Contents

1. Introduction

1.1 Purpose of this Report

This Central Sub-Region report is one of five covering each of the sub-regions in London, as identified in the Draft London Plan (June 2002). The purpose of the report is twofold.

- First, to provide a review of transport and development interactions from a sub-regional perspective.
- Second, to develop a compendium of transport and land use data relating to the sub-region, the first time data has been collated on this basis.

As described in more detail below, the reports are part of the wider process of revising the Mayor's Transport Strategy and Spatial Development Strategy (London Plan). They report on the first phase of this process identifying problems and opportunities, for testing and evaluation and strategy development in the next work phases.

1.2 Report Context: Sub-Regional Development Frameworks

The draft London Plan (June 2002) sets out a number of key spatial development priorities for London, as outlined below:

- Development in the Central Activity Zone and Central London Opportunity Areas to intensify and accommodate substantial growth, especially in economic activity.
- Major development to the east of London, along the Thames Gateway with an expansion of some central London functions into the City fringe, Isle of Dogs and Stratford.
- Enhancement and diversification of the role of town centres across London.
- Significant improvements in access, services and sustainability in suburban areas.
- A focused integration of spatial policies, including neighbourhood renewal, better health, improved learning and skills, greater safety and better employment and housing opportunities in the Areas for Regeneration.
- Appropriate intensification and mix of uses with a special focus on the Areas for Intensification.

The draft London Plan notes that these are strategic policy directions that will shape London's future. They need to be pursued in a manner that reconciles London-wide strategy with local aspirations and implementation. The development of sub-regional frameworks, considering the future strategic role of each particular sub-region, is seen as critical to this process. Transport for London commissioned Llewelyn-Davies to prepare transport inputs to these sub-regional frameworks. The broad stages of this project, as shown in Figure 1.1, are to:

- Stage 1: analyse problems, opportunities and key trends
- Stage 2: develop objectives and targets
- Stage 3: develop an integrated transport and land use strategy
- Stage 4: provide a costed and prioritised programme of schemes
- Stage 5: appraise and test packages of measures against the objectives and targets

Each of these stages provides information by sub-region, consistent with the pan-London revision of the Transport Strategy.

Figure 1.1: *Project Stages*

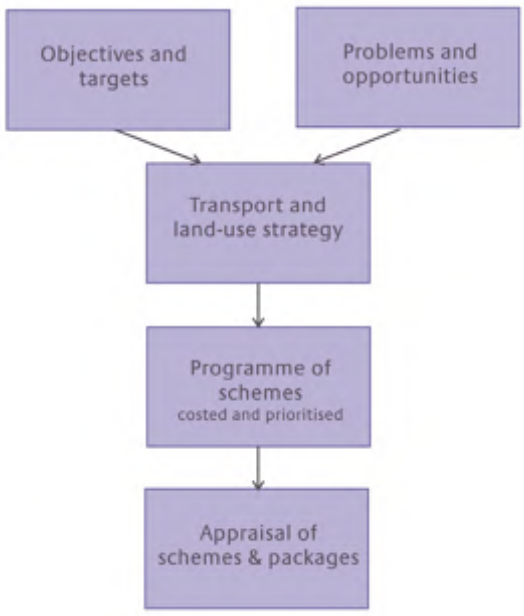
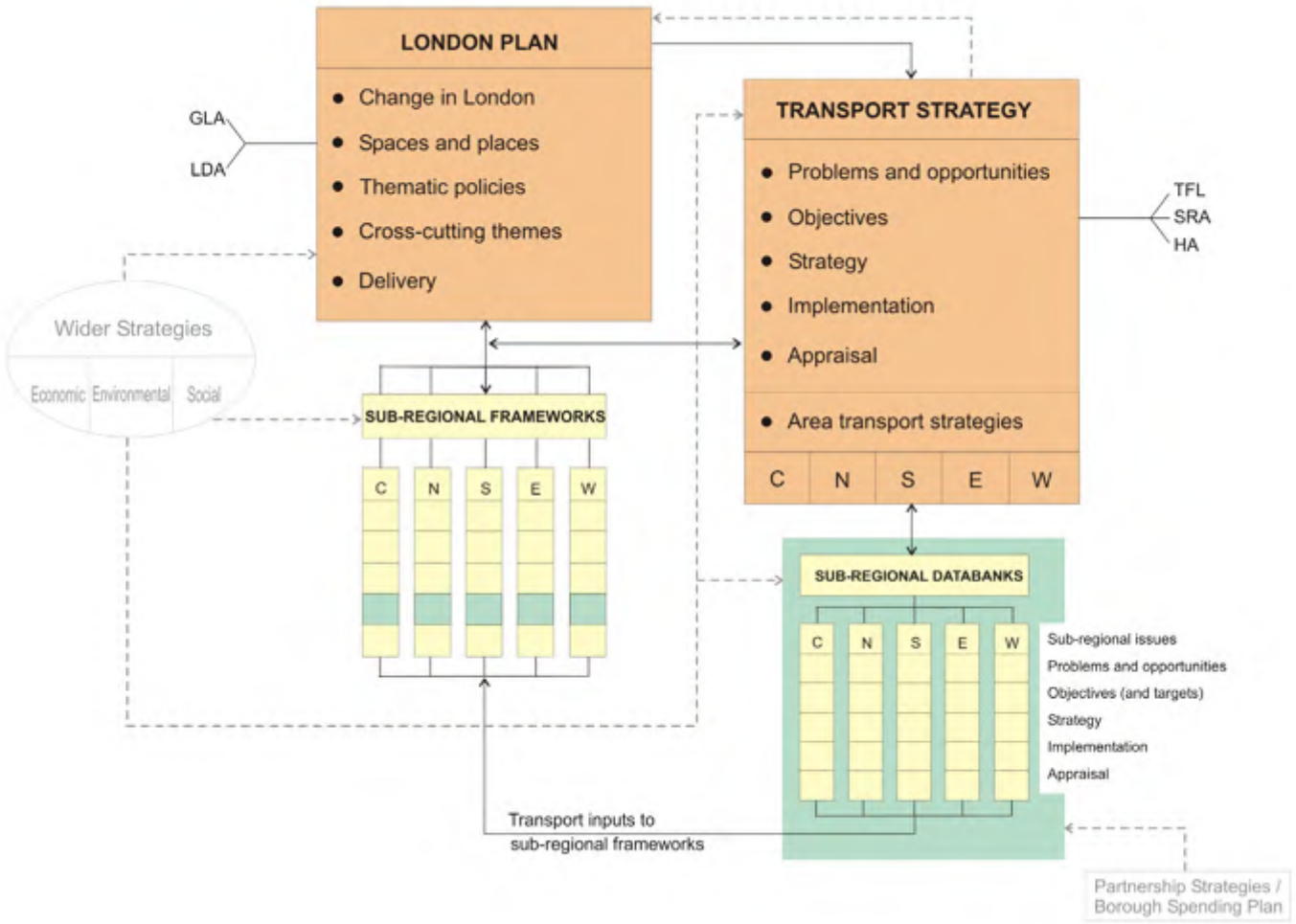


Figure 1.2 shows the relationship of the work with the ongoing development of the Transport Strategy and London Plan.

This report provides a sub-region databank and an assessment of the problems and opportunities for the Central Sub-Region. It will be used as context to the future development of objectives and targets, a transport strategy, and programme and appraisal, for the sub-region.

