CYCLING IN LONDON

Report

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Prepared for:

Transport for London

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FIGURES

CYCLING IN LONDON: SUMMARY

Introduction

This summary highlights key findings from a review of well over one hundred studies connected with cycling, ranging from qualitative research to large scale travel surveys such as the LTDS (London Travel Demand Survey).

The numbered references (e.g. [1]) refer to the source document or dataset, a full list of which is included in an Appendix within the full report.

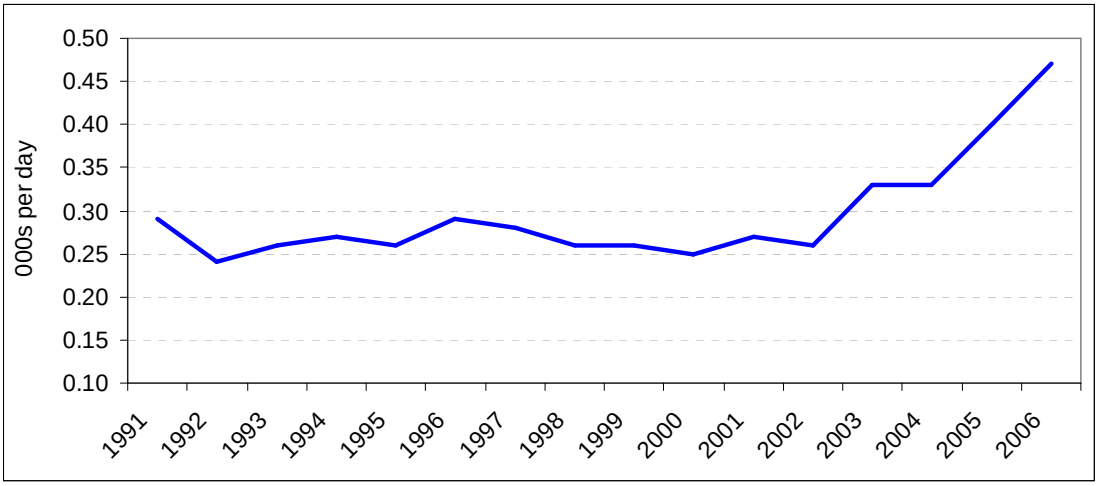
Policy context

Increasing cycling in London is integral to the vision to develop London as an exemplary sustainable world city [10, 2004]. This is because there are substantial economic, health and personal benefits associated with cycling, which could potentially be incorporated into everyday life for 28% of Londoners with access to a bike [66, 2004].

Travel patterns and trends

- 28% of Londoners have access to a bicycle, including 41% of 16-24 year olds [66, 2004].
- Cycling accounts for 1.6% of all trips in London, though it is higher in inner London where, for example the cycle mode share for journeys to work is 3.7% [3, 2006/7].
- Males aged 25-44 are the demographic group most likely to cycle, and they account for 40% of all cycle trips, more than women of all ages combined [1, 2006/7].
- School children are much more likely to cycle than adults, with 41% of 11-15 year olds cycling at least once a week [44, 2005].
- Around half of cycling trips are for journeys to work [1, 2006/7].
- 85% of cycle trips are 5km or less in length [134, 2001].
- Since 2003, the volume of cycling trips has been increasing at a substantial rate (on average, around 17% a year [1, 2006/7]).

Average daily cycle flows on major roads in London [1]



Attitudes towards cycling

- There is a noticeable gap in attitudes between cyclists and non-cyclists: cyclists find the mode considerably more appealing than non-cyclists. This gap is also noticeably bigger than the gap between users and non-users of other modes such as walk, car, bus, train, and Underground [44, 2005];
- for cyclists, the bicycle is fast, convenient, reliable, healthy, good value and enjoyable. It gives a sense of control and freedom [44, 2005];
- for non-cyclists, it is a means of travel which is perceived as dangerous, and which they wouldn't wish to be associated with, although, the idea of cycling has an appeal from an environmental, health and enjoyment point of view. It can also evoke positive childhood memories [75, 2005].

Economic benefits

Studies have shown that regular cycling can help to improve health (and reduce the economic costs of ill-health), while replacing cycling journeys for car and public transport trips result in congestion and environmental benefits [6, 2007]. Cost-benefit analysis of four case studies (London Cycle Network+, cycle training, 'Bike It' and Links to Schools) has shown that measures to encourage cycling can result in positive overall net benefits (for all the case studies, the economic benefits were higher than the costs). [6, 2007]

Barriers

The barriers that the public state prevent their wider adoption of cycling are summarised below. We make a distinction between "infrastructure" related barriers which can be addressed by "hard" measures such as cycle lanes, and "image" related barriers which require a "softer" approach such as training and advertising.

Although the image issues are harder to research and measure, they should not be regarded as less important because of this, and the poor image of cyclists (which is even held by many cyclists themselves) is a barrier to cycling becoming a more mainstream mode.

	Infrastructure	**Image**
Safety	• Lack of segregated cycling routes • Volume of traffic • Speed of traffic • Driver behaviour	• Fear of other traffic • Attitudes of car/taxi/bus drivers • View that "London is not a good place to cycle" • Lack of confidence
Facilities	• Lack of secure bicycle parking facilities • Lack of changing and showering facilities	• Fear of cycle theft • Not wishing to look "hot and sweaty"
Other	• Lack of information about secure bicycle parking and cycling facilities	• Habitual nature of travel • Poor image of cyclists • Perception that cycling is primarily for healthy men

Overcoming the barriers

To make a major impact on the level of cycling it is likely to be necessary to implement a combination of hard and soft measures: the soft measures to encourage people to think about and try out cycling, the hard measures to ensure that when they do, they have a positive experience and continue to cycle. This implies that initiatives like the new cycling corridors and bicycle hire scheme will be more effective if supported by good marketing and Personalised Travel Planning programmes.

Cycling and children

- Cycling to school is an attractive option for some schoolchildren, but many parents do not support it because they are concerned about their child's safety [43, 2003].

- Cycling to school is quite age and gender-specific with 11-15 year old boys much more likely to cycle to school than other groups [124, 2006]. This suggests that the image of cycling affects young girls more than boys.
- There is evidence that measures to encourage more cycling to school (such as training and provision of cycle parking) can be effective where well targeted and executed [54, 2004].
- There appears to be quite a substantial number of children who own a bicycle but who do not use it [78, 2005], perhaps implying that there is scope to increase cycle usage amongst children if concerns over safety, and image barriers, can be overcome.

Segmenting the market

The market can be broken down in terms of behaviour (such as distinguishing between cyclists, potential cyclists and cycle rejectors), demographics (age, gender social class), attitudes (whether or not enjoy cycling), location (inner or outer London), or any combination of these. However, cutting across all these is an important distinction which exists between "utility" cycling (mostly commuting, but including other "A to B" cycling and cycling to school) and cycling for leisure or sport. For these two broad categories there are clear differences between the motivations of cyclists, and the wider effects of their cycling (leisure cycling has health benefits, but does not necessarily affect congestion or the environment).

1. INTRODUCTION

1.1 This report presents a summary of our current state of knowledge about cycling in London. It is based on a review of well over 100 reports, covering a wide range of types of research, ranging from small scale qualitative research to the latest travel data from the LTDS.

1.2 It is structured around eleven topic-based chapters covering different aspects of cycling, and concludes with a short commentary on what we think are the key lessons for future policy making on cycling.

1.3 Chapter 2 briefly reviews the existing policy context, drawing particularly on the "Transport 2025" transport vision document.

1.4 The next section covers "hard facts" on cycle usage. Chapter 3 covers the latest available data on who cycles and what trips they make, and Chapter 4 looks at trends in the volume of cycle trips.

1.5 Chapter 5 moves on to attitudinal research and looks at how cyclists and non-cyclists view cycling and cyclists. Chapter 6 considers the positive aspects of cycling and includes a review of work undertaken to quantify the benefits of cycling for the purposes of economic appraisals and cost-benefit analyses.

1.6 Evidence for barriers to cycling are reviewed and summarised in Chapter 7. The measures that have been employed to overcome these barriers and increase the volume of cycling are covered in Chapter 8. This includes evidence of the effectiveness of both "hard" measures such as infrastructure and "soft" measures like advertising and information.

1.7 Chapters 9 to 11 then review evidence relating to three key market segments, as defined by journey purpose: commuting to work and school, and cycling for leisure purposes, including cycling as a sport.

1.8 As we get more sophisticated in our cycling strategies it will be important to segment the market and in Appendix A1 we briefly review how this has been done to date.

1.9 Appendix A2 provides some background data on accidents and accident rates.

1.10 In Appendix A3 we list the sources obtained and reviewed for this study. The sources used are generally less than five years old, though some older ones which are still relevant are used. While the emphasis has been on utilising reports on cycling, some original analysis of the LATS and LTDS London travel surveys has been undertaken to provide as clear a picture as possible of cycling behaviour.

2. POLICY CONTEXT

2.1 Cycling has for quite some time had a prominent role in TfL's policy agenda, and this is reflected in the 2004 London Cycling Action Plan "Creating a chain reaction" [10]. This stated that the vision is:

> *to make London a city where people of all ages, abilities and cultures have the incentive, confidence and facilities to cycle whenever it suits them..*

2.2 This plan identified ten objectives including behaviour change supporting aims such as "Objective 7: Increase mutual awareness and respect between cyclists, pedestrians and other road users" and infrastructure changes for cyclists like "Objective 1: Introduce quality conditions on the London Cycle Network plus (LCN+)" and "Objective 3: Increase cycle parking provision".

2.3 The 2025 Transport Vision [119] has an ambitious target to increase cycling by 400% by 2025 and in doing so achieving a 5% mode share (compared with 1.6% in 2006/7). Overall then, cycling is central to achieving the vision to cut congestion and emissions while maintaining London's position as the country's financial powerhouse.

2.4 This will be achieved through:

- Infrastructure improvements – e.g. completing 1,000km of the London Cycling Network+ and developing local network initiatives;
- Marketing and promotion – e.g. by providing more cycle maps, events and advertising;
- Awareness and training programmes – e.g. through strategies to increase cycling awareness among young people and to provide training for all age groups;
- Parking – e.g. provision of new parking sites in town centres, at public transport interchanges and schools and colleges;
- Integration with other programmes – e.g. through improved land use planning, travel planning processes and by using corridor management to incorporate cycle facilities where possible;

- Linkages with other policy measures including:
  - smart transport measures;
  - travel plans for workplaces and schools and residential developments; and
  - congestion and emission reduction plan which will improve conditions for cycling.

3. CYCLE USAGE

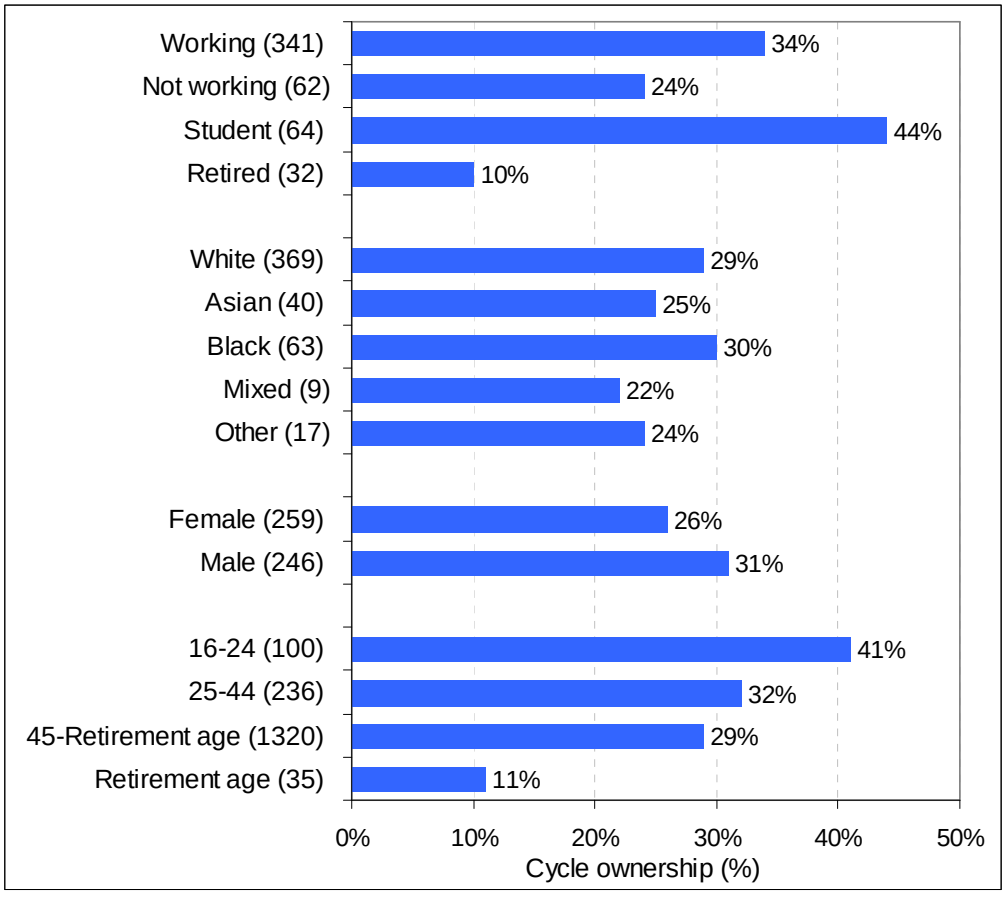
Summary

- 28% of Londoners have access to a bicycle, including 41% of 16-24 year olds [66, 2004].
- Cycling currently accounts for 1.6% of all trips in London, though amongst males aged 24-44 it is twice this at 3.3% [1, 2006/7].
- School children are much more likely to cycle than adults, with 41% of 11-15 year olds cycling at least once a week [44, 2005].
- Around half of cycling trips are for journeys to work [1, 2006/7].

Ownership

3.1 Overall, approximately 28% of Londoners have access to a bicycle [66]. As a general trend, bicycle ownership decreases with age: 41% of 16-24 year olds (and 44% of students) have access to a bicycle, falling to 11% of those of retirement age or older. Ownership amongst school children is believed to be considerably higher, at up to 80% [78]

FIGURE 3.1 ACCESS TO A BICYCLE (2004)



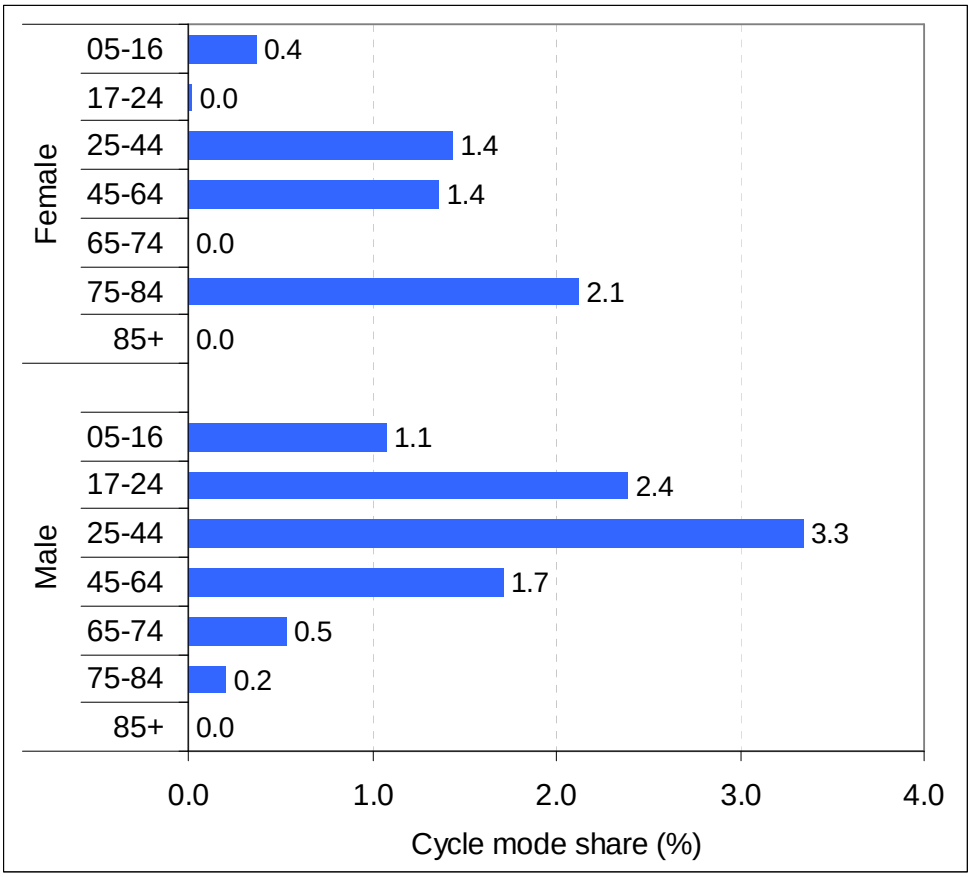
Source: Near Market for Cycling [66] Note: sample size in brackets

Bicycle mode shares

3.2 Overall, 1.6% of trips in London are by bicycle[1]. The following charts reveal how this percentage varies by working status, age & gender, ethnic group and trip length. Points to highlight are:

- cycling has the highest mode share amongst males aged 24-44 (3.3%) [1];
- generally, bicycle mode shares are lower for women than men [1];
- bicycle mode shares tend to be lower for people from non-white ethnic groups [1];
- in terms of trip length, bicycle has the highest share in the 0.5-2km (0.3-1.2 miles) range (below that it is dominated by walk, above by motorised modes). Nevertheless, its share holds up reasonably well until trip lengths reach 10km (6.2 miles) [134];
- in volume terms though, 85% of bicycle trips are 5km (3.1 miles) or less [134].

FIGURE 3.2 BICYCLE MODE SHARE AND AGE & GENDER (2006/7)

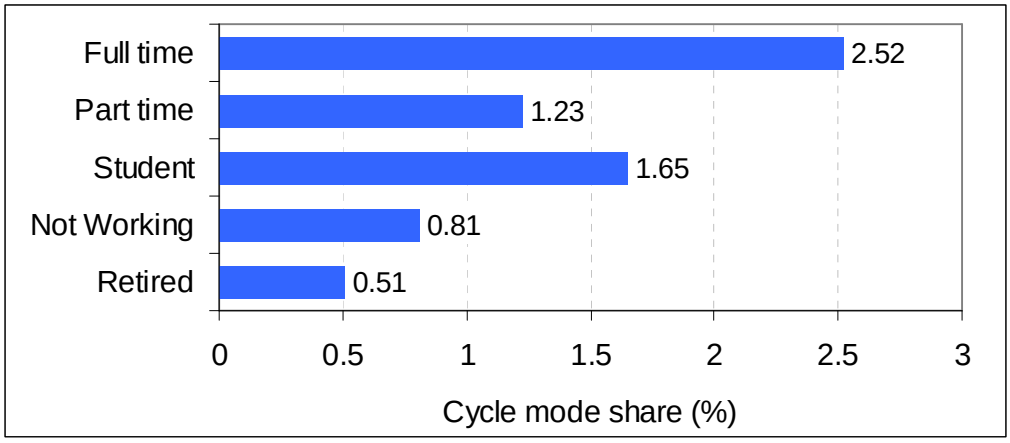


Source: LTDS [1] Note: the mode share for females aged 75-84 should be treated with caution and is likely to be a statistical anomaly caused by small sample size

3.3 Cycling has the highest mode share amongst males aged 24-44 (3.3%), and generally, bicycle mode shares are lower for women than men [1].

3.4 Full time employees make more of their trips by bicycle than any other working status groups, followed by students (see Figure 3.3 below) [1].

