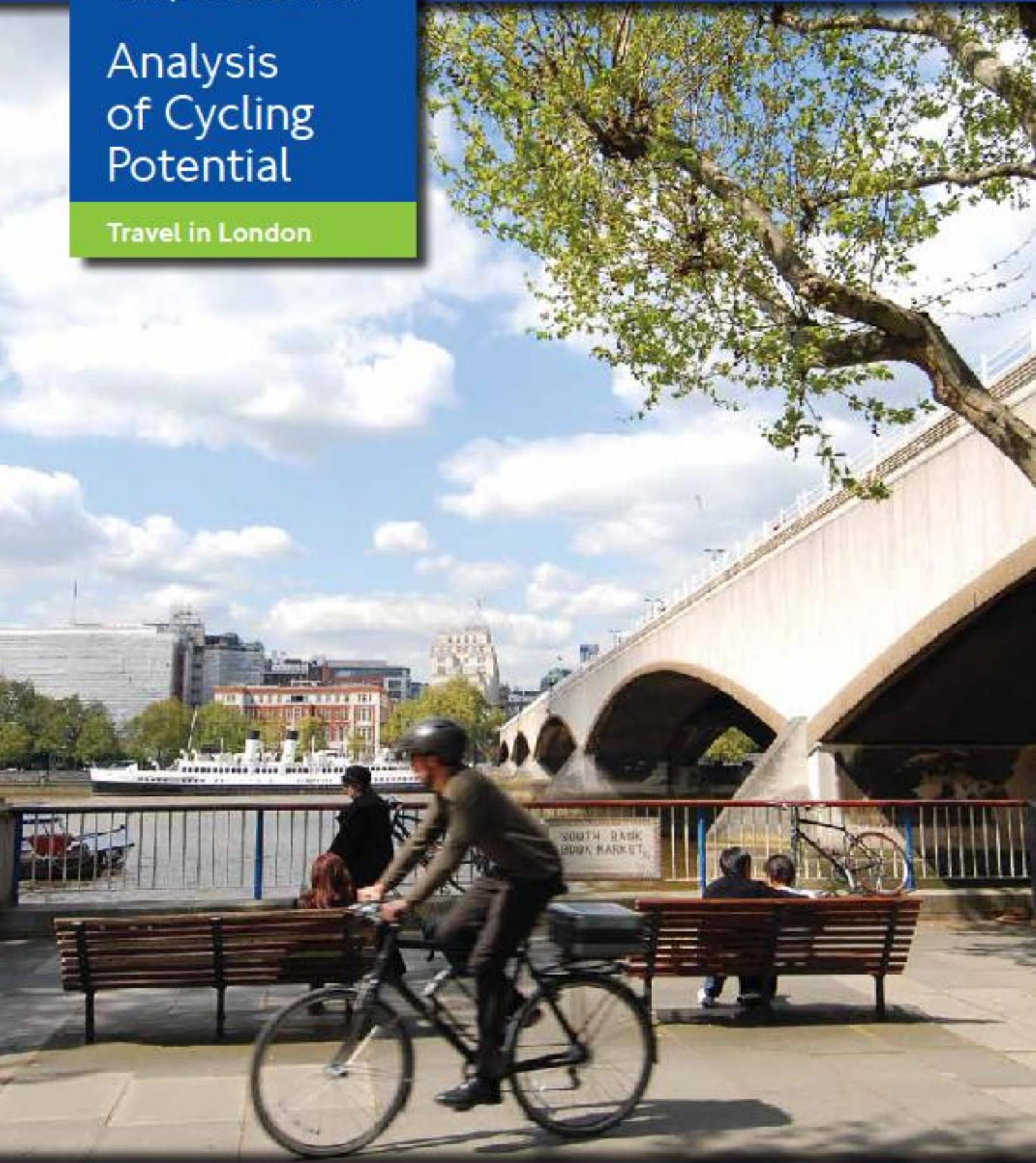


Transport for London

Analysis of Cycling Potential

Travel in London



Analysis of Cycling Potential

Policy Analysis Research Report

December 2010

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Contents

Introduction	2
Executive Summary	4
Chapter 1 Identifying the potential for growth in cycle travel amongst Londoners	8
Identifying potentially cyclable trips	8
Potentially cyclable trips by current mode	10
Potentially cyclable trips by purpose	12
Potentially cyclable trips by day and time	13
Current and potential cycle trips by distance and time taken	13
Chapter 2 Where is the greatest potential for growth in cycle travel?	16
Location of potentially cyclable trips	16
Areas with high density cycling potential	19
Inner London beyond the Cycle Hire Zone	20
Olympic area	20
Inner south London and Croydon	21
Chapter 3 Cycling potential by sub-region and borough	23
Introducing the London sub-regions	23
Cycling potential by sub-region	24
Cycling potential by borough of residence	26
Chapter 4 Who is making potentially cyclable trips?	28
Current and potential cyclists by age and sex	28
Current and potential cyclists by ethnicity	29
Current and potential cyclists by income	30
Potentially cyclable trips by whether currently cycle	31
Chapter 5 Identifying the cycling market	32
Introducing TfL's Cycle Market Segmentation	32
Segmenting the population	33
Potentially cyclable trips by market segment	36
Spotlight on the 'Urban Living' – Potentially cyclable trips	37
Spotlight on the 'Young Couples and Families' – Potentially cyclable trips	40
Chapter 6 Potential policy implications – moving from analysis to policy	43
Appendices	50

Introduction

This document presents the results of analysis carried out to understand the potential for growth in cycle travel. The goal of this analysis is to better understand the nature of this potential, in terms of what type of trips, people and places offer the best opportunity for growth. The analysis aims to make the best use of available data to inform policy development – it has been carried out at TfL using existing data sources. This report does not seek to present a complete picture of all aspects of the potential for growth; in particular, there is potential beyond that identified by this analysis to increase cycling as a leisure activity, as a method of accessing other public transport modes, and for those visiting London. Nevertheless, the data provides a unique and fascinating insight into cycling potential, and can help the Mayor, TfL and London's boroughs to plan policy interventions that provide good value for money whilst meeting the needs of London residents.

Policy Context

The Mayor has declared his aim of delivering a 'cycling revolution' in London by 2026; delivering a 400 per cent increase (from 2001) in the number of cycling trips and a 5 per cent mode share for cycling. In 'Cycling Revolution London', the Mayor sets out his vision for London to become a cyclised city: one where people can ride their bikes safely, enjoyably and easily in an environment that embraces cycling. Making this a reality requires that physical and cultural changes are made in the city, demanding further investment, strong partnership working across the Capital and continued political leadership.

2010 is the Year of Cycling and has seen the launch of two Cycle Superhighways to Barking and Merton and the Central London Cycle Hire scheme, alongside numerous events and initiatives. Thirteen outer London boroughs have chosen to become Biking Boroughs and are developing strategic plans to deliver real change for cycling in their local areas. In the medium-term, the Mayor has declared his intention to launch 10 more Cycle Superhighways and to explore options for expanding the Cycle Hire scheme. Significant investment is also planned for cycle parking, smarter travel and Greenways. In the longer term, TfL must develop policies which can deliver substantial mode shift; current barriers, in terms of infrastructure, information and attitudes, will need to be overcome to achieve this.

Introducing the analysis

Researchers across TfL have been working together to gather evidence on how TfL and the boroughs can deliver the Mayor's target. Two new tools have been developed, presented here, to support the development of cycling policy. Separately and in combination, these new analytical tools provide TfL with an insight into where the greatest potential to increase cycling can be found. The first, an Analysis of Cycling Potential, is derived from TfL's London Travel Demand Survey (LTDS, 2005/06 to 2007/08), and seeks to identify current trips which *could reasonably be cycled all the way* but are not cycled at present. The Survey provides an insight into how Londoners travel and includes 19,000 households and 42,000 residents. The analysis of cycling potential seeks to quantify the nature and extent of the potential for cycling in London, by identifying trips made at present by other modes, and assessing whether they could potentially be cycled, based on a set of criteria about the person and trip.

The second tool is a bespoke Cycle Market Segmentation, an analysis derived from a range of data sources that evaluates the influences over travel behaviour in order to identify people most amenable to cycling in future and most likely to cycle at present. The segmentation is a geo-demographic classification based upon full postcode, so that each postcode is classified into one of seven segments according to the average characteristics of its residents. Because postcode zones are very small, resident populations tend to be highly homogeneous and therefore such classifications can be used with a reasonable degree of accuracy to predict the likelihood of an individual or household to exhibit a particular behaviour, characteristic or attitude. The market segmentation utilises behavioural and attitudinal data and can be used to identify who is in the 'near market' for cycling and where they live, ensuring that interventions are suitable for the needs of local people.

Structure of the report

This report describes the findings of this analysis and identifies the people and places across London which can benefit most from the Mayor's Cycling Revolution.

Chapter 1 describes the method used to identify potentially cyclable trips, trips made by London residents which *could reasonably be cycled all the way* but are not cycled at present. It presents a summary of the potential for cycling in terms of the nature of trips being made and compares the characteristics of potentially cyclable trips with current cycle travel.

Chapter 2 describes where potentially cyclable trips are being made, identifying those locations with the greatest potential for cycling growth. It presents analysis of areas containing dense 'clusters' of potentially cyclable trips.

Chapter 3 presents analysis of cycling potential at a sub-regional and borough level. The London sub-regions provide a level of London's geography that is wider than a single borough, to facilitate the consideration of transport challenges and solutions on an area basis. Analysis has been carried out at a sub-regional and borough level to inform TfL's Sub-Regional Transport Plans and borough Local Implementation Plans.

Chapter 4 describes who is making potentially cyclable trips and compares their characteristics with current London cyclists. The Chapter explores the demographic characteristics of those making potentially cyclable trips and assesses the potential for growth that remains amongst those who currently cycle, and those who do so frequently.

Chapter 5 introduces TfL's new Cycle Market Segmentation, an analysis derived from a range of data sources that evaluates the influences over travel behaviour in order to identify households most amenable to cycling in future and most likely to cycle at present. Analysis of the potential for cycle travel by market segment is presented in the Chapter, with a particular focus on the two segments with the greatest propensity to cycle at present and most amenable to cycling in future.

Finally, Chapter 6 describes the wider implications of the analysis for cycle policy development, drawing conclusions about how TfL and London's boroughs can maximise the potential available to them.

Executive Summary

Purpose of the report

The Mayor has declared his aim of delivering a ‘cycling revolution’ in London by 2026; delivering a 400 per cent increase (from 2001) in the number of cycling trips and a 5 per cent mode share for cycling. This report presents the results of analysis carried out by TfL Group Planning to understand the potential for growth in cycle travel and the nature of this potential, in terms of the type of trips, people and places offering the best opportunity for growth. The analysis draws on two new tools developed by TfL which, separately and in combination, provide a fascinating and unique insight into where the potential to increase cycling can be found, and help the Mayor, TfL, and London’s boroughs plan effective and good value for money policy interventions.

Analysis of potentially cyclable trips

The Analysis of Cycling Potential is derived from TfL’s London Travel Demand Survey (LTDS, 2005/06 to 2007/08) and seeks to identify current trips *which could reasonably be cycled all the way*, but aren’t at present. A trip is defined as a one-way movement from one place to another to achieve a single main purpose. More than one mode of transport may be used during a single trip; this analysis looks at trips currently made by a mechanised mode (car or public transport) that could be cycled all the way. The potential for part of a trip to be cycled is not explored in this analysis.

All trips currently made by mechanised modes have been assessed according to a set of criteria based upon the characteristics of currently cycled trips. This is not intended to act as a limit on the potential for growth in cycle travel; TfL recognises that many of the trips excluded by the filters could and would be cycled. Equally, there is much we do not know about the trips and it is likely that many of the trips identified here as potentially cyclable could not in fact be cycled in practice. Nevertheless, the filters are designed to reflect the characteristics of the majority of trips currently made by bicycle and act as a ‘rule of thumb’ to identify those trips *most likely to be considered cyclable by most people*.

In total, 4.3 million trips per average day have been identified as potentially cyclable, equivalent to 23 per cent of trips by all modes and 35 per cent of trips by mechanised modes. Analysis of the characteristics of these trips shows that:

- Nearly two thirds of potentially cyclable trips are currently made by car with the remainder largely made by bus;
- Four in ten potentially cyclable trips are made for shopping and leisure purposes and just under a quarter for work purposes; and
- Of the 4.3 million potentially cyclable trips made every day, 3.5 million would take less than 20 minutes for most people to cycle.

The greatest unmet potential for growth can be found within outer London – 54 per cent of potentially cyclable trips – and only 5 per cent of the ‘total potential’ in outer London is actually cycled, compared to 14 per cent of that for central London (defined as the Central Activities Zone,

broadly equivalent to Zone 1) and 9 per cent for inner London. The 'total potential' is defined as the total number of trips currently cycled added to the number of potentially cyclable trips.

- A high density of potentially cyclable trips are made within central and parts of inner London and around the outer London metropolitan town centres.
- A higher proportion of mechanised trips made by residents of inner London are potentially cyclable, yet there is greater potential in outer London, simply due to the size of the region.
- Currently, nearly half of all cycle trips have an origin or destination in the Central sub-region (including the Cities of London and Westminster, the boroughs of Camden, Islington, Southwark and Lambeth and the Royal Borough of Kensington & Chelsea). In comparison, potentially cyclable trips are more evenly dispersed across London, although the Central sub-region still accounts for around a quarter of the total.

Identifying the cycling market

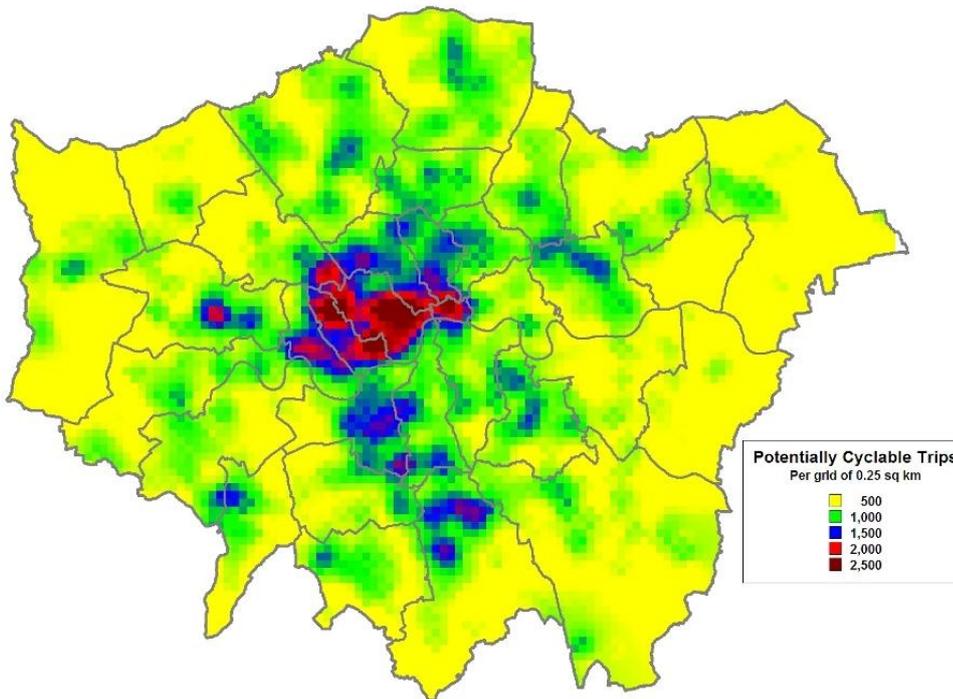
A simple comparison of those making current and potentially cyclable trips shows that, whilst frequent cyclists are typically white, male, between 25 to 44, and on a higher than average income, much of the potential comes from women, ethnic minorities, younger and older people, and those on a lower income. Nevertheless, there remains significant potential for growth amongst existing cyclists and people similar to them.

TfL's new Cycle Market Segmentation tool provides a more sophisticated method of understanding who cycles at present and who is most amenable to cycling in future. The Cycle Market Segmentation is derived from a wide range of survey and demographic data and allows all London postcodes to be classified into seven segments based upon the average characteristics of their residents. Key sources of data include TfL's London Travel Demand Survey, Market Segmentation Survey and the annual Attitudes to Cycling Survey.

The segment most likely to cycle at present and most amenable to cycling in future is the 'Urban Living', making up 23 per cent of the London population and concentrated in central and inner London and in the metropolitan town centres. A postcode classified as 'Urban Living' can be expected to generate 4.6 times as many cycling trips as a postcode of comparative population classified as 'Comfortable Maturity', the group least likely to cycle.

It is possible to combine the datasets and identify potentially cyclable trips made by those in the segments most amenable to cycling. This can be considered the 'near market' for cycling. Figure E1 below shows potentially cyclable trips by origin made by those in the top four segments by propensity to cycle.

Figure E1 Potentially cyclable trips by origin, top four segments by propensity to cycle



Source: Cycle Market Segmentation, TfL 2010; Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Implications – moving from analysis to policy

In summary, drawing upon the research evidence presented in this report and other research evidence collected by TfL in recent years, this report concludes:

- The Mayor has set an ambitious target to increase levels of cycling in London by 400 per cent by 2026. To achieve this it would be necessary for one in every six potentially cyclable trips to be cycled each day, throughout the year, based on the trip volumes of today.
- Frequent cyclists already make the majority of cycle trips in London, but there remains some potential for growth, particularly for the journey to work.
- There remains significant potential to increase cycle trip making amongst existing infrequent cyclists – safety, traffic and lack of facilities are the greatest barriers to this.
- Cycling remains a minority activity – there are many people who are ‘just like’ cyclists but do not currently cycle, offering excellent potential for growth in cycle travel.
- The cycle mode share in central London is already close to 3 per cent and there is the potential to achieve a mode share in the centre of the Capital to challenge that of other major European cities.
- Beyond the centre, the potential to increase cycling is concentrated in pockets around the outer London metropolitan town centres and some inner London major centres – boroughs in these locations are well placed to deliver radical change.

- Regions expecting significant growth in population and employment have the opportunity to 'design in' a high cycle mode share through innovative transport and land use policies.
- Huge potential exists in highly dispersed trips across outer London, demonstrating the continued need to maintain investment in interventions targeted at and able to reach all Londoners.
- Whilst the best potential may come from targeting existing cyclists and those most similar to them, non-cyclists can be encouraged to cycle through measures designed to encourage leisure travel bringing long term transport benefits and shorter term benefits to health and community.

Further information

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Chapter 1 Identifying the potential for growth in cycle travel amongst Londoners

Key findings

- The Analysis of Cycling Potential seeks to identify trips currently made by mechanised modes which *could reasonably be cycled all the way* but are not cycled at present, based upon the London Travel Demand Survey 2005/06 to 2007/08.
- 4.3 million trips currently made by mechanised modes have been identified as potentially cyclable, 23 per cent of trips by all modes and 35 per cent by mechanised mode.
- Nearly two thirds of potentially cyclable trips are currently made by car and four in ten potentially cyclable trips are made for shopping and leisure purposes
- There are 3.5 million potentially cyclable trips made every day which would take less than 20 minutes for most people to cycle.

This Chapter describes the method used to identify potentially cyclable trips, trips made by London residents which *could reasonably be cycled all the way* but are not cycled at present. It presents a summary of the potential for cycling in terms of the nature of trips being made and compares the characteristics of potentially cyclable trips with current cycle travel.

