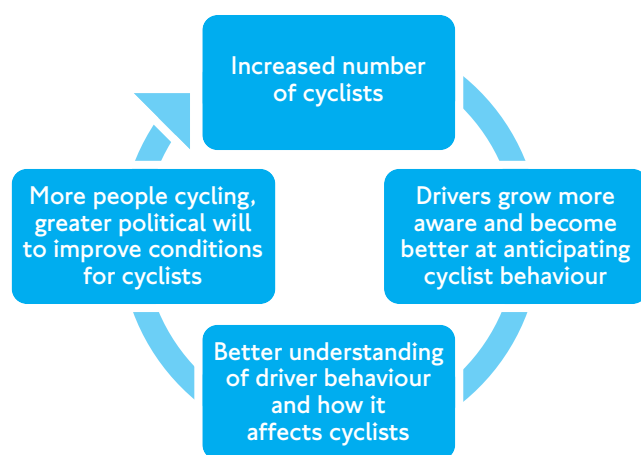


Figure 18: Safety in numbers effect – a virtuous circle

An increase in the number of cyclists using the Barclays Cycle Superhighways appears to be bringing greater familiarity and perception of safety. This is a positive message to the large numbers of cyclists using the routes, whether new users or seasoned riders.

5.3 How satisfied are cyclists with the interventions in general?

Satisfaction with the visibility, signage and directness of the Barclays Cycle Superhighways were particular high. Obstructions along the routes and the lack of cycle parking both caused dissatisfaction.

A range of specific interventions were introduced as part of the Barclays Cycle Superhighways, such as:

- ▶ Creation of more space for cyclists in the carriageway, as well as safer routes avoiding major gyratories
- ▶ New blue cycle lanes and improvements to existing cycle lanes, along 80% of the routes
- ▶ Mirrors at signal controlled junctions
- ▶ Bespoke DfT-approved signs
- ▶ Supporting measures targeted to cover the origin and destination of the trip (home and work end) as well as mitigating the risks associated with an increase in cycling

The above interventions all contribute to the superhighways providing end-to-end safety, way-finding and comfort benefits for commuter cyclists. Those using the CS3 corridor were most satisfied with:

- ▶ visibility of blue cycle lanes/road markings (86% satisfied)
- ▶ predictability of journey times (77% satisfied)
- ▶ quality of road surface (75% satisfied).

They were least satisfied with:

- ▶ the number of cycle lanes (24% dissatisfied)
- ▶ the obstructions on the route (23% dissatisfied)
- ▶ cycle parking facilities (20% dissatisfied).

Those using the CS7 corridor were most satisfied with:

- ▶ visibility of blue cycle lanes/road markings (88% satisfied)
- ▶ signage and ease of finding your way (72% satisfied)

There were some high levels of dissatisfaction, with this group being least satisfied with:

- ▶ obstructions on the route (51% dissatisfied)
- ▶ volume of traffic on the route (37% dissatisfied)
- ▶ quality of road surface (32% dissatisfied)

The mean scores of satisfaction are shown in Table 4. Scores are rated out of 5, on a scale ranging from very satisfied (5) to very dissatisfied (1).

Aspect of the Barclays Cycle Superhighway	BCS3	BCS7
Visibility of blue cycle lanes/road markings	4.18	4.16
Predictability of journey times	4.03	3.72
Quality of road surface	3.87	3.22
Signage and ease of finding your way	3.76	3.83
Direct route to my destination	3.84	3.75
Volume of traffic on the route	3.64	2.84
Lack of obstructions on the route	3.47	2.64
Advanced stop lines at junctions	3.57	3.70
Junctions are easier to navigate	3.48	3.37
Number of cycle lanes	3.37	3.17
Blindspot visibility mirrors at junctions	3.09	3.29
Cycle parking facilities	2.96	2.97

Table 4: Mean levels of satisfaction with different aspects of the Barclays Cycle Superhighways

Base: BCS3: 200 respondents and BCS7: 301 respondents

Source: Barclays Cycle Superhighways Scheme User Survey, TfL 2010

Satisfaction is highest with the visibility of blue surfacing, signage and direct routes to people's destination. These are key principles in the design and implementation of the Barclays Cycle Superhighways. Although a major cost element, successfully navigating cyclists through junctions remains a priority for future routes. Cycle parking facilities were rated poorly for both routes, identifying a need that is being addressed by the Barclays Cycle Superhighways programme, through the supporting measures it delivers. Obstructions on the route were a particular issue for BCS7 users.

The qualitative research found that the work at junctions is generally considered to be very good. The diversion that avoids the Elephant and Castle roundabout (northbound) is ignored by some and welcomed by others.

5.4 What does research tell us about the specific interventions?

When prompted, almost all Heavy Goods Vehicle drivers said blindspot visibility mirrors would increase safety for cyclists. Between half and two thirds of people felt safer due to the blue surfacing, and a number of improvements in driving behaviour were noticed due to the blue lanes. The success of the supporting measures in encouraging more people to cycle is unknown at present; business surveys will be completed in March 2012.

Some specific research and monitoring has been done on several of the Barclays Cycle Superhighways interventions; mirrors at signal controlled junctions, blue surfacing, and supporting measures. The output of this research is summarised in the following sections.

5.4.1 Blindspot visibility mirrors

The London Cycle Safety Action identified the importance of addressing driver behaviour, and in particular that of Heavy Goods Vehicles (HGVs), which in 2007 caused 8 of the 15 cycling fatalities. Left turning HGVs are of concern mainly due to their large blindspot.

Blind spot visibility mirrors fixed to traffic signals are used in several countries so HGV drivers can watch for the signal to change and see cyclists to their nearside and in the blindspot. As these mirrors are currently not permitted for use in the UK, TfL conducted a three phase trial to investigate their benefit and suitability. Phase 1 assessed the benefits of the mirrors and identified risks and proposed mitigations, using an off-road trial. Phase 2 developed a design for the on-road trial, including technology development and resulted in an application being approved by DfT for a trial as part of delivery of the Barclays Cycle Superhighways pilot routes. For the trial, 37 blindspot visibility mirrors were installed at traffic signals along the two Barclays Cycle Superhighways.

Phase 3 evaluated the benefits of the mirrors and aimed to respond to issues that may result from the presence of mirrors, including: vandalism, distraction due to glare from sunlight and headlights, incorrect mirror position and driver's over-reliance on mirrors. Monitoring of the trial consisted of customer research, behavioural analysis, glare and condition monitoring. The findings were that no distracting glare was experienced as a result of the mirrors and when asked in customer research, drivers didn't identify glare as an issue.