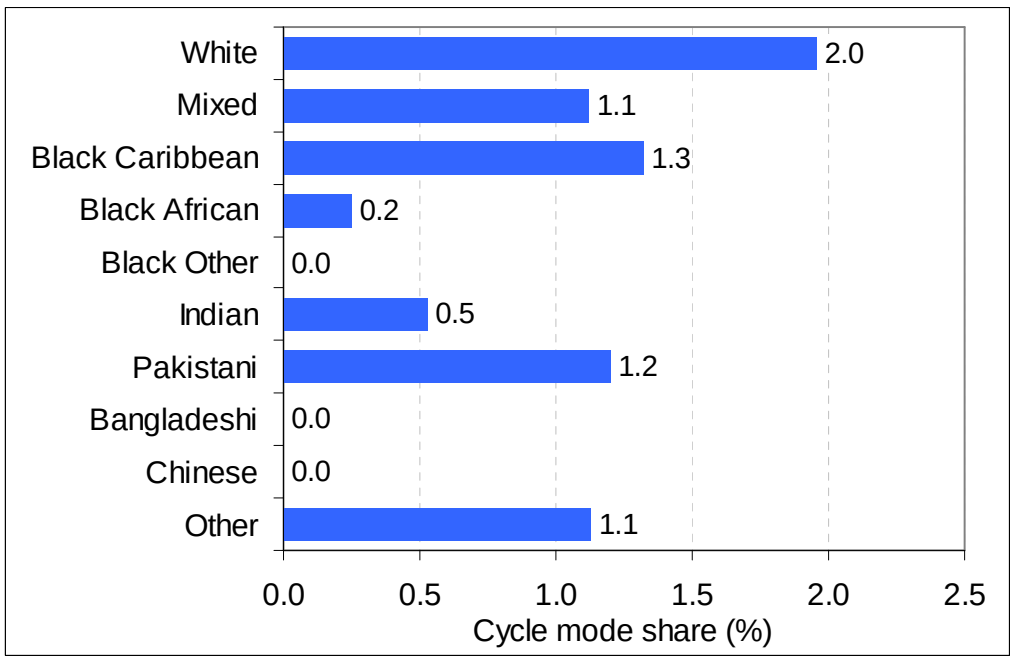
FIGURE 3.3 BICYCLE MODE SHARE AND WORKING STATUS (2006/7)



Source: LTDS [1]

3.5 Bicycle mode shares tend to be lower for people from non-white ethnic groups [1].

FIGURE 3.4 BICYCLE MODE SHARE AND ETHNIC GROUP (2006/7)

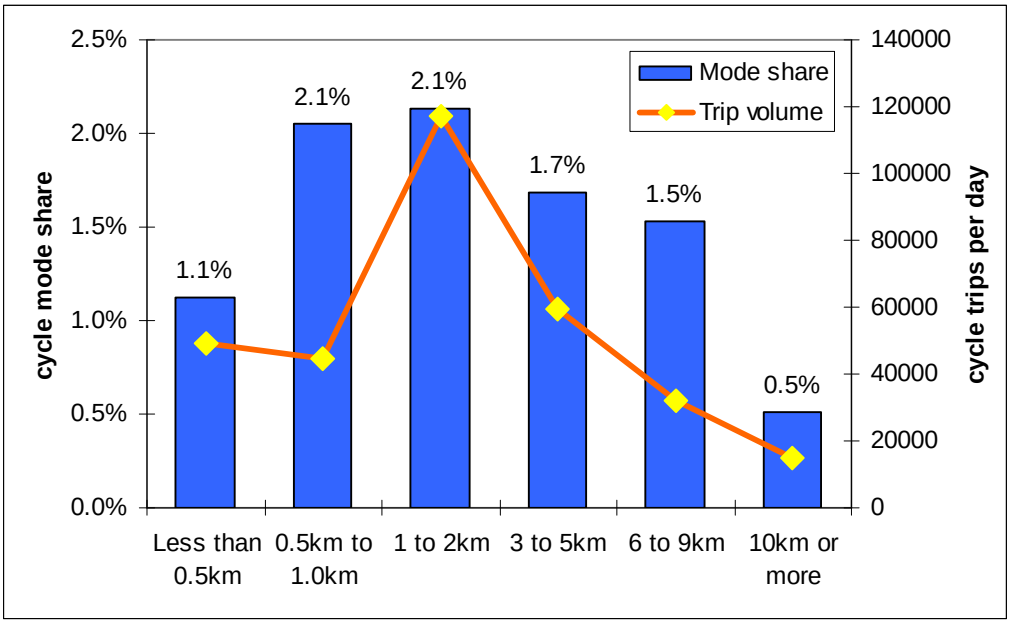


Source: LTDS [1]

3.6 in terms of trip length, bicycle has the highest share in the 0.5-2km (0.3-1.2 miles) range (below that it is dominated by walk, above by motorised modes). Nevertheless, its share holds up reasonably well until trip lengths reach 10km (6.2 miles) [134].

3.7 In volume terms though, 85% of bicycle trips are 5km (3.1 miles) or less [134].

FIGURE 3.5 CYCLE SHARE AND TRIP VOLUME BY LENGTH (2001)

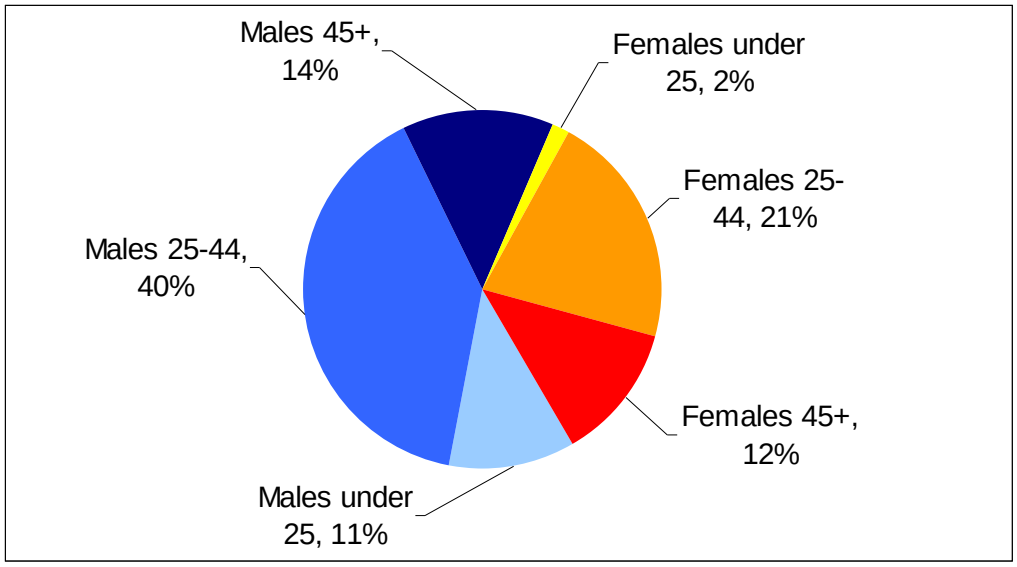


Source: LATS [134]

Note: LATS is based on 2001 data as trip length was not available from LTDS at the time of writing this report

3.8 Of all bicycle trips, two-fifths are made by men aged 25-44. Women across all ages combined account for a third of trips (see Figure 3.6) [1].

FIGURE 3.6 SHARE OF CYCLE TRIPS BY AGE & GENDER (2006/7)



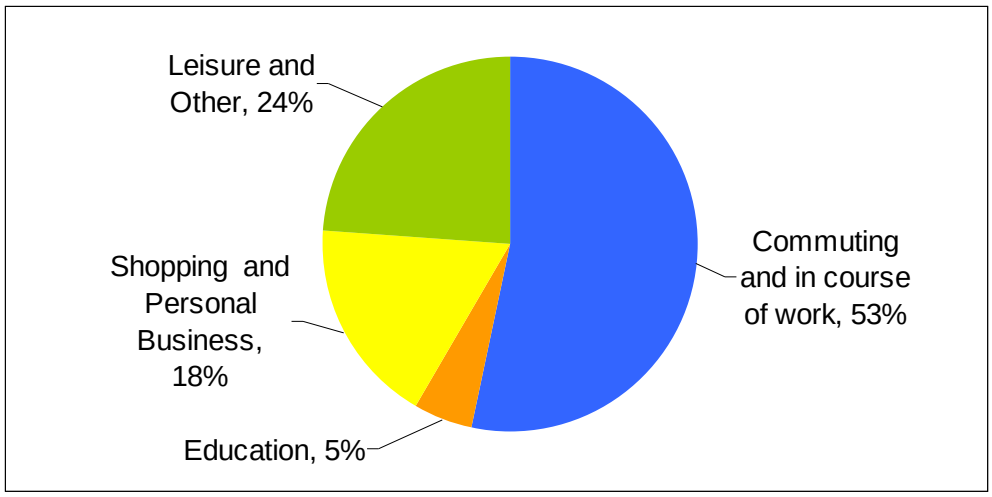
Source: LTDS [1]

3.9 The bicycle mode share for travel to school is 3% for secondary and 1% for primary schools, although this varies substantially between boys and girls (it is considerable higher for boys) and depending on the length of the journey: travel to school is examined in more detail in Chapter 11.

Purposes of bicycle trips

3.10 Broadly half of all cycling trips in London are for commuting or work purposes, with 5% for education, and a quarter each for getting to a leisure activity, and shopping/personal business [1].

FIGURE 3.7 PURPOSE SHARE FOR BICYCLE TRIPS (2006/7)



Source: LTDS [1]

4. CYCLING TRENDS

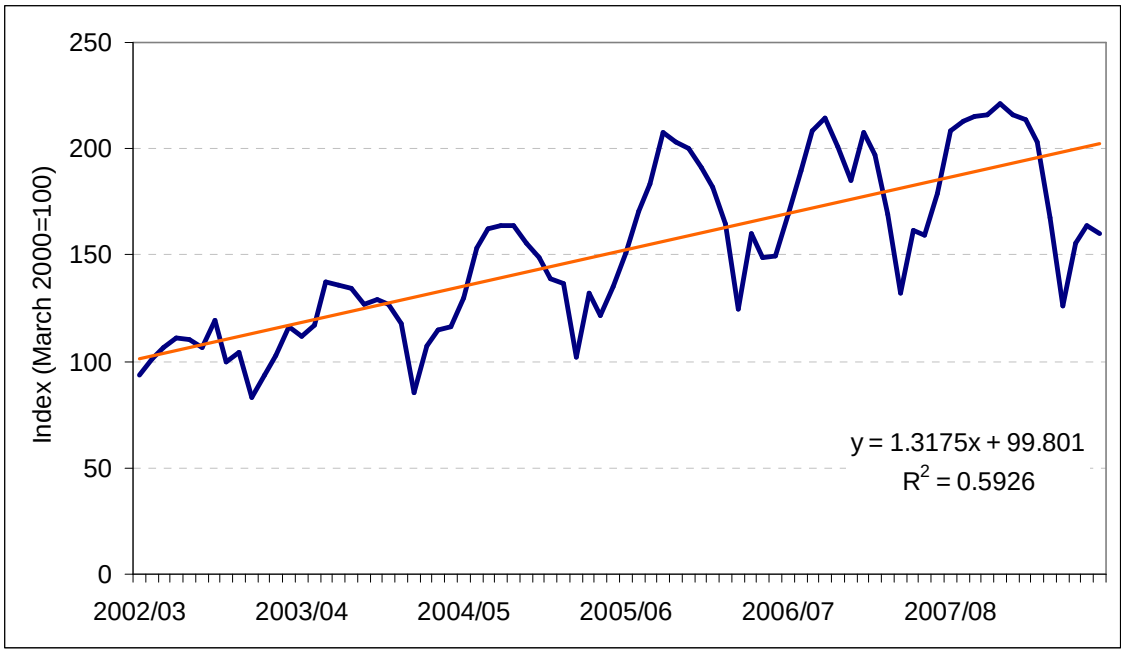
Summary

- There has been quite rapid growth in cycling in London between since 2003. This is illustrated by the 17% p.a. increase in cycle trips on the Transport For London Road Network, and the 43% increase in cycle mode share for travel into central London between 2003 and 2006.
- The reasons for this growth in cycling are a mix of "push" (such as road congestion, "pull" (such as health) and "trigger" factors (mainly changes in personal circumstances, particularly a change of home or job location).

Growth in trip volumes

4.1 The volume of cycle trips on the Transport For London Road Network (TLRN) has been growing at quite a rapid rate since 2003: equivalent to an average of 17% a year [1].

FIGURE 4.1 CYCLE TRIPS ON THE TRANSPORT FOR LONDON ROAD NETWORK (TLRN)



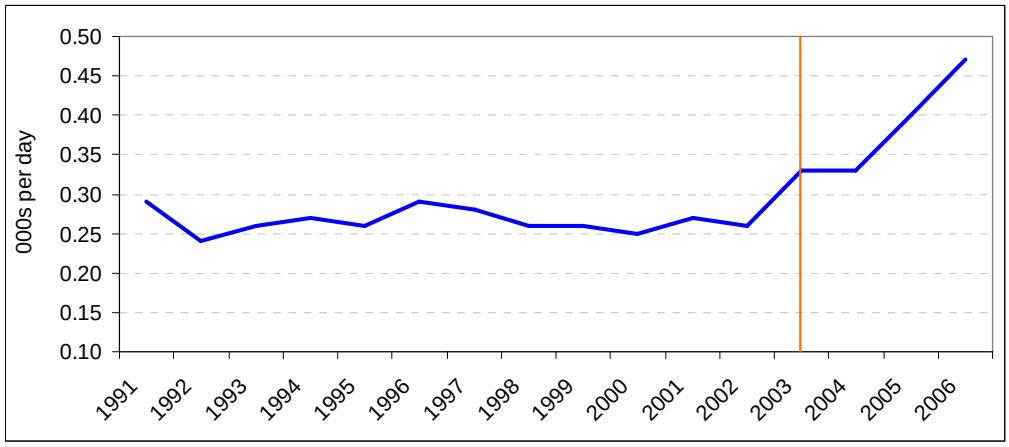
Source: Automatic Traffic Count data [1]

Note: trendline shows an average increase in trips over the period of 1.3% per four-week period

4.2 Data from cycling on major roads (Figure 4.2) highlights how there appears to have been a significant turning point in 2003: before then volumes were largely flat but between since then they have increased by 64%[1].

4.3 This is backed up by data on cycling into central London in the morning peak [1], though in this case the period of rapid growth appears to start slightly later (2004). In addition, the time series data on travelling into central London shows that the cycle mode share increased from 1.2% in 2003 to 1.6% in 2006, an increase of approximately two-fifths.

FIGURE 4.2 CYCLE TRIPS ON MAJOR ROADS



Source: Automatic Traffic Count data [1]

Reasons for growth

4.4 The reasons cyclists give for their own increase in cycling are a mix of "push", "pull" and "trigger" factors. Health and cost are the most frequently mentioned pull factors, while road congestion is the dominant push factor, though poor reliability of public transport is also important [11, 66]. The "trigger" factors are primarily changes in personal circumstances, particularly a change of home or job location also play a role (see Figure 4.3) [66].

4.5 Research into the process of behaviour change shows that on their own, these motivating ("push" and "pull") factors are not usually

[1] the 64% increase refers to the change between 2003 and 2006

sufficient to generate a substantial change in behaviour, which is dominated by habitual behaviour. Rather, a trigger is usually required to stimulate a significant change in behaviour, while motivators like health help to determine the nature of this change [135].

4.6 Interestingly, the introduction of central London congestion charging has been identified as a significant trigger factor which appears to have led many Londoners to think about their travel rather than continue with their usual routine [136] and this is picked up in Figure 4.3 below as a contributory "negative car" factor.

4.7 In interpreting Figure 4.3 (and indeed any quantitative research based on respondents explaining a behaviour) it is worth recognising that it is human nature to post-rationalise and look for plausible answers (qualitative research can overcome this tendency and uncover more deep-seated and emotional influences).

FIGURE 4.3 REASONS GIVEN FOR CYCLING MORE (2004)

Positive cycling	**All (%)**	**Main (%)**
Cycling is healthy	73	19
Cycling is cheaper than alternatives	66	6
Cycling is enjoyable	49	10
Have friends / family who cycle	33	6
Joined cycling club	12	1
Negative car	**All (%)**	**Main (%)**
Roads are too congested when driving a car	61	23
Congestion charging	54	2
Car parking prices are too high	50	5
Neutral	**All (%)**	**Main (%)**
Changed home address	49	4
Change in employment/employment status	27	2
No longer have car / motorbike	16	1
Negative public transport	**All (%)**	**Main (%)**
Public transport is unreliable	45	11
Public transport is overcrowded	28	1
Other	**All (%)**	**Main (%)**
Any	53	11

Source: Near Market for Cycling [66]

Note: "All" = all mentioning, "Main" = stated main reason

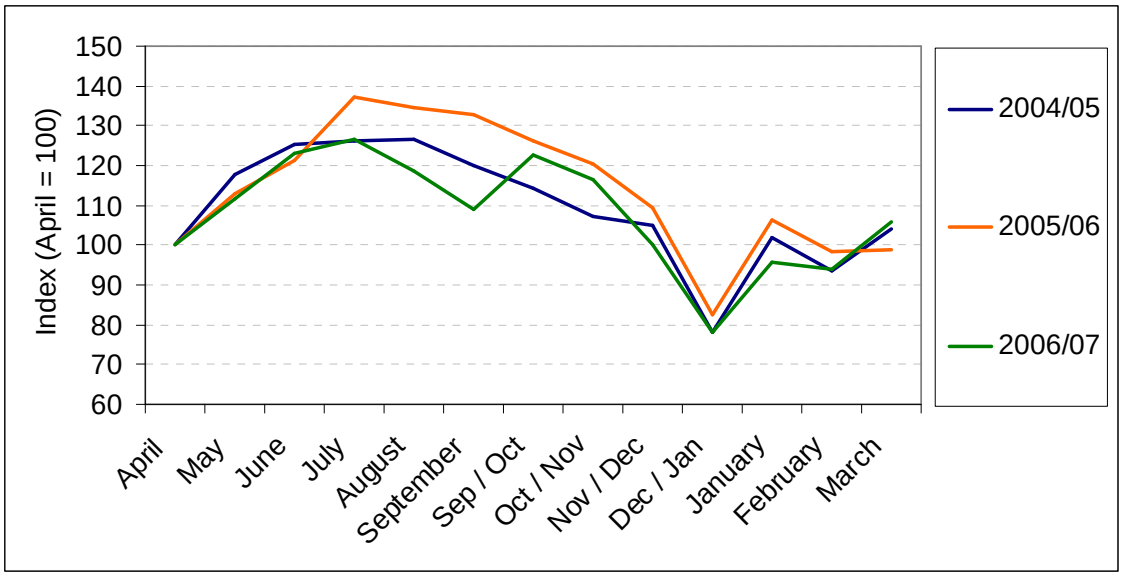
Seasonality of cycling trips

4.8 The volume of cycling trips on the TLRN over three years is illustrated in the chart below. Overall, the busiest period has around 60% more trips than the quietest period for cycling.

4.9 The busiest of the thirteen four-weekly periods are in July, while the quietest is the December / January period.

4.10 Since a high proportion of cycling trips are for work, holidays will affect the seasonality figures, which probably explains the slightly lower August / September volumes noticeable in 2006/7.