Figure 1.2: *Transport Inputs to the Sub-Regional Frameworks*



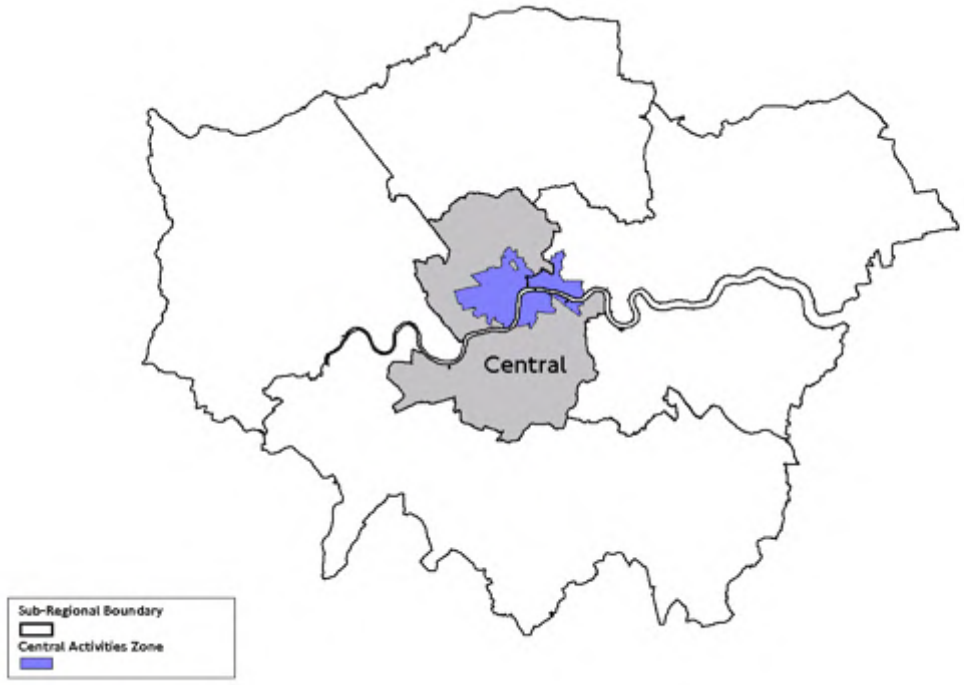
(Source: Llewelyn-Davies)

1.3 The Sub-Regions

The sub-regions within London are defined in the London Plan (June 2002) as follows:

- Central London – Camden, Islington, Kensington & Chelsea, Lambeth, Southwark, Wandsworth and City of Westminster.
- North London – Barnet, Enfield, Haringey and Waltham Forest.
- South London – Bromley, Croydon, Kingston upon Thames, Merton, Richmond upon Thames and Sutton.
- West London – Brent, Ealing, Hammersmith & Fulham, Harrow, Hillingdon and Hounslow.
- East London – Barking & Dagenham, Bexley, City of London, Greenwich, Hackney, Havering, Lewisham, Newham, Redbridge and Tower Hamlets.

Figure 1.3: *The Sub-Regions in London showing Central SR and CAZ*



(Source: TfL, Hannah Shrimpton)

The sub-regions reflect the administrative areas of a number of agencies, such as the Learning and Skills Councils, Business Links and Local Authorities, and areas which are practical in terms of data collection. The sub-regions are also the focus of area-based partnerships, with key roles in the co-ordination of transport, economic development and regeneration activities.

1.4 Report Structure

The remainder of this Central Sub-Regional report is structured as follows:

- Section 2 reviews problems and opportunities and the degree of "fit" between these and identified transport actions.
- Section 3 is a compendium of transport and land use data organised into three parts. The first gives a brief overview of the sub region, the second discusses the key drivers of change, and the third describes travel patterns and trends both quantitatively and qualitatively.

Two annexes provide further detail:

- Annex 1: Submissions to the Examination in Public
- Annex 2: Useful references

2. Transport and Development Interactions

2.1 Introduction

This section of the report reviews the transport and land use problems and opportunities for the sub-region, particularly concentrating on interactions at the sub-regional level. First, we consider the broad characteristics of the sub-region, then summarise stakeholder aspirations, perceived problems and opportunities, and conclude with a synthesis of key policy issues.

2.2 The Central Sub-Region: Broad Characteristics

The Central Sub-Region is an extraordinarily diverse, dynamic and innovative area. The main distinguishing feature of the sub-region is that it includes a high proportion of the "world city" functions of the central area. For the purpose of the London Plan sub-regional work the City of London is counted as part of the East sub-region. However, the City continues in particular to have strong linkages with the Central sub-region, and if it is notionally counted as a working part of the Central sub-region, there is a focus of employment and specialised metropolitan functions that is unique in Europe. This results in a high degree of inward commuting to the Central Sub-Region, mainly to the Central Activities Zone, from throughout south-east England. This commuter movement also results in other parts of the Central Sub-Region being subjected to heavy traffic flows, both on road and rail routes. On the one hand this provides the Central Sub-Region with high levels of public transport provision, but on the other the environmental impacts of movement are more intense than in the other sub regions.

Local travel throughout the Central Sub-Region is mainly on foot and by bus, and to an extent on the Underground. Medium to longer distance travel relies heavily on the Underground north of the River Thames, while south of the river greater reliance is placed on services on the National Rail network. Herein lies an issue for the Central Sub-Region, since TfL (and the Mayor) has more direct responsibility for rail public transport north of the river.

A further distinguishing feature relates to the areas of high density housing and other development outside but close to the Central Activities Zone. These areas are served by a number of retail centres of varied range and quality (such as Putney, Clapham Junction, Streatham, Brixton and Camden Town) whose role and in some cases strength is limited by the proximity of central London, and also by serious environmental intrusion of high traffic levels.

Current Transport Strategy schemes are shown in Figure 2.1.

2.3 Stakeholder Aspirations

The broad future strategy as identified in the London Plan (2002) is to increase the sub-region's capacity to accommodate economic and population growth, recognising the Mayor's overall strategy to promote development further to the East. The sub-region is home to many of London's World City activities including international business and finance, government, culture and tourism. Demand for these activities will continue to grow and much of it will require a Central London location. The sub-region could have 140,000 new homes and 216,000 new jobs by 2016.

These will largely be accommodated through:

- More intensive development in the heart of London, known as the Central Activities Zone.
- In the Opportunity areas. These are largely found on the fringe of the Central Activities Zone and around mainline termini where access is especially good.
- In the Areas for Intensification.
- Elsewhere in the sub-region where there is good public transport access and the potential for higher densities without harm to existing residential communities or to outstanding heritage and environment.

The sub-region is the focus for London's transport network and at the hub of the National Rail network. Improved public transport capacity is important to accommodating further growth.

A number of issues have been highlighted during the Draft London Plan Examination in Public as important to the future of the Central Sub-Region. Below we show a summary of the key aspirations[1] (further details are shown in the Annex).

GLA family comments:
- Central London has the highest levels of public transport accessibility in London.
- Public transport has suffered from under-investment; investment is needed.
- The proposed transport improvements will ease rail crowding problems.
- Significant growth in bus capacity is planned.
- Developing residential areas close to the concentration of employment growth in Central London will help to minimise demand for travel.