Figure 19: A blindspot visibility mirror at Clapham North (opposite)



Almost half of HGV drivers interviewed that had driven through the trial junctions recalled the blindspot visibility mirrors when prompted and over a quarter stated that they used them⁶. Almost all stated that the mirrors would improve the safety at the junctions for cyclists and HGVs and three quarters stated that the mirrors would increase safety for pedestrians. A minority of HGV drivers, and some cyclists, pointed to the potential for the mirrors to increase cyclist confidence and therefore they might act with less caution at these junctions.

During the trial period, TfL also conducted driver training, urged cyclists not to undertake lorries through a marketing campaign throughout London, and hosted “exchanging places” events run by the Metropolitan police where cyclists can sit in the driving seat of an HGV to better understand sightlines.

The scheme user research found that cyclist awareness of the roadside mirrors was very low amongst the BCS3 sample, where 14 per cent of respondents were aware of them compared to 36 per cent of the BCS7 sample. This is relatively low for a key safety feature, although awareness amongst vehicle drivers is more important. The target market research however found that 39 per cent of respondents were aware of the mirrors. It then provided those respondents with more information about the mirrors, following which 70 per cent said they make them feel safer.

In March 2011, the DfT approved the rollout of blindspot visibility mirrors on all future Barclays Cycle Superhighways.

5.4.2 Blue surfacing

The Barclays Cycle Superhighways introduced a continuous blue surfacing along most of each route. At least 1.5m in width, the road surface was improved and skid resistant non-fading blue surface was applied.

Figure 20: Blue surfacing on BCS3 (opposite)

⁶Trial of Roadside Safety Mirrors for Cycle visibility (TfL, September 2010)

What do people think of Barclays Cycle Superhighways?



The scheme user survey found that the blue coloured surfacing gave a greater feeling of safety; more than half of the BCS3 sample and almost two thirds of the BCS7 sample identified an improved feeling of safety. Four per cent of respondents said that it reduced their feeling of safety. The results of the target market research were similar; two thirds of respondents commented that the blue surfacing made them feel safer.

A report commissioned by TfL analysed the effect of blue surfacing and symbols in bus lanes and at conflict points. The research assessed the impact of the blue colouring and symbols on road user behaviour at bus lanes, bus stops, vehicle parking/loading bays and at junctions. A summary of the results is as follows:

- ▶ Blue in nearside lane at signalised left turns means cyclists ride further from kerb on approach to a junction, which is in line with cycle training advice to reduce the risk of conflict with left turning vehicles
- ▶ Other traffic tends to avoid the blue lanes unless they need to use it for a manoeuvre
- ▶ Cars and HGVs positioned further from the kerb at the entry to junctions
- ▶ Blue in bus lanes had little impact on cyclists' positioning, but powered-two-wheelers tended to use the remaining red strip in the bus lane, particularly during congested periods
- ▶ No conflicts appear to be attributable to the presence of blue surfacing and or symbol patches

The materials used on the routes are currently performing well. The 'street paint' used on off-carriageway cycle lanes is an epoxy modified water based material, which requires 3 coats and needs to dry between coats, therefore laying this material in cold and wet conditions can cause difficulty.

The material used for the general carriageway locations is a blue pigmented methyl methacrylate (MMA) with granite chippings and hard sand filler. The advantage of using MMA over other adhesives is that it sets chemically rather than having to dry, meaning that it sets quicker and is less temperature sensitive. This allows large amounts to be laid and the carriageway to be re-opened quickly.

The high friction surfacing used blue epoxy coated chippings on two types of adhesive; MMA and Epoxy, a more familiar adhesive to the MMA, but slower to cure at low temperatures. The materials used were either Highways Authorities Product Approval Scheme (HAPAS) approved when specified or passed testing to HAPAS standards.

There have been several reports of the blue surfacing being slippery. The blue surfacing has been tested, both at the supplier's depot and after having been applied on the street. Although it may appear shiny when wet, it exceeds skid resistance requirements for use on London's roads. However, the surfacing will continue to be monitored.

5.4.3 Supporting measures

Significant investment has been made, through home and work end initiatives and specific interventions, to complement the Barclays Cycle Superhighways and maximise the number of cycling trips. The measures are an essential part of delivering success for the routes as they are designed to break down the barriers to cycling and encourage more people to cycle the routes regularly. The supporting measures included:

- ▶ A package of measures for businesses on or near to the Barclays Cycle Superhighways
- ▶ Borough funding for cycle parking, training and travel awareness activities
- ▶ Targeted interventions, covering safety, security and future commuters
- ▶ A monitoring and evaluation programme

Research before the implementation of the Barclays Cycle Superhighways suggested up to 27 per cent of the projected increase in cycling trips can be attributed to the proposed smarter travel measures⁷. The target and actual delivery of a range of supporting measures is outlined in Table 5.

Business area	Target	Actual
Number of business expressions of interest	640	938
Number of registered businesses	200	164
Total number of employees in the registered businesses	60,000	72,000
Number of cycle parking spaces	5,300	4,113
Number of cycle training hours	3,500	4,370
Number of bicycles maintained	3,000	4,143
Number of delivery and servicing plans	3	4
Number of HGV drivers who undertook CPC (certificate of professional competence) training covering vulnerable road users	240	695

Table 5: Target and actual delivery of supporting measures

⁷TfL Cycle Superhighway Demand Analysis for 10 routes

The supporting measures are a long term investment, and one that will continue to yield benefits as more people are made aware of what is available. Ongoing monitoring and evaluation to explore the impact of these measures on mode shift and behavioural change is due for completion in March 2012.

5.5 How have we raised awareness of the Barclays Cycle Superhighways?

The marketing of the Barclays Cycle Superhighways was very successful; over two thirds of scheme user survey respondents saw or heard the advertising.