FIGURE 4.4 SEASONALITY OF CYCLE TRIPS ON THE TRANSPORT FOR LONDON ROAD NETWORK (TLRN)



Source: Automatic Traffic Count data [1]

5. ATTITUDES TOWARDS CYCLING

Summary

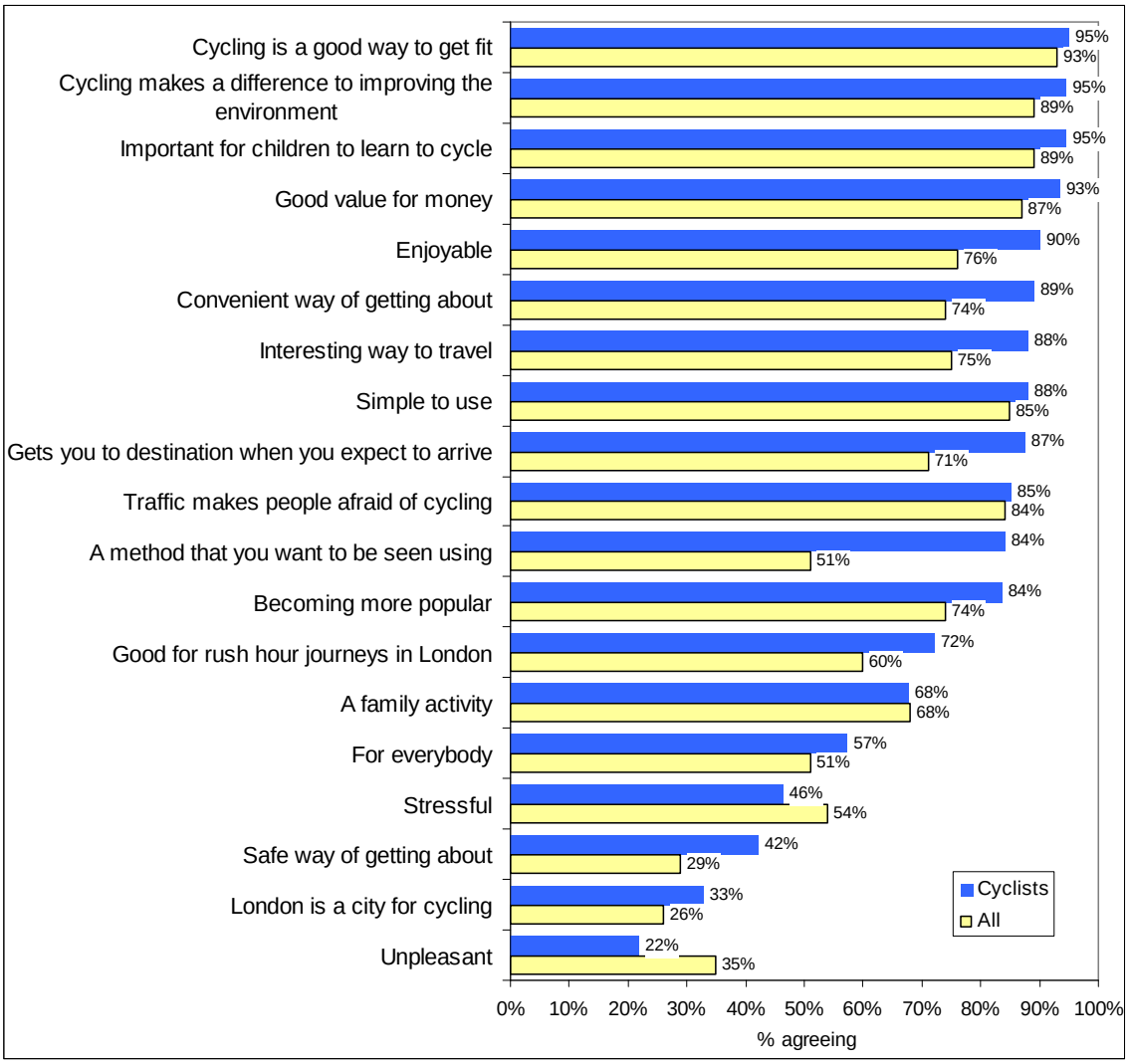
5.1 The key issues raised in this chapter are:

- there is a noticeable gap in attitudes between cyclists and non-cyclists, which is bigger than for other modes and likely to be a barrier to cycling becoming viewed as a mainstream mode [11,2007];
- for cyclists, good for the environment, good value for money, enjoyable and a convenient way of getting about. It gives a sense of control and freedom [11,2007; 75,2005];
- for non-cyclists, it is a means of travel which is perceived as dangerous, and which they wouldn't wish to be associated with, in part because there is a tendency to stereotype cyclists as "urban warriors" who have little respect for other road users [75,2005]. This image is one which cyclists themselves recognise, but do not like;
- nevertheless, the idea of cycling has an appeal from an enjoyment, environmental and health point of view, and can evoke positive childhood memories [75,2005].

Attractions of cycling

5.2 Cycling is widely seen as a good way to get fit, good for the environment, good value for money, enjoyable and a convenient way of getting about. However, safety is an issue: a large proportion agree that traffic makes people afraid of cycling in London, and only a minority (three in ten) agree that cycling is a safe way of getting about. Overall, around one-third of cyclists would say that "London is a city for cycling". Figure 5.1 provides further details relating to fourteen attitude statements used in the TfL omnibus survey on cycling [11].

FIGURE 5.1 ATTITUDES TO CYCLING (2007)



Source: TfL Omnibus Survey [11]

5.3 The reasons why people do and do not cycle are explored further using a more qualitative approach in the Challenging Attitudes to Cycling study [75]. A summary diagram from this is provided as Figure 5.2.

5.4 Practical considerations (speed, consistent journey times) are important for those cycling for a purpose (such as commuting), while health and the environmental benefits can apply to all. As the quotation below illustrates, the attraction of cycling goes beyond the practical and provides a positive, aspirational feeling:

The best thing, I'm in control, and I feel less like a commuter, it feels better

Cyclist, Southwark [75]

5.5 Also at a more emotional level, the idea of cycling for leisure also carries positive connotations of youth and freedom. This sense of nostalgia leads many to aspire to images of cycling in the park with their children. As such, many identify with the image here of a mother and child in Richmond Park.

5.6 Safety and risk of an accident is the primary deterrent amongst non-cyclists…

Well, with the amount of cars, motorbikes, busses, it's dangerous. I mean, I certainly wouldn't let a youngster go on a bike anywhere

Non-cyclist, Harrow [75]

I did once, and I'll never do it again. I have never been so frightened in my life. It was awful

Non-cyclist, Harrow [75]

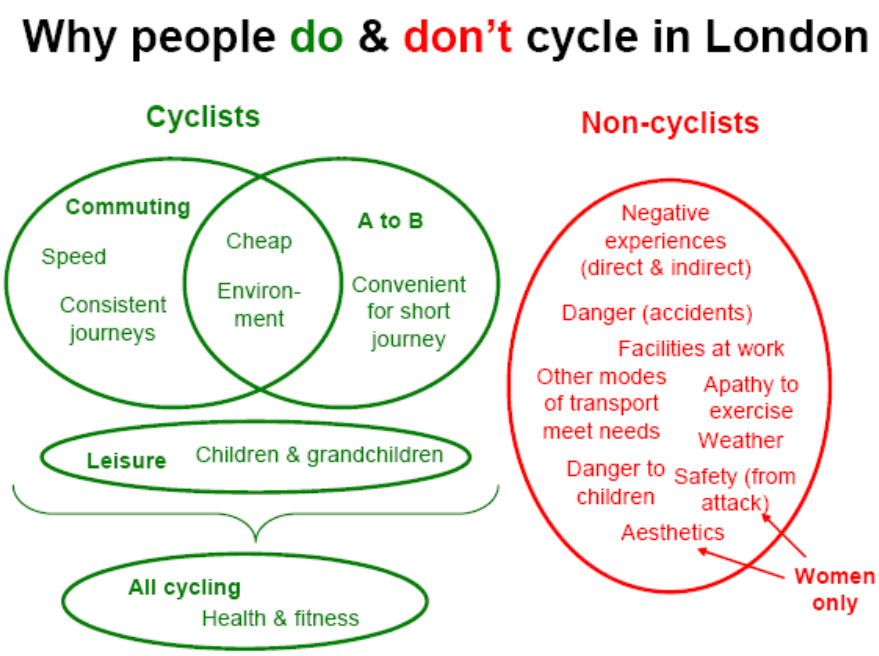
5.7 Cycle lanes are perceived to be necessary to negate these fears. However, views amongst regular cyclists are somewhat different and these feel that few cyclists actually use cycle lanes.

5.8 On top of viewing cycling as dangerous, non-cyclists can be discouraged from cycling in London because of the weather and a general aversion to all forms of exercise. Female non-cyclists may be further deterred by fears of personal safety (i.e. attack) and the aesthetic effects of cycling (i.e. sweat and red cheeks) [75].

5.9 Cyclists would like to cycle more in London but feel that current facilities inhibit them. Supermarkets and train stations have insufficient bicycle racks and workplaces offer few racks, showers or lockers. Each of these hinders commuter and "A to B" cycling.

5.10 There is also a significant aversion to exercise among non-cyclists. In an age when obesity rates are soaring, perhaps this physical apathy is a reflection of society.

FIGURE 5.2 REASONS FOR CYCLING OR NOT CYCLING



Source: Challenging Attitudes to Cycling [75]

Gap in opinions between cyclists and non-cyclists

5.11 As is to be expected, cyclists have a more positive opinion of cycling than Londoners in general with higher proportions agreeing with positive statements and lower proportions agreeing with negative statements. However, it is particularly interesting to note that for most of these statements the level of agreement amongst cyclists and all Londoners is quite similar, but with the notable exception of "is a method of transport that you would want to be seen using". For this statement, while 84% of users agreed, just 51% of all Londoners did [11] (see Figure 5.1).

5.12 This illustrates the negative imagery that is associated with cycling, and cyclists. Cyclists in London are seen as a nuisance among both non-cyclists and cyclists. Much the same as the common car driver dictum, cyclists view all other cyclists as awful – yet they exclude themselves from this categorisation [75].

5.13 The average cyclist in London is sometimes likened to an urban warrior (see the picture opposite and quotes below) and though this kind of image is recognised by cyclists, it is one they do not like, and do think applies to them personally [75].

> *I think they're … a bit kamikaze (Non-cyclist, Southwark)* [75]
>
> *he really annoys you when you're driving or walking. He cuts you up, goes through the red light* (Non-cyclist, Harrow) [75]
>
> *Everybody I've spoken to about cyclists, people that don't cycle, the first thing they say is, they're a blooming nuisance. That's the general response I've had from everybody I've mentioned to about cyclists. A blooming nuisance on the road* (Non-cyclist, Harrow) [75]
>
> *The golden rule on the road: everybody other than you is a complete idiot* (Non-cyclist, Southwark) [75]
>
> *He's gone out and bought himself a high spec bike and he doesn't know how to ride it and he doesn't know to look over his shoulder before he pulls out* (Cyclist, Southwark) [75]

The relative appeal of cycling compared to other modes

5.14 Benchmarking the appeal of cycling against other modes is revealing and shows that cycling, along with walking, has the greatest appeal amongst users (the Tube has the least appeal amongst users of the mode) [44]. Even more enlightening though is the finding that the gap between users and non-users is far greater for cycling than any other mode. Thus, while 88% of cyclists find it appealing, only 48% of non-cyclists do.

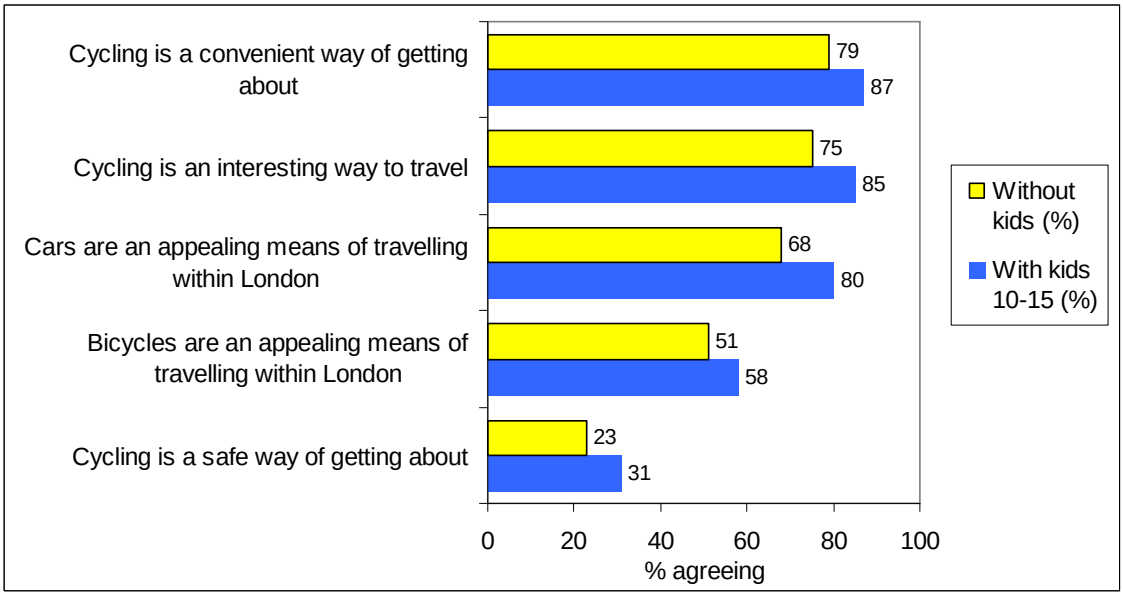
5.15 This reinforces the picture identified earlier of the cyclist being seen as a breed apart.

Attitudes of parents

5.16 TfL are keen to encourage youngsters to cycle more often and an influence on this is the attitudes of parents. Comparisons between the attitudes of adults with and without children aged 10-15 are compared in Figure 5.3 [44]. Parents of 10-15s are more positive about the benefits of cycling but also find the car significantly more appealing than non parents.

5.17 The issue of danger and a fear of accidents has a particular impact on the children of non-cyclists who feel that cycling is dangerous. While well-meaning and in the interests of protecting their children, such attitudes do mean that these children are less likely to be encouraged to cycle by their parents [75].

FIGURE 5.3 ATTITUDES OF PARENTS (2005)



Source: TfL Omnibus Survey [44]

Aspirations for cycling

5.18 The aspirations for cycling, as taken from the study Challenging Attitudes to Cycling [75] are summarised in Figure 5.4, which makes a distinction between three groups: cyclists, non-cyclists who are interested in cycling, and non-cyclists who have no interest in cycling.

5.19 Cycling is widely regarded as a "good thing", as illustrated by the comment below. But for current users, lack of good facilities can hold back further use, while for non-users fears over safety are a major barrier which may require segregated cycle routes to overcome them.

> *They are environmentally friendly things. There is no question. If we can all learn, as they do on certain areas of the continent, to ride a bike with discipline, with decorum, with respect, then cycling is fantastic. It's good for the exercising. It's good for the environment*
>
> Cyclist, Harrow [75]

FIGURE 5.4 ASPIRATIONS FOR CYCLING (2005)

Aspirations for cycling in London

Cyclists	Non-cyclists	
Interested	***Interested***	***Uninterested***
Like to cycle more Facilities hold them back Trains and supermarkets lack enough safe cycle racks & workplaces lack showers and lockers as well Quality of cycle routes is a major gripe BUT better lanes unlikely to make them cycle more as hardly used	Cycled as a child ⟷ Cycling = youth and fun Leisure cycling appeals NOT commuting or A to B Like to cycle with and teach children to ride BUT need a safe environment separate from cars e.g. park or exclusive cycle lanes	Cycled as a child Too dangerous now Car is king Bike is no longer appealing

Source: Challenging Attitudes to Cycling [75]

6. BENEFITS OF CYCLING

Summary

- Cycling has benefits for both the individual and society as a whole.
- These benefits include improved health and fitness, reduced pollution, reduced congestion, better journey time reliability, improved social inclusion, and improved mental wellbeing of travellers [10, 2004].
- Some of these benefits can be quantified in economic terms using a cost-benefit analysis approach. This approach can be applied to specific schemes, and in an evaluation of four case studies, all came out as having a positive net benefit, though with the extent of this net benefit varying substantially [6,2007].

Overview of benefits

6.1 Cycling can benefit both individuals and society, by:

- improving health & fitness of individuals and reducing the costs of health treatment, inactivity and premature death [6];
- reducing pollution and thereby reducing the associated health costs [6]; and
- reducing congestion and as a consequence, improving journey time reliability, improving the travel experience and reducing pollution [6].

6.2 Each of these benefits can be evaluated in economic terms, and each is considered in a little more detail in the following sections. In addition though, there are some harder to quantify benefits:

- improved perceived security and comfort accruing from better cycling infrastructure;
- social inclusion in cases where it enables people and communities without access to cars or public transport to connect with each other;
- improvement to the mental wellbeing of the traveller;
- benefits to tourism;
- in London, where there is congestion on public transport, there is a benefit of substituting Underground and bus trips for bicycle (this benefit was not included in the TfL Business Case [59] or subsequent Cycling England study, “Valuing the benefits of cycling” [6]).

Health benefits

6.3 The justification for cycling having positive health benefits is made within the 2007 report "Valuing the benefits of cycling"[6]:

- there is a strong link between physical activity and health. The current recommendation of 30 minutes exercise, five days a week is being met by 37% of men and 25% of women;
- physical activity reduces the risk of developing major chronic diseases (e.g. coronary heart disease, stroke and type 2 diabetes) by up to 50%, and the risk of premature death by about 20-30%;
- reducing inactivity and obesity will improve lives, reduce health care costs and improve productivity;
- the easiest and most acceptable forms of physical activity are those that can be incorporated into everyday life, which include walking or cycling instead of driving;
- the relationship between inactivity and risk of chronic diseases is "curvilinear". The scale of benefit is greater at higher levels of activity but there is a 'law of diminishing returns';
- in addition, inactivity leads to higher health care costs and absences from work;
- cycling can make a major contribution to reducing obesity, although this cannot be valued in the same way. As well as the possibility that obesity will track through into adulthood with the associated costs, reducing obesity can help improve confidence and self esteem among children. Cycling can build up physical activity as a habit as well as help other aspects of physical development.

6.4 The same report [6] attempts to quantify these benefits in economic terms by evaluating the effects of a cyclist travelling 624 kms a year (based on three trips per week, each of 3.9km). This level of cycling is regarded as sufficient to create a modest step up in physical activity which then generates the health benefits.

6.5 The values in this report are summarised in Figure 6.1. This shows that the overall health benefit is equivalent to £159.48 per cyclist per year. In other words, if £160 per cyclist was spent on promoting cycling the health benefits would pay this back in one year, through a combination of savings to the NHS, productivity savings (for example from less time lost to illness), and fewer deaths through poor health.

FIGURE 6.1 VALUE OF HEALTH BENEFITS OF CYCLING (2007)

Health benefit	Values PER YEAR of cycling	Note
Value of loss of life	£11.16 for 16 – 44 year olds £99.53 for 45 - 64 year olds £242.07 for 65 year olds and over £58.77 average	SQW estimates based on NHF data Note £498 for commuters found by Copenhagen study
NHS savings	£28.30 for all cyclists	Uses National Heart Forum scenario applied to costs of treating CHD – applicable to all cyclists
Productivity gains	£47.68 all cyclists	Based on conservative assumption of lost GVA – applicable to working population cycling
Total health benefits	£87.06 for 16 -44 year olds £175.51 for 45 – 64 year olds £159.48 average	Assumes a full year of cycling by adult Note that older people will tend to have higher values
Child health and obesity	Not quantified	Requires a different approach based on cycling as an investment in reducing future health costs

Source: Valuing the benefits of cycling [6]

Pollution benefits

6.6 The contribution of cycling to reducing pollution depends on substituting car use for cycle trips. The valuation of pollution benefits made within the "Valuing the benefits of cycling"[6] report is based on:

- a reduction of external costs from the production of airborne pollutants and greenhouse gases. This includes the health costs associated with pollutants and the cost of carbon emissions based on the value of carbon derived from the Stern report's "business as usual" case;
- early action aimed at reducing carbon emissions to combat climate change, and that delays in action would lead to serious implications in terms of costs of mitigation;
- for metropolitan areas such as London, the Stern report [137] estimates values of 4.9 pence and 31.6 pence for petrol engine and diesel engine per car kilometre removed;
- if a cyclist in London makes 160 cycle trips of 3.9km, rather than by car, this would equate to pollution-related savings of £69.14 a year;
- this could include cycling to school rather than being taken by car.

Congestion benefits

6.7 The contribution of cycling to reducing congestion also depends on substituting car for bicycle, which tends to be most effective when cycling measures are seen as part of a wider set of transport measures. The economic valuation of congestion benefits made within the "Valuing the benefits of cycling"[6] report is:

- the value of reducing congestion is the benefit, as a result of less traffic, created for other road users;
- Sloman (2003) estimates that increased cycling could contribute to a 0.3% reduction (2003 – 2010) in national car travel demand. In the ambitious change scenario she argues that there could be a 1.2% reduction in car traffic;
- Cairns et al (2004) estimates that a high intensity scenario could result in a reduction in national traffic of 11% whilst the low intensity scenario would result in a reduction of 2-3%. These reductions would be dependent on other supportive policies;
- the value of substituting car for cycle trips is higher in areas of greater congestion and at peak times;
- to derive urban and rural values, data from the Surface Transport Costs and Charges report (1998) have been used to produce estimates of 22 pence in urban areas;
- if a cyclist makes 160 trips a year of 3.9km, rather than by car, this would equate to savings for other road users of £137.28 a year as a result of reduced congestion in urban areas.