Borough comments:
- The relationship between the scale and phasing of development and public transport capacity is critical.
- Failure to provide adequate transport infrastructure will increase congestion.
- Scenario testing is needed; if the funding & growth do not occur then the Mayor needs to have commitments to other public transport services.
- Investment in transport is needed.

Other stakeholder comments
- Transport capacity should not be used to control (or delay) the phasing (and planning) of new development.
- If major projects fail, the crowding will intensify.
- Without major investment in transport, the quality of the Central London environment will deteriorate.
- Growth should focus on areas where transport capacity already exists or can be realistically increased.
- The DLP needs to be more realistic in terms of accommodating growth within transport constraints.
- Given the historical development and high levels of public transport capacity in Central London it may not be possible to redirect commercial development from the centre.
- The DLP should place emphasis on the Coach Strategy review as promised in the Mayor's transport strategy.

[1] Source: Chris Hyde's Summary of Borough Submissions to the EIP (2003)

- CLOA's present opportunities for a variety of different travel patterns to emerge.
- The area within the Central London sub-region but outside the CAZ needs consideration of its own.
- Air space above railway lines has scope for development.

2.4 Transport Problems

A key purpose of this report is to address the transport issues associated with growth and change. However, in tackling these issues, it has to be recognised that the present transport system falls short of expectations, even for the present demands that are placed on it. Using a set of problem indicators, the Central Sub-Region situation is set out in Table 2.1, together with commentary on how problems may develop, and any consequent need for intervention. Some of the problems are London wide and need to be addressed as such by the Transport Strategy.

Table 2.1: *Transport Problems*

Problem indicator	Central Sub-Region performance and trends	Projection and strategy intervention
Walking difficulties and quality of street environment	▪ Barriers to walking are summarised in the draft Walking Plan – people are discouraged by factors such as traffic volume, poor air quality, road safety issues, personal security, poor quality of street environment and a lack of information. ▪ Pedestrians account for 21% of road casualties in CSR. Future data need to inform following: ▪ CAZ relatively good walking conditions because of high intensity pedestrian movement, and relatively high provision of crossing facilities. ▪ Outside CAZ, high degree of severance on main radials, often with infrequent crossings.	▪ Central London can improve further if capitalise on congestion charge benefits. ▪ Rest of Central Sub-Region likely to deteriorate further unless traffic increases reversed. Likely increases in traffic at edges of CCZ. ▪ Greater priority to walking in traffic management needs policy and scheme development. ▪ Some improvements due flagship projects and to road space reallocation projects, and to traffic calming and parking control measures.
Cycle difficulties	▪ The Central Sub-Region has the highest proportion of people cycling to work at 4% (2001 Census). ▪ It can be assumed that poor safety and complex traffic conditions suppress demand for cycling. ▪ Cycling accounted for 12% of casualties but an assumed 4% or less of all trips. This highlights the high level of risk of cycling in this sub region. (See Table 3.16). Future data need: ▪ Mode share for all trips ▪ Attitudes on deterrents to cycling ▪ Impact of cycle route and facility provision on casualties and	▪ Cycling conditions may deteriorate further, unless traffic reduction is achieved. ▪ Improved LCN+ routes are proposed on commuter routes, with safe, high quality, high capacity facilities. ▪ Could improve with CCZ and any potential extensions to this. ▪ Policy choice: use of street capacity for cycling or for public transport and walking. ▪ Need for improved cycle parking facilities at stations and work places.

	levels of cycling	
Bus unreliability	▪ Some variation within the sub-region boroughs, but reliability is generally worse than other sub-regions, especially for low frequency buses (see Figure 3.17).	▪ Bus reliability improved in CCZ with congestion charging ▪ Overall trend unclear ▪ Reliability needs further action outside CCZ ▪ Bus use within the CCZ has increased by 14%, in part reflecting that reliability has improved.
Inadequate bus service routes or frequencies (Social exclusion issue in terms of people working shifts outside hours of operation, or gaps in route coverage)	▪ Coverage of bus services is relatively good. ▪ Future data need: ▪ Public satisfaction with service coverage in terms of routes, service levels and hours of operation.	• Increased night service provision will assist
Bus overcrowding	Data required to inform: ▪ Extent of overcrowding, especially on routes not served by Underground ▪ Especially commuter peak hours ▪ Some night bus routes ▪ School hours where coincident with commuter peaks	▪ TfL's planned capacity increase (40% by 2011, 50% by 2016) could address the problem, but needs to be underpinned by data on overcrowding. ▪ Problem could reduce if bus reliability improves, due to traffic reduction or bus priority provision.
Rail unreliability	▪ SRA data at Figures 3.21 and 3.22 shows that rail reliability varies by operator. Some operators such as SWT consistently under-perform.	▪ Key pan-London output indicator. ▪ Issue of control, especially National Rail.
Rail overcrowding	▪ Many Underground sections are overcrowded in weekday peak periods. ▪ Specific problems of station overcrowding, e.g. Camden Town. ▪ Radial National Rail routes also overcrowded. Forecast that it should improve with improved capacity, though some problems will still occur on some parts of the network	▪ Pan London key issue ▪ Overcrowding heaviest in Central Sub-Region (and East Sub-Region).
Station and passenger environment and facilities	▪ See customer satisfaction below	▪ Existing programme of upgrades to address adequate?
Road crashes and casualties	▪ Higher rate of casualties per capita than rest of London. Explained by higher daytime population (commuters and visitors) and traffic intensity. See Figure 3.10 and Table 3.16. ▪ Proportion of pedestrian casualties is higher than any other sub-region, but comparative rate not known.	▪ Casualty levels reducing over time. ▪ Road space reallocation and speed management policies could accelerate improvements (e.g. TfL suggestion for 20 mph limits on some parts of main road network).

Environmental problems	▪ Assumed that noise impact worst in Central Sub-Region. ▪ Air quality better than North, West and East sub-regions. See Table 3.17 and 3.18 for NO_x and PM10. ▪ It can be assumed that deterioration is greatest where traffic is growing fastest (outside peaks, outside CA, and on residential "rat runs")	▪ Improvements expected in air quality ▪ CO_2 reduction unlikely without further traffic reduction ▪ Residential streets will deteriorate unless environmental traffic management. Likely trade-off with main roads unless total traffic reduced
Road congestion (delays and unreliability)	▪ Slowest traffic speeds of all sub-regions – and deteriorating (see table 3.33 and Figures 3.25 – 3.27) ▪ Deterioration greatest where traffic fastest growing (outside CAZ, and outside am peak) ▪ Speeds may increase due to congestion charge.	▪ Deterioration will continue, both peak and especially off-peak ▪ Will cause increasingly unstable traffic conditions (unpredictable delays) ▪ Problem reduced in CAZ ▪ Choice of solving problem through extended traffic reduction measures
Parking difficulties	Future data needed if sub-regional parking strategy to be produced ▪ Residential parking difficulties throughout the Central Sub-Region. ▪ Non-residential parking has reasonable controlled balance between supply and demand. ▪ CAZ problems ameliorated through CC.	▪ Further deterioration unless further extensions to Respark ▪ Contribution of Car Clubs to solving this problem ▪ CAZ reallocation of parking to other uses? ▪ Further action around centres and stations?
Costs of public transport for those on low incomes	Future data needed: ▪ Impact of costs of travel on access to jobs from labour market area (social exclusion issue. ▪ Still high costs of public transport use by international comparison, so CAZ businesses likely to experience labour market problems affecting competitiveness.	▪ Improved with ticketing and fare initiatives ▪ Improving as fare levels held ▪ Young and unemployed people discounts ▪ Potential capacity problem with lower fares (subsidy, service, fares triangle)
Lack of transport payment integration	User impact data required: ▪ Pan-London problem ▪ Especially marked in Central Sub-Region because of conjunction of National Rail and Underground services	▪ Travelcards have helped ▪ Will partly improve with Oyster card ▪ Further integration potential with National Rail, parking, taxi, car club
Accessibility to PT for disabled people	Data could inform:: ▪ Most rail services inaccessible; a particular Central Sub-Region problem in terms of equal opportunities employment? ▪ Buses – proportion accessible	▪ Accessible buses programme – 79% of buses are wheelchair accessible. ▪ Rail – programme adequate?
Risk and fear – personal security	User data required: ▪ Fear influence on mode or destination choice and trends ▪ Fear of crime and unsocial behaviour known to be major deterrent to off-peak public	▪ Trends not known