A variety of marketing tools were used to raise awareness of the Barclays Cycle Superhighways up to launch, at launch and after launch. These comprised:

- ▶ **Launch advertising & PR** – communication with local residents and employees within the catchment of BCS3 and BCS7, using a mixture of broadcast and printed media and promotions
- ▶ **Web** – TfL has invested heavily in developing a cycling web page which is a one-stop-shop for cycling needs in London. This includes information to encourage both home and work end users of the Barclays Cycle Superhighways
- ▶ **Leaflet** – outlining exactly what the Barclays Cycle Superhighways are, and their benefits, used in a number of different environments e.g. ‘hit squad’ activity around tube stations/main congregation areas (both home and work end), roadshow/borough events (work end), as well as for doordrop activity (home end)
- ▶ **Street banners** – street banners were used along the routes to build awareness of the Barclays Cycle Superhighways. More detailed consultation with London Borough Councils will be followed when installing these for the next two routes
- ▶ **Posters** – located on bus shelters, at tube stations, and other high visibility, high footfall areas

Following launch 54% of the target market respondents had seen or heard advertising or other information about the Barclays Cycle Superhighways and two thirds of the sample from the scheme user survey had seen or heard advertising or other information, most on posters on bus shelters or on the Underground. The website received a very high number of visitors around launch with over 80,000 visitors in July 2010. This understandably reduced as advertising and press stories decreased after launch and the colder weather set in. Along with the positive perceptions explored earlier, these results demonstrate the success of the marketing campaign in raising awareness of the Barclays Cycle Superhighways and in encouraging people to take up cycling along the Barclays Cycle Superhighways.

5.6 How much does it cost to deliver and maintain the Barclays Cycle Superhighways?

The total cost of implementing the two pilot Barclays Cycle Superhighways was £18m.
The total annual maintenance cost for the two routes is £72,000.

The implementation costs of the Barclays Cycle Superhighways are spread over a range of workstreams including infrastructure, supporting measures, project overheads and design, as shown below. A breakdown of the costs is shown in Table 6.

Workstream	Pilot routes total (£m)	BCS3 (£m)	BCS7 (£m)
Supporting measures (including home and work end support, and information)	3.27	1.64	1.64
Powers and consents	0.84	0.69	0.16
Project management, contract management, monitoring and research, and special interventions (including blindspot visibility mirrors)	3.10	1.55	1.55
Development, design and build, of which:	10.81	4.34	6.47
• General carriageway condition and resurfacing (not including blue)	1.23	0.43	0.80
• Blue surfacing	3.18	1.12	2.05
• Alterations to junctions and road layouts	3.93	1.75	2.18
• Cycle signing	0.87	0.32	0.55
• Legacy schemes	1.60	0.72	0.88
Total	18.02	8.21	9.81

Table 6: Implementation costs of the Barclays Cycle Superhighways

5.6.1 Maintenance: TLRN

An approximate annual maintenance cost of £4,080 per km per annum has been applied to the extent of Barclays Cycle Superhighways delivered on the TLRN to generate the annual total cost of maintenance. These calculations also include the cost of maintaining Cycle Superhighway totems. The resulting annual total cost of maintaining the Barclays Cycle Superhighways on the TLRN is estimated in Table 7.

Route	Total annual cost
Barclays Cycle Superhighways 3	£30,000
Barclays Cycle Superhighways 7	£42,000
Total pilot routes annual cost	£72,000

Table 7: Estimated total annual cost of maintaining the Barclays Cycle Superhighways

Ongoing maintenance of the TLRN sections is budgeted within the TfL highways operational budget, with the maintenance regime varying depending on location and volume of traffic.

The specification for the blue surfacing and symbols has been provided to the utility companies, and where utility companies dig up the Barclays Cycle Superhighways infrastructure they are required to reinstate it like for like within 6 months.

There have been many instances since the pilots were launched of temporary reinstatement in black, with companies revisiting within 6 months to reinstate blue. Although this is keeping with the requirements, this means there can be several months when the blue surfacing is patchy. Considering the importance of the blue surfacing from a safety and wayfinding perspective, TfL is looking into how the agreement with the utility companies could be improved.

5.6.2 Maintenance: borough roads

Maintenance on borough roads is covered in an agreement with each borough, and commuted sums have been provided to cover their future maintenance costs; these costs are included in Table 6 above. The value of commuted sums cover:

- ▶ Renewal of blue surfacing on-highway
- ▶ Replacement Superhighway symbols and sign plates

The commuted sum calculations are based on an assumed renewal once every 20 years and the values equate to the same approximate annual maintenance cost of £4,080 per kilometre of Cycle Superhighway route as used on the TLRN.

5.7 Have the Barclays Cycle Superhighways had a detrimental impact on other modes?

At isolated locations, the Barclays Cycle Superhighways have affected traffic journey time and bus journey reliability, notably where a lane of traffic has been removed.

In order to analyse the impact upon other modes, a number of locations were chosen where either a traffic lane was removed or junction capacity was reduced. These were the locations most likely to have an impact on other modes, so this analysis provides insight into the worst case examples. It can not be applied to other junctions along the route. Analysis was only completed on BCS7 as the much of BCS3 is off-carriageway.

5.7.1 Traffic journey time

The speeds of general traffic along the Barclays Cycle Superhighways were monitored using the London Congestion Analysis Project (LCAP) system which is based on vehicle journey times between pairs of Automatic Number Plate Recognition (ANPR) cameras. Three areas were analysed along BCS7 in detail: A24 Clapham Common south; A3 Clapham Road north of A203 South Lambeth Road/Stockwell Road; and Kennington Park Road. At the first two locations there were only small fluctuations in the journey times (of less than one minute) despite significant changes to the characteristics of the route. The increased congestion was mitigated by fine tuning the SCOOT operation⁸, and in the case of Clapham Road north a left turning filter was added, increasing storage capacity for left turning traffic. However the SCOOT optimisation at Kennington Park Road did not completely mitigate the impacts of the removal of a lane of traffic, and an increase of 4.1 minutes in northbound journey time was witnessed.

5.7.2 Bus journey times and reliability

A further risk associated with the implementation of the Barclays Cycle Superhighways was an impact upon bus journey times and reliability caused by greater interaction between cyclists and buses. TfL's state-of-the-art Automatic Vehicle Location system, iBus, allows a detailed examination of the change in bus journey times and reliability.

Clapham South to Oval was chosen for this analysis due to the large number of bus routes and high flows of cyclists. Appendix 6 shows the change in average actual run time between September 2009 and September 2010, Monday to Friday averaged across the whole month, for five separate sections along bus routes 155, 50 and 88⁹.

The overall impact across the five sites was a slight improvement in average journey time but deterioration in journey time reliability. One general traffic lane was removed between Clapham Common and Clapham South, which is the likely cause of the significant deterioration in journey time reliability on route 50.