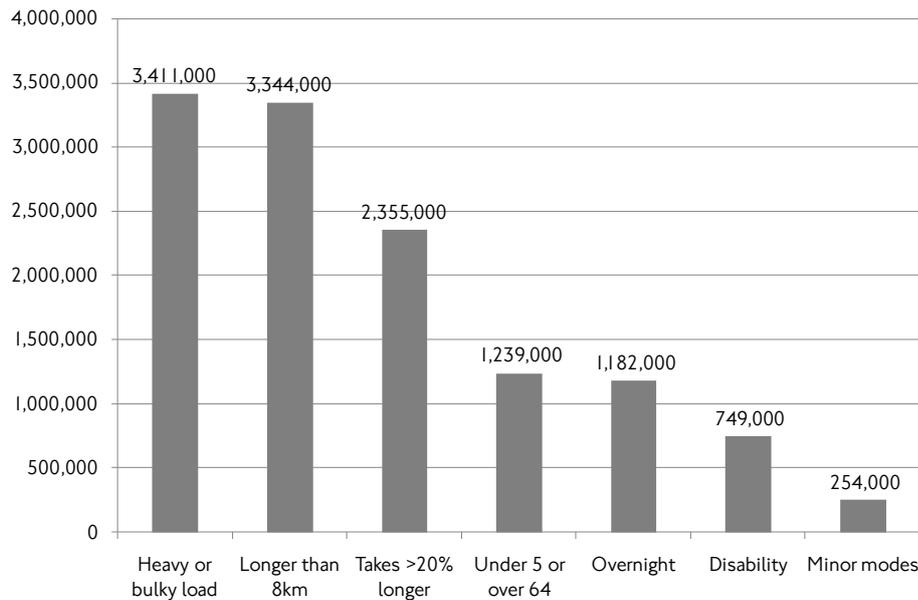
Identifying potentially cyclable trips

Between 2005/06 and 2007/08, London residents made an average of 18.5 million trips per day by all modes. Of these, around 300,000 were already cycled and 5.8 million walked. The remainder, 12.4 million trips, were made by mechanised modes, primarily car, bus, underground and rail. This analysis explores whether or not these trips currently made by mechanised modes could potentially be cycled. Each trip is assessed according to a set of criteria based on the characteristics of currently cycled trips; the filters are designed to reflect the majority of trips currently made by bicycle. Table 1.1 describes the filters applied to the analysis and Figure 1.1 shows their impact.

Table 1.1 Filters applied to trips made by mechanised modes

Filter	Proportion of currently cycled trips
Person carrying a heavy or bulky load	70% of cycle trips are unencumbered
Trip is longer than 8km	94% of cycle trips are currently below 8km
Trip would take over 20% more time to cycle	Based on a reasonable value of time estimate
Traveller is over 5 and under 64	95% of cycle trips made by people in this age group
Trip is made between 8pm and 6am	93% of cycle trips are between 6am and 8pm
Traveller has a disability affecting their travel	96% of cycle trips made by those without a disability
Trip made by van, dial-a-ride, plane or boat	Trips by these modes not considered switchable

Source: Data for current cycle trips based upon London Travel Demand Survey 2005/06 to 2007/08

Figure 1.1 Mechanised trips excluded as not cyclable, by reason for exclusion

Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Note: The filters overlap, so the sum of excluded trips is less than the sum of each

CAVEATS

The filters are intended to act as a 'rule of thumb' to identify those trips most likely to be cyclable. As a result, some trips are excluded which could, in fact be cycled. In particular, keen cyclists will generally cycle faster and further than average, and so would be willing to cycle trips excluded here as not potentially cyclable.

It is also the case that there is much we do not know about the trips identified as potentially cyclable and the people making them. In particular, we do not know who the person may be travelling with or what else they are doing on that day. People who in actuality are travelling as a group are by necessity treated separately in this analysis. Therefore, some of the trips identified as potentially cyclable could not, in fact, be cycled.

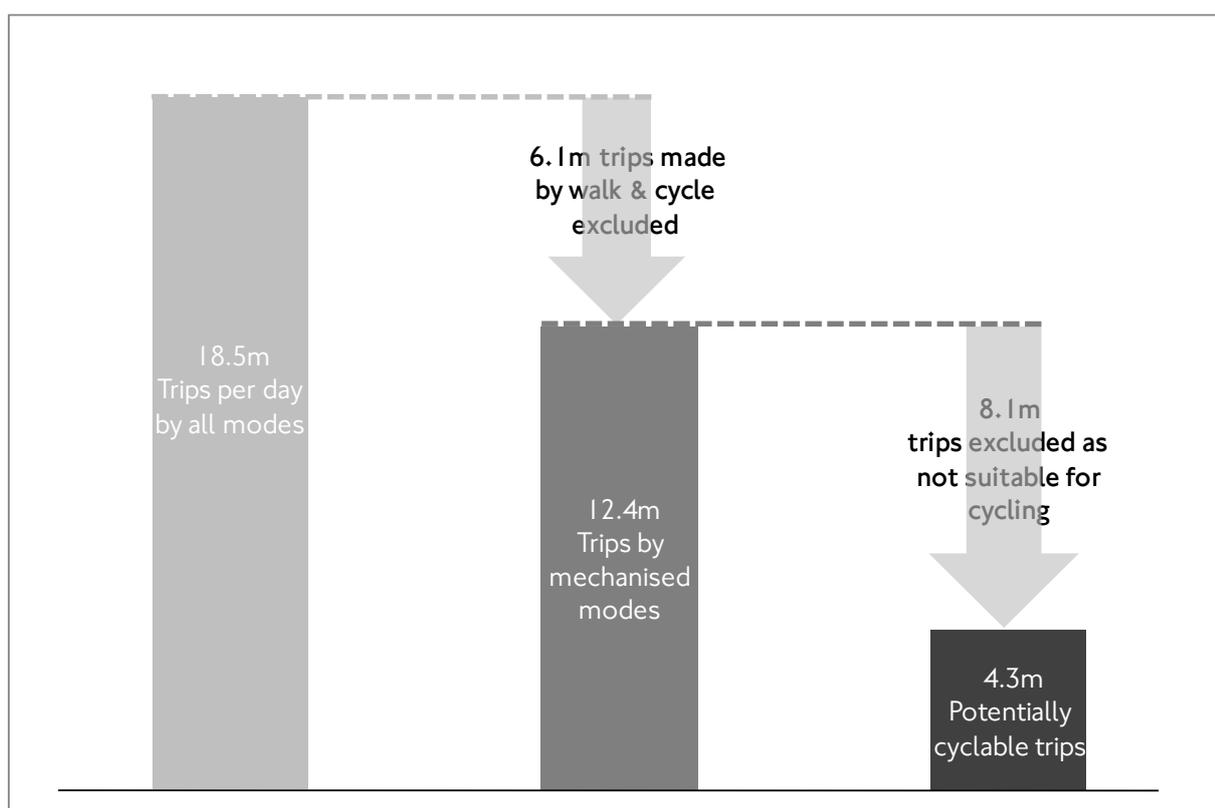
The analysis is limited to trips made by London residents (excluding those who travel to London from elsewhere to work, shop and use services) and to trips which could potentially be cycled all the way. Therefore, any potential for increases in cycle travel for parts of trips, such as after-rail, is not captured here. Note that this will particularly understate the potential for growth in cycle travel in central London, which receives a high volume of daily visitors.

Finally, note that it is necessary to draw on a wider range of data sources in order to draw conclusions about whether or not these trips could or would transfer to cycling, or under what circumstances such a change might happen. The Cycle Market Segmentation tool provides some evidence on the likelihood of mode shift for an individual. It is worth noting that around three in ten London residents consistently say that cycling is not for them under any circumstances; any potentially cyclable trips made by this group are highly unlikely to ever be cycled.

In total, 4.3 million trips per day currently made by mechanised modes were identified as potentially cyclable, equivalent to 23 per cent of trips by all modes and 35 per cent of trips by mechanised modes. Figure 1.2 summarises the results of the analysis.

Assuming that the 'total potential' is the sum of the currently cycled and potentially cyclable trips, and noting that London residents currently make 300,000 cycle trips on an average day, this amounts to 7 per cent of potentially cyclable trips actually being cycled. This excludes trips which are currently walked but could be cycled, reflecting the Mayoral goal to increase the overall mode share for active travel modes.

Figure 1.2 Process to identify potentially cyclable trips



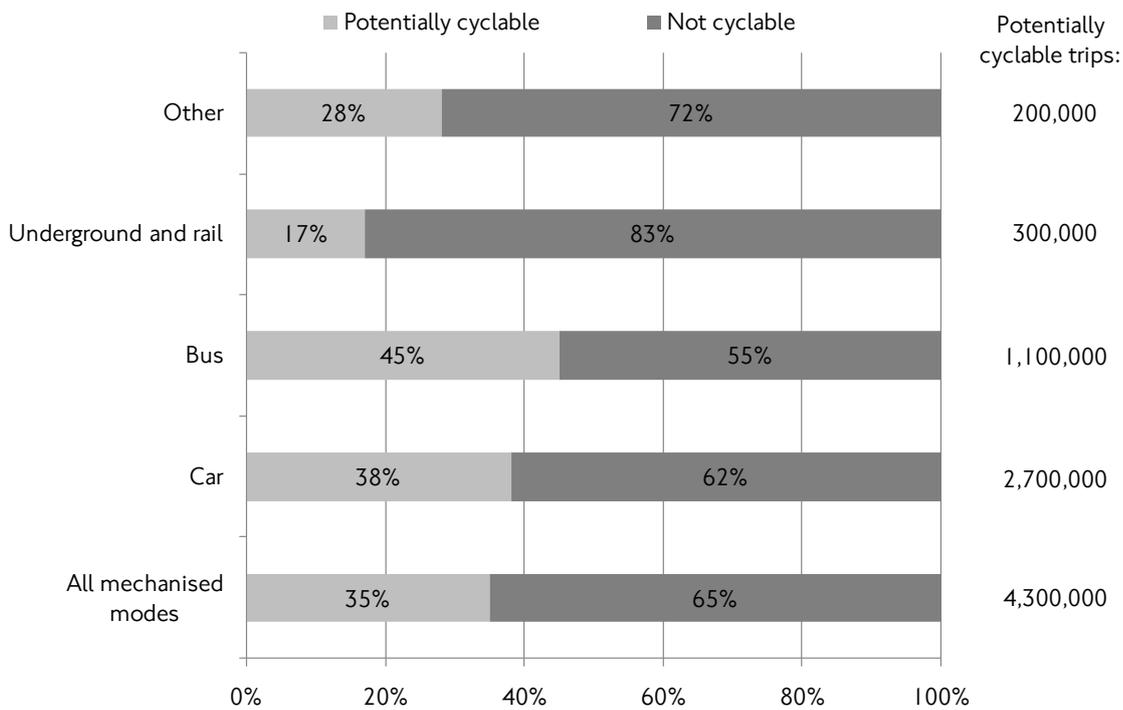
Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Potentially cyclable trips by current mode

Nearly two thirds of all potentially cyclable trips are currently made by car, just fewer than four in ten of the car trips made in London by London residents. This reflects the high number of very short car trips made in London and especially in the outer London boroughs. On a modal basis, trips made by Underground and rail were the least likely to be potentially cyclable, and bus trips were the most likely. This reflects both the average distance travelled by these modes, and the relative speeds: rail trips are longer on average and rail travel is quicker than travelling by bus, meaning that they are more likely to have been excluded as being longer than 8km or taking more than 20% longer by bicycle. Figure 1.3 shows the proportion of trips by each mode that were assessed as potentially cyclable, and Figure 1.4 shows potentially cyclable trips by the mode currently used to make the trip.

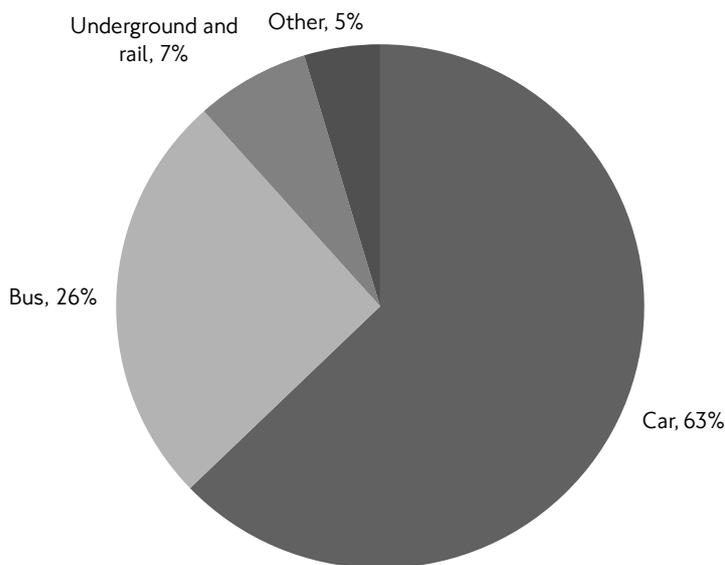
The current mode used for potentially cyclable trips varies considerably by the location of the trip. Three quarters of potentially cyclable trips with an origin and/or destination in outer London are currently made by car, compared to 46 per cent of those in inner London and only 15 per cent of those in central London. Bus accounts for most of the remainder. More than half the potentially cyclable trips made by Underground and rail were within central London or between central and inner London, presumably reflecting the greater distances between stops further from the centre.

Figure 1.3 Trips by each mode identified as potentially cyclable or otherwise



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 1.4 Potentially cyclable trips by current mode

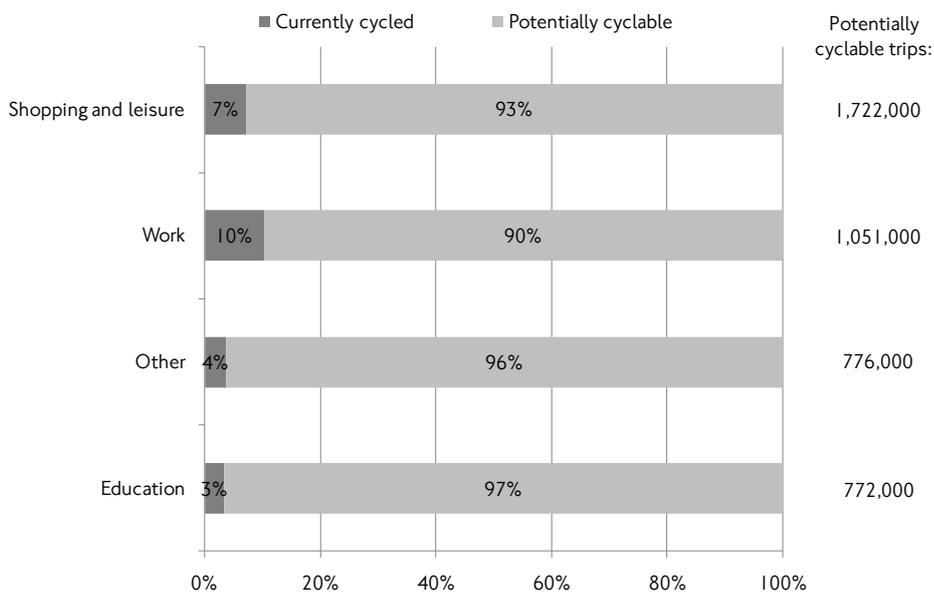


Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Current and potential cycle trips by purpose

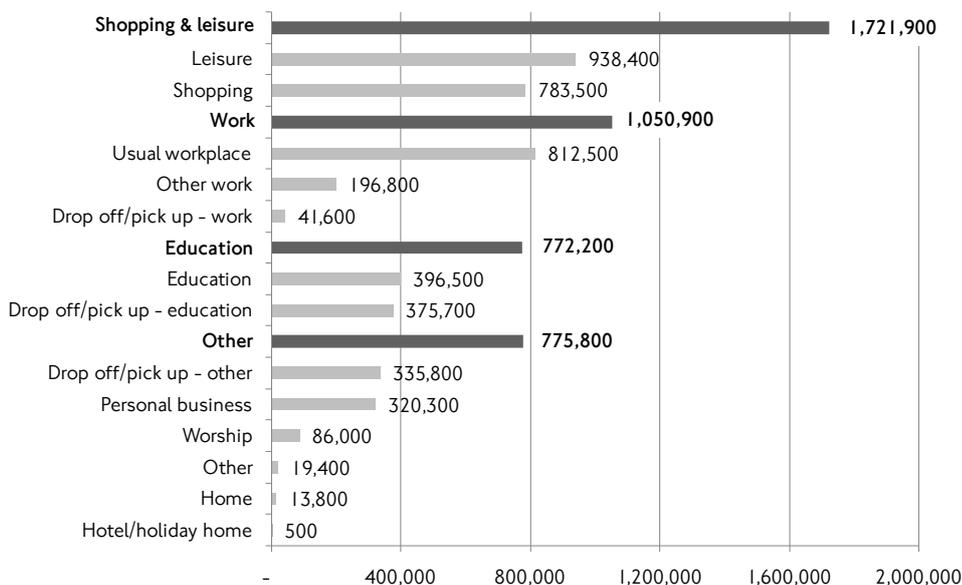
Currently, cycle travel is disproportionately for work purposes; 38 per cent of cycle trips are made for work compared to only 23 per cent of trips by all modes. In comparison, work accounts for under a quarter of potentially cyclable trips, which are much more likely than current trips to be for education and other purposes, such as personal business. Reflecting this, at present around 10 per cent of the 'total potential' (currently cycled and potentially cyclable trips) for work purposes is already cycled, compared to only 3 to 4 per cent of the potential for education and other purposes. Figure 1.5 shows the proportion of the potential currently realised, by summary journey purpose and Figure 1.6 shows the number of potentially cyclable trips by detailed journey purpose.

Figure 1.5 Current and potential cycle trips by journey purpose



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 1.6 Potentially cyclable trips by journey purpose

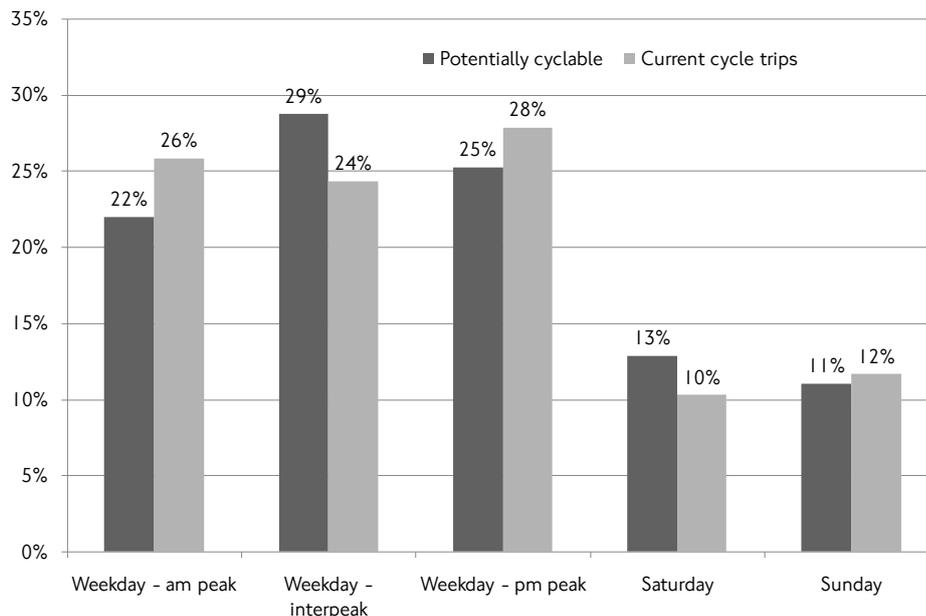


Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Current and potential cycle trips by day and time

Reflecting the proportion of current cycle trips made for work purposes, half of all current cycle trips are made during the weekday peak periods. Potentially cyclable trips are somewhat less likely to be made during the weekday peak periods and somewhat more likely to fall during the weekday inter-peak (see Figure 1.7). Broadly the same proportion of current and potentially cyclable trips is made at the weekend (22 per cent compared to 24 per cent). More potentially cyclable trips are made on an average weekday (4.5 million) than a Saturday (4.2 million) or Sunday (3.6 million). In comparison, current cycle trips are somewhat less likely to be made on a Saturday than a Sunday, although this may simply be the effect of small base sizes for weekend cycle trips.