Cost-benefit analyses

6.8 The recent Cycling England Study [6] drew on the TfL Business Case report [59] to undertake cost-benefit analyses on four case studies:

- **LCN+:** a network of cycle routes, cycle lanes, and junction improvements, implemented as part of a wider strategy of education and promotion. The cost-benefit analysis is based on TfL's forecasts for anticipated additional cycling trips;
- **Bike It:** aimed at increasing cycling by young people to school and more generally. Involves Cycling Officers providing training and support, and various events such as Bike to School Week;
- **Links to Schools:** aims to connect young people to their schools by providing traffic-free and traffic-calmed walking and cycling routes. There have been 147 links developed providing improved walking and cycling access for over 300 schools;
- **Cycle Training:** this case study is based on work carried out in 2003 for Cycle Training UK by Transport for London's Centre of Excellence. This reviewed the effectiveness of their cycle training courses over the previous five years. The training included one-to-

one sessions that aim to assist people of all ages to gain more confidence and develop their cycling skills.

6.9 A summary of these cost-benefit analyses is provided in Figure 6.2. Some points to note are:

- all the case studies show a positive "benefit cost ratio" meaning that their benefits are greater than their costs (calculated by dividing the benefits by the costs, so the higher the value, the better the business case);
- the LCN+ value includes an estimate for the ambience benefits of cycle lanes (and as a consequence is higher than in the TfL Business Case [59]);
- although the LCN+ valuation was based on estimates of additional trips, monitoring data does appear to show that these are realistic;
- the cycle training benefits are influenced by a number of assumptions about the lifespan of the effect (assumed to be five years), the representativeness of survey data, and the causal effect of the training and subsequent increase in cycling. For these reasons, the benefit to cost ratio may be on the high side, but would still be positive;
- for each of these evaluations, the assumption is that 25% of any additional cycling trips were previously made by car;
- the longer term health benefits to children are not included, and nor are the benefits to existing cyclists of accident reduction measures.

FIGURE 6.2 SUMMARY OF EVALUATION OF CYCLING CASE STUDIES (2007)

£ millions

	Links to Schools	Bike It[114]	LCN +	Training
Appraisal period	30 years	4 years	30 years	5 years
Benefits	£4.80	£0.33	£794	£0.79
Costs	£2.22	£0.24	£201	£0.11
Net Present Value	£2.58	£0.09	£592.50	£0.68
Benefit cost ratio	2.17	1.36	3.94	7.44

Source: Valuing the benefits of cycling [6]

7. BARRIERS TO CYCLING

Summary

7.1 Barriers to cycling fall into two broad categories: those to do with physical, "infrastructure" issues which can be addressed by measures such as cycle lanes, and those to do with perceptions and "image" which require a behaviour change approach such as training and advertising. Thus, while safety is the number one barrier, this has two aspects to it: the physical problems of high volumes of traffic and lack of good cycle routes; and the fear aspect (Figure 7.1 illustrates this distinction further).

7.2 The other infrastructure type barriers are lack of secure parking facilities, dedicated information/signage and changing facilities at destinations [50, 2002; 51, 2004].

7.3 The image issues, although harder to research and measure, should not be regarded as less important because of this. These image barriers include a general view that London is not designed for cyclists [15, 2007], a poor view of cyclists themselves and how they are perceived [11, 2007;10, 2004]. In other words, phrases like "hot and sweaty" do not just reflect a need for shower facilities, they also reveal an underlying negative image of cyclists which people would rather not be associated with.

FIGURE 7.1 OVERVIEW OF BARRIERS

	Infrastructure	Image
Safety	• Lack of segregated cycling routes • Volume of traffic • Speed of traffic • Driver behaviour	• Fear of other traffic • Attitudes of car/taxi/bus drivers • View that "London is not a good place to cycle" • Lack of confidence
Facilities	• Lack of secure bicycle parking facilities • Lack of changing and showering facilities	• Fear of cycle theft • Not wishing to look "hot and sweaty"
Other	• Lack of information about secure bicycle parking and cycling facilities	• Habitual nature of travel • Poor image of cyclists • Perception that cycling is primarily for healthy men

Safety

7.4 For journeys in London that could be made by bike, the most commonly mentioned barrier is fear of other traffic and attitudes or behaviour of other road users towards cyclists. Despite a decrease in cycling casualties since 1998 [71] the majority of non-cyclists (including potential cyclists, parents of children who could cycle etc.) who are perhaps motorists themselves still hold a generally negative attitude towards cycling safely in London overall.

7.5 In a 2007 online survey of 575 residents of London Boroughs just 26% of residents agreed with the statement "London is a good place for cycling" and 26% agreed that "cycling is a safe way of getting around" [15]. Similarly, the 2005 cycling omnibus survey saw 87% of respondents agreeing with the statement "traffic makes people afraid of cycling in London" [44]. Though an encouraging sign could be that in the more recent 2007 omnibus the figure had dropped to 80% [97].

7.6 Safety aspects were considered in 2003 qualitative research [85] with cyclists and non cyclists who identified "busy roads", "lack of cycle lanes", "unpredictable behaviour by motorists (sudden opening of doors or pulling out of side roads)" and "confusion about cycle lanes both by motorists and cyclists" as the top barriers to cycling. As a result cycling during peak hours was avoided by many.

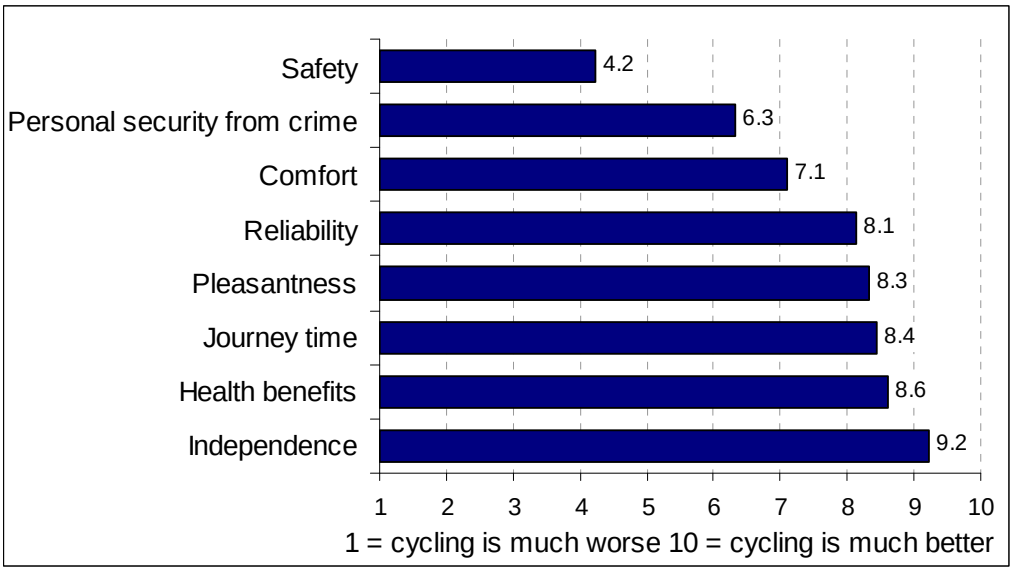
7.7 Similarly, the "Gap Groups" research study [41] identified the "absence of continuous cycle lanes" and "lack of physical separation" as top perceived barriers for actual and potential cyclists. Potential cyclists in particular were frightened by traffic and found it "intimidating". In addition, leisure travellers were put off making extra trips by the level of traffic.

7.8 Recent qualitative research into personalised travel planning in Camden revealed that barriers to cycling in terms of safety were linked to "poor road surfaces (i.e. pot holes, cobbles etc.)", "too few cycle lanes", the "hazard from buses (and in particular bendy buses)" and "little knowledge about flags and helmets" [80].

7.9 Even amongst cyclists themselves there is a feeling of being the "least protected" of all road users [80].

7.10 In comparison to other modes (including Underground, bus, car, walking, DLR, taxi and train) cyclists think that safety is much worse (see Figure 7.2) [79].

FIGURE 7.2 COMPARISON OF CYCLING WITH OTHER MODES (2003)



Source: Cycling Infrastructure Initiatives [79]

Note: this survey was undertaken amongst cyclists

7.11 Children are also prevented from cycling by road traffic levels. In 2006 research into the youth market [87] reported that even though just over half of 10-15 year olds own a bike, only 3% of secondary school children cycle to school the reasons being parental concern about safety on roads as well as lack of bike sheds/responsibility taken by schools for bikes.

7.12 In a study of secondary school children cycling is acknowledged as a dangerous activity, and busy roads are big hazards for many of the cyclists. For the majority, traffic is the chief downside of cycling in London [54]. A wider ranging literature review on children and teenager's attitudes towards cycling identify barriers such as distance and lack of time as more important than safety concerns [84], leading to the assumption that safety concerns are London specific.

7.13 Amongst disabled people too the main barrier to cycling is the volume of traffic in London and the potential for accident and injury to the cyclists. Additionally central London was seen to be particularly hazardous due to the speed of traffic and some negative perceptions of London drivers [18].

7.14 Other safety concerns not associated with traffic included fear of assault especially amongst women, or generally in parks or on riverside parks and not being seen in the dark [79].

Physical barriers - facilities

7.15 For commuting, a host of barriers related to practicality are mentioned. The need to carry work related objects, change clothes and park the bicycle somewhere safe all add to a 'hassle factor' not experienced by using other modes which require less effort for example public transport. Other barriers such image, the weather and lack of confidence exacerbates these physical deterrents.

7.16 Lack of secure parking, shower and changing facilities through to having to carry heavy luggage are often mentioned as barriers to cycling more for commuting (explored further in Chapter 9), shopping and getting to some leisure activities. Some of these barriers have been addressed by providing improved cycle parking facilities, although even when these have been implemented, the security of bikes left unattended still seems to be a problem [51].

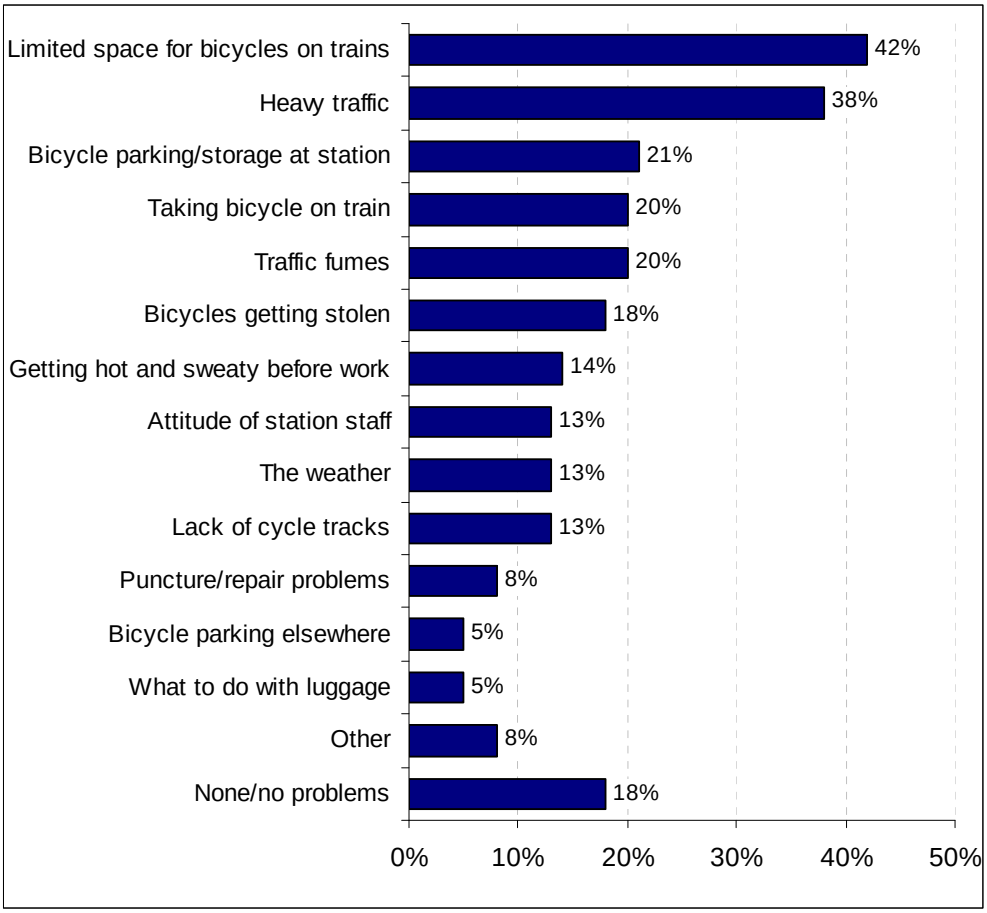
7.17 People who cycled at least once a month in London were asked to rate a list of six cycling aspects in their area and the two lowest satisfaction levels were for the availability of cycle racks or stands and the security of the bike when it is left.

7.18 The mean ratings of parking facilities for bicycles are rising however, with the biggest increase in satisfaction in the North Central area [68]. The impact of improvements to cycle parking facilities at rail stations was assessed in a study of cyclists and station users at Surbiton Station in Surrey. In addition to 3% of station users who had started cycling to the station (equivalent to 9 new cyclists) 22% of station users agreed with the statement that the new facilities "had made them consider cycling in the future".

7.19 However, there is clearly a perception that bicycles left at the station would not be safe, with 30% of station users stating this as a reason for not cycling to the station and 23% stating that they would not have been able to take the bicycle on the train with them as the reason. In response to whether CCTV would allay people's fear of bicycle theft and encourage them to cycle to the station 35% agreed and if station users were allowed to take their bicycle on the train 31% would be encouraged to cycle [51].

7.20 A survey of commuter cyclists at Waterloo Station similarly identified major barriers that had to be overcome as "limited space on trains", "bicycle parking/storage" and "having bicycles stolen" as well as "heavy traffic" and "pollution" . Other less frequently mentioned barriers to cycling to work were identified as "getting hot and sweaty before work" (14%), "attitude of station staff" (13%) and the weather (13%) [50] (see Figure 7.3).

FIGURE 7.3 BARRIERS TO CYCLING IN LONDON (2002)



Source: After Rail Cycling [50]

8. MEASURES TO INCREASE CYCLING

Summary

8.1 There is some evidence that measures aimed at increasing cycling can be successful, but this is not always the case. Apparent successes include:

- improvements to cycle routes with surfacing work, traffic calming, and segregated cycle lanes: these can lead to reported increases in use in excess of 50% (though the source of this increase and the extent to which it might be captured from car is often not known) [59, 2004];
- cycle training: this can lead to significant increases in reported cycling amongst those that attend [59, 2004]; and
- provision of secure cycle parking: for example, providing safe cycle parking at Surbiton station led to a third of users of the facility switching from another mode, including 10% from car [51, 2004].

8.2 The success of some other measures has been less clear:

- those attending cycling events typically report positive attitudes, but it is also the case that these tend to attract people who are already interested in cycling [75,80,82,83, 2005-7];
- the monitoring of cycling advertising campaigns have shown ad awareness and positive attitudes towards cycling, but have not proved any causality (i.e. that the advertising has changed attitudes or behaviour) [90, 2006].

Introduction

8.3 In this chapter we summarise the evidence on the impact of measures to increase cycling including:

- new cycle schemes;
- measures to improve the safety of cycling;
- information;
- training;
- cycle parking; and
- advertising.

Impact of cycling schemes

8.4 New cycling schemes can generate substantial increases in cycling trips, as shown in the table below [59]. However, their effectiveness does depend on the design of the scheme and the starting position (where there is very little cycling before the scheme is introduced,

percentage increases can look very impressive).

FIGURE 8.1 IMPACT OF NEW CYCLE SCHEMES IN LONDON (2004)

Location	Impacts
Riverside Path (LB of Richmond)	Recent cycle counts on the route junction by Teddington Lock Bridge and Thames path show that the number of cyclists on these cycle paths have doubled between April 2001 and May 2003, partly due to the resurfacing of the cycle path (previously un-made up surface).
Royal College Street (LB of Camden)	A two-way off-carriageway cycle track has been introduced on Royal College Street, linking Kings Cross and Camden Town. The number of cyclists increased by 58% over 3.5 years.
King Charles Street (RB Kingston)	On King Charles Street, a range of measures such as traffic calming, counter-flow cycling, speed humps for cars with a passage for cyclists and a segregated section, was introduced in 2002. The number of cyclists increased by 49% over 2 years.
Forest Road (LB Waltham Forest)	New cycle lanes and special traffic lights giving cyclists priority led to an increase of cycling levels of 65% on Lee Bridge Road and 118% over 4 years on Forest Road.
Kings Road (LB HF)	Cycle lane improvement led to an increase in cycle flows of 31% over 4 years on Kings Road.
Kensington High Street (RBKC)	Cycle flows in May 2003 have gone up by over 50% after the introduction of a new street layout, a high number of new cycle parking stands and the congestion charge. Compared with measurements in July 2001, eastbound cycle flows have gone up by about 60 cycles an hour. Eastbound cycles in the am peak now makes up about 27% of traffic compared with 14% in the before situation. Taking into account weather conditions on the survey days, the effective increase could be even higher.
Kensington Gardens (Royal Parks)	The conversions of two pedestrian paths to pedestrian/cycle shared use in spring 2001 attracted a high number of cyclists to Kensington Gardens. The number of cyclists increased from 13 per hour (although forbidden) to 106 per hour.

Source: Business case for cycling [59]

Measures to reduce the safety barrier to cycling

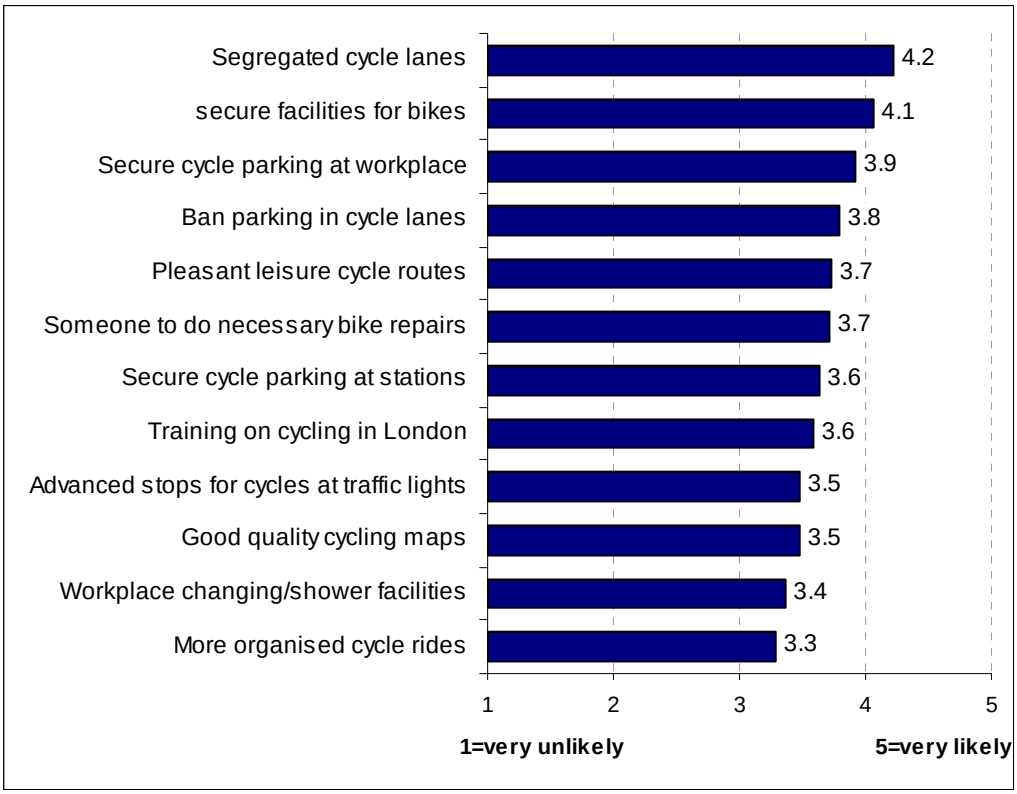
8.5 In response to people's safety concerns several studies have been carried out to identify how people can be encouraged to cycle more. With specific regard to traffic, one study looked at the effects of cyclists using the A23 bus lane. Although 60% of cyclists said they felt much safer, 24% reported no change in feelings of safety and 17% felt much less safe [77]. The main problems were inconsiderate bus drivers, buses being too close, and other traffic.