⁸SCOOT is a computerised method of traffic control, using sensors buried in the road to dynamically optimise traffic signal timings according to current traffic demand.

⁹Data collected for 22 weekdays in both September 2009 and September 2010

Bus routes around Stockwell witnessed an increase in journey time reliability, suggesting the junction safety improvements may have had a positive impact on bus routes using the junction. Network wide reliability, measured through Excess Wait Time, has been consistent during this time period. Route specific results must be viewed with caution due to the number of factors that can impact upon bus service reliability at specific locations, such as congestion, weather, roadworks and accidents.

5.8 Are there still barriers to cycling along the two routes?

Even considering the success of the Barclays Cycle Superhighways, security and safety remain barriers to the target market. There was also concern identified around obstructions along the routes, with pedestrians and parked vehicles identified as the main obstructions. However, the majority of the barriers are factors that cannot be addressed through the Barclays Cycle Superhighways, such as the weather, the need to carry items and facilities at people's destinations.

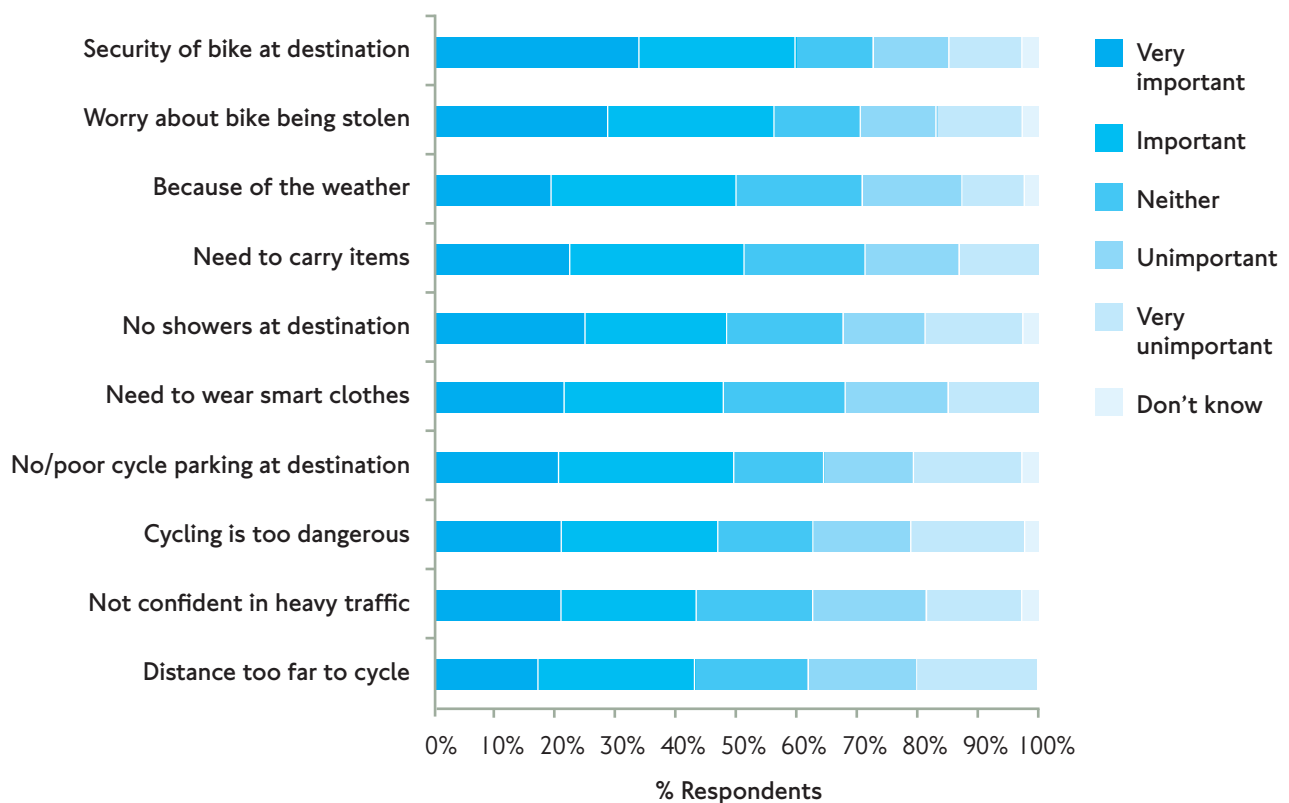


Figure 2 I: Importance of top 10 possible barriers to cycling for 'cyclists'

Base: 217 Wave 2 'cyclists'

Source: Barclays Cycle Superhighways Target Market Survey, TfL 2010

Security of bicycle at destination is a major issue for existing cyclists, and one that must continue to be targeted across London (Figure 21). Perception of safety and confidence in cycling are other barriers that the Barclays Cycle Superhighways can help address.