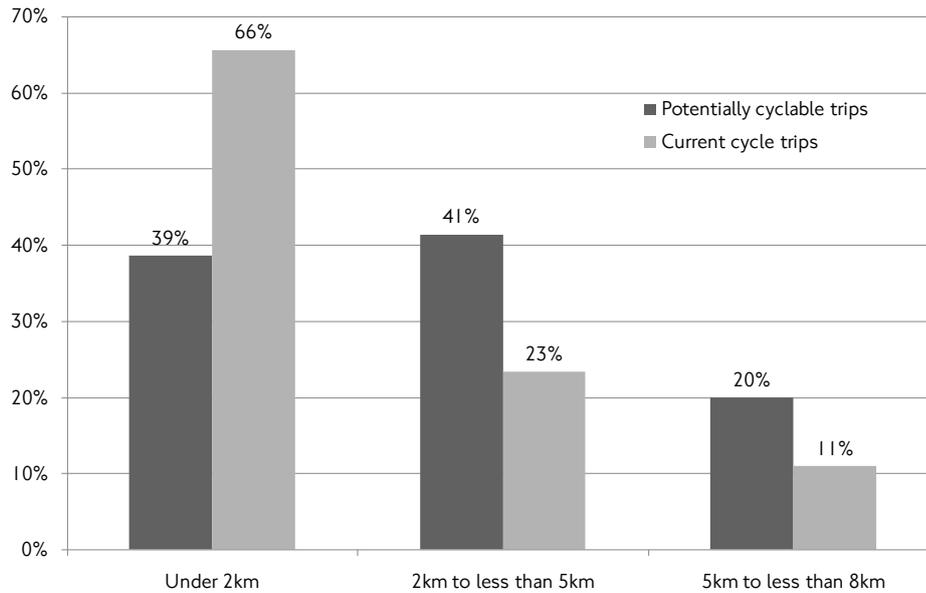
Figure 1.7 Potentially cyclable trips by time and day



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Current and potential cycle trips by distance and time taken

Figure 1.8 compares current and potentially cyclable trips by distance. This shows that potentially cyclable trips are longer on average than currently cycled trips, and a much lower proportion are below 2km in length. Two thirds of all current cycle trips are less than 2km in length, compared to only 39 per cent of potentially cyclable trips, and 10 per cent of the 'total potential' for trips at this distance is realised, compared to only around 4 per cent for longer trips. Nevertheless, this still represents significant potential: there are fewer than 200,000 current cycle trips below 2km but 1.6 million potentially cyclable trips at this distance. Very short potentially cyclable trips are particularly concentrated in outer London; nearly seven in ten potentially cyclable trips under 2km have an origin and/or destination in outer London, 42 per cent of all potentially cyclable trips made in outer London. Again, this reflects the prevalence of short car trips in outer London and the relatively lower walk and cycle mode share.

Figure 1.8 Current and potential cycle trips by trip distance (crow-fly)

Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

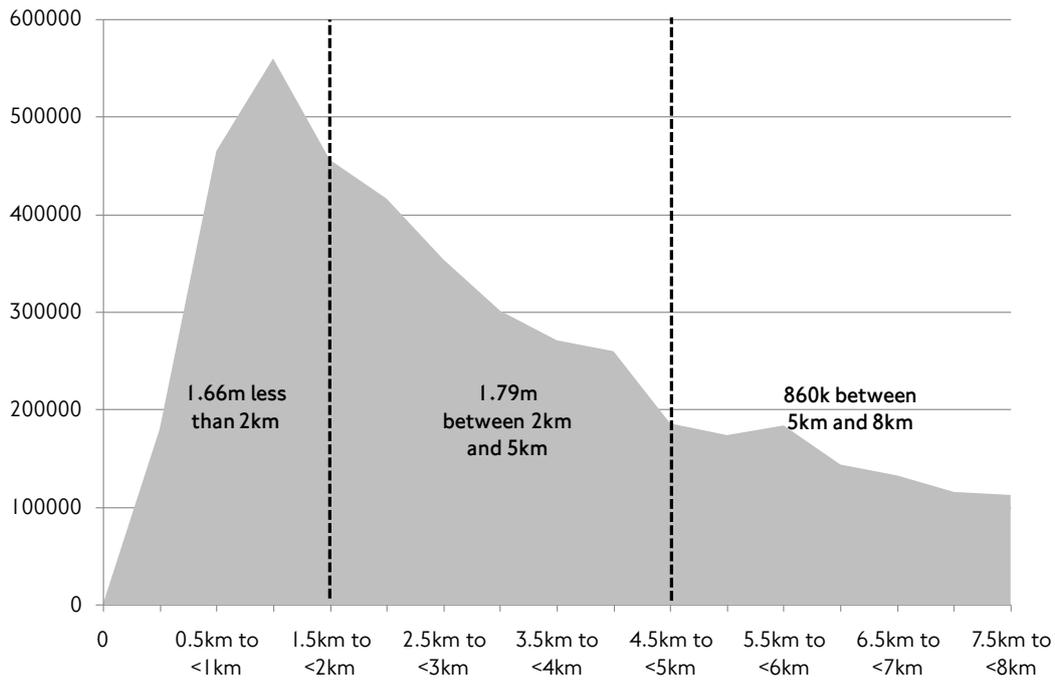
Figure 1.9 shows the profile of potentially cyclable trips by distance. The majority of potentially cyclable trips are between 0.5km and 3km in length. The average cycle speed is assumed to be 15 kilometres per hour. Consequently, more than half the potentially cyclable trips would take between 2 and 12 minutes to cycle.

Based upon this estimated average speed, a trip of 2km would take around 8 minutes, of 5km around 20 minutes, and of 8km around half an hour. A more experienced or fitter cyclist would be expected to achieve higher average speeds. In total, there are nearly 3.5 million trips made every day in London which would take less than 20 minutes for most people to cycle. It is notable that 15km per hour is faster than average peak hour road speeds in central London and only a little lower than peak speeds in inner London (around 18km per hour).

Furthermore, cycle journeys tend to be more predictable. Research carried out by TfL's Road Network Performance team concluded that cycle journey times are highly consistent per rider, and largely independent of traffic conditions and time of day. The research used GPS to track the journey times of eight cyclists on their regular route to work over a period of several days; on one example route, Colliers Wood to Victoria, the same 9.4km outbound journey was completed on nine separate occasions and the variation between all those journeys was 53 seconds on a journey time of 30 minutes. This was typical of results across the different routes (RNPR Traffic Note 11 Cycle Journey Time Reliability).

On average, potentially cyclable trips with an origin and/or destination in central London are longer than those with an origin and/or destination elsewhere in London: 46 per cent are between 5 and 8 km compared to only 20 per cent overall. This suggests that there is considerable potential for time savings to be achieved.

Figure 1.9 Potentially cyclable trips by trip distance (crow-fly)



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Chapter 2 Where is the greatest potential for growth in cycle travel?

Key findings

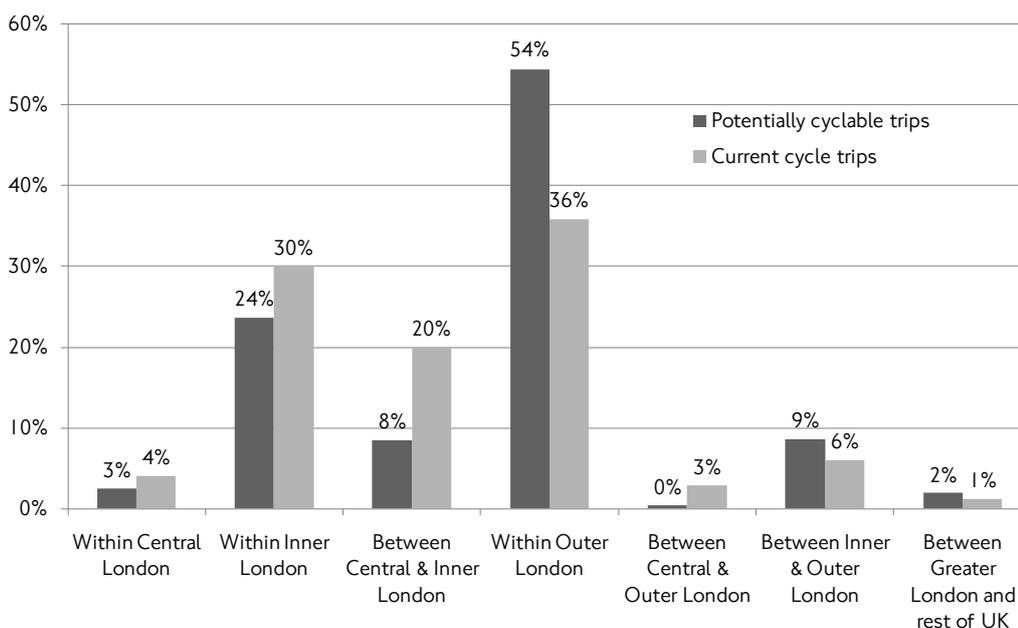
- A quarter of potentially cyclable trips are made within inner London, 54 per cent within outer London and 9 per cent travelling between the two regions.
- A high density of potentially cyclable trips are made within central and parts of inner London and around the outer London metropolitan town centres. In particular, more than 30,000 potentially cyclable trips had an origin or destination in each of Croydon, Ealing, Bromley and Ilford town centres.

This Chapter describes where potentially cyclable trips are being made, identifying those locations with the greatest potential for cycling growth. It presents analysis of areas containing dense 'clusters' of potentially cyclable trips.

Location of potentially cyclable trips

Between 2005/06 and 2007/08, London residents made an average of 307,000 cycle trips per day. Of these, the majority (192,800, 63 per cent) had an origin and/or destination in central or inner London and a quarter involved travel to or from central London from elsewhere in London. Figure 2.1 compares the origin and destination of current and potential cycle trips. It is clear that in particular there is a great deal of unmet potential within outer London as only 5 per cent of the 'total potential' of trips with an origin and/or destination in outer London is actually cycled, compared to 14 per cent of that for central London and 9 per cent for inner London.

Figure 2.1 Origin and destination of current and potential cycle trips, London residents



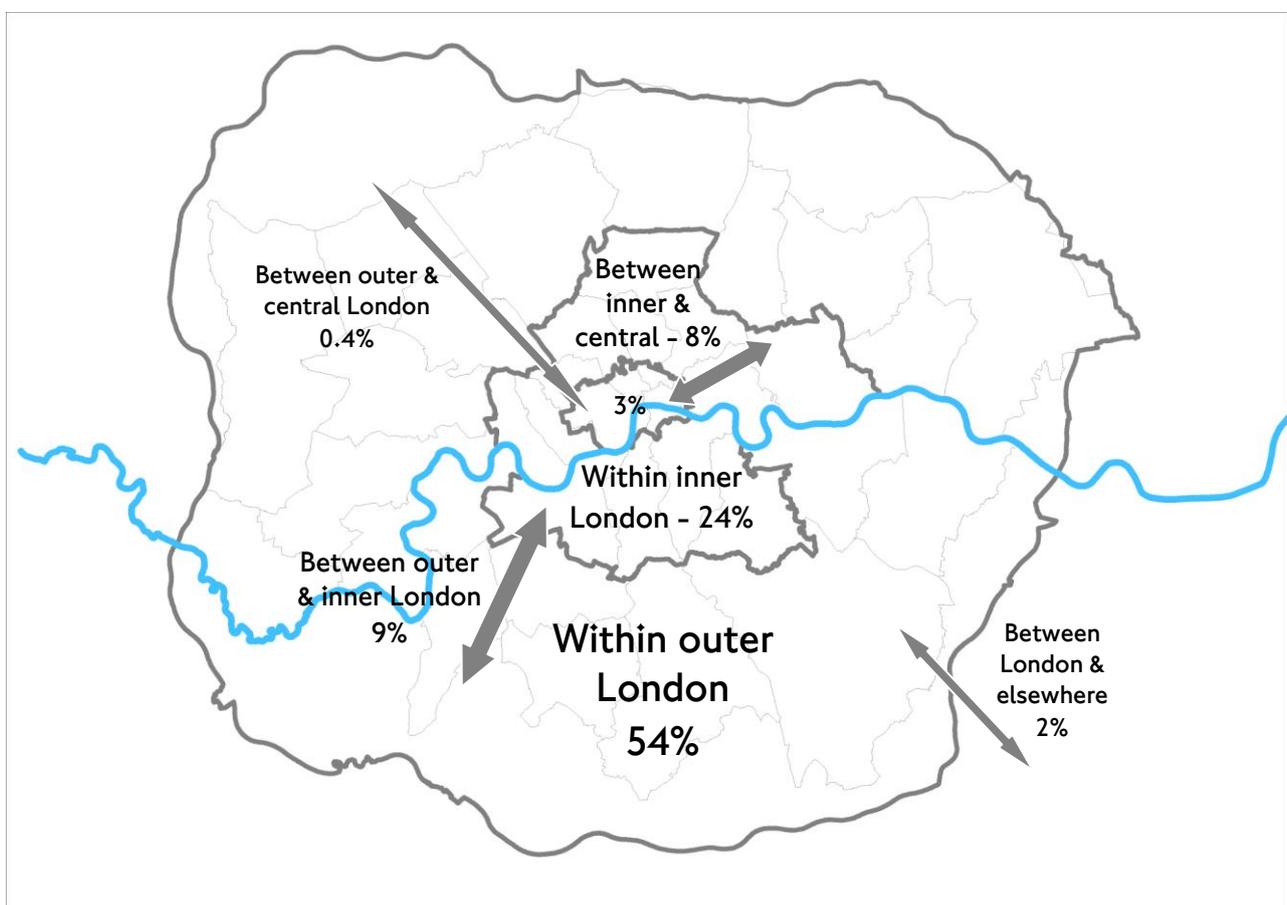
Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Note: Central London defined as the Central Activities Zone, broadly equivalent to Zone 1

The map presented in Figure 2.2 provides a summary of where potentially cyclable trips are being made. There is particular potential for growth in a number of different markets: short hops in central London (around 100,000 trips); commuter trips from inner and outer London to central London (nearly 400,000 trips); and local trips in inner (1 million trips) and outer London (more than 2.3 million trips). Note that this analysis includes London residents only. Central London attracts a vast number of non-Londoners every day, coming to work, shop and use the many services unique to the Capital city. Therefore, the real potential for cycling in this area may be considerably higher than is represented here.

Potentially cyclable trips with an origin or destination in central London were twice as likely as trips made elsewhere to be for work purposes (44 per cent compared to 22 per cent), accounting for one in five potentially cyclable trips made for work purposes.

Figure 2.2 Origin and destination of potentially cyclable trips made by London residents

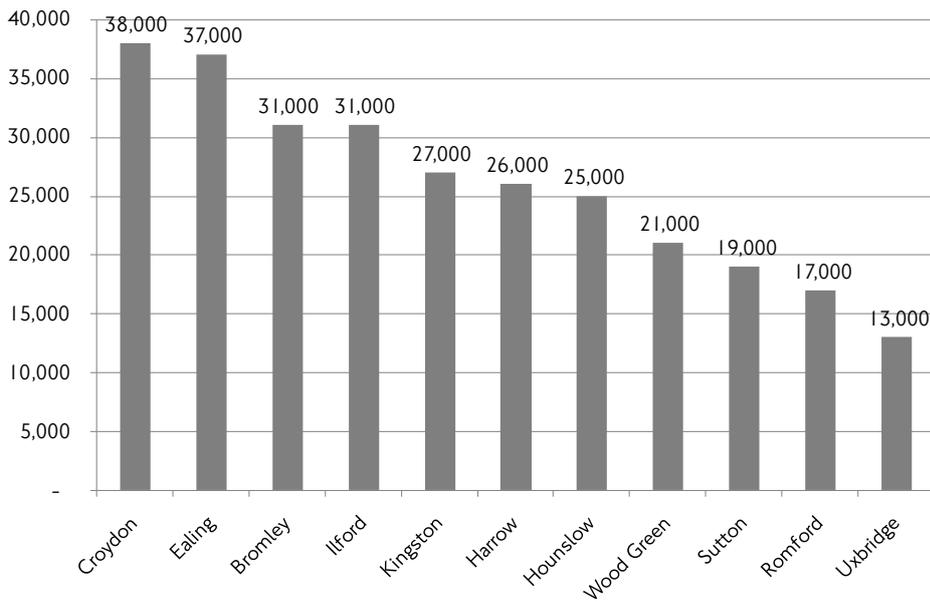


Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Note: Excludes non-residents therefore 'Between London and elsewhere' includes trips by London residents only; Central London defined as the Central Activities Zone, broadly equivalent to Zone 1

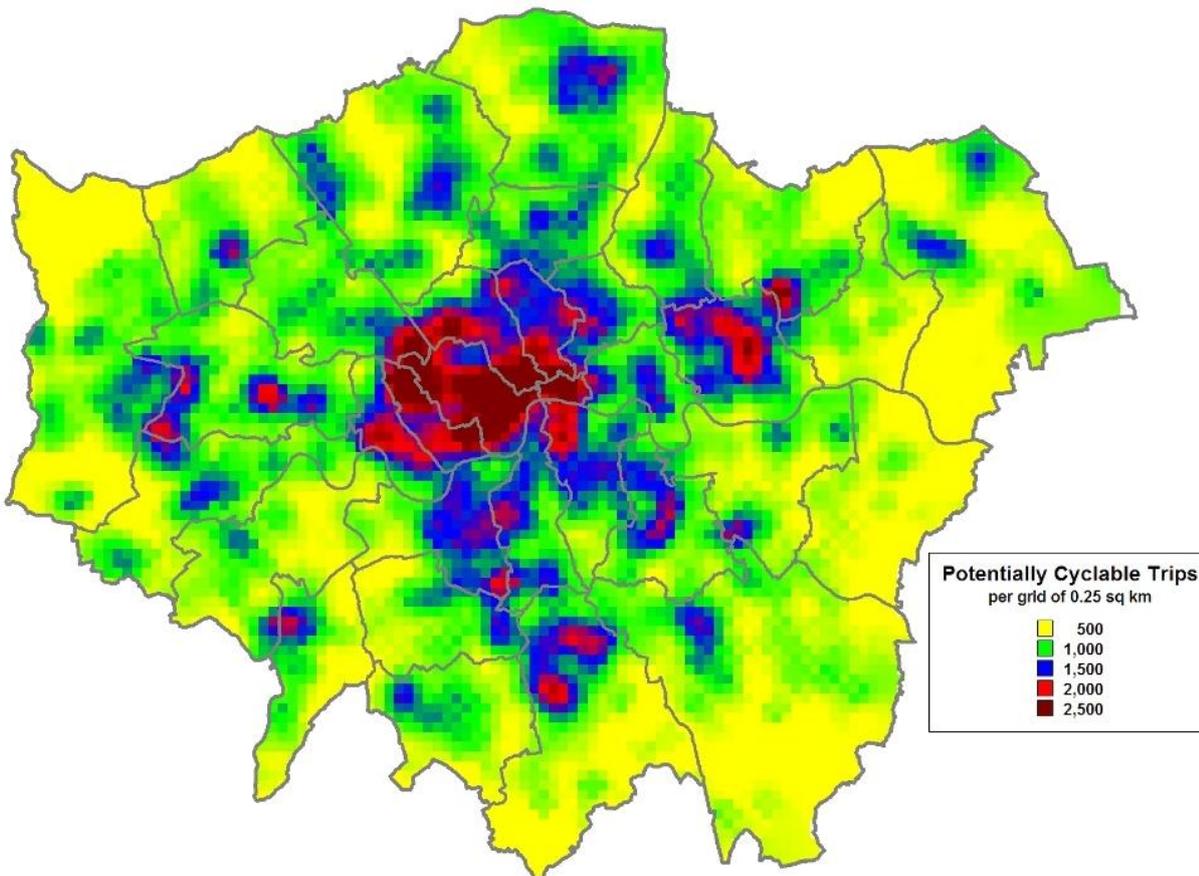
As shown in Figures 2.4 and 2.5 overleaf, around a quarter of potentially cyclable trips originated in London's 48 International, Metropolitan and Major town centres. Trips are concentrated in the West End (130,000) and Knightsbridge (50,000) in central London and in Kilburn (31,000), Hammersmith (27,000) and Lewisham (23,000) in inner London. 7 per cent of potentially cyclable trips originated in the 11 outer London Metropolitan town centres, shown in Figure 2.3.