8.6 Complete segregation from traffic seems to have the biggest effect on intention to cycle and cycling more often. When Battersea bridge was closed unexpectedly to all traffic except pedestrians, cyclists and buses travelling in one direction only, an opportunity arose to conduct research on cyclists attitudes towards using the bridge in much

reduced traffic. Amongst all bridge users the closure to traffic had a positive effect, but this was most prevalent amongst cyclists (75%) rather than walkers (59%) [58].

8.7 A sample of 854 respondents who had decreased their amount of cycling due to too much congestion/traffic (51%) stated that segregated cycle lanes would lead to the most people taking it up again [66]. In the London Cycling Action Plan (2004), 67% of Londoners want more cycle lanes, 56% want road space converted to bus lanes, cycle and pedestrian use and 24% Londoners would cycle to work if adequate facilities were in place [10]. Cycle lanes were at the centre of required improvements for potential and actual cyclists in making London a better place for cycling in [66].

FIGURE 8.2 STATED IMPACT OF MEASURES (2004)



Source: The Near Market for Cycling in London [66]

8.8 Studies on the effectiveness of Advanced Stop Lines (ASLs) for bicycles also show mixed success. Designed to help cyclists reduce conflict with traffic at junctions the cycle only areas extend beyond normal traffic stop lines, giving cyclists a degree of priority and allowing them to manoeuvre from junctions safely.

8.9 In one report on ASL's an increase of 26% in cycle flows was reported, however TRL also reported a 36% encroachment level by cars and other vehicles. Cyclists and motorcyclists were also reported to increase rates of jumping red lights. Despite these problems cyclists were reported to favour ASL's and satisfaction with cycling conditions on roads increased after ASL's had been introduced [19].

8.10 Whilst 49% of cyclists still rate the provision of cycle lanes/advanced stop lines as poor or very poor, the scores are a slight improvement on 2006, indicating that an increase in the availability of cycle lanes and advanced stop lines has been beneficial [68].

Information measures

8.11 One way of looking to encourage more cycling is to raise awareness of quieter routes by the provision of information, normally in the form of cycle maps or websites which identify quieter/cycle routes as well as having the effect of bringing places closer together so that they appear less disparate.

8.12 However cyclists tend to select routes based on the 'shortest and quickest' journey [41]. Other qualitative research found initial scepticism from commuters and leisure cyclists regarding information availability through a 'Virtual Cycling Club' if physical barriers towards cycling such as 'safety of roads' and 'lack of adequate cycle roads' were not tackled first [8].

8.13 A qualitative review of the London Cycling Guide with people who cycle in London revealed a "surprising lack of information required by cyclists on a regular basis". Most people the report identified were happy to find their way around routes they already knew or by using A-Z or the London Cycling Guide for unfamiliar journeys. The main need for on-going information relates to safe cycle routes and secure bicycle parking [85]. This is backed up by qualitative research with potential and actual cyclists which found that most used known car routes or A-Z to plan their journeys [41].

8.14 A study to identify the demand and prioritised content of a Virtual Cycling Club by user type identified different information needs for cycling 'activists', 'commuters' and 'leisure users' as shown below [8].

FIGURE 8.3 INFORMATION NEEDS (2007)

Activists	Commuters	Leisure users
Cycling Journey Planner	Cycling Journey Planner	Cycling Journey Planner
A Q&A section	Cycling tips	Fun Interesting places to cycle
A section for uploading pictures, favourite routes and shortcuts	Fun interesting places to cycle	A Q&A section
Fun interesting places to cycle	A Q&A section	
Insurance and security information	Cycling equipment reviews and tips	
News of London cycling events and group rides	Insurance and security information	
Personalised road works update	News of London cycling events and group rides	
Cycling Journey Planner	Personalised road works update	
	Special membership offers and discounts	
	A section for uploading pictures, favourite routes and shortcuts	
	General cycling news	
	London cyclist forum	
	SMS weather information	

Source: 'Virtual Cycling Club' Strategic Development Research [8]

Cycle Training

8.15 A study was undertaken on the effectiveness of its cycle training in 2003 [reported in the Business Case for Cycling, 59]. This survey showed that:

- 44% took road skills/confidence lessons, 41% complete beginner lessons and 15% beginner/control skills lessons.
- 84% own a bike and 15% bought a bike after, or as a result of, the training.
- 81% say they cycle more, or more confidently, now than before the training, 82% of them said this could be attributed to the

training.

- The reported frequency of cycling increased substantially after the training. 20% now say they cycle 5 or more days per week (compared to 8% before), 18% say they now cycle 3-4 days per week (5% before), 19% say they now cycle 1-2 days per week (13% before). Overall, the implied number of trips has more than doubled.
- The distance of cycling increased as well after the training: 13% now cycle 5 miles or more each way (9% before), 20% now cycle 3-5 miles each way (14% before).

Cycle parking

8.16 Some evidence for the effects of providing safe cycle parking comes from a study at Surbiton rail station [51]. In this example:

- a quarter stated that they only started cycling since the parking was introduced;
- nearly one in five cycle to the station more often;
- nearly a third stated that they would have been unlikely to have cycled without a parking facility at the station;
- nearly a third have replaced another mode of transport as a result of the introduction of the cycle parking facility and importantly, just over one in ten have replaced the car with cycling.

8.17 Results from the Department for Transport's Cycling Projects Fund suggest a substantial increase of 50% to 100% in cycling levels after the introduction of cycle parking facilities at different schools, while Results from the "Business Cycle" project in Central London suggest an increase of 20% to 50% in cycling levels after introduction of new cycle parking and shower facilities at the workplace [59].

Events

8.18 High profile cycling events go some way to successfully enhancing the image of cycling, increasing confidence and intention to travel to sympathetic audiences. A large online survey of people who registered for and took part in the GLA Freewheel event in 2007 found that the event had had a positive effect on attitudes [83]. This included 10% of participants stating that they would "consider commuting by bike", 6% stating that they "start commuting occasionally" and 4% stating they would start commuting regularly by bike. Interestingly 23% of participants thought the event had "made them feel more confident" about cycling.

8.19 Various surveys were carried out in relation to the Tour de France which took place earlier the same year as the GLA cycling event. Again, more positive attitudes towards cycling were reported with 50% of people interviewed after the event agreeing that they were motivated to cycle more or take it up due to the event. 21% said they were motivated to join a cycling club and 10% said they were motivated to take part in a cycling sports event [80].

8.20 The Tour of Britain (in which stage 6 was started in London in 2005) event analysis also caused a positive reaction amongst attendees with 45% believing the event would be very or quite likely to motivate people to cycle more. Of those who were likely to cycle more 41% thought this would be cycling for leisure whilst 5% specified this would be cycling to work, school or college [93].

8.21 However, although events have a positive effect on those attending them, there is a tendency for them to attract those who are already interested in cycling. For example, the Changing Attitudes to Cycling report [75] made the point that "Mass participation events do not appear to make cycling more accessible but instead seem niche and exclusive".

8.22 Increasing the profile of cycling through schools and TV advertising are two of the methods to encourage participation of cycling for sport amongst children. In a survey of cycling club secretaries to measure the impact of the Tour de France on cycling for sport 85% thought increasing the profile in schools and 58% thought greater TV coverage of cycling events would be effective methods.

Advertising

8.23 There has been a monitoring programme for the Spring Cycling campaigns [90], although the effect of these is inconclusive. While it is true that people who recognise the ad are more positive about cycling and more likely to say they will cycle more in the future, there is no evidence about causality: it could just be that those interested in cycling are more likely to engage with the advertising.

9. CYCLING TO WORK

Summary

9.1 Key points are:

- commuter cycling is dominated by white males aged 25-44 (even more so than cycling in London more generally) [1, 2006/7];
- women face some additional barriers to cycling to work as a result of expectations regarding personal appearance [75, 2005];
- two-thirds of commuter journeys by bicycle are under five miles / 8 kilometres [134, 2001];
- pool bikes appear to offer substantial benefits for both employers and employees [29, 2008].

Cycling to work facts

9.2 In 2006/7 cycling to work accounted for 44% of all cycle trips in London [1], other work related journeys add a further 7% to this figure. This makes commuting and work related journeys the single largest use of the cycle in London, accounting for over half of all cycling journeys.

9.3 The profile of the commuter cyclist is different to the overall cycling population: the commuter cyclist is more likely to be male, aged 25 to 44, and white (see Figure 9.1 below).

FIGURE 9.1 PROFILE OF COMMUTER CYCLISTS (2006/7)

	London Cyclist	London Commuter Cyclist
Male	63%	71%
Female	37%	29%
17-24	13%	13%
25-34	27%	33%
35-44	30%	32%
45-59	21%	19%
60+	8%	3%
White	78%	90%
BAME	22%	10%

Source: LTDS [3]

9.4 Looking at the data in more detail, cycling to work is twice as common for people living in inner London, and as the following table illustrates, the age profile is also much younger:

FIGURE 9.2 INNER AND OUTER LONDON COMMUTER CYCLISTS (2006/7)

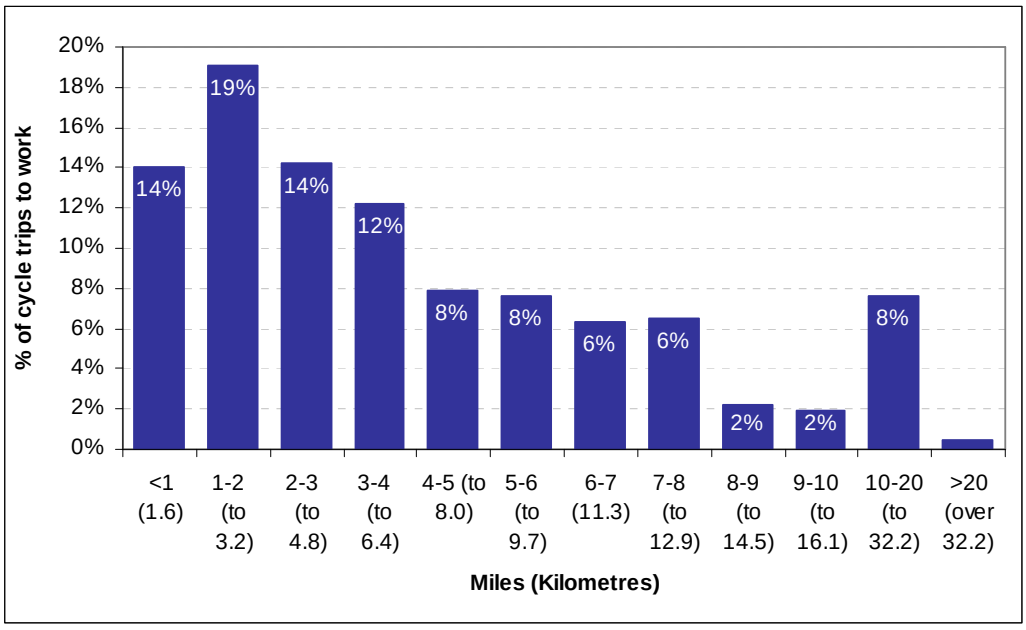
	Commuter Cyclists Inner London	Commuter Cyclists Outer London
% of London residents cycling to work	3.7%	1.7%
	% of Inner London commuter cyclists	% of outer London commuter cyclists
17-24	13	13
25-34	37	27
35-44	32	31
45-59	15	25
60+	3	4

Source: LTDS [3]

Average commuter distances

9.5 The following graph shows the distances travelled to work by cyclists. It shows that 67% of journeys are less than 5 miles (8 kilometres), and 92% are less than ten miles (16 kilometres). There are however a relatively small group (8%) who are travelling longer distances.

FIGURE 9.3 LENGTH OF COMMUTER TRIPS BY BICYCLE (2001)



Source: LATS [134]

Benefits & deterrents of cycling to work

9.6 Cycling, in the context of the workplace can benefit both the employer as well as the individual member of staff. A web based quantitative study amongst both cyclists and non cyclists undertaken by Camden Consultancy Services [20] has found:

- health, reliability, and speed are perceived to be the main positive 'drivers' of cycling to work; whilst
- road safety and pollution were the main deterrents.

9.7 Other factors identified as barriers include, professional appearance, lack of showering facilities, and company dress codes.

9.8 Amongst non cyclists, the three most significant barriers are road safety, pollution, and distance. Comments regarding appearance, dress code, and showers were also at comparatively high levels.

Travel during work hours

9.9 Amongst those who cycle to work, almost 88% travel during work hours for business, at least occasionally [20]. Of these, almost 18% of business journeys are by bike, with an average journey time of 23 minutes. This length of time is comparable to other modes, with the exception of car which was used for longer journeys (55 minutes).

9.10 Those who cycled to work were also asked which of the facilities their employer provides, were most important. Top of the list is 'secure cycle parking, followed by showers, lockers, and a drying room.

Pool bikes

9.11 A number of initiatives have been taken to encourage both use of private cycles and the development of pool schemes. 'Pool bikes for Business' [129] draws together data from a number of sources and presents the benefits of cycling generally and cycle pool schemes in particular to both businesses and individuals. Benefits are discussed under the following heading:

- reduced travel expenses;
- time savings and convenience;
- health and fitness improvements;
- improved accessibility;
- environmental benefits; and
- enhanced reputation.

9.12 Employers involved in the Bikes for Business scheme estimated the average savings to the organisation as around £25 per month per bike,

with some saving as much as £80 per month per bike on taxi and public transport fares.

9.13 Individuals using the pool bikes for commuting recorded personal savings of approximately £50 per month thanks to reduced transport costs.

9.14 69% of pool bike users said that improved fitness was a benefit, whilst 52% appreciated the opportunity to get out in the fresh air during the day.

9.15 The survey also found that:

- 79% of pool cycle users reported that it saved them time;
- 38% stated that using the pool bikes avoided parking problems; and
- 24% reported that using the pool bike meant they avoided the inconvenience of driving.

9.16 Some qualitative feedback from car pool initiatives to be found in the Pool Bikes for business document include:

"Riding a bike has increased my productivity at work because it saves time and allows me to move round very quickly without any form of delay."

Aylesbury New Deal for Communities

"I think pool bikes are a great idea, cost effective, environmentally friendly and sometimes quicker than public transport!"

Red Kite Learning

10. CYCLING TO SCHOOL

Summary

10.1 Key points in terms of cycling to school and cycling more generally by children are:

- cycling to school is quite age and gender-specific with 11-15 year old boys much more likely to cycle to school than other groups (the same is also true of cycling by children more generally) [124, 2006];
- the optimum distance band for cycling to a secondary school is 1 to 3 miles (or 1.6 to 3.2 kilometres), with bus taking over for longer journeys – the cycle mode share for these types of trip is 5% (2006) [124, 2006];
- for primary schools, cycling is rarely a realistic option [124, 2006];
- within the realistic distance band (1 to 3 miles / 1.6 to 3.2 kilometres) the top barrier is fears over safety (particularly on the part of parents), followed by lack of cycle parking [43, 2003];
- there is evidence that measures to encourage more cycling to school (such as training and provision of cycle parking) can be effective where well targeted and executed [54, 2004];
- there appears to be quite a substantial number of children who own a bicycle but who do not use it [78, 2005].

Cycling and children

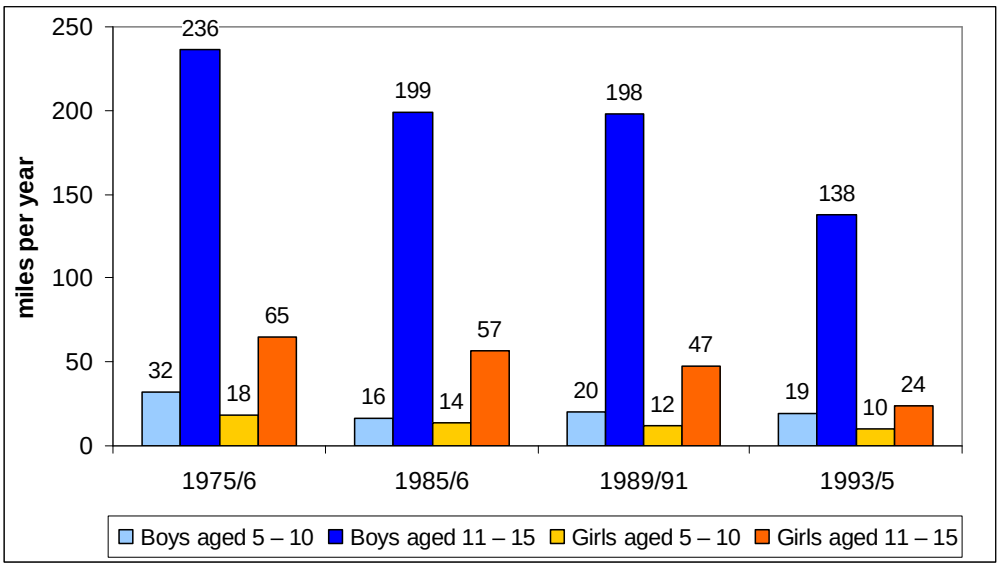
10.2 The main attractions of cycling for children are fourfold; firstly it is fun, it dramatically expands the area they can reach independently, it is a social activity and it allows for close engagement and interaction with the environment and other people on the route [78]. These attractions lead to high take-up of cycling amongst children, and estimates by Young TransNet that 80% of school children own a bicycle [78].

10.3 There is a difference between cycle ownership and use, with figures suggesting that 43% of all 10-15 year olds cycle and the majority (41% of all 10-15 year olds) do so at least weekly [44].

10.4 Cycling differs by gender and age group within children, as seen in Figure 10.1 below. Boys aged 11-15 cycle the furthest per year on average, higher than girls of the same age and younger boys. Girls aged 5-10 cycle the least distance, standing at only 10 miles a year in 1993/5. The distances cycled by children are the highest of any age group, with distance declining with age [78].

10.5 Children are much more likely to cycle than adults. In 1993/5, 54% of households with 1 child had access to a bicycle, this increased to 69% of households with 2 or more children. This compares to 12% of pensioners homes and 38% of other childless households. Although it should be noted that this is not necessarily bicycles to which the children have access [78].

FIGURE 10.1 DISTANCE CYCLED PER YEAR



Source: Cycling and children and young people [78]

10.6 Although cycling is higher amongst children than adults, cycling has been declining, as can be seen from the chart above (Figure 11.1). Distances cycled by children have been declining since 1975/6, and by comparison, over the same period for those aged 16-59 cycled distances remained relatively steady.

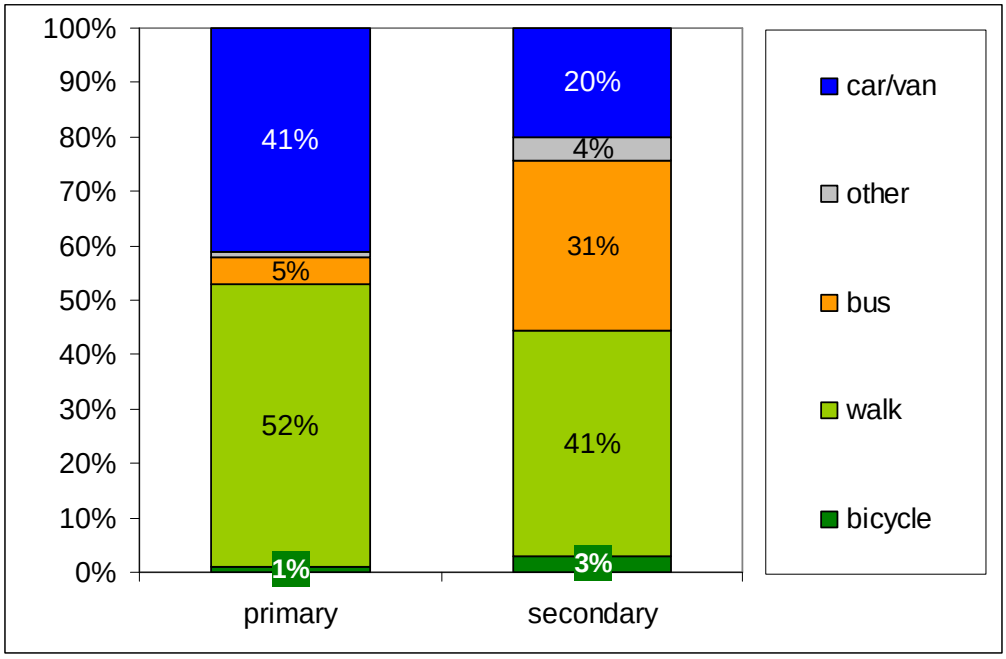
10.7 Take-up of cycling amongst children is also dependent on other demographic factors. In London, children in households without cars cycled less than those in car-owning households. This is likely to be dependent on the areas lived in, as in inner city areas where car ownership is lower we also see low levels of cycling by children [78].