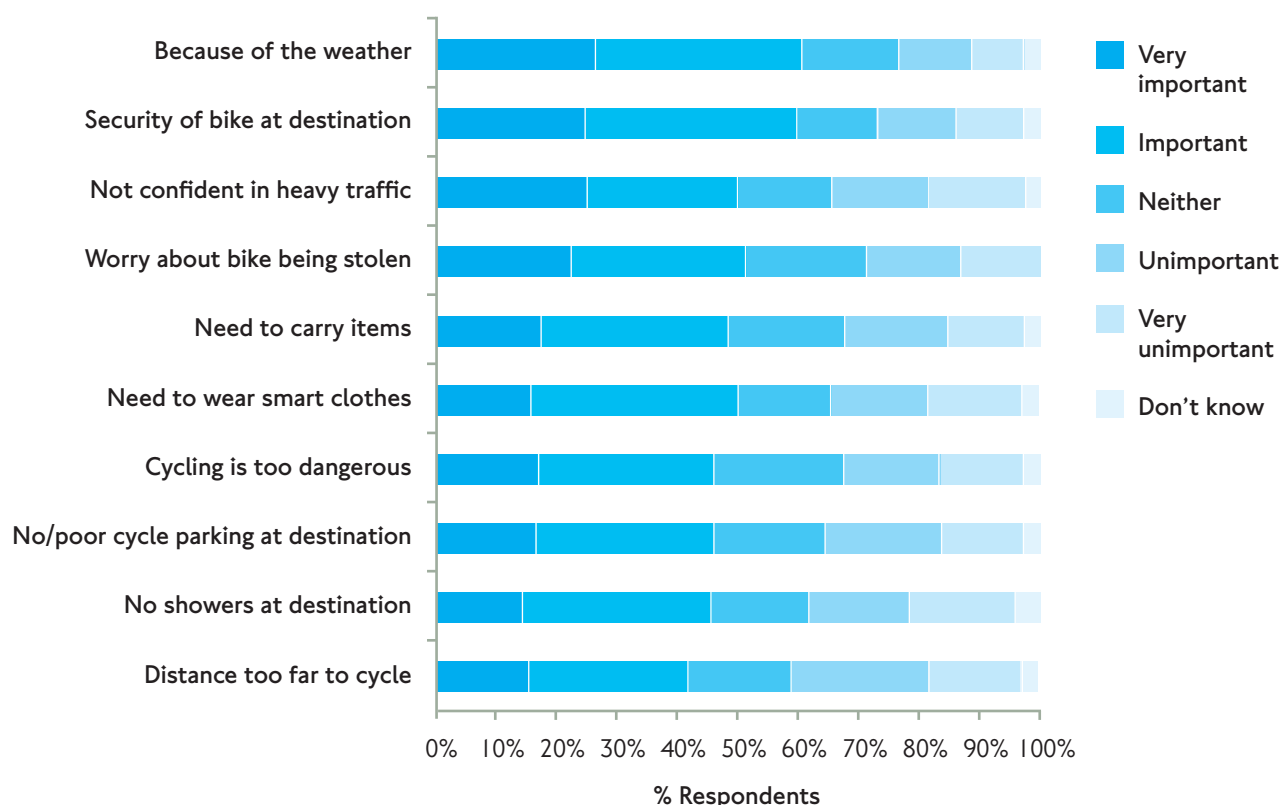


Figure 22: Importance of top 10 possible barriers to 'potential cyclists'

Base: 289 Wave 2 'potential cyclists'

Source: Barclays Cycle Superhighways Target Market Survey, TfL 2010

The same barriers to cycling are identified by 'potential cyclists' although in a slightly different order. Security is still a big issue, although confidence in heavy traffic is much more important to potential cyclists.

Finally, the behavioural research uncovered a specific lack of satisfaction caused by obstructions on the route. Pedestrians were a particularly big problem identified in the scheme user survey, with 72 per cent of the BCS3 sample and 52 per cent of the BCS7 sample stating that pedestrians often or always stepped into the Barclays Cycle Superhighways. There were also issues with vehicles parking in the Barclays Cycle Superhighways, particularly on the BCS7 corridor (Figure 22), although it is not known whether they were legally or illegally parked.



Chapter 6

What will be done differently for future Barclays Cycle Superhighways?

Following delivery of the two pilot Barclays Cycle Superhighways, lessons have been learnt how to improve delivery of the next phases of the programme. The table below summarises the recommendations for delivery of the future routes.

Implementation	Stakeholder Consultation	<p>Stakeholder consultation played a key role in the development of the pilot routes. For example consultation on BCS3 at feasibility stage alone yielded 202 individual comments from stakeholders, of which 140 were incorporated at design stage. Similar consultation will continue and for Phases 2 to 5, more consultation at preliminary and detailed design will be included in the programme. The range of stakeholders, including council officers, the police, and local cycling representatives, London Cycling Campaign, Town Centre Partnerships and other special interest groups will continue to be engaged and the stakeholder list will be reviewed to ensure a range of cyclists is represented in the engagement and consultation for future phases.</p> <p>The London Boroughs have a particularly important role to play in the planning of the Barclays Cycle Superhighways. Bi-weekly meetings between the project team and borough officers throughout preliminary and detailed design will continue.</p>
	Procurement	<p>The pilots were delivered within very tight timescales with both the concept and design evolving as they were delivered. The most effective and efficient approach to procurement of the feasibility, design and construction elements will be reviewed for future phases, with activities brought in house where possible. The accuracy of the cost estimating at the end of feasibility and throughout the design stage will be improved for future routes.</p>
Infrastructure	Mandatory cycle lanes	<p>The implementation of mandatory cycle lanes is planned for future Barclays Cycle Superhighways where capacity and capability allows. Over the long term mandatory lanes will continue to ensure the benefits of cycle lanes on busy carriageways are realised, subject to their enforcement.</p>
	Wider spacing of symbols	<p>Along certain sections of the pilot routes, the symbols are very close together, and as a result some are being removed (e.g. Narrow Street). The symbols are only being removed where there is no risk to the continuity of the Barclays Cycle Superhighways. There will be further investigation into the required spacing of symbols so as to not impact upon continuity.</p>

Infrastructure continued	Blind spot visibility mirrors	Although there is a relatively low awareness of blindspot visibility mirrors amongst cyclists, almost all HGV drivers in research understood their purpose and stated that they would improve safety, Trial of Roadside Safety mirrors for Cycle visibility (September 2010). Having gained approval from the DfT, the mirrors will be rolled out on all BCS routes.
	Length of routes	Each superhighway is planned to take into account demand in and around the area it serves. The lengths of the Barclays Cycle Superhighways will therefore be tailored accordingly.
	Connectivity	As the network of Barclays Cycle Superhighways builds, the importance of connectivity with other cycling infrastructure grows. Evaluation and improvement of existing Barclays Cycle Superhighways will continue, including reviewing signage to and from routes in the surrounding areas.
	Busy / complicated Junctions	Significant safety improvements were implemented at Stockwell and Oval. Improving highly trafficked junctions such as these can prove complex and expensive. The data presented in this report has indicated that one of the key success factors for the Barclays Cycle Superhighways is the provision of direct routes. Therefore where possible improvements will enable cyclists to progress directly through a junction, but if not possible, an alternative route such as at Elephant and Castle will be considered. Appropriate markings and signage will be implemented to encourage as many cyclists as possible to use these less trafficked alternatives.
	Car parking	TfL will aim to implement changes to the operation of parking bays along the Barclays Cycle Superhighways where practicable, to provide consistency along a route e.g. peak, off-peak, tidal. Wherever possible, potential parking issues will be designed out of future routes to avoid car parking on the Barclays Cycle Superhighways, and will be enforced where appropriate. Consultation with residents and businesses will take place where this is planned.