Figure 2.3 Potentially cyclable trips with an origin in the outer London Metropolitan town centres, London residents



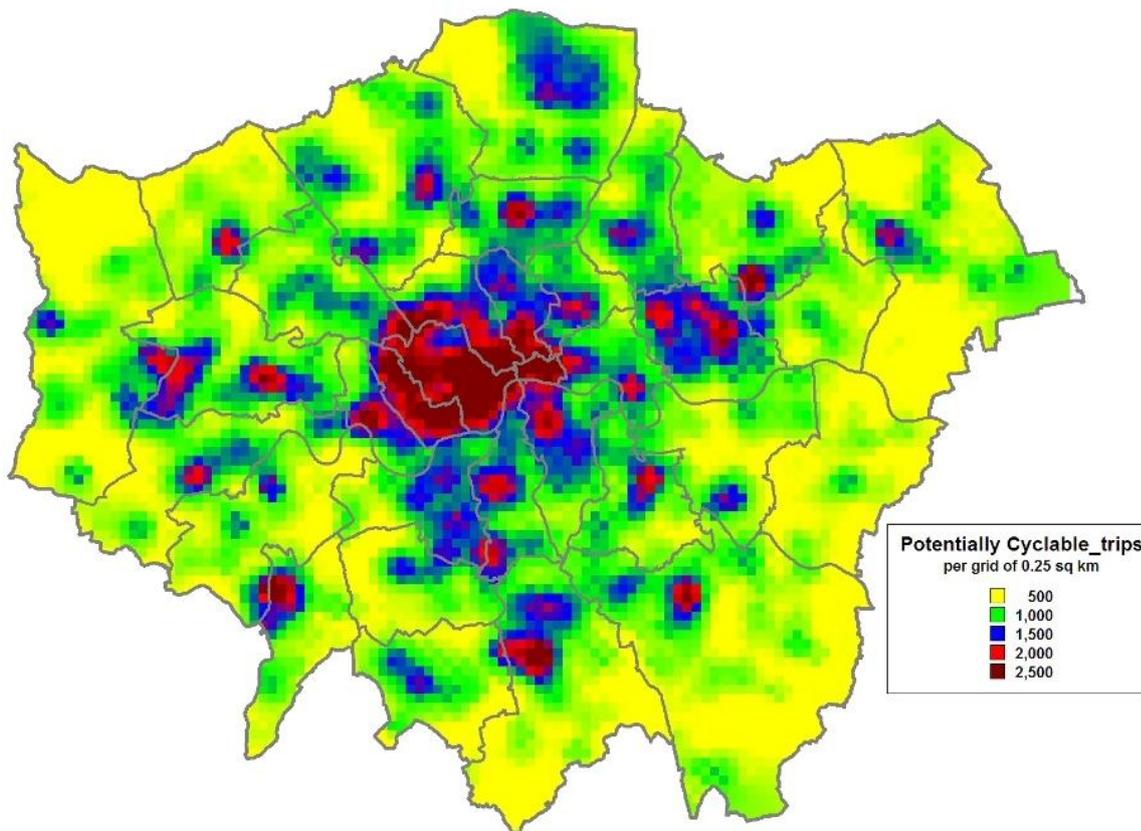
Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 2.4 Potentially cyclable trips by trip origin, London residents



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 2.5 Potentially cyclable trips by trip destination, London residents



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Areas with high density cycling potential

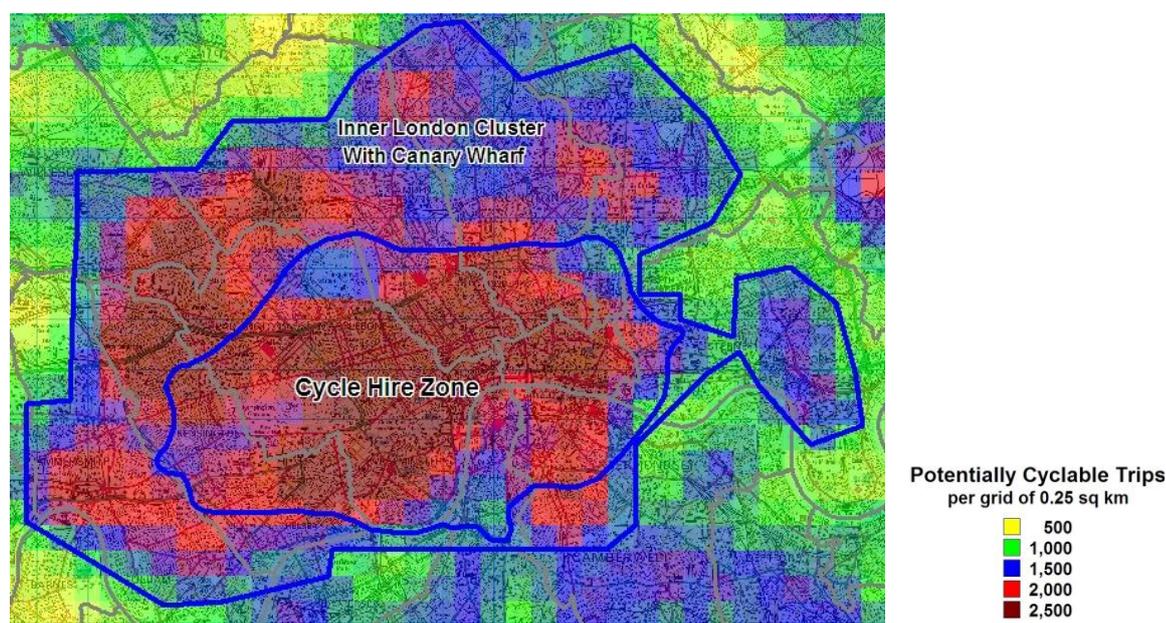
The cycling potential 'heat maps' shown in Figures 2.4 and 2.5 show a high density of potentially cyclable trips in some central and inner London boroughs, particularly the City of London, Westminster, Kensington and Chelsea, Camden, Islington, Lambeth and Hammersmith and Fulham. The Barclays Cycle Hire Scheme will cater for much of the potential for short trips within central London, whilst the Cycle Superhighways will deliver commuter cyclists into the city centre from inner London and beyond.

By analysing areas with a high density of potentially cyclable trips, and understanding the nature of such trips and the people making them, it is possible to identify places where intensive interventions could provide value for money. More than half of the potentially cyclable trips are local trips dispersed across inner and outer London, marked in yellow and green on the heat maps, demonstrating the continuing need for interventions that can reach a dispersed population.

Inner London beyond the Cycle Hire zone

Analysis has been carried out of existing potential in the area just beyond the current London Cycle Hire Scheme zone, shown in Figure 2.6. This area covers approximately 75 sq km and around half a million potentially cyclable trips have an origin within the boundary, but outside the Cycle Hire zone. Particularly high densities of trips are visible in Kensington and Chelsea and Hammersmith to the west and in Camden and the northern parts of Westminster to the north-west of the zone. The potential is largely derived from trips made by residents of the boroughs (85 per cent of trips) and is drawn from public transport trips, particularly those made by bus (58 per cent public transport, including 41 per cent bus).

Figure 2.6 Potentially cyclable trips in inner London and Canary Wharf



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

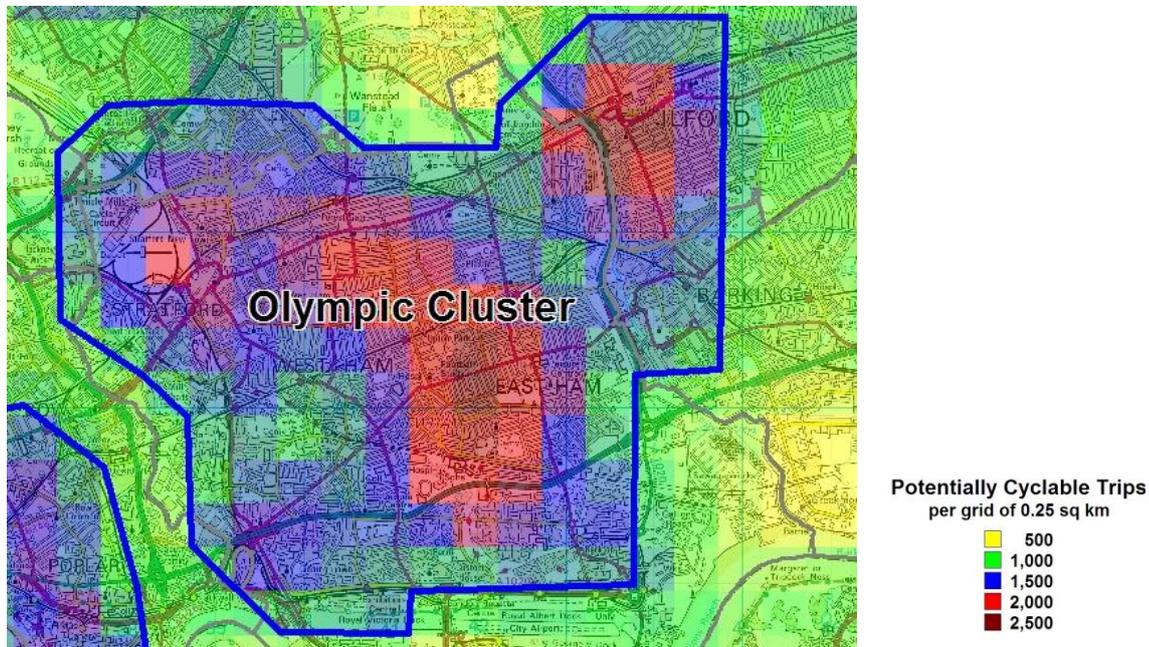
Beyond the centre of London, there exist significant clusters of potential in some regions of inner and outer London, as well as in and around several Metropolitan town centres. Analysis has been carried out exploring in greater detail the potential for cycling in a selection of these areas. This is summarised below.

Olympic area

This analysis describes the potential for cycling in an area of approximately 37 sq km lying mainly within the London Borough of Newham, as well as small parts of Redbridge, Waltham Forest and Barking and Dagenham. Nearly 200,000 potentially cyclable trips originated from this cluster, undertaken by around 100,000 people. Potentially cyclable trips undertaken in this area were shorter than average, with half under 2km compared to around 40 per cent across London, and more likely to be made by bus, accounting for three in ten potentially cyclable trips in this area. The vast majority of trips made in this area were made by residents of Newham, Redbridge, Waltham Forest and Barking and Dagenham (96 per cent) and six in ten were made by car. Half of those making a potentially cyclable trip had a low household income of less than £20,000; there is therefore good potential to promote cycling as a relatively low cost and efficient mode.

The area around the Olympic park is projected to experience very high growth in population and employment over the London Plan period to 2031. This analysis only takes into account trips made by current residents of the area; the projected growth provides considerable additional potential, particularly given the opportunity to 'build in' walking and cycling with innovative land use, infrastructure, parking and urban realm policies.

Figure 2.7 Potentially cyclable trips in the Olympic area

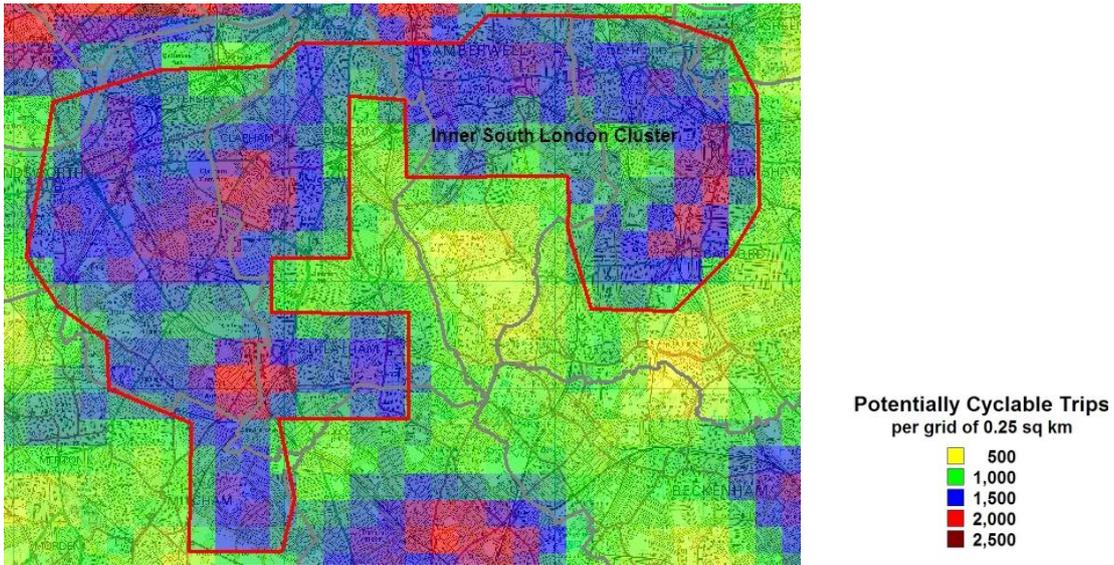


Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Inner South London and Croydon

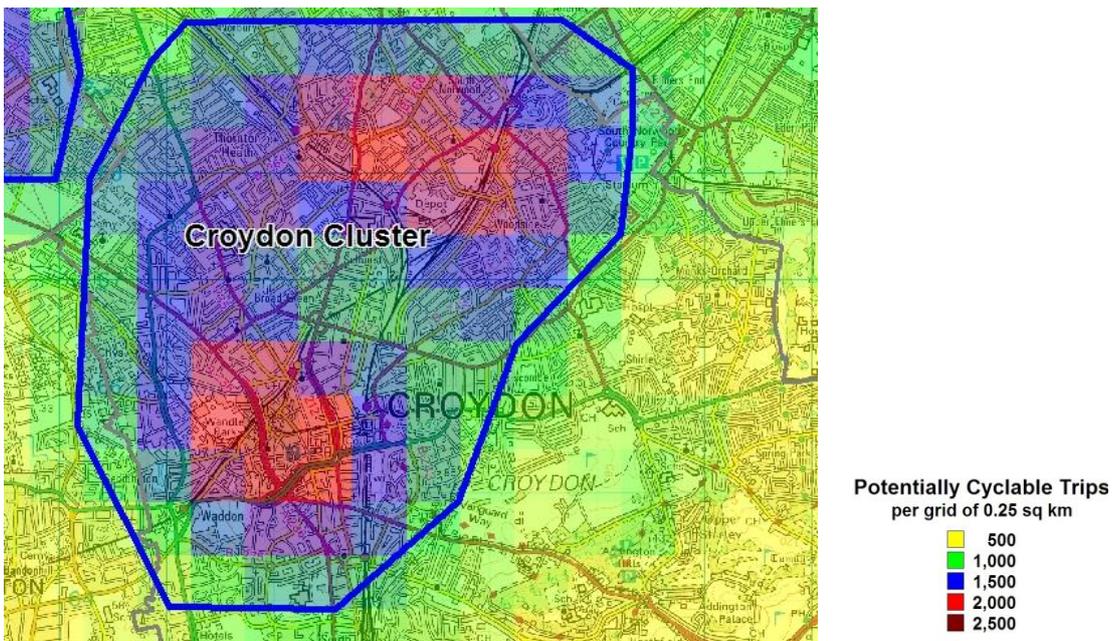
A 'spur' of high cycling potential southwards from central London is evident from the mapping of the potentially cyclable trips, shown in Figure 2.8. This covers a large area of inner south London, 66 sq km in total from Wandsworth in the west to Deptford and Lewisham in the east, and reaching as far south as Catford and Mitcham. There is a further 'hotspot' with a high density of potentially cyclable trips around Croydon town centre. This area covers a further 22 sq km and is shown in Figure 2.9. These two areas contain more than 450,000 potentially cyclable trips – 343,000 in inner south London and 119,000 in Croydon. 70 per cent of potentially cyclable trips were made by car in Croydon compared to 56 per cent in inner south London, with the remainder largely made by bus. Four in ten of those making a potentially cyclable trip in inner south London have a household income below £20,000, so again there is good potential to promote cycling as a low cost mode. Furthermore, Croydon is projected to experience substantial population and employment growth over the coming decade, which can be expected to increase the potential demand for cycle travel.

Figure 2.8 Potentially cyclable trips in Inner South London



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 2.9 Potentially cyclable trips in Croydon



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Chapter 3 Cycling potential by sub-region and borough

Key findings

- Currently, nearly half of all cycle trips have an origin or destination in the Central sub-region. In comparison, potentially cyclable trips are more evenly dispersed across London, although the Central sub-region still accounts for around a quarter of the total (note that the Central sub-region comprises the Cities of London and Westminster, the boroughs of Camden, Islington, Southwark and Lambeth and the Royal Borough of Kensington & Chelsea. It is therefore larger than central London as defined in Figures 2.1 and 2.2).
- A higher proportion of mechanised trips made by residents of inner London are potentially cyclable, however, there is greater potential overall in outer London, simply due to the size of the region.

This Chapter presents analysis of cycling potential at a sub-regional and borough level. The London sub-regions provide a level of London's geography that is wider than a single borough, to facilitate the consideration of transport challenges and solutions on an area basis. Analysis has been carried out at a sub-regional and borough level to inform TfL's Sub-Regional Transport Plans and borough Local Implementation Plans.