	transport use, especially for women. National survey suggested that this suppresses public transport travel by 10% ▪ Same study found problems were greater walking and waiting at stops rather than on vehicle (Crime Concern and Transport and Travel Research, 1997, "Perceptions of Safety from Crime on Public Transport", DETR) ▪ Central Sub-Region better or worse than other sub-regions?	
Customer satisfaction	Data by sub-region required: ▪ Underground: customers are least satisfied with cleanliness of stations and helpfulness of staff and more satisfied by factors such as information, the services and safety and security (Transport Statistics for London 2001). ▪ Buses: customers are least satisfied with service reliability and cleanliness of buses and slightly more satisfied with personal safety issues and staff behaviour (Transport Statistics for London 2001).	

2.5 Development and Transport Opportunities

The previous section sets out transport problems in the Central Sub-Region as they now exist, or might develop. The Transport and Spatial strategies, however, can go further and set out ways of developing improved outcomes and should show how development opportunities will be supported by appropriate transport actions. This section therefore tackles this issue of how to capitalise on transport and development opportunities.

To some extent it is difficult to separate "problem solving" from "opportunity utilisation". For example, if a new transport facility is provided to help regenerate an area, it may also go some way towards solving existing transport problems. Improving accessibility and the potential for intensification provide the key land use and transport opportunity for the Central Sub-Region.

A further key issue to be addressed in the SRDF is the timing and phasing of major growth and increases in transport capacity. This is partly concerned with whether and in what ways the timing of transport and development can be co-ordinated, and partly the degree to which this is feasible. Relevant to this issue is the fact that the bringing forward of development schemes, and the implementation of some major infrastructure projects, are not within the control of the GLA or TfL. Nevertheless, this issue is strongly made in the representations made regarding the DLP, and it may be appropriate for the SRDFs to address this on a case by case basis.

Table 2.2: *Development and Transport Opportunities*

Opportunity	**Related transport interventions**	**Comment on transport/development "fit" (An "OK" entry is given where the fit is judged to be clear)**
Opportunity Areas		
Vauxhall/Nine Elms/ Battersea (Inbound access for 7,600 jobs Outbound for 1500 homes)	Vauxhall interchange	▪ "Inbound" catchment insufficient for 7,600 jobs? Re-schedule for more homes, less jobs? ▪ Western end may need better public transport. ▪ Proposals to be devised? ▪ Cross river tram could serve?
Waterloo (15,000 jobs 500 homes)	Station redevelopment Cross river tram	▪ OK
Elephant & Castle (4,200 jobs 4,200 homes)	Station redevelopment Better interchange	▪ OK
London Bridge (24,000 jobs 500 homes)	Station redevelopment	▪ OK
Kings Cross (11,400 jobs 1,250 homes)	CTRL, Crossrail 2	▪ OK
Paddington (23,200 jobs 3,000 homes)	Crossrail 1	▪ OK
Intensification Areas		
Arsenal/ Holloway (1,500 jobs and stadium, 2,000 homes)	None?	▪ No stop on Thameslink 2000 or Crossrail 2 ▪ Is more PT needed to support inbound access for 1,500 jobs and major stadium?
Euston (4,000 jobs. 200 homes)	Crossrail 2	▪ OK
Victoria (2,000 jobs. 200 homes)	None	▪ Depends on jobs/homes location within the area ▪ Extra PT might be needed, especially in south part of area ▪ Consider serving the area by extending the Cross River Transit via Vauxhall
Farringdon/ Smithfield (2,000 jobs. 100 homes)	Thameslink 2000 Crossrail	▪ Assumed to meet requirements
Holborn (2,000 jobs. 200 homes)	None?	▪ Continued crowding on Central Line and Piccadilly Line (no stop on Crossrail) ▪ Is extra PT needed to serve jobs?
Tottenham Court Road (2,000 jobs. 200 homes)	Crossrail	▪ Substantial increase in rail access capacity, but continued crowding on Central Line and Northern Line ▪ Issue of pedestrian capacity at street level
Major Centres Intensification		

Putney	None	▪ Little potential for intensification?
Wandsworth	None	▪ Develop public transport proposals?
Clapham Junction	Crossrail 2, ELLX	▪ Street capacity issue could limit potential for intensification
Tooting	Tramlink extension	▪ Link to Wandle Valley regeneration? With Tramlink extension?
Streatham	Thameslink 2000	▪ Why no transport proposals? ▪ Regeneration potential?
Brixton	Orbirail/ELLX	▪ OK ▪ Extend Cross River tram to Brixton (and beyond?)
Peckham	OrbirailELLX/Cross River Transit	▪ OK
Kings Road	None	▪ Little potential for intensification
Kensington High Street	None	▪ Little potential for intensification
Shepherd's Bush	(West SR border) White City development? Public transport proposals with White City	▪ Are proposals sufficient ▪ Orbirail role – new station at Shepherd's Bush, increased frequencies on West London Line
Queensway/ Westbourne Grove	Crossrail	▪ Little intensification potential ▪ OK
Camden Town	Cross River Transit	▪ Little intensification potential? ▪ Traffic reduction measures needed ▪ Camden Town Underground needs redevelopment
Angel	No proposals	▪ Little potential for intensification?
Nags Head	No proposals	▪ Regeneration potential ▪ Consider Thameslink 2000 stop?
Other opportunities not identified in DLP. (Accessibility and Intensification)	Would need new or redeveloped interchange stations	
Finsbury Park	ELLX, Thameslink 2000, (plus Crossrail2 ?)	▪ Potential for intensification e.g. employment and retail
Tulse Hill South	If new interchange	▪ Potential for high density housing?
Loughborough Junction	ELLX/Orbirail, Thameslink2000	▪ Opportunity for new community?
Streatham Vale	ELLX, Thameslink2000 (rail from 5 directions)	▪ Potential for homes and jobs? Other?
West Hampstead	Thameslink 2000 (Rail from 6 directions, but poor interchange between them)	▪ Potential for major centre development to fund new interchange station. ▪ Land or site availability issues?
Transport opportunities	Would need new or Redeveloped interchange stations	
Better integration of Underground and National Rail services. Provision of "Metro" frequencies on National Rail.	Crossrail 2 would aid the integration of the two networks (as would Thameslink 2000, although mostly in East Sub-Region). New interchange stations (see above) would also open up the	▪ Commuting to Central Sub-Region is mainly by Underground north of Thames, and mainly by National rail south of the Thames. ▪ Underground and especially National Rail services are aimed at radial commuter trips. Their role could be diversified if a network could be established through better