10.8 Income also has an impact, as about a quarter of households in the lowest 40% income bracket own a bicycle, whereas nearly half of all other households have a bicycle [78].

Travel to school

10.9 Although large proportions of children cycle in their leisure time, just 1% of primary school children and 3% of secondary school children cycle to school, as illustrated in the chart below. At secondary level, this increases to 6% of boys compared to 1% of girls cycling to school.

FIGURE 10.2 MODE SHARES FOR TRAVEL TO SCHOOL (2006)



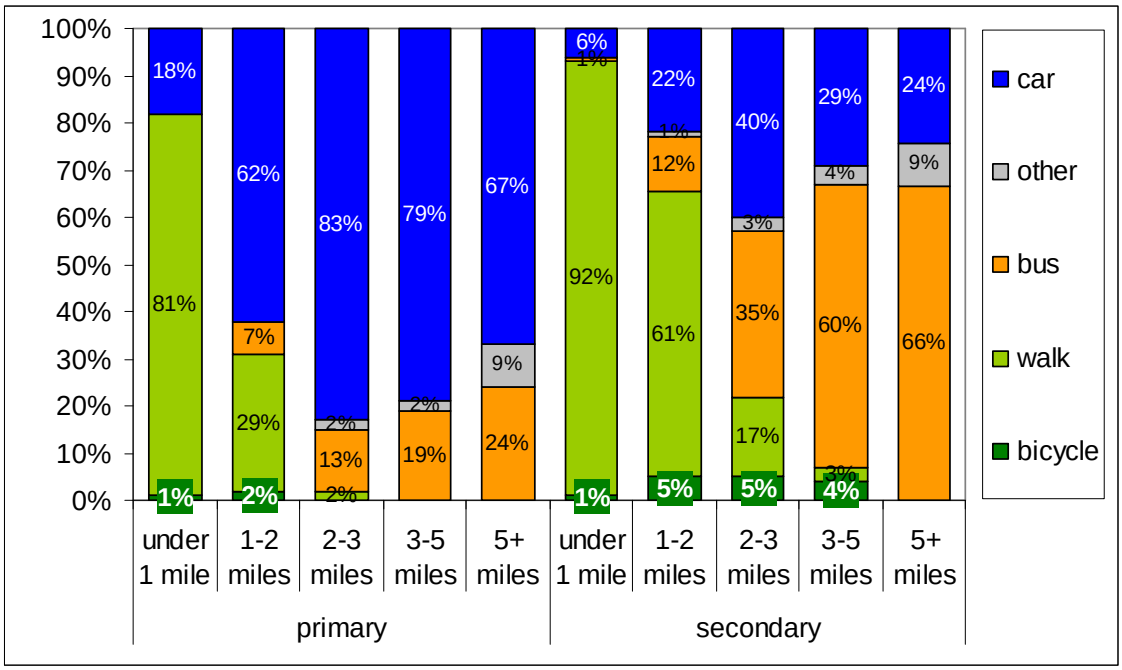
Source: Travel to school factsheet [124]

10.10 This proportion varies widely depending on a number of factors such as permission from the school, availability of bicycle parking, length of journey, local road layout etc.

10.11 The distance of the journey from home to school made by bicycle at the two school levels shows that secondary school pupils are more likely to make longer journeys to school by bicycle. At primary schools cycle journeys are all of 2 miles (3.2 kilometres) or less, whereas at the secondary level journeys are more likely to be between 1 and 5 miles (1.6 to 8.0 kilometres). This is largely a reflection of the longer distances secondary pupils live from their schools: the average for secondary schools is 3.4 miles (5.5 kilometres) compared to 1.5 miles (2.4 kilometres) for primary schools [124].

10.12 Aside from the distance difference, there is also a more prevalent intrinsic barrier to cycling to primary school which is that parents feel that children of primary school age cannot travel on their own, whatever the length of trip [124].

FIGURE 10.3: DISTANCE FROM SCHOOL (2006)



Source: Travel to school factsheet [124]

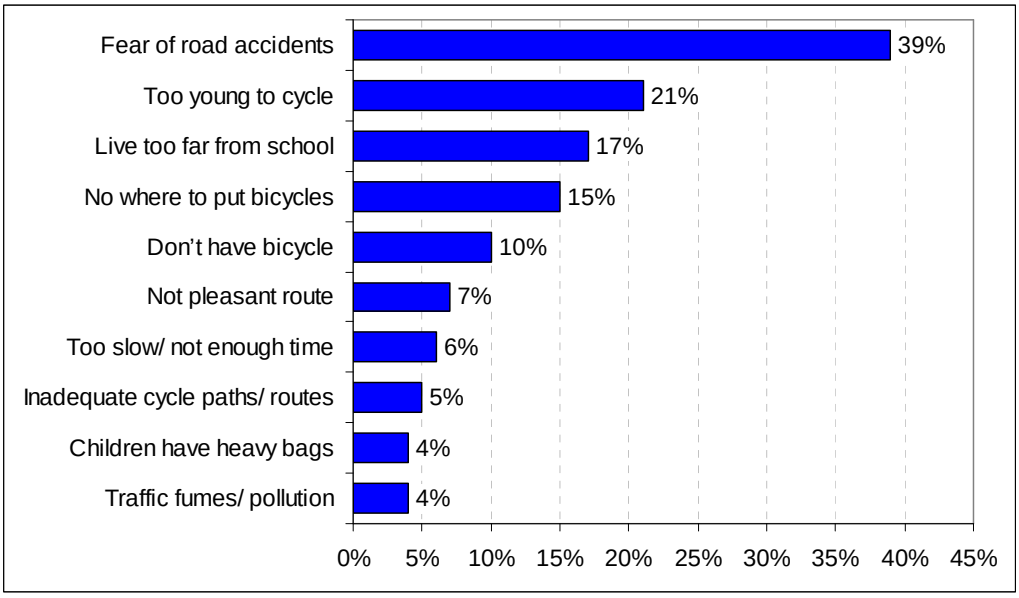
10.13 Some secondary school pupils receive free bus travel, although interviews with pupils in the eligible age group show the same proportion of pupils travel to school by bicycle whether they have free travel or not (2%). However, amongst those who travel on the bus more than they used to, bus use has replaced bicycle use for 5% of their trips [25].

Barriers to cycling to school

10.14 The main themes in barriers to cycling to school are a strong culture of car use, fear and dislike of local environments, children as responsible transport users and parental responsibilities for their children [84]. Although other issues such as cost of equipment, the needs of children to carry a lot to/from school and lack of maintenance know-how and distance were also mentioned [54].

10.15 In a quantitative study of parents who drove their child to school, the top mentioned reason for their child not cycling to school was 'fear of road accidents' (39%), followed by 'too young to cycle' (21%) and 'live too far from school' (17%). The top mentions above 3% are shown in Figure 10.4 below [43].

FIGURE 10.4 BARRIERS TO CYCLING TO SCHOOL (2003)



Source: Understanding school run car use [43]

10.16 Traffic conditions in London are felt to be too dangerous, and parents who themselves cycled to school would not think of allowing their children to cycle to school:

> *"For most parents, cycling was not a top-of-the-mind alternative to the school run, but fear of accidents meant many parents would not even consider this option"* [43].

10.17 When parents who drive their children to school were asked, about 40% said there was nothing which could stop them taking their child to school by car [43]. However there is an interest in change from children themselves; when asking children who are taken to school by car, 21% would prefer to cycle to school [69].

10.18 Distance is one of the other main factors which precludes cycling to school. How far is 'too far' is difficult to measure as it depends on many other factors such as "age, cycling skill, confidence, ...road traffic levels, presence of cycle routes, and whether friends cycled too" [54].

10.19 In addition, distance of travel to school is not usually the primary concern in the school selection process, as standard of education comes first:

> *"If all schools were as good as each other, they could go to the local school."* [43]

10.20 Not getting a place at the first choice school can affect this even more, as journey lengths are often increased.

10.21 Parents do have a large amount of control over whether children can cycle to school, as they have to consider the issues of the child's level responsibility and independence. Overall, eight in ten parents are opposed to their child cycling to school due to safety concerns [97].

10.22 Just 7% of parents would let their 10 year old child cycle alone to school; this increases to 25% who would allow their 11 year old and to 51% for 13 year olds. Almost 3 in 10 parents (28%) said they would never allow their child to cycle alone to school, even at 18 years old [43].

Incentives and Travel Plans

10.23 It is important to encourage sustainable travel behaviour in children as these are likely to be carried into adult life, as well as children who never travel by bicycle being less likely to switch to this mode later in life [69].

10.24 The National Cycling Strategy (1996) set a target to double school cycling rates, and the Greater London Assembly in its "State of London's Children" Report stated that TfL:

> "will create improved conditions for walking and cycling so that children and young people can have safer and more convenient access to schools and training facilities, leisure, sport and recreational facilities and town centres … [and] introduce a programme to provide facilities for cycle parking at school, as well as cycling information, training, and developing low-cost cycle helmet purchase schemes" [78].

10.25 School travel planning is now widespread across London, with more than 1600 schools taking part so far (as of 2007) and with an aim for all schools to have a plan by 2009. School travel plans have often included measures to increase cycling to school, including taking part in the cycle parking programme. Since the scheme began in 2004, 10,000 new school cycle spaces have been provided at more than 400 schools across London [128].

10.26 Incentives are often required to encourage an increase in cycling to the school, with new cycle parking a good example of this.

10.27 There is evidence to suggest that new cycling facilities in a school (namely cycle racks) encourage cycling to school. 61% of pupils who had cycled to school in the past month stated that the new cycle racks had encouraged them. It should be noted that these pupils had

often previously walked or got the bus to school [54], and that the facilities in this study were new and usage might suffer as enthusiasm wears off.

10.28 However, when parents who drive their child to school were asked, cycling did not feature highly in the ways parents would be encouraged not to drive. The top mentions were 'provide safe/ reliable school buses' (23%) and 'promote health benefits/ award scheme to encourage walking' (17%). Cycling ('provide adequate cycle paths/ routes') was mentioned by only 2% of parents [43].

10.29 As well as physical initiatives, motivation (for primary school pupils) can also come from cycle shows, events and competitions. Secondary school pupils are more prone to peer pressure and having more friends cycling will encourage them [54]. Generally, attitudes change as children get older, in particular as slightly older teenagers look forward to learning to drive [97].

Training

10.30 Cycle training is generally seen as important in negating some of the barriers to cycling to school, although low participation rates are seen. Training instils confidence as well as skill in pupils [54], and also gives confidence to parents and schools in respect to children being able to cycle alone.

10.31 Less than 1 in 3 parents say their child has attended cycle training through school, although three quarters of parents say they would be keen for their child to attend training. Eight in ten say it would make a big difference to their child's safety [97], showing the impact it could potentially have in encouraging parents to relax restrictions on their child's cycling.

10.32 Across London, 21% of 10-15 year olds have ever attended cycle training, with 38% of cyclists of all ages ever attending cycle training [44]. Training in children tends to be more prevalent amongst those who already cycle to school, or frequent leisure cyclists as opposed to others who cycle occasionally [54].

10.33 It is important to implement cycle training at the right age group as it is more highly regarded by younger pupils and girls, than older pupils and boys [54].

Cycle clubs

10.34 A study into cycling clubs in the UK has shown that 28% of larger clubs have seen an increase in membership amongst 11-16 years olds. These members are also likely to be keen, with over 90% of this age group seen as 'active' members (participating in cycling events at least every 2-3 months). Club secretaries see the main barriers to cycling as sport as unsafe roads, other sports taking precedence and cycling having a low profile. Increasing the profile of cycling in schools was seen to be the main way to encourage cycling amongst children [73].

11. CYCLING FOR PLEASURE

Summary

- Cycling is a popular pastime and spectator sport, with a key motivation being the health benefits [66, 2004; 82, 2007; 83, 2007].
- There are 150 cycling clubs in the South East, with average club membership of 77 [73, 2007].

Introduction

11.1 This short chapter considers the evidence on cycling as an activity in itself, including cycling clubs. In practice there is relatively little evidence on this topic, with most of the emphasis being on "utility" cycling such as to work and school.

Cycling as a leisure activity

11.2 Cycling is a popular leisure pastime and spectator sport underlined by the popularity of cycling events such as the Stage One of the Tour de France [82] which took place in London and Kent in 2007 and the GLA Hovis Freewheel event in September 2007 [83] London in which approximately 38,000 people took part.

11.3 A key motivation for cycling as a leisure activity is the health benefits, and indeed, in the Near Market for cycling study [66] this was the most frequently mentioned reason why people had increased their volume of cycling.

11.4 A survey of cycling club secretaries also revealed that they believe the most significant factor hindering greater participation in cycling for sport among children is unsafe roads due to high levels of traffic (54%) [73]. A lack of accessible play areas and parks being too isolated are also barriers to children cycling for leisure [104]. Children and young people themselves cite safety concerns to a lesser extent with distance and lack of time more important [84].

Cycling clubs

11.5 There are over 1,000 cycling clubs nationwide, 150 of which are in the South East. On average, these clubs have 77 members [73].

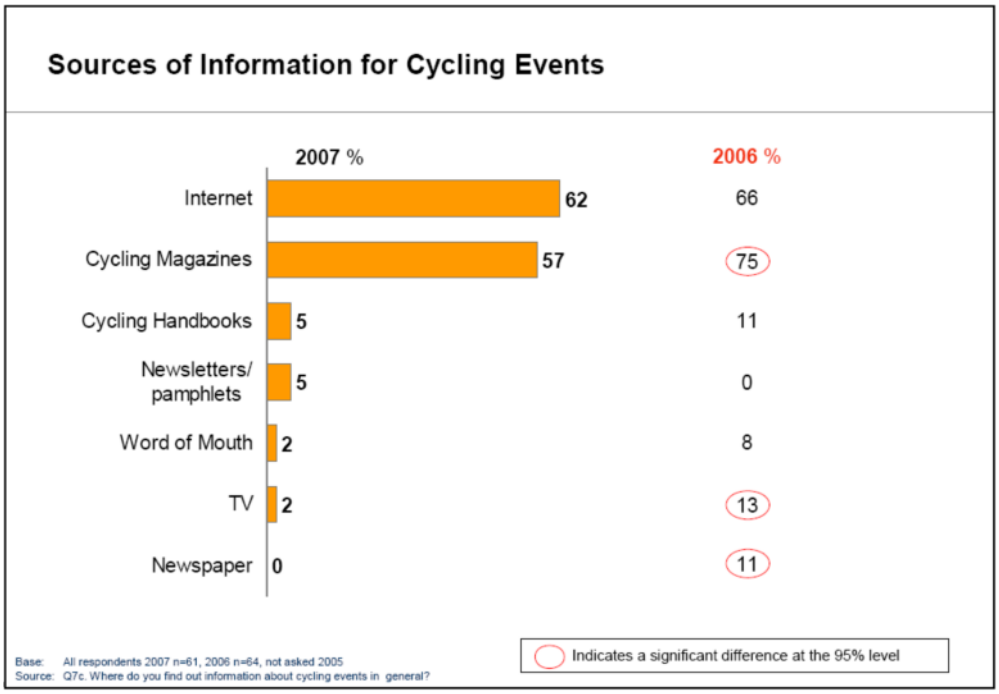
11.6 According to club secretaries, the average active cycling club member is in their late 30's. Despite perceived increases in membership, younger people still make up only a small proportion of the active

club membership [73].

11.7 The most popular types of cycling amongst club members are road cycling, time trials and leisure cycling [73].

11.8 The information sources used by club secretaries are highlighted in Figure 11.1, with the internet and cycling magazines both being important.

FIGURE 11.1 SOURCES OF INFORMATION (2007)



Source: Cycling for sport [73]

APPENDICES

A1. CYCLIST SEGMENTS

Summary

A1.1 Within the studies undertaken on cycling, the most prevalent segmentations are based on either usage (cyclists v non-cyclists) or demographics (age, gender). Reasons for usage, attitudes and geodemographics are other approaches which could be explored further.

Types of segmentation

A1.2 Cyclists can be segmented in a variety of ways, depending on the data source used and the reason for wishing to segment. These include:

- levels of usage;
- reasons for usage;
- demographic;
- attitudinal; and
- geodemographic.

A1.3 Some of the segmentations used are identified below, by type.

Levels of usage

A1.4 At its most simple, a segmentation by levels of use can simply distinguish between users and non-users. However, it can also be useful to distinguish between frequent or regular users and more occasional cyclists. Some specific examples of segmentations by level of use are provided in Figure A1.1.

FIGURE A1.2 LEVEL OF USE SEGMENTS

Source	Segments
London Cycling Action Plan [10]	Cycle less than once a week Cycle 1-4 days a week Cycle 5 or more days a week
Near Market for Cycling [66]	Non users (never cycle) Very low users (less than once a month) Cyclists (cycle once a month or more)
Cycling Market Audit [97]	Heavy (1 a week or more) Light (less than 1 / week) Non cyclists

Reasons for usage

A1.5 A clear distinction can be (and often is) made between cycling for a particular purpose ("utility" cycling) and cycling for the sake of it (as a leisure activity, means of staying fit or as a sport). Given the importance of commuting as a journey purpose (see Chapter Three), and the unique characteristics of journeys to work, it makes sense to separate this out from cycling for other purposes. Similarly, cycling to school (and other cycling by school children) has clear points of difference so is sensible to separate out.

A1.6 Thus, we have four reasons for use segments:

- commuting;
- other "utility" (or "A to B") cycling;
- leisure cycling; and
- school children cycling.

A1.7 While these are implicit in many of the projects undertaken on cycling, a more explicit segmentation on these lines would add some clarity.

Demographic

A1.8 The demographic-based segmentations used most often are gender and age, with ethnicity and social class also being used (for example, Cycling Omnibus [44]).

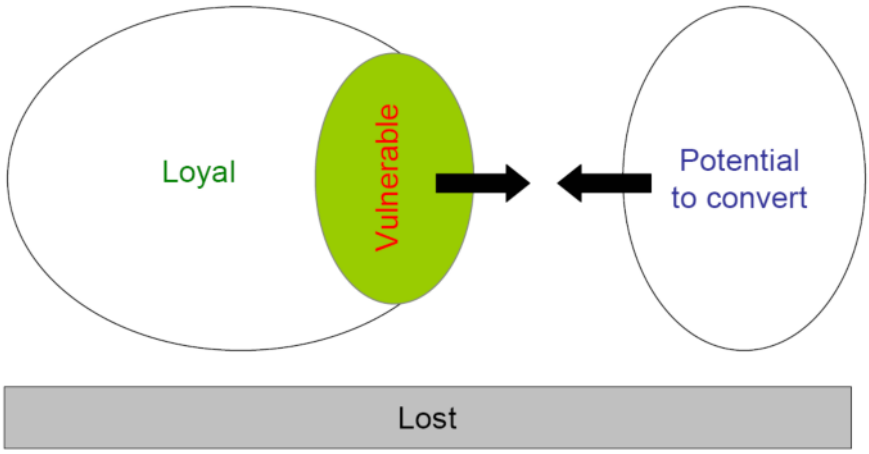
Attitudinal

A1.9 A variety of attitudes towards cycling are clear from the qualitative research (for example, Challenging the Attitudes to Cycling [75]). One example of an attitude based segmentation is distinguishing between those that may be interested and not interested in cycling (or increasing their cycling) – see Figure 5.4.