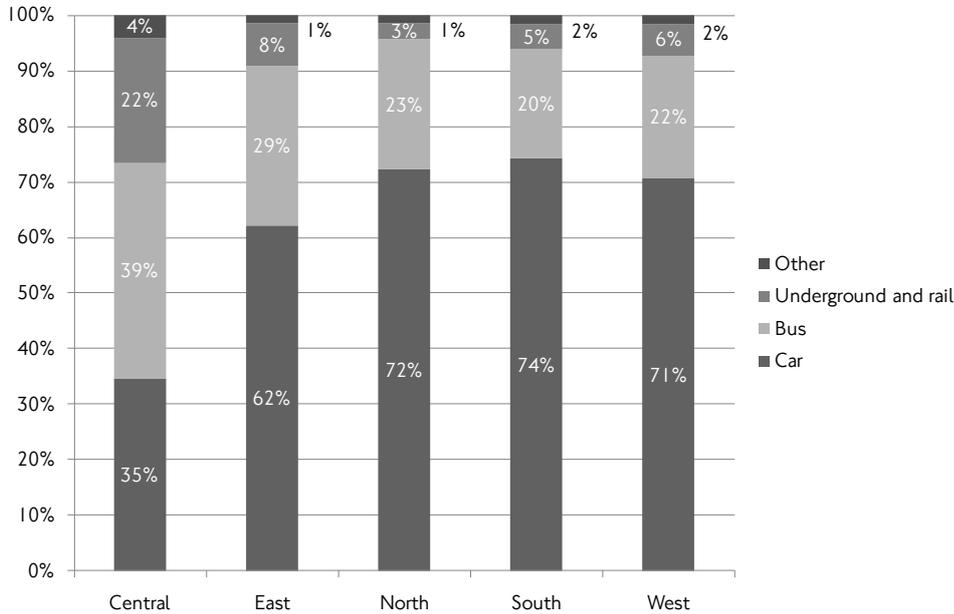
Introducing the London sub-regions

A series of sub-regional plans were published in autumn 2010. These further develop London-wide policies as set out in the Mayor's Transport Strategy, exploring how the Mayor's aspirations can be delivered on a local level, recognising the different characteristics and challenges present in each sub-region. The Sub-Regional Plans provide an important link between London-wide policies and the boroughs' own priorities, which will be progressed through Local Implementation Plans (LIPs) and other local plans. This chapter provides a summary of cycling potential at a sub-regional and borough level.

There are five sub-regions: central, east, north, south and west London, shown in Figure 3.1. The sub-regions are considered to have 'fuzzy' boundaries, recognising that any consideration of transport challenges and other issues has cross-boundary impacts.

As shown in Figure 3.2, potentially cyclable trips in the central sub-region are primarily made by bus, Underground and rail at present, whereas across the other sub-regions the vast majority of potentially cyclable trips are made by car. A higher than average proportion of potential cycle trips is made by bus in the east sub-region, reflecting low levels of car ownership and use in the region.

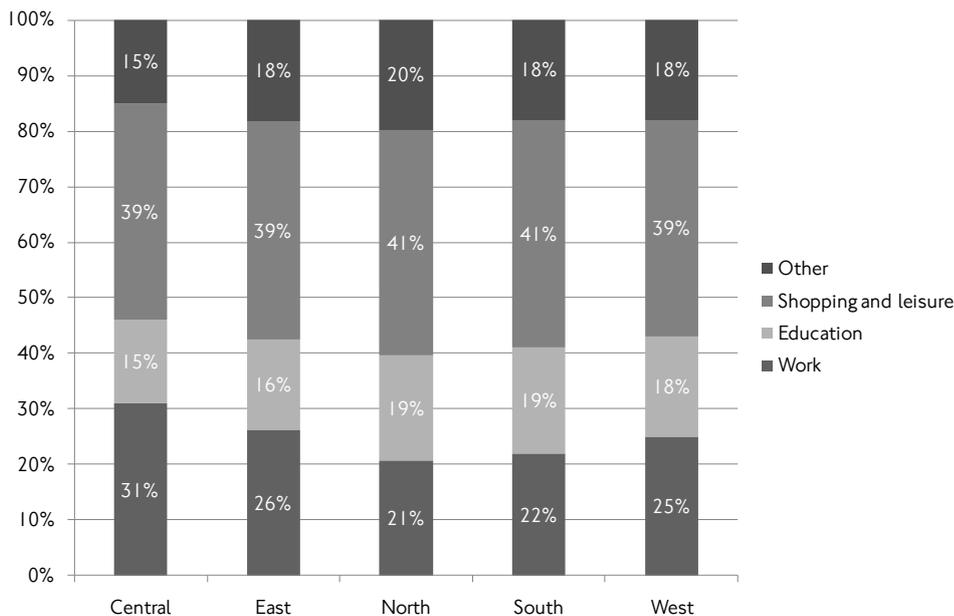
Figure 3.2 Potentially cyclable trips by mode, by sub-region of origin/destination



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 3.3 compares potentially cyclable trips with an origin and/or destination in each London sub-region by journey purpose. Potentially cyclable trips in the central sub-region are more likely to be for work purposes and less likely to be for education purposes than those in the other sub-regions.

Figure 3.3 Potentially cyclable trips by journey purposes, by sub-region of origin and/or destination



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

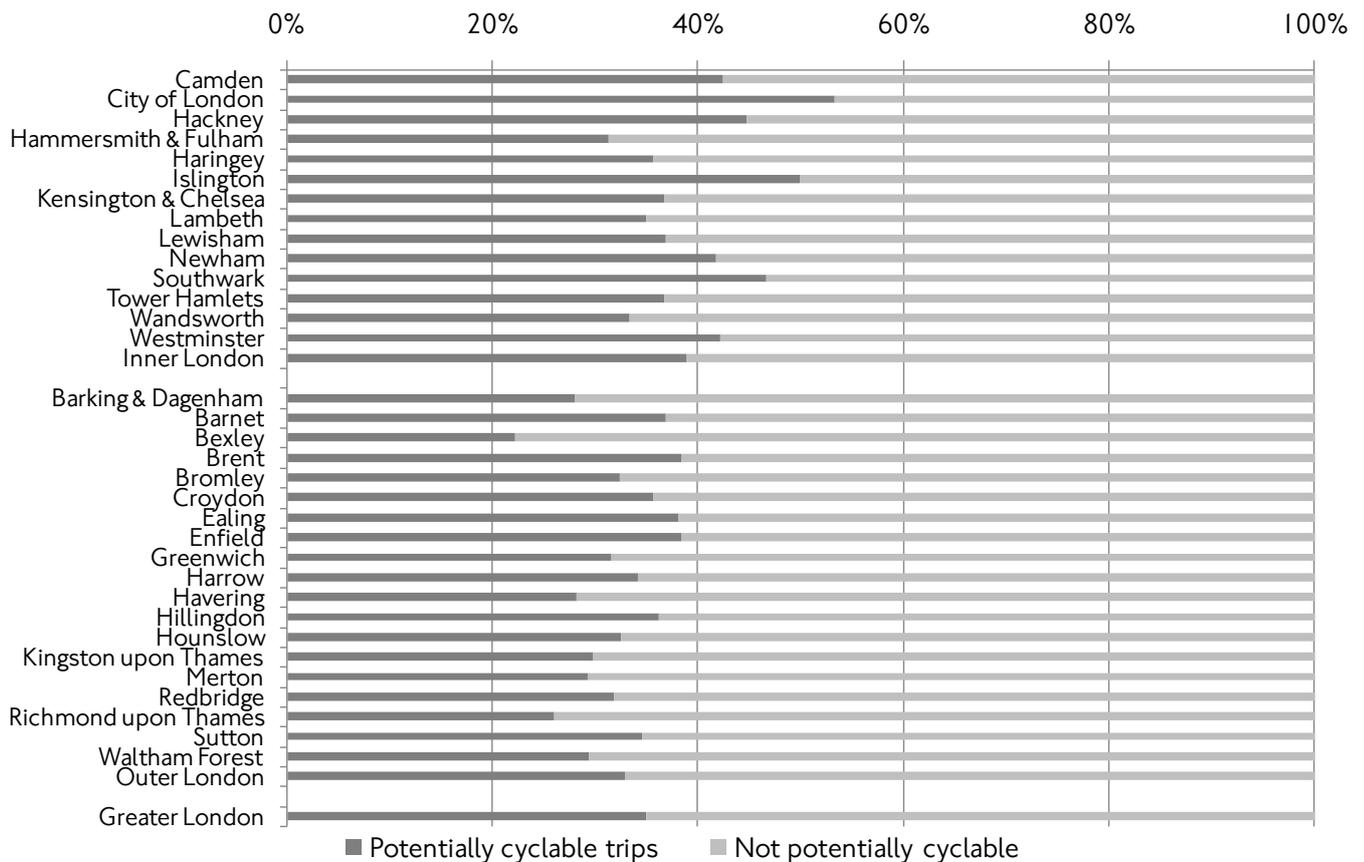
Cycling potential by borough of residence

At present, the cycling mode share by borough of residence varies from less than half a per cent in Bromley to 8 per cent in Hackney (based on 2005/06 to 2007/08 data). However, all boroughs have significant potential to achieve mode shift to cycling amongst local residents. Figure 3.4 shows the proportion of trips by mechanised modes that are potentially cyclable, by borough of residence.

On average, a higher proportion of mechanised trips made by residents of inner London are potentially cyclable (39 per cent compared to 33 per cent in outer London). Boroughs with a particularly high proportion of cyclable trips made by mechanised modes are Islington (50 per cent), Southwark (47 per cent) and Hackney (45 per cent) in inner London, and Brent, Ealing and Enfield in outer London (all 38 per cent). It is notable that Hackney has a particularly high proportion of current mechanised trips that are potentially cyclable, despite already achieving the highest cycle mode share of any London borough.

Although a higher proportion of trips made by mechanised modes in inner London are potentially cyclable, there is greater potential overall amongst trips made by outer London residents simply due to the size of the region. In total, 63 per cent of potentially cyclable trips are made by residents of outer London (compared to 67 per cent of mechanised trips and 63 per cent of all trips).

Figure 3.4 Potentially cyclable trips as a proportion of all trips by mechanised modes, by borough of residence



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

As shown in Table 3.2 at present, residents of Hackney and Richmond upon Thames make the greatest number of cycle trips and have realised the greatest proportion of the 'total potential'. Residents of Barnet and Ealing make the greatest number of potentially cyclable trips.

Table 3.2 Current and potential cycle trips by borough of residence

Borough of residence	Current cycle trips 2005-8	Potential cycle trips	Proportion of potential realised
Camden	15,600	130,400	11%
City of London	<100	9,400	<1%
Hackney	32,000	102,500	24%
Hammersmith & Fulham	15,200	89,100	15%
Haringey	7,500	124,300	6%
Islington	9,800	111,000	8%
Kensington & Chelsea	14,300	91,900	13%
Lambeth	12,100	146,300	8%
Lewisham	6,700	143,600	4%
Newham	3,500	150,600	2%
Southwark	11,900	132,000	8%
Tower Hamlets	7,700	86,400	8%
Wandsworth	20,100	157,700	11%
Westminster	18,500	130,400	12%
Inner and Central London	174,800	1,605,700	10%
Barking & Dagenham	3,100	68,800	4%
Barnet	8,500	241,200	3%
Bexley	3,500	77,500	4%
Brent	8,100	169,300	5%
Bromley	3,100	211,900	1%
Croydon	8,800	210,700	4%
Ealing	12,400	219,800	5%
Enfield	4,800	194,400	2%
Greenwich	4,700	107,900	4%
Harrow	3,500	126,900	3%
Havering	3,600	122,000	3%
Hillingdon	7,800	178,600	4%
Hounslow	12,600	124,500	9%
Kingston upon Thames	8,200	97,100	8%
Merton	4,700	101,500	4%
Redbridge	5,500	143,800	4%
Richmond upon Thames	20,400	86,900	19%
Sutton	2,800	118,200	2%
Waltham Forest	6,600	118,400	5%
Outer London	132,800	2,719,500	5%
Greater London	307,600	4,325,200	7%

Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Chapter 4 Who is making potentially cyclable trips?

Key findings

- Frequent cyclists are typically white, male, between 25 to 44 years old, and on a higher than average income.
- In comparison, many of the potentially cyclable trips are made by women, ethnic minorities, younger and older people, and those on a lower income.
- Nevertheless, there remains significant potential for growth amongst existing cyclists and people similar to them.

Chapter 4 describes who is making potentially cyclable trips and compares their characteristics with current London cyclists. The Chapter explores the demographic characteristics of those making potentially cyclable trips and assesses the potential for growth that remains amongst those who currently cycle, and those who do so frequently.

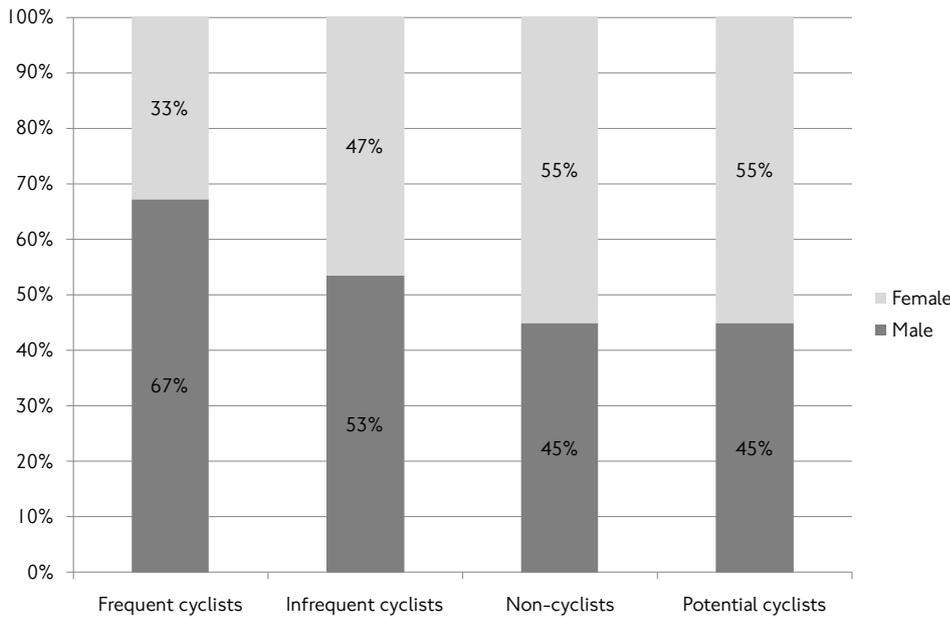
When comparing the characteristics of those making potentially cyclable trips with current London cyclists, it is assumed that it may be easier to realise the potential where the person making the trip has more in common with people who currently choose to cycle, and that trips made by people who are currently less likely to cycle would be harder to convert. It is worth noting that frequent cyclists may have already assessed their travel for the potential to cycle and therefore that potentially cyclable trips made by this group may in fact have already been judged not cyclable in practice.

Current and potential cyclists by age and sex

Two thirds of frequent cyclists (those who cycle once a week or more often) and more than half of infrequent cyclists are men. The proportion of men who cycle frequently is twice that of women (16 per cent compared to 8 per cent). In comparison, women make up more than half those making a potentially cyclable trip. Figure 4.1 compares current and potential cyclists by sex.

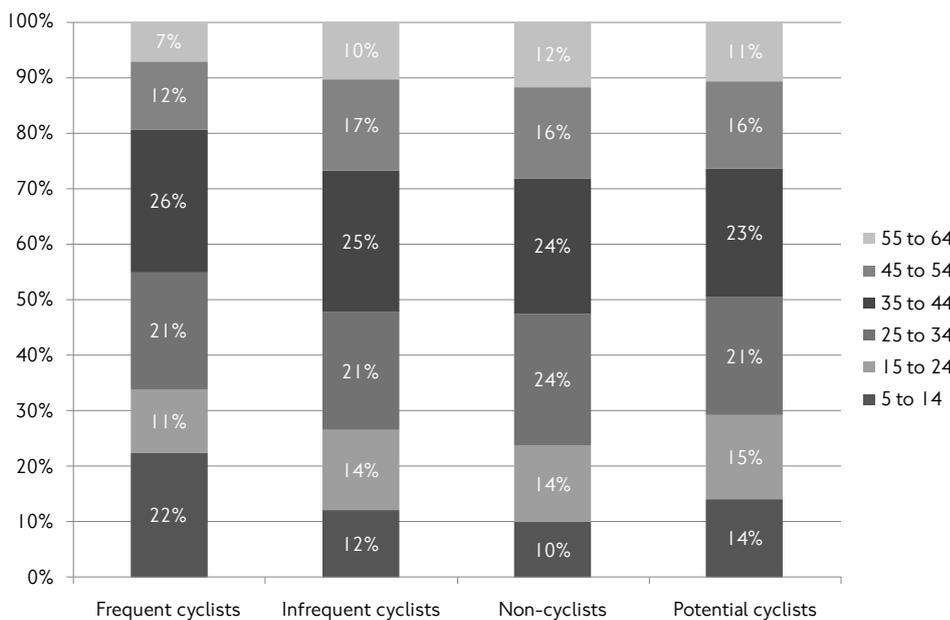
The age profile of current and potential cyclists is broadly similar (shown in Figure 4.2), although it is notable that only one in six frequent cyclists is over 45, compared to a quarter of potential cyclists. At present, children under 14 are the age group most likely to cycle at least once a week and around 300,000 potentially cyclable trips are made by under 14s, suggesting that there may be good potential to realise mode shift amongst this age group. In particular, 18 per cent of potentially cyclable trips are made for education purposes, and just over half of these are made by under 19s (the remainder are largely aged 35 to 44, and are parents escorting their children to school). This demonstrates the potential that could be realised by continuing to work with schools and parents, building on initiatives such as school travel planning.

Figure 4.1 Current and potential cyclists by sex



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 4.2 Current and potential cyclists by age

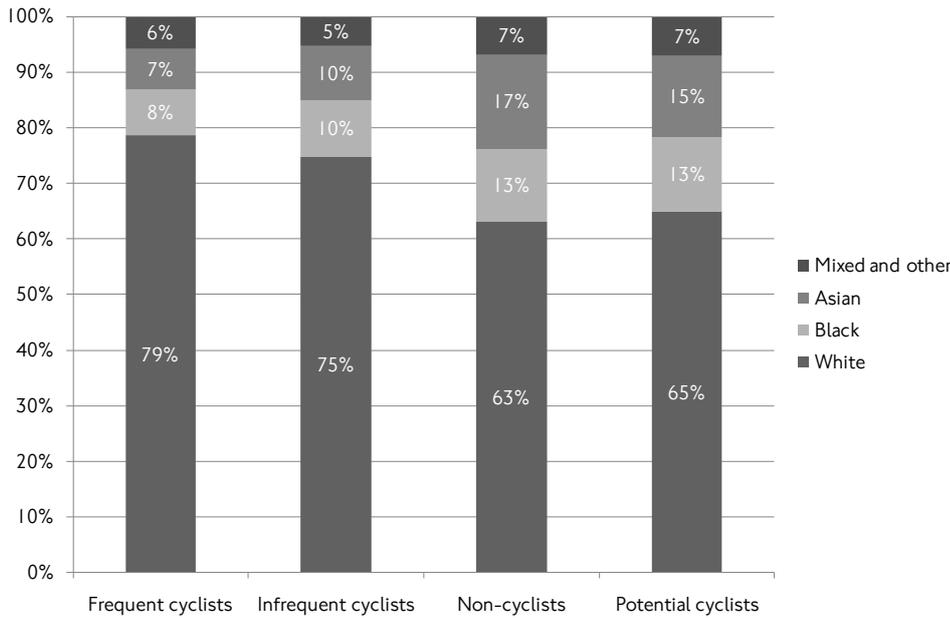


Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Current and potential cyclists by ethnicity

Eight in ten frequent cyclists and three quarters of infrequent cyclists are white. Asian people are particularly unlikely to cycle frequently – only 7 per cent of frequent cyclists are Asian, compared to 17 per cent of non-cyclists. There is a significant opportunity to increase cycling amongst those from a minority ethnic background, in that they make up 35 per cent of potential cyclists, but there may be cultural barriers to realising this potential amongst some ethnic groups. Figure 4.3 compares current and potential cyclists by ethnicity.