	"network" function of rail services as opposed to their radial commuter function.	interchange and frequencies. ▪ Development could help to fund the interchange infrastructure (see above).
ELLX/Orbirail	▪ Development nodes could be identified along Orbirail route: ▪ Willesden Junction ▪ White City ▪ Olympia? ▪ Brixton? ▪ Loughborough Junction? ▪ Canada Water ▪ Dalston? ▪ Chalk Farm? ▪ West Hampstead?	▪ New rail services Orbirail and ELLX do not appear to be related to land use growth, nor do they address the need for additional commuting capacity to Central Sub-Region. ▪ The proposed tangential services are therefore seen as primarily addressing transport issues rather than development issues. ▪ Moreover, the proposed frequencies on most of the routes are well short of Underground standards, thus limiting their potential in a regeneration context. ▪ The exception is Canada Water where accessibility from the south and north is considerably enhanced.
A23 Corridor		▪ Potential to extend Cross River Tram and/ or Tramlink routes on this corridor currently served only by bus.

2.6 Modelling Transport and Development Interactions

LTS modelling (programmed for May/June 2003) is to be based around the following scenarios:

1. Assumed development scenario (new homes and new jobs to 2016)
- Lower development aspiration (-50% London Plan)
- Current agreed development aspiration (London Plan)
- Higher development aspiration (+50% London Plan)

2. Transport scenarios
- 2001 Base: committed schemes (e.g. funding committed)
- 2011 model run: reference case and planned schemes
- 2016 model run: reference case and planned schemes

NB. Model runs to follow in May/June. Results by borough/sub-region (LTS cannot robustly go down to a finer level, e.g. opportunity area). Standard LTS model outputs.

2.7 Strategic Policy Issues

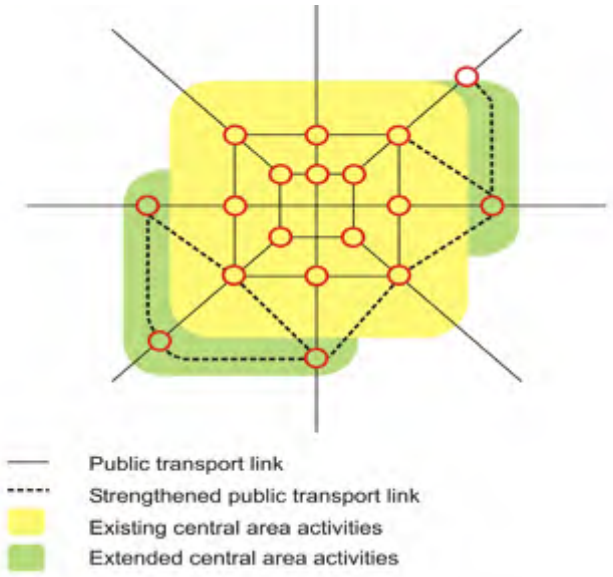
2.7.1 Growth and transport links

Large scale growth is expected in the Central Sub-Region of 140,000 homes (an increase of about 20%) and 216,000 jobs. Much of this growth will occur in or near the Central London (CAZ) part of the sub-region.

Two issues arise from this. First, the increase in jobs exceeds housing growth, with the implication that there will be more in-commuting that will need to be accommodated (equivalent to 1.5 Canary Wharfs). This will be addressed by Crossrail 1 and 2, Thameslink 2000, and to lesser extent Underground improvements, Cross River Transit and bus capacity increases. However, even with this extra public transport provision, there will still be overcrowding at peak

times on certain Underground and National Rail lines in the future. Second, a substantial amount of growth (more than half of the total homes but less than half of the jobs) is expected outside the CAZ. These areas lie mostly outside the dense network of public transport routes. Although public transport is still at a high level, it is configured primarily as routes to and from the CAZ, and is less well suited for inward access as would be required for employment uses. This is shown diagrammatically in Figure 2.2.

Figure 2.2*: Extended Central Area Activities and Transport Links*



There are public transport proposals that will address this, by making tangential movement easier, including ELLX and current schemes to improve frequencies on certain Inner London National Rail services. Even so, outside the CAZ, the strongest connections are radial rather than tangential. The policy issue here is to match growth and development locations with improved tangential public transport links, and the creation or strengthening of public transport nodes. Elephant & Castle and Vauxhall are two examples. Some of the other opportunities worth exploring are listed in the “opportunities” table above. Development at such nodes can help to fund the new interchange infrastructure.

2.7.2 Transport and areas of deprivation

Better transport links are required between areas of deprivation (especially Lambeth and Southwark, Islington and North Kensington) and the areas of opportunity and intensification. The Boroughs are expected to identify links, but possibly a wider view can be taken. For example, the Cross River Transit and ELLX proposals seem well configured in terms of areas of deprivation, but could the bus network be more explicitly integrated with these rail schemes?

2.7.3 Road network

Proportionally, the road network in the Central Sub-Region is under the most intensive pressure of anywhere in London. Not only does the Central Sub-Region host the most intensive activity, its road system is mostly as laid out prior to the motor vehicle; narrow and winding and with frequent connections.

This sub-region therefore has most need for limitation of car travel, and most need for rationalisation of road space according to identified hierarchies and priorities. Top priority use of the road network in the Central Sub-Region should

be public transport and walking. The density is such that distances to facilities and to public transport are short, so walking is generally realistic for trips within the sub-region.

Potentially, the Central Sub-Region strategy should place less emphasis on cycling as an alternative mode of travel than in other sub-regions because of the possible conflict with higher bus use and pedestrian activity, in that road space that is more restricted. In addition, the apparently very high casualty rate per trip (see Table 3.16) means that cycling should not be encouraged unless the casualty rate can be reduced to a fraction of its current level. Cycling provision should continue to be explored, but perhaps not at the expense of pedestrian or public transport capacity, safety or convenience, and will generally result in shared space provision rather than segregated. Potentially valuable measures might include segregated provision for cyclists across roads and key junctions that pose particular difficulties for cyclists, notably the inner ring route, greater provision of cycle parking at stations, and enhancement of segregated long distance routes (e.g. national and regional routes along waterways).

2.7.4 Network integration

Commuting to the CAZ is mainly by Underground north of the Thames, and mainly by National Rail south of the Thames. Crossrail 2 would aid the integration of the two networks (as would Thameslink 2000) by increasing the proportion of destinations that can be served without a change, and by increasing the range of interchange possibilities. Integration of fares, ticketing and information is a long-standing objective, but there is scope for more integration between the different modes.

A continuing issue is the absence of metro-style train services on the National Rail lines serving London. This network is not under the control of TfL, and in any case requires wider consideration in view of track sharing between London, regional, and national services. In the south part of Central Sub-Region, there is potential to increase development intensity if higher frequency rail services and better interchange could be provided.

3. A Compendium of Data for the Sub-Region

3.1 Introduction

This section of the report provides a compendium of transport and land use data for the Central Sub-Region. Such a sub-regional disaggregation has not previously been provided in London. There are four key parts as outlined below:

- Drivers of change - key demographic, economic, social and environmental changes in the sub-region over recent years.
- Travel patterns and trends – key transport data such as mode share, weekday travel patterns, travel forecasts, etc.
- Major transport schemes
- Key development sites and areas

Where possible, this data is trend based, and compared to London as a whole.