A1.10 The Understanding London's Travel Market document [67] uses a segmentation based on a combination of behaviour and attitudes to divide the market into "Loyal", "Vulnerable", "Potential", and "Lost" groups (see Figure A1.2).

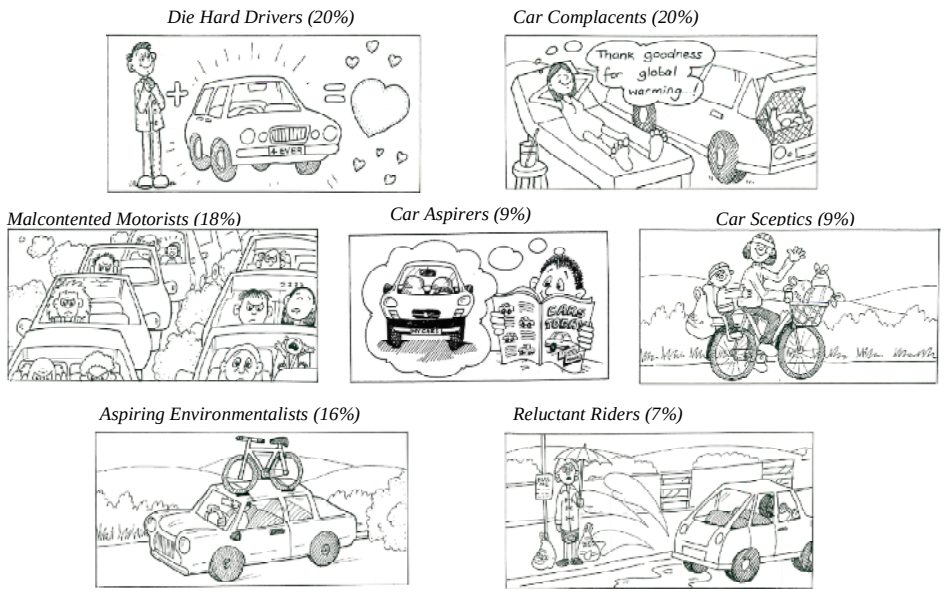
A1.11 For cycling, the breakdown between these is 11% Loyal, 6% Vulnerable, 48% Potential and 36% Lost.

FIGURE A1.3 MARKET MAP SEGMENTS



A1.12 One example of a purely attitudinal based segmentation that is used by TfL is the Driver Types originally developed by Jillian Anable and subsequently developed as part of the Car Dependency work [135]. An illustration of these is provided in Figure A1.2 below. This segmentation is based on a set of a dozen or so attitude questions subjected to a cluster analysis. The value of this type of segmentation is that it gives planners and marketers a way of getting inside people's heads and developing solutions (measures and messages) which are relevant to them.

FIGURE A1.4 EXAMPLE ATTITUDINAL SEGMENTATION



Source: Car Dependency [135]

Geodemographic

A1.13 Where someone lives (and works) is likely to affect the extent to which someone is likely to cycle. Quite often this combines with demographics since there is quite a strong relationship between the two (some locations are more exclusive and attract wealthier people than others, while some areas are more suitable for families and children than others, and so on). The limit of spatial segmentation for cycling is largely confined to separating inner and outer London (this is done in the Cycling Omnibus [44]).

A1.14 An example of a geodemographic segmentation can be found in the Car Dependency work where the Driver Types attitude based segmentation was "fused" with MOSAIC to create MOSAIC Driver [135]. Whilst primarily based on car travel, there is a relationship between car travellers and cyclists: to some extent, they are like the opposite sides of a coin. The MOSAIC Driver segmentation is illustrated in Figure A1.3 which provides a summary description. The key benefit of using a database like MOSAIC is that it enables every Postcode in London to be placed into one segment on the basis of which is most likely to be dominant within that location.

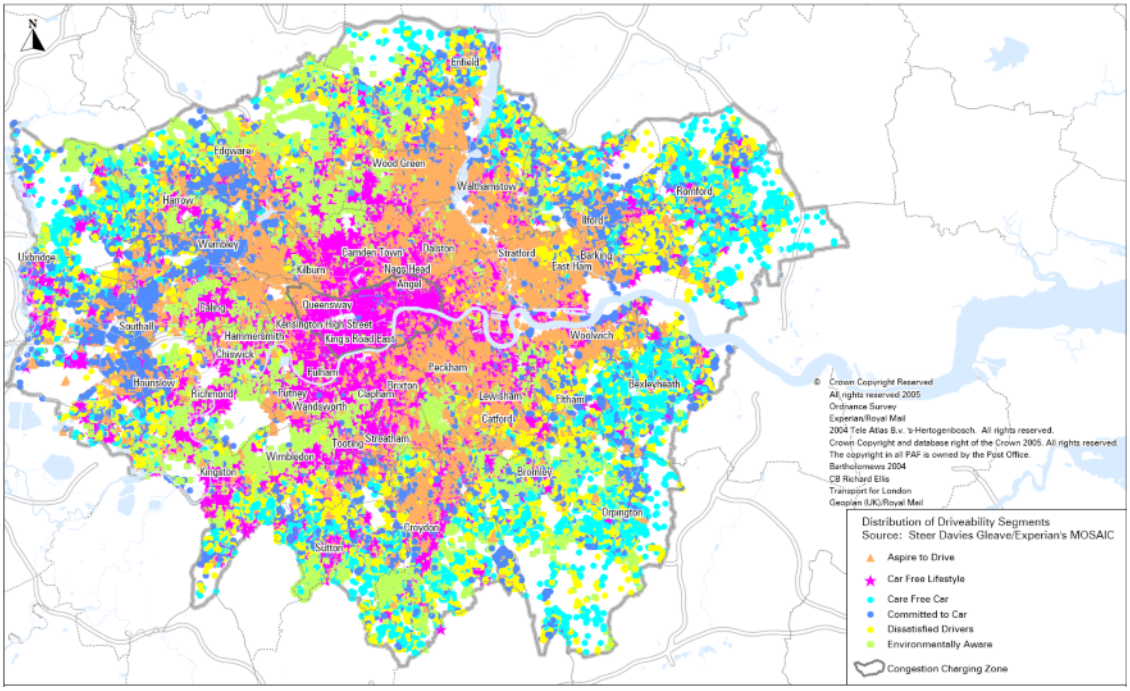
FIGURE A1.5 MOSAIC DRIVER GEODEMOGRAHIC SEGMENTATION

Label	Dominant Driver Typology	Typical attitude	Cycling
Environmentally Aware	Aspiring Environmentalists	*"Being environmentally responsible is important to me".*	Well above average
Dissatisfied Drivers	Malcontented Motorists	*"I drive because it's convenient and not because I enjoy it."*	Below average
Care Free Car	Car Complacents	*"Environmental threats such as global warming have been exaggerated".*	Below average
Committed to Car	Die Hard Drivers	*"People should be allowed to use their cars as much as they like, even if it causes damage to the environment" .*	Well below average
Car Free Lifestyle	Car Sceptics	*"I would be willing to pay higher taxes on car use if I knew the revenue would be used to support public transport".*	Well above average
Aspire to drive	Reluctant Riders	"I would use a car if I could afford to have one".	Average

Source: Car Dependency [135]

A1.15 The key benefit of this type of segmentation is that they can address policy questions concerning ***where*** to implement policies which are relevant to particular types of people, as well as ***how*** to communicate and engage with different groups. The map below aims to illustrate this point by showing the distribution of MOSAIC Driver segments across London.

FIGURE A1.6 MAP OF MOSAIC DRIVER SEGMENTS



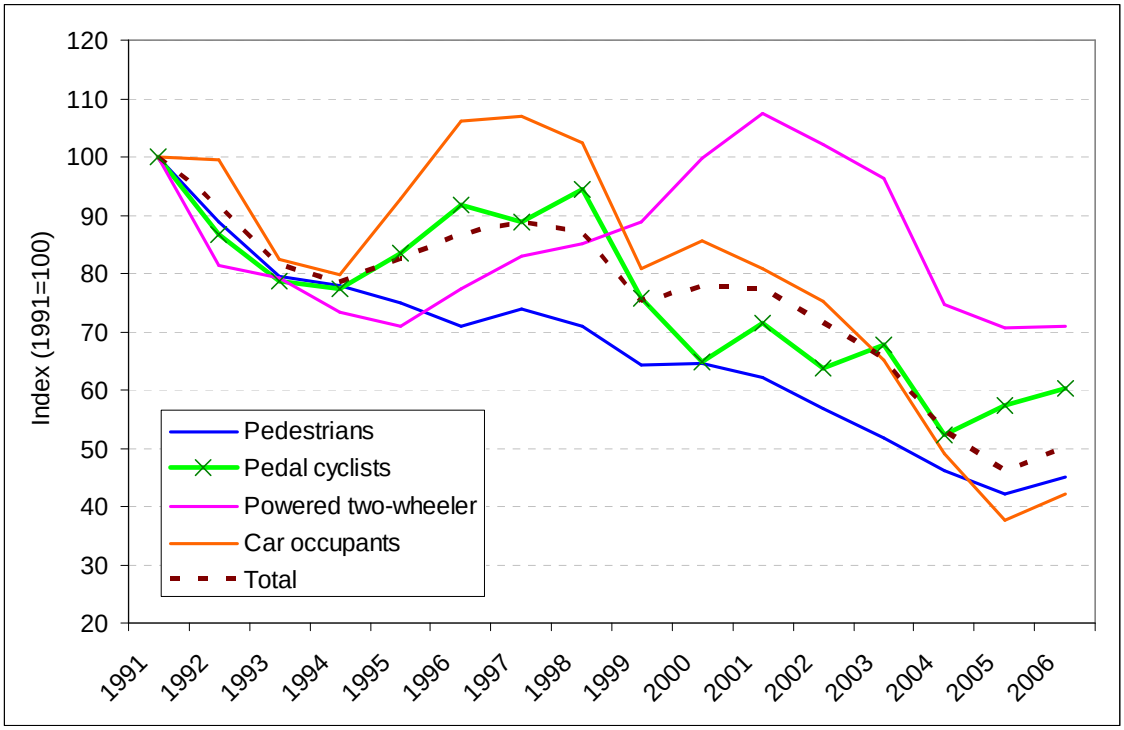
Source: Car Dependency [135]

A2. ACCIDENT DATA

Trends

A2.1 The historic trend in the number of accidents is illustrated below. For cycling, the number of accidents is now 60% of what it was in 1991, despite the growth in cycling trips. It is this growth which is one factor in the increase in accidents between 2005 and 2006.

FIGURE A2.1 TRENDS IN NUMBER OF ACCIDENTS



Source: TfL London Road Safety Unit

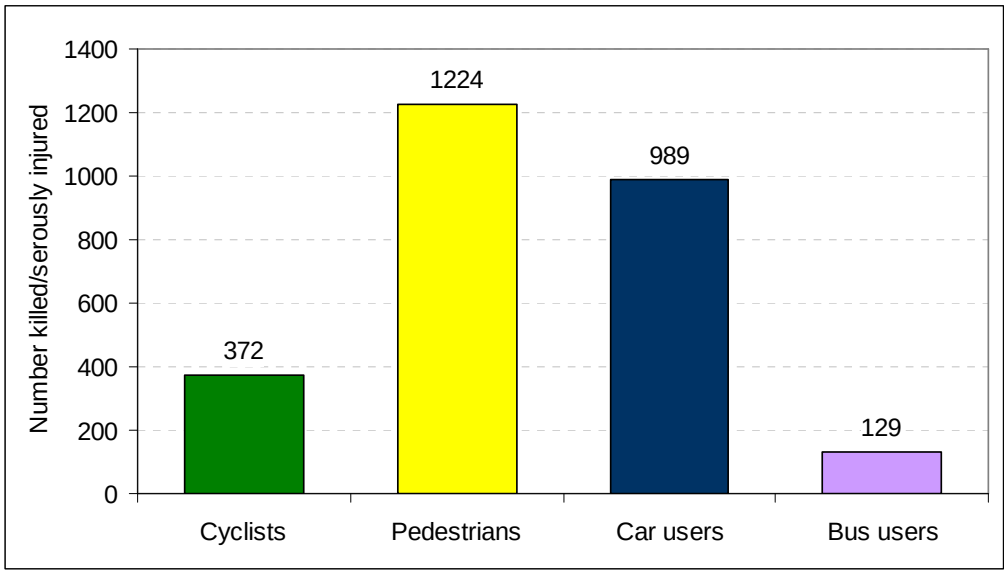
Mode comparisons

A2.2 Comparisons between major modes (bicycle, walk, car and bus) are made using three statistics:

- the number of travellers killed or seriously injured;
- the accident rate based on distance travelled (accidents per 1,000km);
- the accident rate based on number of trips (accidents per 1,000 trips).

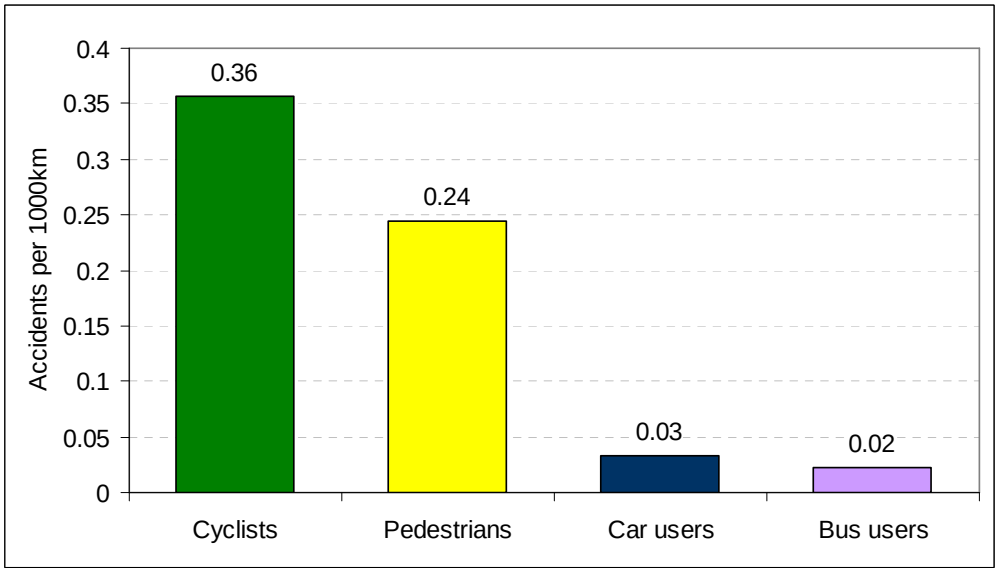
A2.3 The picture for cycling is quite different depending on which measure is used. While there are relatively few accidents involving cyclists, there are also relatively fewer cyclists, so statistically, it is probably the accident rate per 1,000km which is the most accurate measure of the actual probably of being involved in an accident. Nevertheless, the accident rate per trip (which is much higher for cycling) may well be a better reflection of the perceived safety of each mode.

FIGURE A2.2 NUMBER OF ACCIDENTS



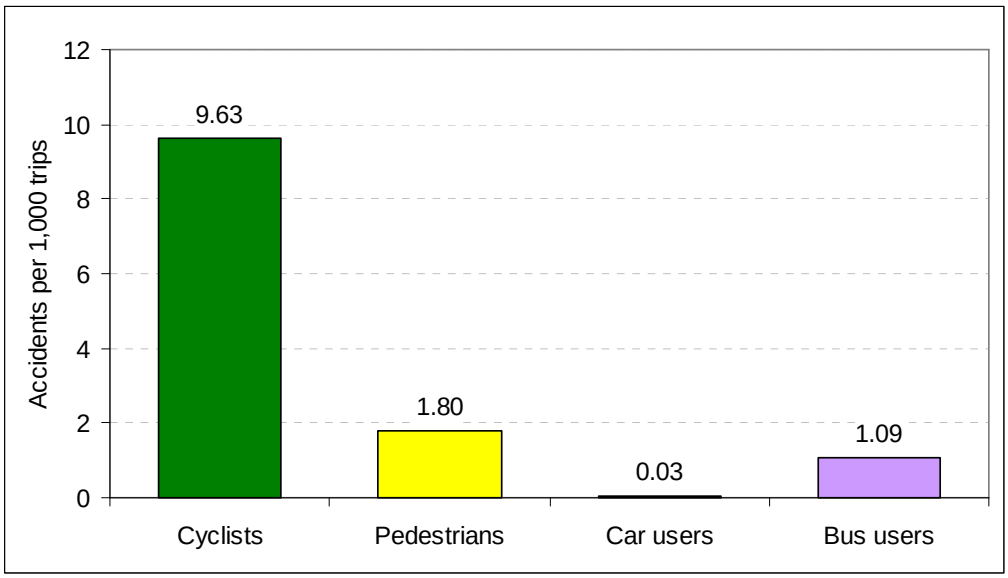
Source: TfL London Road Safety Unit

FIGURE A2.3 ACCIDENT RATES (PER 1,000KM)



Source: TfL London Road Safety Unit

FIGURE A2.4 ACCIDENT RATES (PER 1,000 TRIPS)



Source: TfL London Road Safety Unit

A3.	SOURCES		
Reference	**Data Source**	**Description**	**key methods**
1	London Travel report 2007, 2007, TfL	Provides information on mode use in London	Data analysis
2	London Travel Report 2006, 2006, TfL	Provides information on mode use in London	Data analysis
3	London Travel Demand Survey, 2006/2007, TfL	Additional analysis of household travel diary dataset	Face to face survey of households
4	Safety & Security when travelling around London, 2007, Synovate	Tracking Londoners' perceptions of safety when travelling around London	Telephone interviews
5	Marketing and research planning, project development, 2003, TfL	Plan for marketing and promotion of walking and cycling in London	Marketing plan
6	Valuing the benefits of cycling, A report to Cycling England, 2007, SQW	Economic (cost-benefit) analysis of cycling	Policy review, case studies
7	Streets management customer satisfaction survey, 2007, Synovate	Londoners' satisfaction with maintenance and management of London's streets	Telephone interviews of 1,107 respondents
8	Virtual Cycling Club' Strategic Development Research, 2007, 2CV	Market testing of a TfL run 'Virtual Cycle Club'	8 focus groups
9	Articulated buses-comparative dwell time and journey times on route 36 & 436, 2003, Steer Davies Gleave	Examination of bus stop time and measurement of journey times	Bus stop surveys
10	Creating a chain reaction - The London Cycling Action Plan, 2004, TfL	Outlines some useful background research, including journey purpose, barriers to cycling and targets.	Policy review and action plan
11	TfL Omnibus attitudes to cycling, 2007, Synovate	2007 annual cycling tracking survey (3 yrs of data shown)	Household omnibus surveys with Londoners
12	Tour de France Grand Départ Awareness - Wave 3, 2007, Synovate	Wave 3 of pre-event research into the Tour de France which took place in London & Kent in 2007	Telephone interviews
13	Cycling Festival evaluation, 2007, Synovate	Cycling festival (same day as TdF) event evaluation	Face to face interviews on day of the event
14	Move it at the Manor Festival Evaluation, 2007, Synovate	Sustainable travel event organised by Smarter Travel Sutton	Face to face interviews with people leaving the event
15	Cycling Marketing Evaluation, 2007, Research International	2007 cycling campaign evaluation	Online survey
16	Workplace Travel Plans marketing development, 2007, Synovate	Evaluation of design concepts for larger (corporate) workplace travel plan packages (offerings)	15 depth interviews with corporate representatives.
17	Research briefing 5, 2007, TfL	Research briefing- selected studies	Various
18	All ability cycling access, 2004, NOP Consumer	Cycling research with disabled people	Telephone depth interviews, mini groups, face to face depth interviews
19	ASL Advanced Stop line background and research studies, 2005, TfL	Summary of UK research on Advanced Stop Lines (ASLs)	Research review
20	Study of commuter cycling in Central London, 2006, Camden Consultancy Service	Main objective to look at cycle commuter patterns and needs within Central London	Online survey of (mainly) cyclists (444) including identifying routes/ hotspots (198)
21	Camden Bike Party evaluation, 2007, Synovate	Evaluation of the Camden & Haringey 'bike party' event	Face to face interviews with people attending the event
22	NMP Demonstration Corridor Survey, 2007, Accent	Customer views of Road Network Management Planning priorities – A232 demonstration corridor. Survey of priorities for improvement for different segments of the A232	Face to face interviews with residents and on street. Telephone interviews with businesses.
23	Bus vehicle design, 1999, Accent	Relative value customers put on design aspects of buses	Stated preference
24	London Underground Disability check audit, 2002, Source unknown	Analysis of Underground travel by impairment	Mystery shopping
25	U16 free bus travel, 2006, Synovate	Topline findings on impact of free bus travel for under 16s	Interviews with 14-15 year olds
26	Online TDM Encyclopaedia: Traffic Calming: Roadway Design to Reduce Traffic Speeds and Volumes, 2004, Victoria Transport Policy Institute	Impacts of traffic calming on speed of traffic and pedestrian safety	Unknown
28	Legible London - walking information strategy and mode change, 2008, Outlook Research	Evaluating user perceptions of prototype wayfinding project	36 accompanied walks, then 4 map development workshops
29	Legible London quick summary, TfL	Customer needs from wayfinding and wall mounted maps	Unknown
30	Newham door2door satisfaction survey, 2003, Synovate	Satisfaction of users of door2door services	Telephone interviews amongst users of door2door services
31	Prioritising highway improvements: Stated Preference study, 2007, Steer Davies Gleave	Prioritising highway improvements amongst mobility/visually impaired	Stated preference
32	Valuing the Walking Experience - Willingness to Pay for Improvements to London's Strategic Walks, 2005, Colin Buchanan for Strategic Walk Network	Report develops an approach to quantifying and valuing the benefits of pedestrian improvements, by using stated preference research as a means to assess willingness to pay for quality improvements.	Stated preference