Figure 4.3 Current and potential cyclists by ethnicity

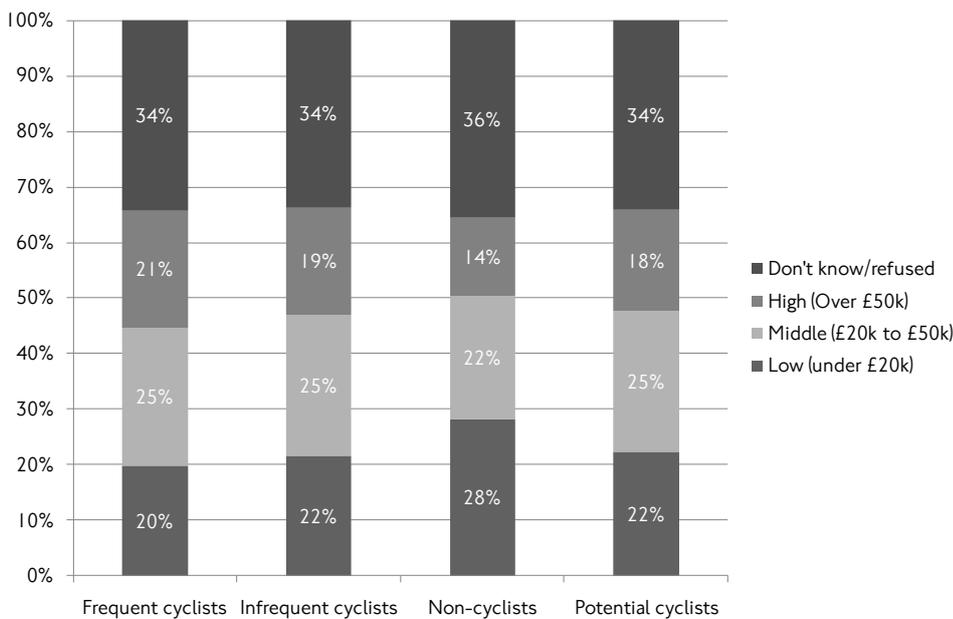


Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Current and potential cyclists by income

The income profile of current and potential cyclists is very similar. However, there is greater unmet potential amongst those on a low income: 28 per cent of non-cyclists have a household income below £20,000 per year, compared to 25 per cent of cyclists. Figure 4.4 compares current and potential cyclists by income.

Figure 4.4 Current and potential cyclists by income



Source: Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Potentially cyclable trips by whether currently cycle

Much of the growth in cycling since 2001 has been driven by existing cyclists making more trips by bicycle. TfL's second Travel in London report stated that cycle trips grew by around 70 per cent between 2001 and 2008. Between 2005/06 and 2008/09, there was an increase of only 3 per cent in the number of London residents who ever cycle, but an increase of nearly 50 per cent in the proportion of cyclists who cycle frequently.

There remains some potential for growth amongst those who cycle frequently – nearly half a million potentially cyclable trips are made by those who cycle at least once a week. In particular, only 24 per cent of those who cycle frequently and are in employment cycle to work and nearly 100,000 potentially cyclable work trips are made by frequent cyclists. Furthermore, around half a million potentially cyclable trips are made by the group most likely to cycle: white men aged 25 to 44.

It is reasonable to assume that it may be easier to persuade existing cyclists to do so more frequently than to get new people to cycle for the first time. The London Travel Demand Survey three year dataset for 2005/06 to 2007/08 identifies over 1.5 million London residents who do cycle, but do so infrequently (less often than once a week). This group makes 1.1 million potentially cyclable trips every day.

Although 63 per cent of the potentially cyclable trips identified are made by those who currently do not cycle at all, other research has found that many non-cyclists have access to a bike in their household, or may even own a bike themselves. Furthermore, most non-cyclists say that they can ride a bike, although they may not have done so since they were a child or feel confident doing so.

It is important to understand that this is a general assessment and that in any group there will be people who are atypical. For example, some current non-cyclists may actually be experienced and enthusiastic cyclists who simply do not have anywhere to store a bike at present and who, given the opportunity, would become frequent cyclists. The evidence suggests, however, that there are more significant barriers for most non-cyclists and that a gentler progression towards cycling is more likely for much of this group.

Chapter 5 Identifying the cycling market

Key findings

- The Cycle Market Segmentation classifies London households into seven segments based upon their propensity to cycle at present and how amenable they are to cycling in future. In combination, the Analysis of Cycling Potential and the Cycle Market Segmentation can identify those trips where the potential can best be realised; in other words, trips *more likely to be cycled in future*.
- Two thirds of potentially cyclable trips are made by those in the four segments with a greater than average propensity to cycle.
- The segments with the greatest propensity to cycle are the Urban Living, making 900,000 potentially cyclable trips, and Young Couples and Families, making more than 600,000 potentially cyclable trips.

This Chapter introduces TfL's new Cycle Market Segmentation, an analysis derived from a range of data sources that evaluates the influences over travel behaviour in order to identify households most amenable to cycling in future and most likely to cycle at present. Analysis of the potential for cycle travel by market segment is presented in the Chapter, with a particular focus on the two segments with the greatest propensity to cycle at present and most amenable to cycling in future.

Introducing TfL's Cycle Market Segmentation

Comparing the characteristics of those making potentially cyclable trips with current London cyclists, as presented in Chapter 4, can inform policy-makers' understanding of who is most likely to respond positively to cycling interventions. Market segmentation exercises provide a more sophisticated means of describing who is most likely to choose to cycle now and in future and identifying where they live.

TfL's new Cycle Market Segmentation classifies the London population into seven segments, evaluating the influences over travel behaviour in order to identify households most amenable to cycling in future and most likely to cycle at present. The segmentation is a geo-demographic classification based upon full postcode, so that each postcode is classified according to the average characteristics of its residents. Because postcode zones are very small, resident populations tend to be highly homogeneous and therefore such classifications can be used with a reasonable degree of accuracy to predict the likelihood of an individual to exhibit a particular behaviour, characteristic or attitude.

The key inputs to the segmentation are:

- TfL's London Travel Demand Survey – continuous survey sampling 8,000 London households per year, providing demographics and travel behaviour patterns.
- TfL's Market Segmentation Survey – one-off survey of 5,000 London residents carried out in 2009 covering travel behaviour and behavioural change, attitudes to travel by mode.
- TfL's Attitudes to Cycling Surveys – annual survey of around 1,000 London residents covering attitudes to cycling, current and past experience of cycling.
- Experian's MOSAIC dataset – consumer classification based upon a wide range of data sources including the 2001 Census, government data such as the edited Electoral Roll, self-reported lifestyle surveys and other compiled consumer data.

The strongest influences on the segmentation were travel behaviour choices and demographics such as age, life stage and income. Weaker influences included attitudes to cycling. Chapter 4 examined the extent to which cycling frequency varies by demographic characteristics and found that cyclists are atypical of the population as a whole; frequent cyclists tend to be white, professional men aged 25 to 44. The segmentation reflects that finding and combines the impact of all the demographic variations into one simple tool. In combination, the analysis of potentially cyclable trips and the Cycle Market Segmentation can identify potentially cyclable trips made by people with a higher than average propensity to cycle at present or in future, in other words, those *more likely to be cycled in future*.

Segmenting the population

The Cycle Market Segmentation classifies the London population into seven segments, presented in Table 5.1. The segment with the highest propensity to cycle at present is 'Urban Living', representing nearly a quarter of the London population. The 'Manual Trades' and 'Comfortable Maturity' segments largely reject cycling – they do not cycle at present and are unlikely to do so in future. They make up just 13 per cent of the population, concentrated in some outer London boroughs. A postcode classified as 'Urban Living' can be expected to generate 4.6 times as many cycling trips as a postcode of comparative population classified as 'Comfortable Maturity'.

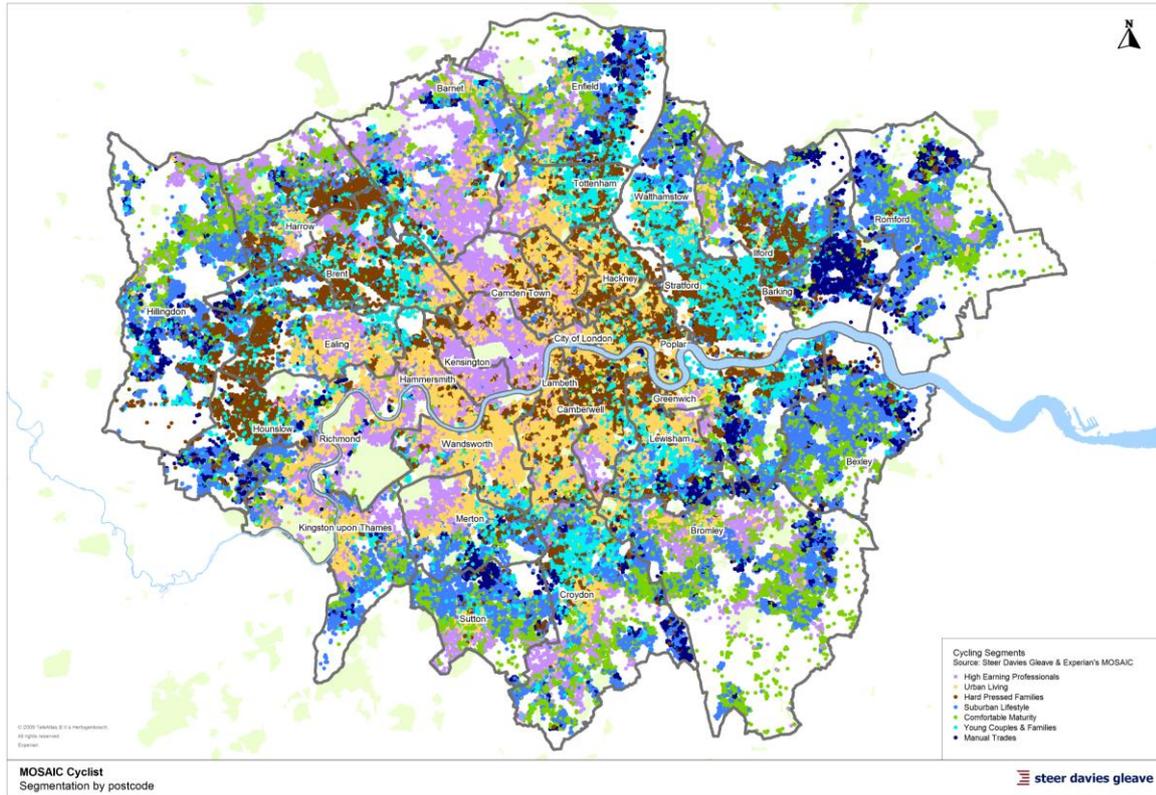
Table 5.1 Cycle Market Segmentation - London segments

	Segment	Description	% of London population
 <p>Most likely to cycle</p> <p>Least likely to cycle</p>	Urban living	Young (54% under 35), white (74%), well educated, reasonably well-off and usually live in town/city centre (41% in central London). Many choose to live without a car (44%).	23%
	Young couples and families	Young (56% under 35), BAME groups (50%) and with young children. Often tight finances, ethnic background may present a barrier to cycling.	15%
	High earning professional	Well educated, affluent, white (83%), often working in multinationals. Tend to use personal rather than public transport, high car ownership (81%). More likely than average to live in central London (24%).	11%
	Suburban lifestyle	Average income, heavily reliant on car (83% own a car) and living in suburbia, especially in the south (24%) and east (22%). Cycling for leisure is as likely as cycling for purpose.	17%
	Hard pressed families	Difficult family finances, and often living in inner city flats and tower blocks, especially in east (25%), west (28%) and central (27%) London. Low car ownership (49% no car). 58% BAME, ethnic background may present a barrier to cycling.	21%
	Manual trades	Mainly white (79%) with high car ownership (70%), this segment is unlikely to cycle with generally negative attitudes towards cycling. 50% are under 35.	5%
	Comfortable maturity	Older (40% over 55) and retired people, white (83%), and reasonably well off, living in suburban areas - some potential for off-road leisure cycling.	8%

Source: Cycle Market Segmentation, TfL 2010

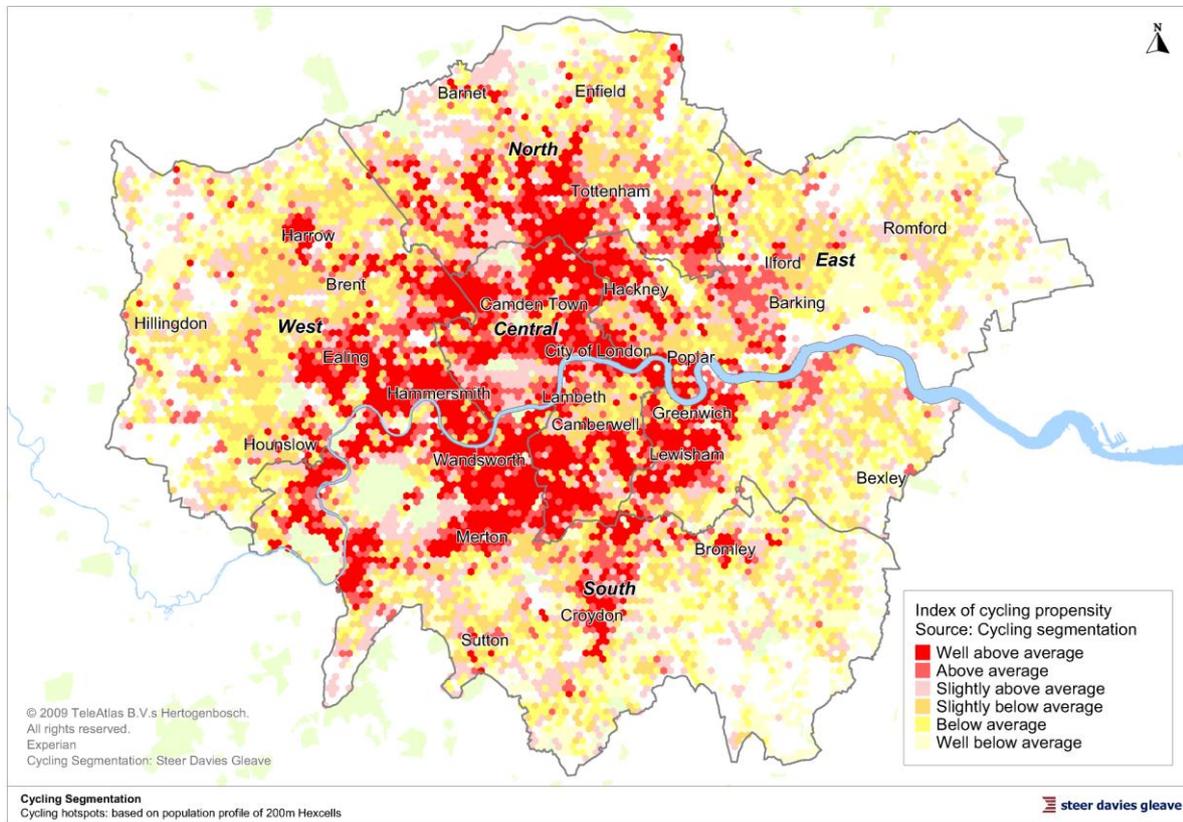
The group with the highest propensity to cycle, 'Urban Living', is shown in yellow in Figure 5.1 and concentrated in central and inner London, the South West London and in some outer London town centres. The segment next most likely to cycle is 'Young Couples and Families', concentrated in a ring on the borders of inner and outer London. The segments least likely to cycle, 'Manual Trades' and 'Comfortable Maturity', tend to be located in outer London to the East and South East.

Figure 5.1 Map of Cycle Market Segments by postcode



Source: Cycle Market Segmentation, TfL 2010

Figure 5.2 Propensity to cycle by postcode



Source: Cycle Market Segmentation, TfL 2010

Potentially cyclable trips by market segment

Table 5.2 presents potentially cyclable trips by the market segment of the person making the trip. It also lists the propensity to cycle of each segment, indexed against average use so that 100 is average, above 100 is above average and below 100 is below average. Two thirds of the potentially cyclable trips are made by people in the four segments with the highest propensity to cycle: ‘Urban Living’, ‘Young Couples and Families’, ‘High Earning Professionals’, and ‘Suburban Lifestyle’, and are shown in Figure 5.3, mapped by origin. High densities of potentially cyclable trips made by those more likely to cycle are visible in many central London boroughs and in pockets around many outer London town centres and across inner London, especially in the South.

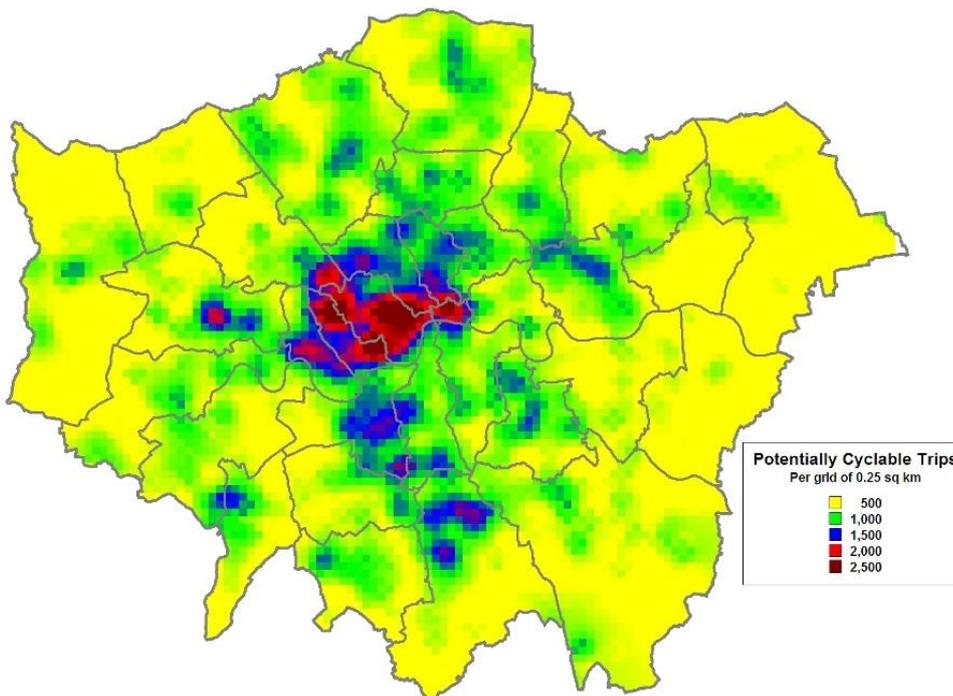
Table 5.2 Potentially cyclable trips and propensity to cycle by segment

Segment	Propensity to cycle	Potentially cyclable trips	
		Number	Percentage
Urban living	140	903,500	21%
Young couples and families	113	632,800	15%
High earning professional	106	546,700	13%
Suburban lifestyle	102	811,700	19%
Hard pressed families	85	839,600	19%
Manual trades	42	276,400	6%
Comfortable maturity	30	310,300	7%
Total	100 (average)	4,321,000	100%

Note: excludes 2,400 records with no home postcode or segment recorded

Source: Cycle Market Segmentation, TfL 2010; Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Figure 5.3 Potentially cyclable trips by origin, top four segments by propensity to cycle



Source: Cycle Market Segmentation, TfL 2010; Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Spotlight on the ‘Urban Living’ - Potentially cyclable trips

People in the ‘Urban Living’ segment are the prime target for cycling. They are the most likely to cycle at present and the most amenable to cycling in future. On average, people in the ‘Urban Living’ segment cycle to a destination on 24 days per year, compared to a population average of 16.5 days. Men in the segment are more likely to cycle than women, cycling to a destination on 30 days per year compared to 16 days. Six in ten people in the ‘Urban Living’ segment agree that “Cycling is a mode of transport that you would want to be seen using”.