3.2 Drivers of Change

3.2.1 Population

The post-1945 decline in London's population was reversed during the 1980s, increasing from 6.81 million in 1981 to 7.19 million in 2001. The Central Sub-Region's population has also grown from just over 1.4 million in 1981 to almost 1.5 million in 2001. It is forecast that by 2016 the population of the Central Sub-Region will be almost 1.7 million, an increase of 14% over 2001, but still well below 1961 levels. Table 3.1 shows population figures and projections by borough and also for the sub-region from 1961.

Table 3.1: *Central Sub-Region and Borough Population*

Sub-Region Borough	1961 Census (000s)	1971 MYE (000s)	1981 MYE (000s)	1991 MYE (000s)	2001 MYE (000s)	2011 (000s)	2016 (000s)
Southwark	313	266.6	218.3	227.2	245.4	276.3	290
Lambeth	342	311.5	252.9	255.0	266.8	297.5	311.4
Islington	261	205.8	166.1	171.8	176.1	193.2	200.6
Kensington & Chelsea	219	189.1	140.1	143.6	159.1	171.0	173.0
Wandsworth	335	307.2	262.0	262.0	260.8	276.9	285.0
City Of Westminster	272	233.3	188.2	185.0	181.7	201.4	207.2
Camden	246	209.3	179.0	180.7	198.4	218.4	223.6
Central Sub-Region Total	**1,988**	**1,722.8**	**1,406.6**	**1,425.3**	**1,488.3**	**1,634.7**	**1,691.0**
London Total	7,994	7,529.4	6,805.6	6,829.4	7,187.9	7,679.3	7,899

Source: 1961 Census and ONS mid-year population estimates (MYE) are Crown Copyright.
Note: Data for 1961 to 1981 use 1991 boundaries. Data for 1991 and 2001 use 2001 boundaries
Source for 2011 and 2016 data is GLA 2002 Round of Demographic Projections (GLA SDS Technical Report 23) © Copyright GLA 2003

Figure 3.1 shows the population trend and forecasts for the Central Sub-Region.

Figure 3.1: *Central Sub-Region Population Trend and Forecasts*

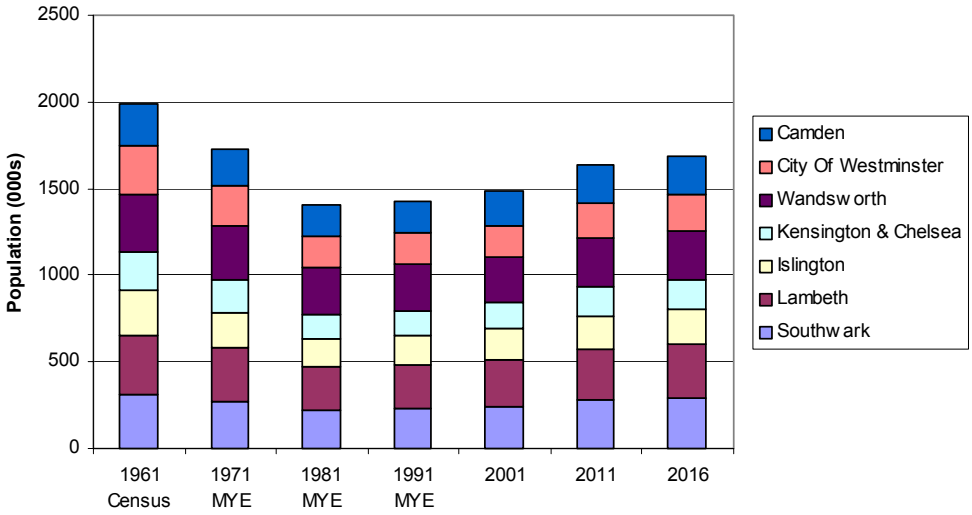


Table 3.2 highlights, recent population increases using mid-year population estimates for the Central Sub-Region in 2001, 2002 and 2003. The 2003 mid-year population estimate for the sub-region is just over 1.5 million people, with all of the constituent boroughs contributing to the increase.

Table 3.2: *Recent Population Change*

Sub-Region Borough	2001	2002	2003
Camden	198,432	201,829	204,941
Kensington and Chelsea	159,147	162,662	165,140
Westminster	181,691	183,693	185,484
Islington	176,103	176,874	177,811
Southwark	245,416	248,574	251,736
Lambeth	266,791	268,914	271,367
Wandsworth	260,847	261,899	263,637
Central Sub-Region Total	**1,488,427**	**1,504,445**	**1,520,115**
London Total	7,188,006	7,238,366	7,290,174

Source: ONS (2003) 2001 mid-year estimates
GLA (2002) Round of demographic projections (GLA SDS Technical Report 23)

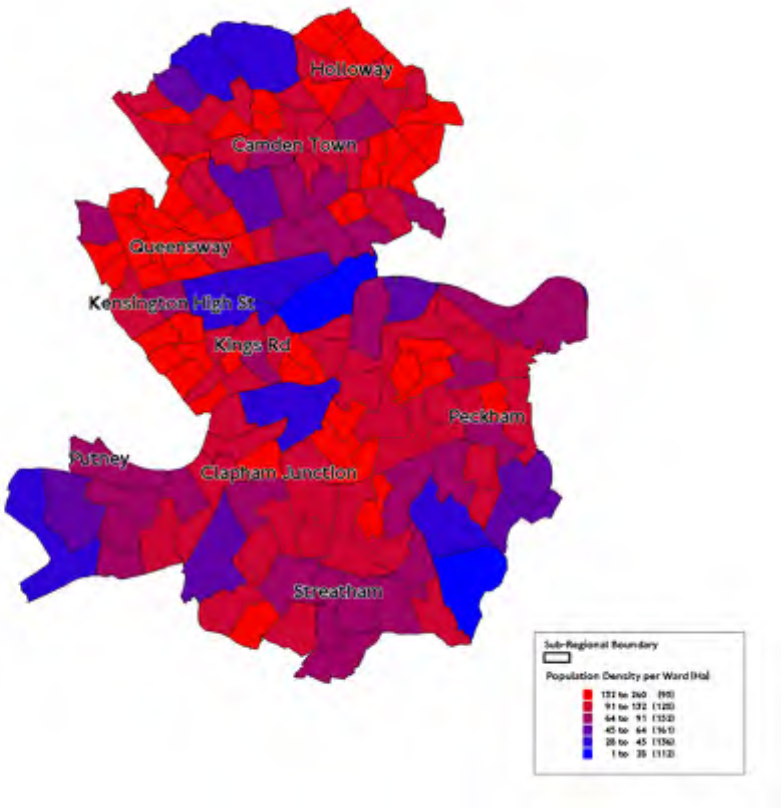
Table 3.3 gives the population densities for each of the London boroughs in the Central Sub-Region. The average population density for the sub-region is 95 people/ha gross. The most densely populated boroughs are Islington, Kensington and Chelsea and Lambeth, all averaging over 100 people/ha. The least dense is Wandsworth, in the south of the sub-region, with 77 people/ha.