Supporting measures	Business engagement	<p>Increased face to face engagement with businesses is planned to ensure each business moves quickly through the process. The face to face engagement will help promote other TfL cycling initiatives such as Sky Ride and the Cycle Challenge and in addition it will ensure commitment to cycling from business leaders.</p> <p>A shorter staff survey has been developed to ensure higher response rates. The team also offers (in certain cases) to carry out the surveys at the site (face to face). This assists large businesses that need a high response rate or businesses with staff that do not have access to computers, such as the NHS.</p>
	Telemarketing	Due to the success on routes 3 and 7 the use of telemarketing will be increased. Direct mail will be removed from future route programmes as few leads were realised through this method and the cost in comparison to telemarketing was high.
	Led rides	A led ride programme was developed for the pilot route programme. There was a lack of demand for the rides so this will not be continued for future route programmes.
	Bidding process	Clearer guidance will be provided for boroughs for the supporting measures bidding process. The process will start as early as possible to enable borough cycle parking to be installed before launch. Potentially duplicative travel awareness activity will also be removed from the borough funding package.
	HGV awareness	Certificate of Professional Competence' HGV training courses will be implemented rather than general HGV/Cycle awareness activities.
	Marketing	Leaflets: the map is the key piece of information so needs to be highlighted more clearly; two leaflets were produced for each route containing similar information and hence duplication (one for events and one for door drops), one leaflet will from now be produced with an additional panel to provide room for extra information. Each route should have a clearly distinguishable leaflet identity, to ensure the leaflet reflects the geographical location of the route and the local community which it serves.

Supporting measures continued		<p>Posters: stakeholder feedback suggested that the poster used on the pilot routes was “lacklustre and old fashioned”; imagery will be reviewed to create the enjoyable buzz TfL seeks to create around cycling; consideration should be given to use of the Barclays Cycle Superhighways “tin tin” logo within the poster, to create eye-catching and fun imagery.</p> <p>More women need to be encouraged to use the routes and the marketing will seek to target them for future phases.</p>
Maintenance	Superhighway Material	The current materials used on the Barclays Cycle Superhighways are performing well and will continue to be assessed.
	Utility works	TfL will seek to improve the agreement with utility companies regarding reinstatement to reduce the number of temporary reinstatements on the Barclays Cycle Superhighways.
	Cleaning	TfL will consider the current standard maintenance regime used on the Barclays Cycle Superhighways and look to enhance it where possible.
Evaluation	Behavioural research	The target market research will not be repeated as it was only needed once. Improvements will be made to simplify the scheme user survey to reflect emerging issues and maximise response rates. The aim of continuing the research will be to understand how usage patterns change over time and to pick up the longer term benefits of the supporting measures, plus any issues as the scheme ages. It will also be important to monitor driver behaviour to minimise encroachment into the lanes.
	Additional evaluation	Evaluation of each superhighway will take place over a number of years to be able to fully determine their level of success. An update to this evaluation report on the key areas is therefore recommended three to five years after implementation.
	Future Barclays Cycle Superhighways	The next two Barclays Cycle Superhighways will be analysed in a similar way to the pilot routes. Planning and implementation of future routes will take into account lessons learned from each delivery phase.



Chapter 7

Conclusions

The aim of the Barclays Cycle Superhighways is simple – to continue the cycling revolution in London and help achieve the Mayor’s target of a 400% increase in cycling by 2026.

Barclays Cycle Superhighways have improved the experience of cycling in London and encouraged people to commute by bike. There is strong evidence through the manual count data that the Barclays Cycle Superhighways have increased cycling, and through the behavioural research that they have encouraged more people to cycle, and existing cyclists to cycle more. The initial growth along both Barclays Cycle Superhighways 7 and Barclays Cycle Superhighways 3 has been significant, with the highest demand in the 5-6km closest to central London, which is also where the largest growth in real terms has been realised.

Cycling journey times have decreased, and the reliability and predictability have been favourably commented upon in the behavioural research. There is a wide range of factors seemingly affecting people’s decisions to switch mode, route or to make a new journey, suggesting a cumulative impact of the package of measures implemented along the Barclays Cycle Superhighways.

There is insufficient data available to analyse the impacts of the Barclays Cycle Superhighways on casualty rates. Full casualty analysis will be completed following the collection of three years worth of data as is the usual practice for casualty analysis. The Barclays Cycle Superhighways are however seen generally as providing an improvement in safety for cyclists, helping to address one of the major barriers to cycling in London, and within the first year there have been no collisions resulting in fatal pedal cycle casualties.

There have been isolated incidences where the Barclays Cycle Superhighways have impacted upon other modes. In most but not all cases, the impact on general traffic has been mitigated by SCOOT optimisation. There have been two incidences however where this has not been possible, and the traffic journey times or bus journey time reliability have been adversely impacted upon.

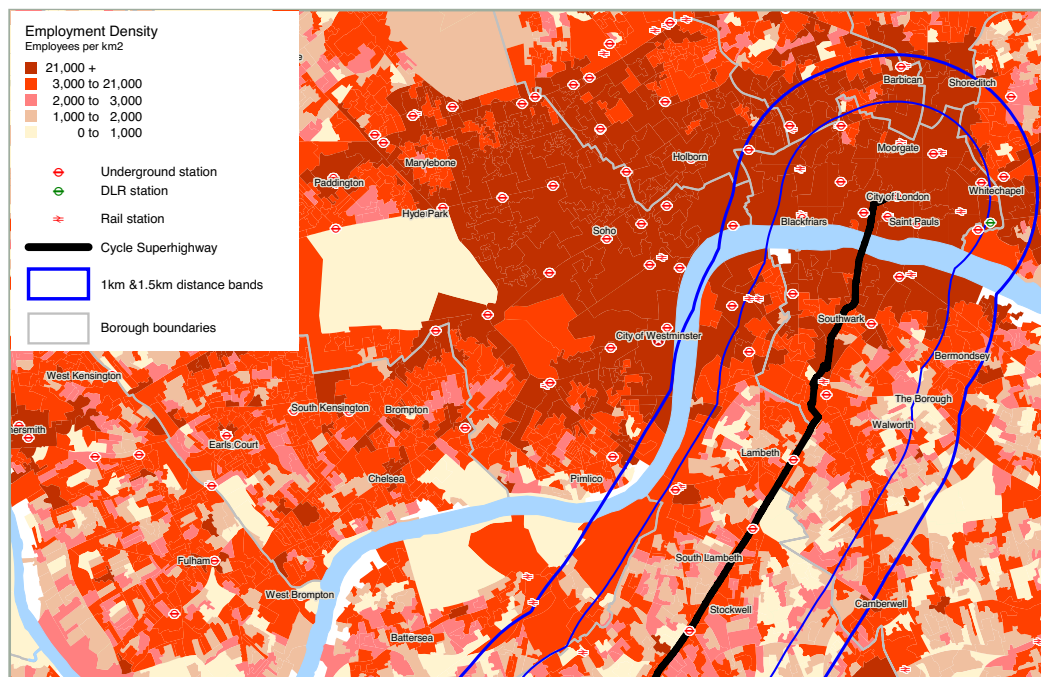
The pilot routes have provided some useful lessons for the rollout of future routes, which should enable smoother implementation, consultation and evaluation. There are a number of areas where further debate and research is required to help inform the planning and implementation of the future routes.