Figure 5.4 Map of ‘Urban Living’ postcodes



Source: Cycle Market Segmentation, TfL 2010

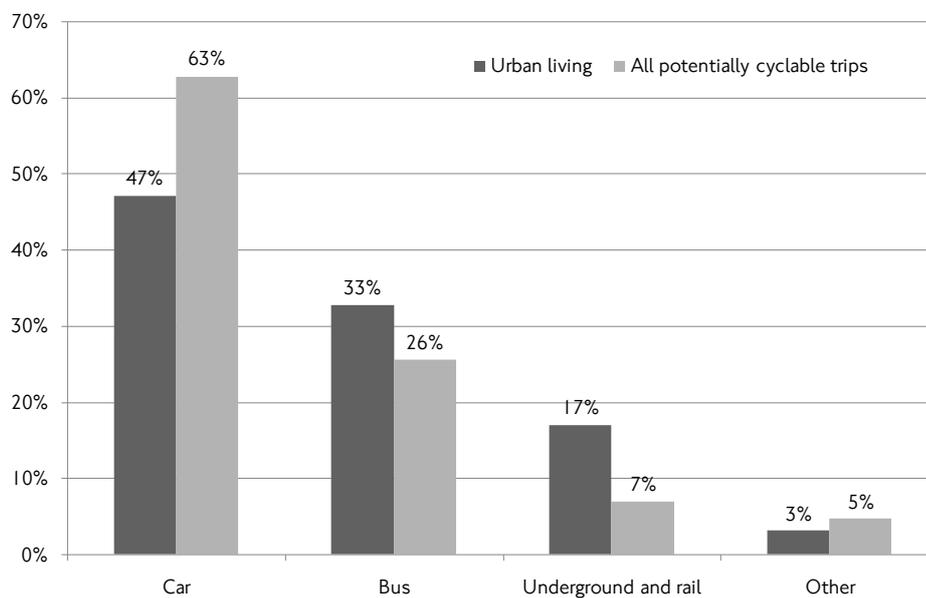
‘Urban Living’ – a pen portrait of a typical young man

Tom is 31, single and lives and works as a business consultant in central London. He owns a one-bed flat in a new development but because of his hectic work and social life spends little time there. Tom was a student in London and although he could afford a car has never felt the need to buy one, as he can get to most places he wants to by public transport. He owns a bike which he uses in his local area for running errands, going to football and meeting friends at weekends. He likes the fact it gets him where he needs to be on time.

Tom uses the tube for his commute and finds it rather crowded. However, he doesn't consider cycling to work an option as he needs to be suited and booted for meeting clients. Anyway, he wouldn't want to be associated with the Lycra-clad brigade. Tom also feels it would restrict the spontaneity of his after-work social life. Tom thinks the new Barclays bikes are a good idea but he hasn't tried them out yet as he's been too busy to join up.

In total, people in the 'Urban Living' segment make more than 900,000 potentially cyclable trips per day. Potentially cyclable trips made by those in the 'Urban Living' segment were more likely to be for work purposes (31 per cent compared to 24 per cent overall) and less likely to be made by car (47 per cent compared to 63 per cent overall). This reflects the relatively low car ownership in this segment: 44 per cent of 'Urban Living' households do not have access to a car. Potentially cyclable trips made by people in the 'Urban Living' segment were also particularly likely to be made by Underground or rail. This reflects the inner London location of most 'Urban Living' postcodes, as well as the fact that people with these characteristics are more likely to have a Travelcard and therefore relatively more likely to make 'short hop' trips by public transport, especially tube. Figure 5.5 compares potentially cyclable trips by current mode for those in the 'Urban Living' segment and the London population as a whole.

Figure 5.5 Potentially cyclable trips by current mode, 'Urban Living' and all London residents

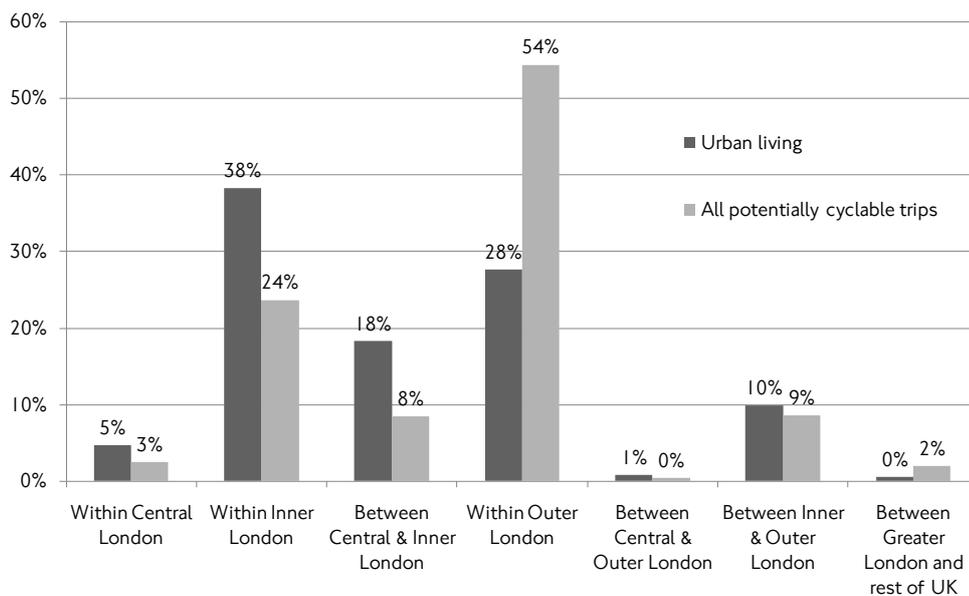


Source: Cycle Market Segmentation, TfL 2010; Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Potentially cyclable trips made by the 'Urban Living' are somewhat longer than average, with 44 per cent between 2km and 5km and a quarter between 5km and 8km. As this group tend to be quite young and generally do not have children, longer trips present less of a barrier to cycling.

A quarter of all potentially cyclable trips made by the 'Urban Living' segment have an origin and/or destination in central London, 44 per cent of all trips with an origin and/or destination in central London. People in the 'Urban Living' segment are much more likely than the population as a whole to be making potentially cyclable trips in central and inner London, and less likely to be making trips in outer London. Figure 5.6 presents the location of potentially cyclable trips made by those in the 'Urban Living' segment and in the London population as a whole

Figure 5.6 Potentially cyclable trips by location, 'Urban Living' and all London residents

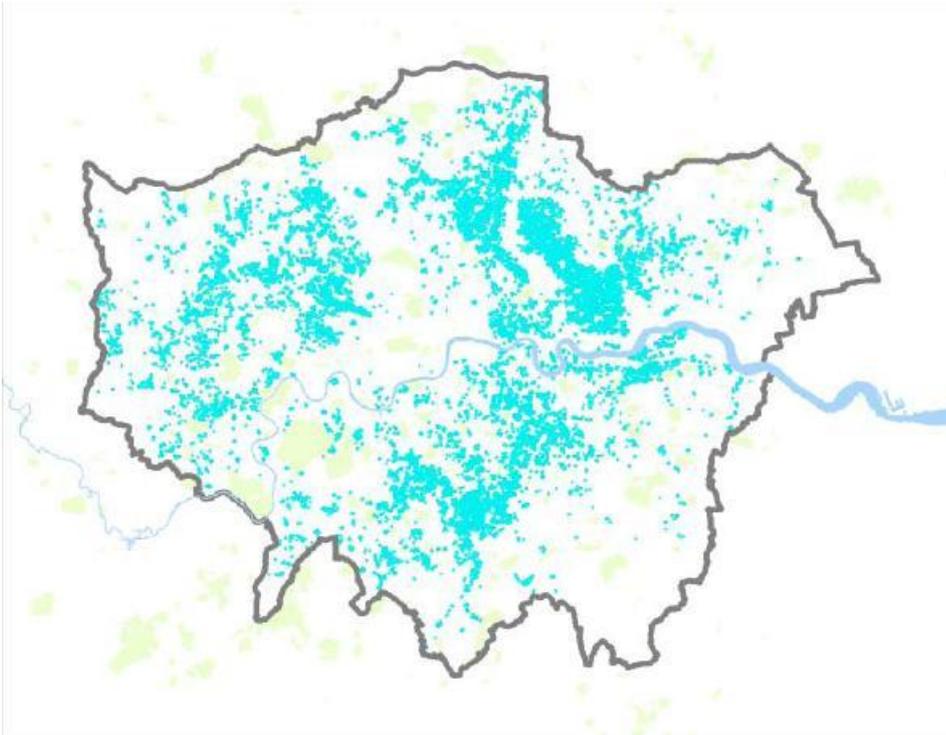


Source: Cycle Market Segmentation, TfL 2010; Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Spotlight on ‘Young Couples and Families’ - Potentially cyclable trips

People in the ‘Young Couples and Families’ segment are a good prospect for cycling. They have relatively low car ownership (39 per cent have no car), are young and have young children. On average, people in the ‘Young Couples and Families’ segment cycle to a destination on 19 days per year, compared to a population average of 16.5. Men in the segment are more likely to cycle than women, cycling to a destination on 25 days per year compared to 11. Six in ten people in the ‘Young Couples and Families’ segment agree that “Cycling is a family activity”.

Figure 5.7 Map of ‘Young Couples and Families’ postcodes



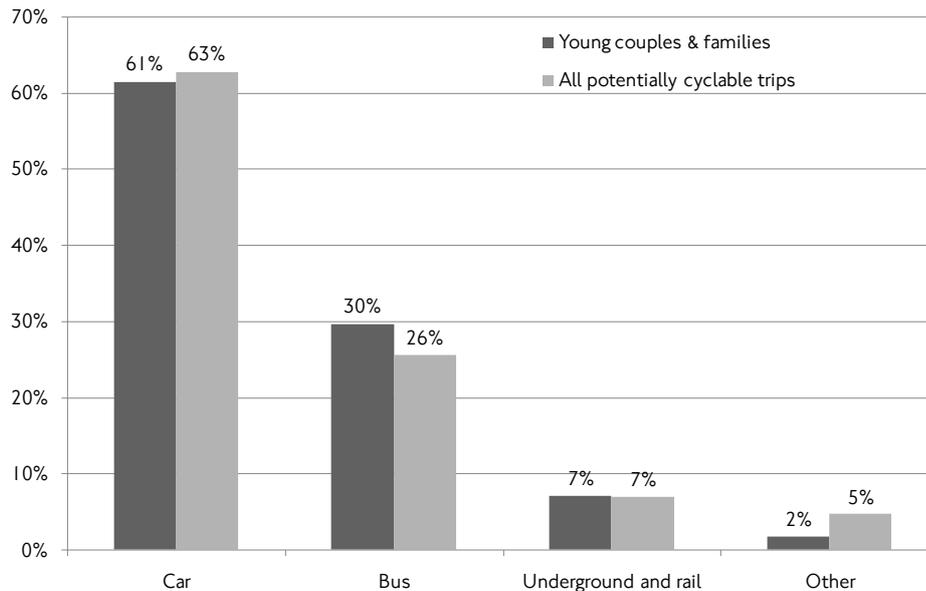
Source: Cycle Market Segmentation, TfL 2010

‘Young Couples and Families’ – a pen portrait of a typical family

Aisha 28 and Daren 29, live in a terraced house in north London with their two young children. Daren manages a call centre and uses the train for his commute to Central London. He can't afford to buy a car at the moment but keeps a look out for a bargain in Autotrader. Aisha has her hands full looking after the family and home. Now the children are at school she works as a teaching assistant and the extra money comes in handy. Aisha thinks a car would make her life much easier but for the moment she gets to most places by bus. Aisha worries that as a family they are not as active as they could be and about how much time the children spend indoors. School has started a cycle to school day once a week. Her son is quite keen but Aisha is concerned that the local streets are not really suitable for cycling. She would feel better if she could cycle with him and a friend has a bike she could borrow. But, she hasn't cycled since she was a little girl and can't really imagine herself on a bike now.

In total, people in the 'Young Couples and Families' segment make nearly 650,000 potentially cyclable trips per day. Potentially cyclable trips made by those in the 'Young Couples and Families' segment were more likely than average to be for education purposes (23 per cent compared to 18 per cent overall) and somewhat more likely to be made by bus (30 per cent compared to 26 per cent overall). This reflects the dominance of families with children in this segment and also the relatively high number of 'Young Couples and Families' postcodes in east London, where bus use is higher than average. Figure 5.8 compares potentially cyclable trips by current mode for those in the 'Young Couples and Families' segment and the London population as a whole.

Figure 5.8 Potentially cyclable trips by current mode, 'Young couples and families' and all Londoners

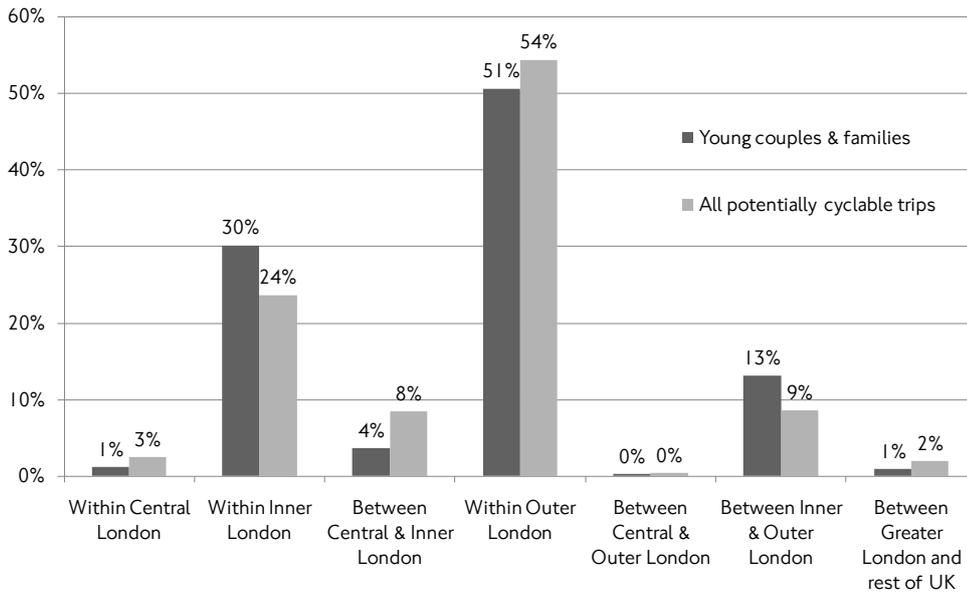


Source: Cycle Market Segmentation, TfL 2010; Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

The profile of potentially cyclable trips by length is very similar for the 'Young Couples and Families' as for the population as a whole. Around four in ten potentially cyclable trips made by this group are less than 2km in length. There may be greater potential to convert short than longer trips amongst this segment; notably, a quarter of the potentially cyclable trips are made by children aged 5 to 19, including 10 per cent made by those aged 5 to 9.

As shown in Figure 5.9, potentially cyclable trips made by those in the 'Young Couples and Families' segment are more likely to be within inner London or travelling between inner and outer London (43 per cent compared to 33 per cent for the general population). They are much less likely to involve travel within or into central London than trips made by the population as whole.

Figure 5.9 Potentially cyclable trips by location, 'Young couples and families' and all Londoners



Source: Cycle Market Segmentation, TfL 2010; Analysis of Cycling Potential, London Travel Demand Survey 2005/06 to 2007/08

Chapter 6 Potential policy implications – moving from analysis to policy

Key findings

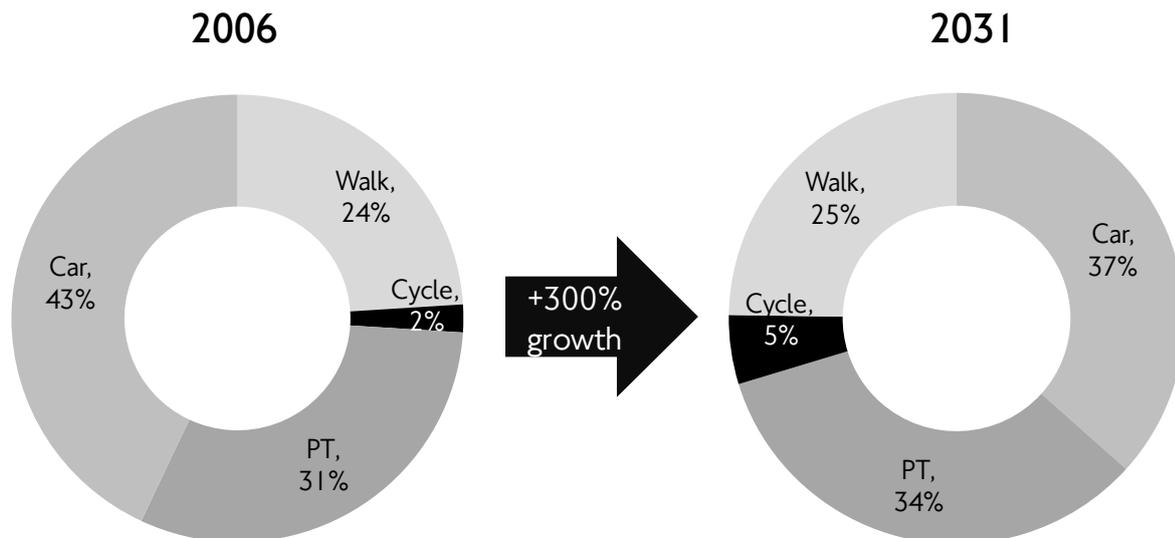
- The Mayor has set an ambitious target for growth in cycle travel: one in six potentially cyclable trips must be cycled to achieve the target, based on the trip volumes of today.
- Frequent cyclists already make the majority of cycle trips in London, but there remains some potential for growth, particularly for the journey to work
- There remains significant potential to increase cycle trip making amongst existing infrequent cyclists – safety, traffic and lack of facilities are the greatest barriers to this
- Cycling remains a minority activity – there are many people who are ‘just like’ cyclists but do not currently cycle, offering excellent potential for growth in cycle travel
- The cycle mode share in central London is already close to 3 per cent and there is the potential to achieve a mode share in the centre of the Capital to challenge that of other major European cities
- Beyond the centre, the potential to increase cycling is concentrated in pockets around the outer London metropolitan town centres and elsewhere – boroughs in these locations are well placed to deliver radical change
- Regions expecting significant growth in population and employment have the opportunity to ‘design in’ a high cycle mode share through innovative transport and land use policies
- Huge potential exists in highly dispersed trips across outer London, demonstrating the continued need to maintain investment in interventions targeted at and able to reach all Londoners

This Chapter describes the wider implications of the analysis for cycle policy development, drawing conclusions about how TfL and London’s boroughs can maximise the potential available to them. It summarises the research evidence presented in this report, and also draws upon other research evidence collected by TfL in recent years, placing the findings of this analysis in a policy and research wider context.