Table 3.3: *Population Density*

Sub-Region Borough	Area (Ha)	Population 2003	Household Density (Household/Ha)	Population Density (Population/Ha)
Camden	2,180	204,941	42.1	94.0
Wandsworth	3,426	263,637	33.8	77.0
Westminster	2,148	185,484	42.5	86.4
Islington	1,486	177,811	55.5	119.7
Kensington and Chelsea	1,213	165,140	65.3	136.1
Lambeth	2,682	271,367	44.2	101.2
Southwark	2,885	251,736	36.8	87.3
Central Sub-Region Total	**16,020**	**1,520,115**	**42.8**	**94.9**
London Total	157,209	7,290,174	19.2	46.4

Source: 2001 Census Key Statistics Table KS01

Figure 3.2: *Population Density*



(Source: Hannah Shrimpton)

Figure 3.3: *Population Density and Travel Behaviour*
CORRELATION/awaiting LTS output from Ian Wright/Atkins
(Source:2001 Census Key Statistics and LTS)

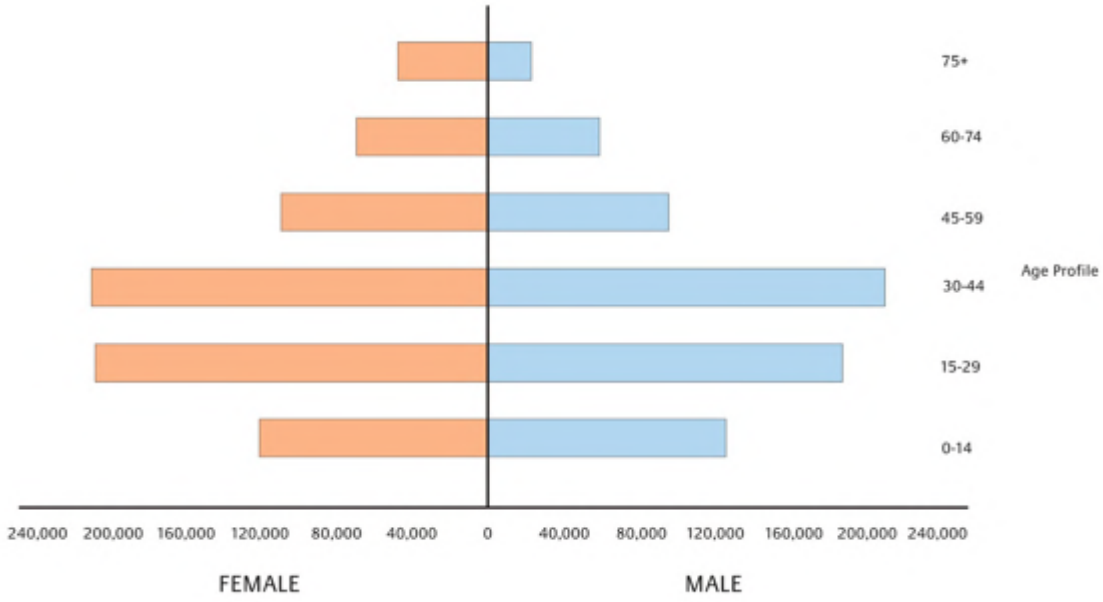
Table 3.4 and Figure 3.4 show the population age profile for the sub-region. A large proportion of the Central Sub-Region's population is between the ages of 15 and 44 years old. The main working age group is 30-44 and in the Central Sub-Region this age group accounts for 28.2% of the population compared to 25.7% for London as a whole. Only a very small proportion of the population are in the 75 plus bracket.

Table 3.4: *Population Age Profile*

Sub-Region Borough	Age Profile												Total
	0-14		15-29		30-44		45-59		60-74		75+		
	M	F	M	F	M	F	M	F	M	F	M	F	
Camden	15,829	15,490	26,157	29,570	26,840	26,652	14,426	15,416	8,576	9,470	3,853	6,153	198,432
Kensington and Chelsea	12,201	11,552	16,225	19,046	22,287	22,404	13,655	15,256	8,023	9,228	3665	5,605	159,147
Westminster	11,893	11,590	23,992	25,261	25,401	24,189	14,393	15,199	9,363	10,075	4015	6,320	181,691
Wandsworth	20,798	19,985	35,680	41,287	36,704	37,505	15,697	17,435	10,616	11,952	4587	8,601	260,847
Islington	15,488	15,039	21,087	24,773	24,883	25,478	12,236	13,029	7,767	8,442	2978	4,903	176,103
Lambeth	24,609	23,699	35,983	36,986	39,467	38,686	16,609	17,709	10,597	11,316	4309	6,821	266,791
Southwark	23,796	23,172	30,587	31,305	34,917	34,702	16,240	17,045	10,369	11,527	4309	7,447	245,416
Central Sub-Region Total	**124,614**	**120,527**	**189,711**	**208,228**	**210,499**	**209,616**	**103,256**	**111,089**	**65,311**	**72,010**	**27,716**	**45,850**	**1,488,427**
	8%	**8%**	**13%**	**14%**	**14%**	**14%**	**7%**	**8%**	**4%**	**5%**	**2%**	**3%**	
London Total	696,652	668,534	801,301	842,328	909,530	939,651	561,090	594,857	355,799	394,474	155,088	268,702	7,188,006
	10%	9%	11%	12%	13%	13%	8%	8%	5%	6%	2%	4%	

(Source: ONS Mid-Year Estimate; GLA, Jon Hollis)

Figure 3.4: *Population Age Pyramid*



(Source: John Hollis, GLA)

Table 3.5 shows the growth in households in the Central Sub-Region, between 1991 and 2001, with projections to 2016. Between 2001 and 2016, household numbers are predicted to increase by around 115,000. Household size is predicted to fall from 2.3 in 2001 to 2.1 in 2016.

Table 3.5: *Household Growth*

Sub-Region Borough	Households 1991	Households 2001	Households 2011	Households 2016
Camden	81,789	91,794	105,500	109,900
Islington	75,302	82,424	88,800	93,100
Kensington & Chelsea	70,695	79,260	88.500	90,500
Lambeth	111,628	118,724	139,000	146,800
Southwark	97,598	106,044	126,600	134,100
Wandsworth	112,746	115,860	121,000	125,600
Westminster	86,386	91,376	97,100	101,000
Central Sub-Region Total	**636,144**	**685,481**	**766,500**	**801,000**
London Total	2,809,056	3,022,674	3,322,700	3,469,800

Source: 1991 and 2001 data from GLA 2002 Round of Demographic Projections (GLA SDS Technical Report 23) © Copyright GLA 2003.
2011 and 2016 projections from GLA, John Hollis

3.2.2 Economy and Employment[2]

Table 3.6 shows that employment in the Central Sub-Region is forecast to grow by 17% overall between 2001 and 2016. Westminster and Lambeth are forecast to increase by19% and 25% respectively. If the City of London is included, the sub-region's forecasted increase in employment rises to 20%.

[2] The Central Sub-Region does not include the City of London. For the purposes of employment analysis, however, it is useful to include the City of London along with the other parts of Central London that do fall within the Central Sub-Region since this is a major focus for the sub-region.