33	Walking campaign evaluation and development, 2007, 2CV	Qualitative discussions on walking attitudes and development of new advertising to encourage walking	Qualitative groups
34	Wealdstone and Harrow Town centre surveys 2007, 2007, Accent	Research undertaken to assess contribution made by bus users to economic health of town centre	On street interviews amongst those visiting town centre to use shops/facilities
35	A Review of Current Traffic Calming Techniques, 1995, University of Leeds, T. Harvey	The most effective traffic calming methods involve vertical shifts in the carriageway - road humps etc. Traffic calming can reduce accident levels by up to 40%	Research review
36	Good Going Awareness, 2004,	Conclusion of interviews with a representative sample of Londoners to Establish level of awareness of the Good Going Travel Awareness Campaign	1020 interviews with Londoners
37	Exploratory research into TfL cycling map designs, 2001, TRBI	Assisting creative development of cycling map material in terms of information, legibility, graphics, access, tone of voice, meeting needs of cyclists	12 focus groups (3 committed cyclists, 9 potential)
38	TfL staff travel survey baseline analysis report, 2007, JMP Consulting	Analysis of staff travel survey for TfL travel plan	Online survey with TfL staff
39	Bus customers in London, 2003, TfL	Summary of information on bus users	Research summary
40	A Word on the Street, 1995, Alan James	Case studies of the execution of streetscape treatment of pedestrianisation and traffic calming	Case studies
41	Gap groups, 2000, Outlook Research	Understand transport priorities for specific customer groups about which existing knowledge is limited	Focus groups split between walkers, cyclists, motorcyclists, van drivers, minicab users
42	Hammersmith Bridge closure: impact study and study phase 2, 1997, Accent	Examining impact of bridge closure on traffic	Telephone interviews with people who had registered an interest, plus call back after 8 months (973 interviews)
43	Understanding school run car use, 2003, FDS International	Analysis into current school run behaviour and attitudes amongst those who drive	Desk research, 3 focus groups, 500 telephone interviews with parents who drive children to school
44	Cycling omnibus survey, 2005, FDS International	Results of omnibus survey looking at incidence of cycling, attitudes and motivations	Telephone omnibus boosted with 10-15 year olds, 1089 interviews
46	Community Impact of Traffic Calming Schemes, 1999, Scottish Executive Central Research Unit By Ross Silcock Limited/Social Research Associates.	Investigates the social and environmental impact of a range of traffic-calmed schemes on both trunk and local roads in Scotland	Literature review, structured interviews with local residents
47	By Design: Urban Design in the Planning System: Towards Better Practice, 2000, DETR By CABE	Guidance on planning. Discussion on objectives of urban design, info on design initiatives. Suggestions on the monitoring and review of planning projects.	Strategic document
48	Route User Monitoring Report, 2006, Sustrans	Usage of the National Cycle Network	Cycle counters, user surveys, Government data
49	Guide to Traffic Calming, 2004, Cornwall County Council	Descriptions and Examples of Traffic Calming	Descriptions
50	After rail cycling, 2002, Sample Surveys Research Group	Survey Investigate potential users views of suggested schemes to encourage cycling from stations to inner London	Face to face interviews
51	Cycle parking at Surbiton Station, 2004, Accent	Survey of station users following improvements to cycle parking facilities	421 self completion surveys of cyclists and general station users using Surbiton station
52	Drivers overtaking bicyclists, 2006, University of Bath	Objective measurement of passing behaviour to investigate riding position, helmet use, vehicle type and gender on overtaking proximities	Cycling trials with bike mounted cameras
53	Evaluation of the new Finsbury Park cycle park, 2007, Synovate	Examination of views of cyclists and non-cyclists on bike park facilities	Self completion questionnaires and interviews
54	Schools cycle parking initiative, 2004, ACT2	Evaluation of new cycle parking facilities at schools	Survey of schoolchildren. 12 mini groups with schoolchildren and teachers
55	Shared zebra crossing study, 2006, TRL	A study into the current use of zebra crossings by cyclists and the impact on other road users - examination about whether it would be possible to formalise permission for their use by cyclists	Literature review, observations and data analysis
56	Transport Policing and Enforcement - Attitudes to Enforcement, 2006, Synovate	Research into attitudes to traffic regulations, policing and enforcement - driving regulations	Telephone interviews
57	Attitudes to walking, 2007, Synovate	Attitudes to walking, levels of interest in TfL initiatives, pre-advertising evaluation	Household omnibus surveys with Londoners
58	Battersea bridge closure – the effects on cyclist and pedestrian traffic, 2006, Synovate	Effects on cyclists and pedestrians of the unexpected closure of Battersea Bridge to most traffic in 2005	Face to face and self completion. 231 responses
59	A Business Case and Evaluation of the Impacts of Cycling in London, 2004, TfL	Evaluation of the impacts of a number of different cycling facilities/measures. Measures that have been considered are LCN+, junction treatments, cycle parking schemes, cycle training schemes and promotional activities.	Summary of other research and desk-top work

60	Casualties in Greater London during 2006, 2007, TfL	Summary of annual analysis of personal injury road traffic collisions and casualties in London	Data analysis
61	Perception of London Streets and the Urban Environment, 2006, TfL	Review of 37 existing TfL research reports, 1998-2006 to determine public perceptions of London's streets and urban environment	Research summary
62	Developing a transport strategy, 2000, Unknown	Attitudes to travel (all modes) in London to inform the 2000 Transport Strategy. To develop transport strategy this provided information on door to door journeys using a range / combinations of modes	86 depth interviews during journeys (accompanied)
63	Attitudes to walking and cycling, 2003, DfT	Attitudes to walking and cycling - frequency of travel, routes used, benefits, image and increasing levels	2002 ONS omnibus survey
64	Walking: personal travel factsheet, 2007, DfT	Analysis about walking levels, trends and attitudes to walking	Data from NTS and ONS omnibus survey 2005
65	Improving walkability - good practice guidance on improving pedestrian conditions as part of development opportunities, 2005, TfL	Document focuses on opportunities for improving walking conditions and the public realm as part of new developments and regeneration projects.	Best practice guide
66	The Near Market for Cycling in London, 2004, Accent	Quantifying the cycling 'near market' in London, to identify priorities for encouraging new cyclists or encouraging a greater number of trips amongst existing cyclists and to understand the reasons for those reasonably likely to take up cycling.	Telephone interviews of 2,141 respondents
67	Understanding London's travel market, 2006, TfL	Segmentation of London population by mode into people who are loyal, vulnerable, potential and lost	TNS survey of 4,898 respondents
68	Streets (TLRN) customer satisfaction, 2007, GfK NOP	Satisfaction with streets	On street interviews
69	Smarter Choices - Changing the Way we travel, 2004, DfT	Review of the effects of a range of transport policy initiatives ('soft' measures), including workplace and school travel plans and personalised travel planning.	Research summary
70	Mystery Traveller Survey – Disabled Travellers, Bus Report, 2007, GfK NOP	Mystery shopping research into bus travel for mobility impaired travellers	Mystery shopping
71	Towards the year 2010: monitoring casualties in Greater London, 2007, TfL	Report of casualty data in Greater London, reporting on trends	Accident statistics
72	Cycling advertising pre-test, 2006, Synovate	Ad testing of cycling ads	Online survey
73	Cycling for sport, benchmark wave 2005, waves 2 & 3 2007, TfL	Measure impact of Tour de France on cycling for sport	Telephone interviews with cycling club secretaries
74	Car travel behaviour as a results of fuel shortages in 2000, Uni of Newcastle/Imperial College	Investigate how travel adapts to the progressive removal of the car and as a consequence to throw light on the barriers to a shift to more sustainable modes of transport	Focus groups and telephone interviews
75	Challenging attitudes to cycling 2005	Structured approach to challenging attitudes to cycling 2005	2x2 stage full day workshops
76	Cycling advertising evaluation, 2005, Synovate	Cycling advertising campaign evaluation	200 online questionnaires
77	Cycling in bus lanes, 2006, Synovate	Considering trials of allowing powered 2 wheelers to use bus lanes with cycles	Self-completion questionnaires
78	Cycling and children and young people, 2005, National Children's Bureau	Review of policy evidence about children and cycling with regard to safety, uptake, policy, views and cycle helmets	Critical review of public policy evidence into children and cycling
79	Impact of New Cycling Infrastructure Schemes - Customer feedback, 2003, Accent	Results of questionnaires that were distributed at cycle facilities to investigate if infrastructure facilities have encouraged more people to cycle.	Self-completion questionnaires
80	Personalised travel planning Camden, 2007, Synovate	Gauge response to PTP strategy and perceptions of TfL, rational and emotional reactions to using various modes	Workshops with residents
81	Town centres survey, 2000, TNS Harris	Identify changes in attitudes as a result of improvements implemented for buses on route 43	On street interviews
82	Tour de France Grand Départ event satisfaction, 2007, Social Research Associates	Summary of 15 research studies into the impact of the TdF in London & Kent	Summary of other research
83	GLA Hovis Freewheel, 2007, GfK NOP	Evaluation of Hovis London Freewheel event	2 large online samples with people who had registered for and had attended the event as well as Londoners in general (sample supplied by GLA)
84	Teenage attitudes to cycling, 2007, JMP Consulting	Looking at attitudes of teenagers on the issue of physical activity and interest in cycling	Literature review

85	London Cycle Guides, 2003, Outlook	Qualitative review of the content of London Cycle Guides	20 face to face depth interviews with cyclists and non cyclists
86	Research briefing issue 1, 2006, TfL	Research briefing- selected studies	Various
87	Research briefing 2, 2006, TfL	Research briefing- selected studies	Various
88	Research briefing issue 3, 2007, TfL	Research briefing- selected studies	Various
89	Research briefing issue 4, 2007, TfL	Research briefing- selected studies	Various
90	Evaluation of Spring 2006 cycling advertising campaign, 2006, Synovate	Pre-test of adverts to encourage cycling in London	400 Face to face (evaluation), 1009 telephone interviews on attitudes towards cycling
91	Tour de France Grand Depart – Wave 1, 2006, Synovate	Awareness of Tour de France coming to London	876 telephone interviews
92	Tour de France Grand Depart - Wave 2, 2007, Synovate	Awareness of Tour de France coming to London, 2nd wave	1638 telephone interviews
93	Tour of Britain Spectator study, 2005, Synovate	Attitudes and profiles of visitors to Tour of Britain	127 on-street surveys
94	Walking 06-07, 2007, Unknown	Summary of information about walking - the market, recent research, pedestrian priorities, barriers	Unknown
95	Walking and Wayfinding, 2006, Synovate	To determine how people find their way around London and evaluate wayfinding tools such as TfL Journey planner, other websites, A to Z, on-street signs and proposed perspective / 3-D view local signboards and walk time radius concepts	Telephone omnibus survey, 6 qualitative accompanied journeys and 3 discussion groups
96	Walking map requester analysis, Synovate	Slides showing the contrast between Sutton residents who requested walking map vs. those who didn't.	Data analysis
97	Market Audits, 2006-2008, TfL	Market Audit for 2006/07 & 2008/09 Business planning	Summary of other research
98	Making London a walkable city - The Walking Plan for London, 2004, TfL	Provides some background information on walking in London, including safety and barriers to walking	Policy document
99	Secure Cycle Parking Study, Waterloo Station, 2004, Mayer Brown Ltd	Development of proposed cycle parking at Waterloo Station	Literature review, observations, consultation, self completion surveys, counts
100	What the public thinks about transport in London in light of T2025, 2007, Gill Wales	The transport needs, priorities, and opinions of people who live in and visit London	Summary of other research
101	PERS - Pedestrian Environment Review System, TRL	Information about PERS, benefits, how it can be used etc	Description of tool
102	The youth market summary of existing knowledge, 2006, TfL	Review of research in order to summarise information available on the youth market, their barriers and drivers to use of public transport.	Summary of other research
103	World Transport Policy and Practice Volume 10, Number 4, 2004, Eco-Logica	List of Article Titles: World Report on Road Traffic Injury, The 'You-move.nrw' campaign - New Partnerships for youth oriented and environmentally friendly mobility management, Evaluating bicycle-car transport mode competitiveness in an urban environment.	Various including travel diaries
104	Stop, look and listen: Children talk about traffic, 2004/05, Banardos and Transport 2000	The UK has one of the worst records for child pedestrian casualties in Europe. 12% of all deaths in the 5-14 yr old age group are caused by road crashes. In 2003	Interviews with children
105	Routes 2 Action, 2004, Sustrans	School travel plans/ sustainable transport including impact and take-up figures	Website for use by school champions
106	Home Zones - Planning and Design, 2005, Department of Transport	Various Case studies, Urban Design / Town Planning	Strategic document
107	Urban Street Activity in 20 mph zones - Ayres Rd Area, Old Trafford, Department for Transport, Babtie Group	The study showed the impact of 20mph zones in reducing speeds	Perceptions and attitudes of residents, counts
109	The Relationship Between Children's Knowledge and Behaviour, 2002, Road Safety Scotland By Dr Susanne Zeedyk	Impact of road safety education on accident rates	Results of projects to run road safety training in schools
110	Travel in Urban and Rural Areas of GB, 2003/2007, DfT/ ONS	Personal travel fact sheet regarding differing travel patterns in rural and urban areas	Data from NTS 1999-2001/ 2006
111	Walking in GB, 2003, DfT/ ONS	Personal travel fact sheet regarding walking - profile, frequency, purposes	Data from NTS 1999-2001
112	Pedestrian Guard Railing: A review of criteria for installation, 2005, Transport Research Group at the University of Southampton	How guard railing is used in London and develop criteria for use which promotes road safety and pedestrian access	Survey of pedestrian behaviour using CCTV, analysis of accident records
113	Measuring Pedestrian Accessibility, 2004. EPSRC Project. M.Tight, F Hodgson, M Page	Full project will quantify attitudes and perceptions to walking and barriers to walking, develop tool to evaluate pedestrian routes - task 1 is literature review	Literature review
114	A New Approach to the School Run, 2004, Commission for Integrated Transport	Article about impacts of school run and potential for change	Unknown

115	Arterial Streets Towards Sustainability, 2004. TSG Research	Review of street classification system to look at approaches to sustainability focussed assessment and management of arterial streets	Case studies
116	Neighbourhood Traffic Calming Workshop Series: Coconut Grove Neighbourhood, 1998, Department of Transportation Services (US)	List of suggestions to improve traffic flow in research neighbourhood.	Workshop with residents
117	Child Pedestrian Accidents in the UK, Monitoring the UK Government's Road Safety Strategy, Paul Hewson	Discussion on the factors affecting Child Pedestrian Accidents. Inconclusive: Government needs to do more in terms of urban design to minimise accidents	Various including accident data
118	Design Guidance: Accommodating Bicycle and Pedestrian Travel - a recommended approach, 2003, Federal Highway Administration (US)	General guidance to design of cycle paths and facilities	Strategic document
119	Transport 2025: Transport vision for a growing world city, 2006, TfL	Policy initiatives for long term vision for London's transport	Strategic document
120	Personal travel trends, 2007, DfT	Patterns of travel and use of modes with trends	ONS data including NTS, Retail prices index and Expenditure and food survey
121	Cycling: personal travel factsheet, 2007, DfT	Analysis about cycling levels, trends and attitudes to walking	Data from NTS and ONS omnibus survey 2005
122	Focus on personal travel, 2005, DfT/ ONS	Full report of personal travel trends in GB, plus analysis of NTS data	Data from NTS
123	Multi modal SP study, 2007, Steer Davies Gleave	Research in London valuing different elements of the travel experience on each mode of travel	Stated preference
124	Travel to school: personal travel factsheet, 2008, DfT	Analysis of how children get to school, trends, distance travelled, traffic caused	Data from NTS 2006
125	Transport Statistics Bulletin: National Travel Survey 2006, 2006, DfT/ONS	Overview of travel in GB showing trends	Data from NTS 2006
126	Perceptions of Public transport in London among equality and inclusion groups: Summary of existing research about disabled people (draft), 2007, Gill Wales	Summary of travel needs and perceptions of disabled Londoners.	Summary of other research
127	London Omnibus 2007 topline results, 2007, Ipsos MORI	Omnibus questions looking at walking	1007 telephone interviews matching profile of London residents
128	Cycling: the way ahead for towns and cities, 1999, European Community	European Commission report into cycle friendly cities, attitudes to cycling	Policy review
129	Pool bikes for business: a practical guide to setting up a workplace bike pool, SEA/Renue /TfL	A practical guide to setting up a workplace bike pool including barriers to success, best practice case studies and policy	Best practice guide
130	Cycle strategy and Action plan, 2005, MVA/ Thames Gateway London Partnership	Agenda for promoting cycling across Thames Gateway sub-region	Strategic document
131	Gender Equalities Analysis, 2007, Steer Davies Gleave	Based on new analysis of LATS looking at differences between genders and by women's lifestage	Data analysis
132	Darlington Travel Choices: protocol analysis, 2007, Steer Davies Gleave	Qualitative research into travel behaviour change in Darlington	Protocol research
133	Second Interim Travel Behaviour Research Report, Socialdata & Sustrans, 2007	Analysis of travel behaviour change in Darlington	Travel diary data
134	London Area Transport Survey, 2001, TfL	Additional analysis of LATS, the 2001 London Area Transport Survey	Travel diary data
135	Overcoming Car Dependency, 2005, Steer Davies Gleave	Research including desk research, and a "Lifestyle" on-line survey examining the nature of car dependency and travel decision making more generally. Included development of "MOSAIC Driver" segmentation	Desk research, on-line survey, geodemographic analysis
136	Congestion Charging Social Research Exploratory Programme, 2005, Steer Davies Gleave	Exploratory research including a review of data and methods, and new qualitative research using 'protocol analysis'	Desk research, geodemographic analysis, protocol analysis individual interviews
137	Stern Review of the Economics of Climate Change, 2006, HM Treasury	Examines the evidence on the economic impacts of climate change and the economics of stabilising greenhouse gases	Policy review
138	Press release: '10000 reasons to cycle to school', 2008, TfL	Press release setting out five new programmes to expand walking and cycling in London	Press release
139	TRLN Automatic Traffic Counter data, 2007/8, TfL	Volumes and indices of cyclists across TRLN	Automatic traffic count data and analysis
140	Cycling: Adults vs Children, 2007, Synovate	Comparison between adults and childrenof attitudes to cycling, takeup of cycle training, awareness of Tour de France and feelings of personal security	Research summary

CONTROL SHEET

Project/Proposal Name: CYCLING IN LONDON

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