The Mayor has set an ambitious target for growth in cycle travel

The Mayor has set an ambitious target: to achieve a 5 per cent mode share for cycling by 2026, representing growth of 400 per cent from 2001. By 2008, the cycle mode share had increased from 1 to 2 per cent. This increase must be repeated three times over to achieve the Mayor's target.

London-wide mode share, Mayor's Transport Strategy 2010



4.3 million potentially cyclable trips are made by London residents every day in the city. Furthermore, many people travel in to the Capital every day to work, shop and use the unique array of services London has to offer. Although most of these inbound journeys will be too great a distance to cycle, non-residents make thousands of shorter trips within the city which could potentially be cycled. Schemes such as Barclays Cycle Hire will help facilitate this.

Nevertheless, it would not be wise to be complacent. Based upon the trip volumes of today, one in six of the potentially cyclable trips must actually be cycled to meet the target. Achieving behavioural change is extremely difficult; on an aggregate level, travel behaviour in London changes very little and very slowly. Underneath this relative stability at the aggregate level is a mass of change at the individual and household level. This is known as 'churn' and can be triggered by a number of factors, including 'push' factors that deter people from their previous choice of mode (such as crowding, congestion or fares increases) and 'pull' factors that encourage people towards an alternative or generate new trips (such as new services, infrastructure or information). In addition macro-economic factors, such as the state of the economy, can influence choice-making.

Evidence suggests that the growth in cycle travel between 2001 and 2008 was largely caused by cyclists increasing their cycle trip-making. There is no evidence of a net increase in the number of cyclists overall, although this disguises a level of 'churn', so that some people stop cycling whilst others start. LTDS showed an increase of only 3 per cent in the number of people who ever cycle between 2005/6 and 2008/9 but an increase of nearly 50 per cent in the proportion of cyclists who cycled frequently. A very small number of cyclists account for a large proportion of trips – recent

analysis of LTDS found that around 2% of London residents cycle as their main mode of travel to work, yet this group accounts for around half of all cycle trips made in London (for all trip purposes). So, although many people have taken up cycling in the past decade, a similar number have stopped cycling - i.e. there has been 'churn' but no change at an aggregate level.

Frequent cyclists already make the majority of cycle trips in London, but there remains some potential for growth amongst frequent cyclists, particularly for the journey to work

It is reasonable to assume that it may be easier to persuade and enable existing cyclists to cycle more frequently than to encourage others to cycle for the first time. There remains potential to increase cycle travel even amongst those who cycle the most frequently. Nearly half a million potentially cyclable trips are made by those who cycle at least once a week. In particular, only 24 per cent of those who cycle frequently and are in employment cycle to work and nearly 100,000 potentially cyclable work trips are made by frequent cyclists.

Research exploring the barriers to cycling and the factors which would encourage people to cycle more found that frequent cyclists were more likely to be put off by their experiences with traffic and other road users and to mention practical barriers, such as a lack of suitable parking or shower facilities (TfL Cycling Behaviour Survey 2010). For all groups, including frequent cyclists, safety was the most significant barrier to cycling in general and for specific trips. This suggests that, in order to realise the remaining potential from existing frequent cyclists, practical measures to increase safety and improve the provision of facilities will be the most effective. As infrequent cyclists begin to cycle more frequently, they can also be expected to benefit from such interventions and be encouraged to cycle more.

There remains significant potential to increase cycle trip making amongst existing infrequent cyclists – safety, traffic and lack of facilities are the greatest barriers to this

More than a million potentially cyclable trips are made each day by those who cycle, but only infrequently. This group will encompass a wide range of people, from those who cycle just once or twice a year and only for leisure purposes, to those who perhaps cycle relatively frequently for a purpose, but less often than once a week. Infrequent cyclists face similar barriers to frequent cyclists to cycling more, but these barriers are stronger and more influential. They are more concerned about safety and other traffic on the roads, as well as about the weather, the time their trip would take, and the facilities available to them. These factors act as a barrier preventing infrequent cyclists from cycling more. For this group, practical facilities are important, alongside measures to raise the perception of safety and increase confidence.

It is clearly worthwhile continuing to target existing cyclists as there remains much untapped potential for growth – more than one and a half million potentially cyclable trips are made by this group. Existing cyclists, both frequent and infrequent, have already overcome many of the barriers to cycling, typically own or have access to a bike, and are much more likely to be prepared to

consider cycling a trip. In a recent survey, when asked to select a trip they currently make by another mode that could feasibly be cycled, 73 per cent of frequent cyclists and 60 per cent of infrequent cyclists said that they would definitely or possibly cycle this trip, compared to only 33 per cent of non-cyclists (TfL Cycling Behaviour Survey 2010). Non-cyclists who did not have access to a bike were less likely to say they would cycle the trip than those who did have access, and as would be expected, those who could not ride a bike were the least likely to say they would cycle the trip.

Cycling remains a minority activity – there are many people who are ‘just like’ cyclists but do not currently cycle, offering excellent potential for growth in cycle travel

Cycling remains a minority activity: around a third of London residents made a cycle trip in the last year and only one in ten cycles frequently (once a week or more). This means that there is significant potential amongst those groups of the population already more likely to cycle – there are many people who are ‘just like’ cyclists, but don’t cycle. This is not true for any other public transport mode in London.

At present, those most likely to cycle are white men aged 25 to 44. Current cyclists have a higher than average income and are more likely to be resident in inner London. Around half a million potentially cyclable trips are currently made by men who fit this profile. TfL’s new Cycle Market Segmentation provides a more sophisticated understanding of the characteristics of those most likely to cycle at present and most amenable to cycling in future. The ‘Urban Living’ segment describes this ‘typical London cyclist’ – young, professional city dwellers who travel more than average but have low levels of car ownership, driven by lifestyle choice rather than income. This group make more than 900,000 potentially cyclable trips. A key barrier to cycling for people in the ‘Urban Living’ segment is not having a safe place to park their bike at home. Whilst difficult to resolve in high density urban locations, overcoming this barrier could un-tap significant potential, given that the Urban Living are the group most likely to cycle frequently when given the opportunity.

Beyond the ‘Urban Living’ segment, other groups offer good potential for cycling. In inner and outer London, the group with the greatest propensity to consider cycling is ‘Young Couples and Families’. Clearly, measures targeted at children and families cycling together will be a particularly effective way of encouraging change amongst this group. They are also more cost conscious and more likely to be travelling by car than the ‘Urban Living’. ‘Young Couples and Families’ have very little in common with the ‘Urban Living’, demonstrating the importance of targeting interventions at the needs of local people.

The cycle mode share in central London is already close to 3 per cent and there is the potential to achieve a mode share in the centre of the Capital to challenge that of other major European cycling cities, such as Berlin

Across central London and parts of inner London, there is an extremely high density of potentially cyclable trips in general, and in particular of potentially cyclable trips made by 'near market' segments – the potential is significant and the likelihood of realising it is good. This potential is primarily derived from existing public transport trips, particularly bus trips, and includes a higher than average proportion of travel to, from and in the course of work. Central London suffers from public transport crowding at peak hours and traffic congestion. Consequently, the potential benefits of achieving mode shift from mechanised to active modes can be considerable in terms of relieving pressure on the network and improving the speed and reliability of individual journeys.

A key barrier to cycling more often, particularly for infrequent and non-cyclists, is time. This may be because the time it would take to cycle a journey is not well understood. In fact, simply cycling at the average speed of 15 km per hour is highly competitive with average speeds in central and inner London, and cycle journeys have been found to be largely unaffected by traffic and time of day, remaining highly predictable in nearly all conditions. One in five potentially cyclable trips made for work purposes had an origin or destination in the Central activity zone, around 200,000 trips.

The high density of trips facilitates investment in major schemes such as Cycle Hire and the Cycle Superhighways. There remains significant potential just beyond the boundary of the existing Cycle Hire Zone. Expanding Cycle Hire eastwards can realise the potential in this area, but there remains scope to introduce new measures to realise the significant potential to the west and north of the existing zone. Existing cyclists say that a key reason for choosing to cycle is that they enjoy it, with safety and traffic acting as major barriers for this group. The high density of travel by all modes makes managing interactions between modes a challenge. Clearly, creative solutions to improve safety and the quality of the cycle journey experience in central London are crucial to realising the potential. This might include opening parks and open spaces to cyclists and improving the permeability of the road network with new approaches to one-way streets and signage. Alongside this, measures are required to improve the perception of cyclists by other road users, and to improve the behaviour of the small minority of cyclists who damage the journey experience of other travellers.

Beyond the centre, the potential to increase cycling is concentrated in pockets around the outer London metropolitan town centres and elsewhere – boroughs in these locations are well placed to deliver radical change

There are clusters of high potential across a range of locations in inner and outer London, with one in fourteen trips having an origin or destination in the 11 outer London metropolitan town centres. In particular, Croydon, Ealing, Kingston and Stratford offer a high density of potentially cyclable trips made by those with a greater propensity to consider cycling. There is also significant high density potential in inner London from Wandsworth and Lewisham southwards to Croydon.

These 'high density' areas of potential would be suitable locations for more significant infrastructure schemes than could be supported elsewhere in outer London; similarly to central London, many of the trips are essentially radial in nature, travelling to the town centres from the surrounding area. However, the trips made and people making the trips are very different in character to those in central London, so solutions would need to be tailored to the specific needs of the area. For example, there is significant potential to promote cycling as a low cost alternative to the car in outer London, and to develop creative solutions such as 'cycle hubs' and local route improvements. The greater access to green space and large volume of low-traffic local roads allow for the development of schemes which would simply not be possible in central London.

Regions expecting significant growth in population and employment have the opportunity to 'design in' a high cycle mode share through innovative transport and land use policies

The London Plan allows for a step-change in development in east London, predicting 600,000 new people and 160,000 new jobs in the region by 2031. The analytical tools presented here only allow assessment of potential based upon current trip and population profiles. These reveal a large number of potentially cyclable trips taking place in the region – 1.1 million – but also show that the population making the trips have a relatively low propensity to cycle; it would be harder to realise the potential in east London than in some other regions. This reflects other work carried out by TfL which found that residents of the region tend to aspire to drive and that, despite low average incomes in the region, the walk and cycle mode share is relatively low.

Nevertheless, there are reasons to focus on east London. The London Borough of Hackney has shown that, despite these constraints, it is possible in the east end to deliver a cycle mode share far above the norm. Investment related to the Olympic legacy will deliver improvements in the urban realm and a network of Greenways across the region, as well as an Olympic park that includes a velodrome. Major developments offer the opportunity to introduce innovative new schemes and policy initiatives, making it easy for residents to choose to cycle for their journeys. This might include a cycle-friendly urban realm, car-free or low car developments, good quality and abundant cycle facilities in homes and at destinations, and a permeable network of streets and routes suitable for cyclists of all ages and levels of experience. This may have two effects, firstly,

to encourage those who would like to be able to cycle to move into the area, and secondly, to overcome some of the major barriers to cycling for the existing population. Further work is required to understand the extent to which cultural barriers to cycling can be overcome or to what extent they may act as a limit to the growth of cycling in the region.

Furthermore, Canary Wharf and the new metropolitan town centre at Stratford will act as major employment hubs, drawing in workers from across London and the South East. It will be necessary to encourage more sustainable modes; schemes like cycle hire offer both residents and non-residents the opportunity to cycle their journeys.

Huge potential exists in highly dispersed trips across outer London, demonstrating the continued need to maintain investment in interventions targeted at and able to reach all Londoners

More than half the potential for cycling is highly dispersed across outer London, from trips largely made by car. The diffuse nature of these trips means that it is not practical to provide a public transport alternative and, similarly, it would not be cost effective to invest in expensive cycling infrastructure in these areas. Typically, trip-makers in outer London are less amenable to cycling and find the car a convenient and cost effective means of travel. Nevertheless, the volume of potentially cyclable trips made across outer London merits attention. In particular, encouraging people to cycle (or walk) very short car trips could reduce pressure on the road network. Measures that can reach a large number of people at relatively low cost, such as marketing initiatives, workplace and school travel plans, can be worthwhile, even if the resulting take-up rate is lower than would be expected in central and inner London. If just one in ten of the potentially cyclable trips dispersed across outer London were to be cycled, this would deliver nearly 250,000 trips, a 50 per cent increase on the current pan-London total.

Appendix A – Notes and Definitions

Central, Inner and Outer London

Greater London: The area consisting of the 32 London boroughs and the City of London, and administered by the Greater London Authority. For analysis purposes Greater London is split geographically into Inner and Outer London, using the following allocation of boroughs:

Inner London consists of the London boroughs of Camden, Hackney, Hammersmith & Fulham, Haringey, Islington, Kensington & Chelsea, Lambeth, Lewisham, Newham, Southwark, Tower Hamlets, Wandsworth, the City of Westminster, and City of London.

Outer London consists of the London boroughs of Barking & Dagenham, Barnet, Bexley, Brent, Bromley, Croydon, Ealing, Enfield, Greenwich, Harrow, Havering, Hillingdon, Hounslow, Kingston upon Thames, Merton, Redbridge, Richmond upon Thames, Sutton, and Waltham Forest.

Inner London may be further divided into Central London (see below) and the rest of Inner London. When both Central and Inner London are shown in tables or figures, it should be understood that results for Inner London exclude Central London.

Central London is an area roughly rectangular in shape, bounded by Regent's Park to the north, Whitechapel to the east, Elephant & Castle and Vauxhall to the South, and Kensington Gardens to the west. It is a larger area than the Central London Congestion Charging zone (excluding the Western Extension), and includes the Inner Ring Road and Paddington, Marylebone, Euston and King's Cross rail stations. It is equivalent (apart from minor boundary differences) to the Central Activities Zone (CAZ) as defined for the London Plan.

London sub-regions

TfL's approach is that sub-regions have flexible boundaries, and boroughs will be in more than one sub-region where that makes sense to them. For statistical purposes only, in order to ensure that journeys are captured only once, sub-regions are defined in this document as the following groupings of boroughs, with each borough included once as shown below.

- **Central sub-region:** primarily comprises the Cities of London and Westminster, the boroughs of Camden, Islington, Southwark and Lambeth and the Royal Borough of Kensington & Chelsea.
- **East sub-region:** primarily comprises the boroughs of Tower Hamlets, Hackney, Newham, Greenwich, Bexley, Barking & Dagenham, Redbridge, Lewisham and Havering. Much of the sub-region lies within the Thames Gateway Growth Area.
- **North sub-region:** primarily comprises the boroughs of Barnet, Enfield, Haringey and Waltham Forest.
- **South sub-region:** primarily comprises the boroughs of Bromley, Croydon, Merton, Richmond upon Thames, Sutton, Wandsworth and the Royal Borough of Kingston upon Thames.
- **West sub-region:** primarily comprises the boroughs of Hillingdon, Harrow, Brent, Ealing, Hounslow, and Hammersmith & Fulham.

Trips and Journey Stages

Trip: A trip is defined as a one-way movement from one place to another to achieve a single main purpose. Round trips are divided so that the return leg is treated as a separate trip. A single trip may use several methods or modes of transport, which divide the trip into its separate stages. In this way, trip rates can be analysed by trip main mode, based on distance: the main mode of a trip is the mode on which the greatest proportion of the total trip distance is travelled.

Journey stage: Trips may be further subdivided into journey stages, the component parts of a trip using a single mode of transport between interchanges. Walking is counted as a separate mode, but walks within single premises or between platforms at interchange stations are not included.

Journey Purposes

The purpose of a trip is defined by the activity at the destination, except when the trip is returning home in which case the purpose is defined by the activity at the origin. The following purposes are defined:

- Work/commuting – travel to, or from, the respondent’s usual place of work;
- Employer’s business/other work – travel in course of work, or to work at a location that is not the respondent’s usual workplace;
- Education – travel as a pupil or student to or from school, college or university;
- Escort education – accompanying a child to, or from, school;
- Shopping and personal business – including shopping and use of services such as hairdressers, dry-cleaners, doctors, dentists, banks, solicitors, etc;
- Leisure – travel to, or from, entertainment, sport or social activities;
- Other (including escort) – all purposes not otherwise classified, including accompanying or meeting another person if that is the main purpose of the trip.

Weekday time periods

- AM peak – morning peak, 07:00 to 10:00.
- Inter-peak – 10:00 to 16:00.
- PM peak – evening peak, 16:00 to 19:00.
- Evening – 19:00 to 22:00.
- Night-time – 22:00 to 04:00.
- Early am – 04:00 to 07:00.

Work status

- Working full-time: People in paid employment normally working for more than 30 hours a week.
- Working part-time: People in paid employment working for not more than 30 hours a week.
- Self-employed: Those who in their main employment work on their own account, whether or not they have any employees.

Appendix B – Glossary of principal sources of data

London Travel Demand Survey (LTDS): Annual sample survey of 8,000 randomly selected households in London and the surrounding area (within the M25). Interviewer-administered sample survey including a one-day travel diary. The data have been expanded to represent the household population of Greater London.

Analysis of Cycling Potential: Tool derived from the LTDS 2005/06 to 2007/08 dataset, identifying trips made at present by other modes, and assessing whether they could potentially be cycled, based on a set of criteria about the person and trip. The Tool is derived from a sample of 19,000 households and 42,000 residents. Trips were excluded if they were:

- Already walked or cycled;
- Made by young children, elderly and/or disabled people;
- Longer than 8km or would take at least 20% more time if cycled (based upon an average cycle speed of 15km/hour);
- Made between 8pm and 6am; or
- Carrying heavy or bulky goods.

Cycle Market Segmentation: Geo-demographic tool classifying the London population into seven segments, evaluating the influences over travel behaviour in order to identify households most amenable to cycling in future and most likely to cycle at present. Key inputs include the LTDS and other TfL surveys as detailed below.

Market Segmentation Survey 2009: One-off survey of 5,000 London residents carried out online in 2009 covering travel behaviour and behavioural change and attitudes to travel by mode.

Attitudes to Cycling Survey: Annual survey of around 1,000 London residents covering attitudes to cycling, current cycle behaviour and past experiences of cycling.

Experian's MOSAIC dataset: Consumer classification based upon a wide range of data sources including the 2001 Census, government data such as the edited Electoral Roll, self-reported lifestyle surveys and other compiled consumer data.