Chapter 8

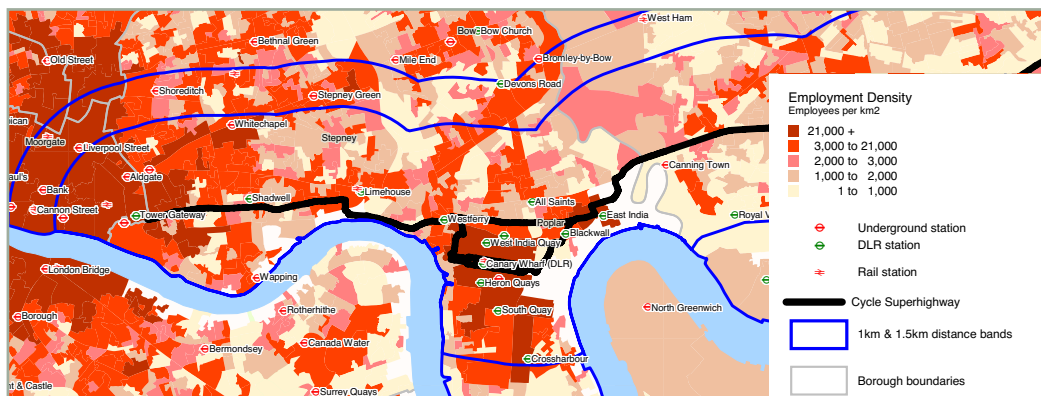
Appendices

Appendix 1: Employment Density surrounding the Barclays Cycle Superhighways routes

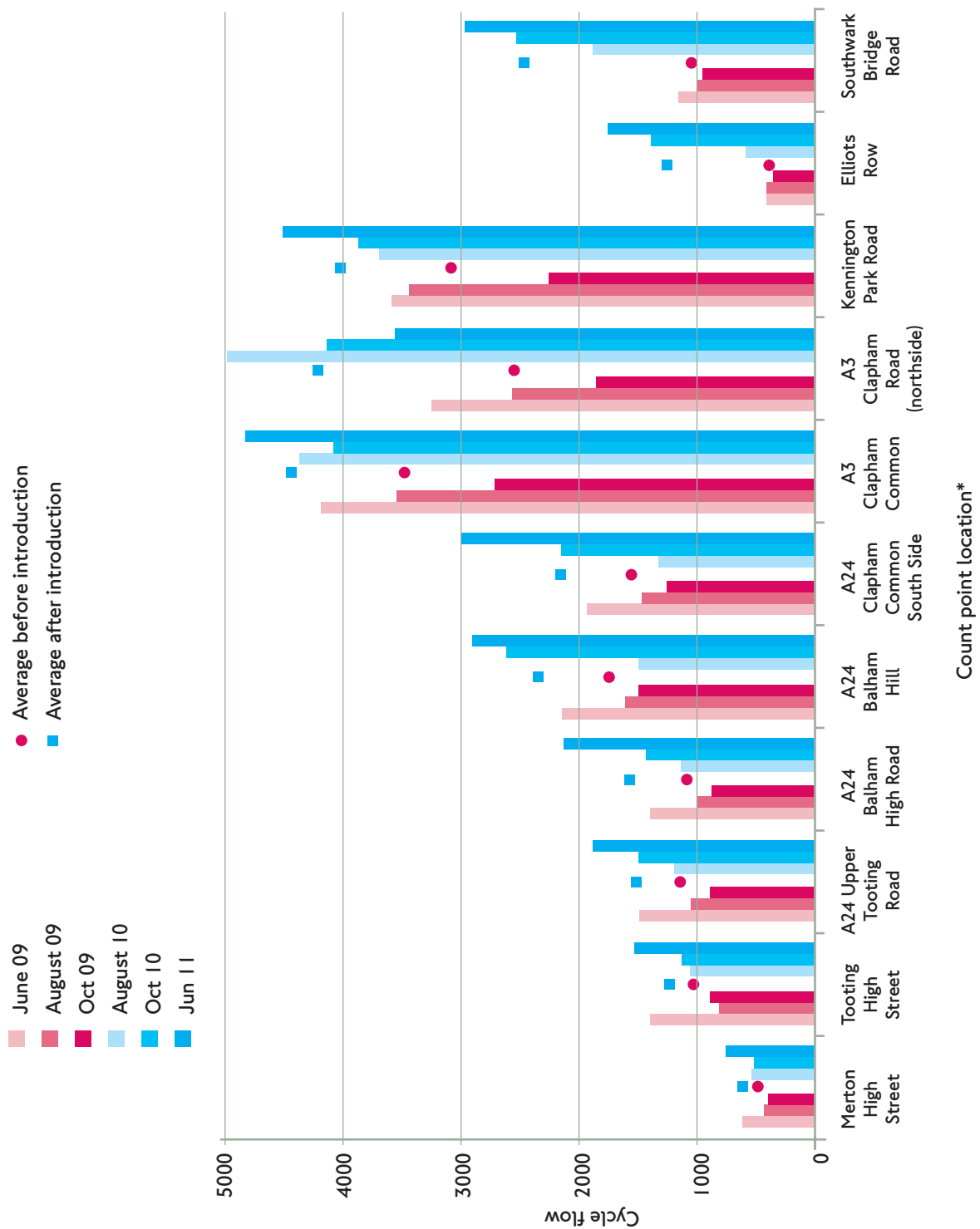
BCS7:



BCS3:

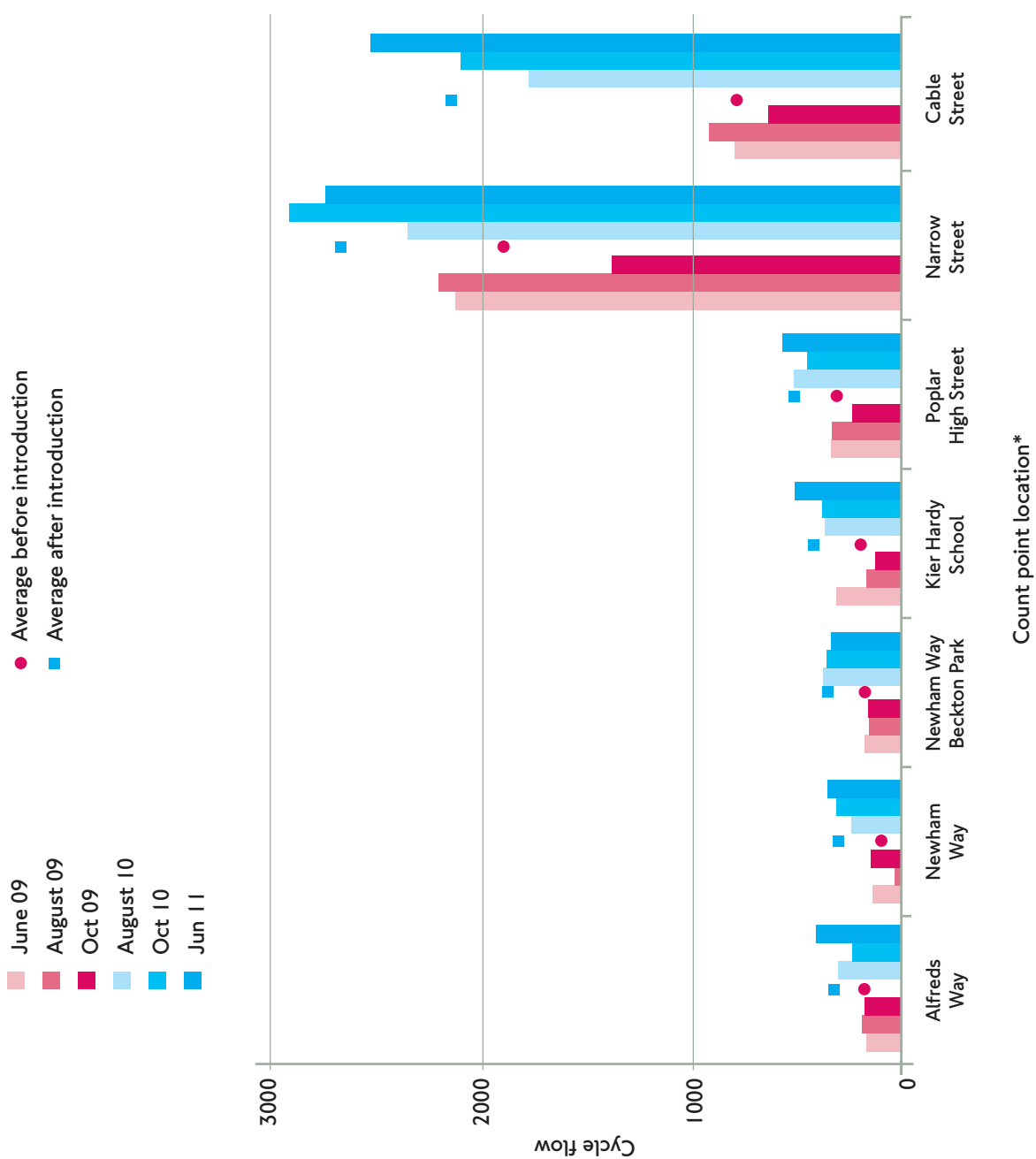


Appendix 2: Growth in cycling along BCS7 route



Note: June 2010 data was not collected as the Barclays Cycle Superhighways were being built during this period

Appendix 3: Growth in cycling along BCS3 route



*Note: June 2010 data was not collected as the Barclays Cycle Superhighways were being built during this period

Appendix 4: Screen line counts

Three screen lines were placed on BCS7 and two on BCS3:

- ▶ Screen line A (BCS7) – intersecting the highway at Balham and consisting of five additional survey points to the one on the route itself
- ▶ Screen line B (BCS7) – intersecting the highway south of Tooting and consisting of eight additional survey points
- ▶ Screen line C (BCS7) – intersecting the highway at Clapham and consisting of six additional survey points
- ▶ Screen line D (BCS3) – intersecting the highway at Poplar High Street and consisting of two additional survey points
- ▶ Screen line E (BCS3) – intersecting the highway at Newham Way near Docklands and consisting of four additional survey points

At each screen line point manual counts of cyclists were collected for each direction, for 12 hours according to the same schedule for the link counts on the highway.

		BCS7			BCS3	
		Tooting High Street	Balham High Rd	Clapham Rd	Poplar High Street	Newham Way
CS	Aug 09 - Aug 10	29%	16%	24%	47%	132%
	Oct 09 - Oct 10	27%	66%	50%	82%	116%
SL*	Aug 09 - Aug 10	-3%	20%	0%	10%	-23%
	Oct 09 - Oct 10	26%	75%	26%	25%	37%

Table 8: Comparison of cycling count growth between Barclays Cycle Superhighways and screen lines

*SL = Screen line count

Appendix 5: Journey times on the Barclays Cycle Superhighways (minutes)

	BCS7						BCS3					
	AM		Inter		PM		AM		Inter		PM	
	NB	SB	NB	SB	NB	SB	WB	EB	WB	EB	WB	EB
Pre	55.5	52.7	53.1	55.7	51.5	59.3	52.8	53.6	52.2	53.8	48.5	47.5
Post	53.6	52.3	49.5	53.8	48.8	52.7	50.8	48.9	50.8	50.2	46.1	45.1
Difference	-1.9	-0.4	-3.6	-1.9	-2.7	-6.6	-2.0	-4.8	-1.4	-3.6	-2.5	-2.4
% Change	-3%	-1%	-7%	-3%	-5%	-11%	-4%	-9%	-3%	-7%	-5%	-5%

Cycling journey times along the two routes were recorded pre- and post-implementation (August and October 2009 and August and October 2010).

Appendix 6: Impact on average actual run time and variation in run time for buses