Table 3.6: *Employment Forecasts*

Sub-Region Borough	2001	2016	Change	% Change
Camden	259,355	298,147	38,792	15%
Islington	150,054	172,002	21,948	15%
Kensington & Chelsea	127,112	146,391	19,279	15%
Wandsworth	106,679	118,264	11,585	11%
Westminster	570,448	677,248	106,800	19%
Southwark	160,833	180,288	19,455	12%
Lambeth	112,770	140,768	27,998	25%
Central Sub-Region Total	**1,487,251**	**1,733,109**	**245,858**	**17%**
City of London	306,368	424,053	117,685	38%
Central Sub-Region and City Total	1,793,619	2,157,162	363,543	20%
*Central Sub-Region total (GLA, London Plan Data)	1,644 (37%)	1,883 (37%)	239	15%
London Total	4,014,206	4,690,799	676,593	17%

Source: Annual Business Inquiry, 2001/Roger Tym & Partners Projections (GLA Economics, Damian Walne)
**Draft London Plan (TfL, 2003, Analysis of the Transport Programme to Support the Draft London Plan)*

Table 3.7 shows the employment densities in 2001 of the individual boroughs and the overall densities for the Central Sub-Region. It also gives the sub-region total, incorporating the City of London.

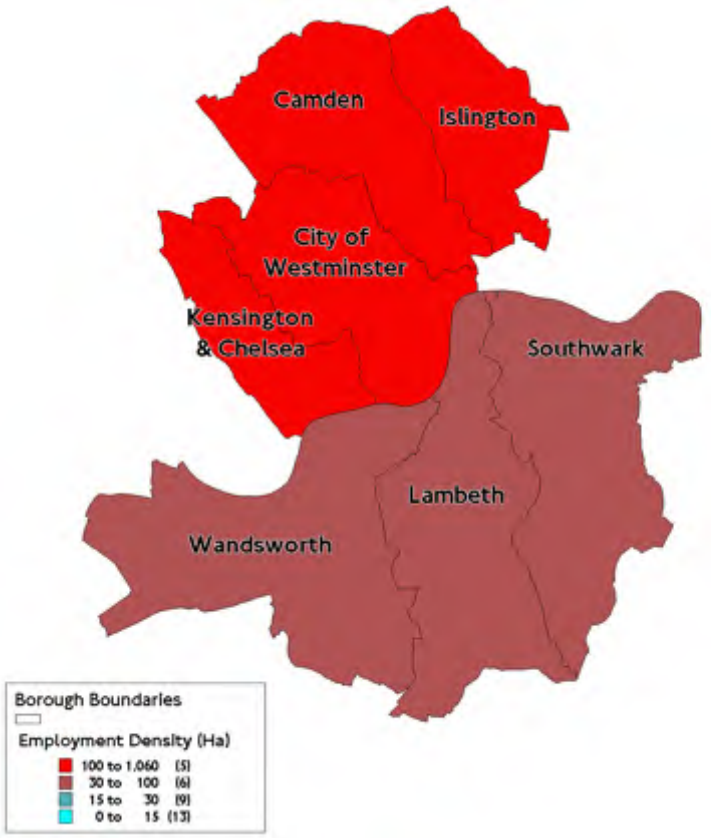
In the Central Sub-Region, Westminster has the highest employment densities (266 employees/ha). The overall sub-regional density is increased from 93 employees/ha to 110 employees/ha if the City of London is included.

Table 3.7 *Employment Density 2001*

Sub-Region Borough	Number of employees	Area (ha)	Employees /ha
Camden	259,355	2,180	119
Islington	150,054	1,486	101
Kensington and Chelsea	127,112	1,213	105
Wandsworth	106,679	2,682	31
Westminster	570,448	2,885	266
Southwark	160,833	3,426	56
Lambeth	112,770	2,148	42
Central Sub-Region Total	**1,487,251**	**16,020**	**93**
City of London	306,368	290	1,056
Central Sub-Region and City Total	**1,793,619**	**16,310**	**110**
London Total	4,014,206	157,209	26

Source: Annual Business Inquiry, 2001/Roger Tym & Partners Projections (GLA Economics, Damian Walne)

Figure 3.5: *Employment Density*



(Source: Hannah Shrimpton)

Figure 3.6: *Employment Density and Travel Behaviour*
CORRELATION/awaiting LTS data from Ian Wright/Atkins

Table 3.8 shows the types of employment in the Central Sub-Region. The sub-region has the largest proportion of employment in London of all the sub-regions, accounting for 37% of all jobs. The most important employment sectors are hotels, restaurants, transport, public administration, education and health. The largest sector is the business services sector, which accounts for 30% of the sub-region's employment, compared to 25% of employment in Greater London as a whole.

A key factor is the high employment density (especially in Westminster and the City of London), and the mis-match between jobs and people, resulting in large scale inward commuting. As indicated by Tables 3.10 and 3.11, the Central Activities Zone is known to be highly specialised, requiring access from a wide labour market area.

Table 3.8: *Type of Employment*

Sub-Region Borough	Agriculture and fishing	Energy and water	Manufacturing	Construction	Distribution, hotels and restaurants	Transport and communications	Business Services	Finance	Public administration, education & health	Other services	TOTAL
Camden	44	866	13,658	5,351	44,821	18,638	82,215	11,143	57,880	24,739	259,355
Islington	17	471	10,459	3,958	21,694	17,252	44,534	14,129	26,659	10,881	150,054
Kensington and Chelsea	96	154	4,339	1,117	48,009	5,955	27,977	5,029	22,128	12,308	127,112
Wandsworth	155	29	3,858	2,978	26,856	7,240	23,371	1,242	31,714	9,236	106,679
Westminster, City of	1,633	3,195	18,419	3,190	138,705	31,406	196,043	28,882	88,395	60,580	570,448
Southwark	29	332	11,963	6,145	26,931	17,433	39,808	12,460	36,112	9,620	160,833
Lambeth	66	998	3,803	4,039	21,266	8,748	30,554	1,436	30,848	11,012	112,770
Central Sub-Region	**2,040**	**6,045**	**66,499**	**26,778**	**328,282**	**106,672**	**444,502**	**74,321**	**293,736**	**138,376**	**1,487,251**
City of London	91	457	4,455	995	24,113	10,790	111,164	133,887	12,767	7,649	306,368
Central Sub-Region and City Total	**2,131**	**6,502**	**70,954**	**27,773**	**352,395**	**117,462**	**555,666**	**208,208**	**306,503**	**146,025**	**1,793,619**
London Total	3,809	11,877	260,360	134,395	891,710	321,623	1,000,889	324,437	780,081	285,025	4,014,206

Source: Annual Business Inquiry, 2001 – (GLA, Damien Walne)

3.2.3 Incomes and Car Ownership

Table 3.9 shows the gross average weekly earnings for full time jobs in the Central Sub-Region (data relates to workplaces and not residents who work outside of the sub-region). Working categories are as follows:

- "High" skill refers to managers, professionals, senior officers, associate professionals and technicians
- "Medium" skill refers to secretarial/administration, skilled and personal service
- "Low" skill refers to sales/customer service, operatives and elementary occupations

The table also benchmarks sub-regional earnings against the GB average, which is indexed at 100. In the Central Sub-Region, average weekly earnings are substantially higher than both Greater London (20% higher) and Great Britain (46% higher). This is due to the high-skill workers in the sub-region.

Table 3.9: *Average Gross Weekly Earnings*

Area	Average Weekly Earnings (Index)	High Skilled Workers	Medium Skilled Workers	Low Skilled Workers
Central Sub-Region	**£474 (146)**	**£616 (128)**	**£311 (126)**	**£297 (120)**
Greater London	£392 (121)	£545 (113)	£282 (114)	£279 (112)
Great Britain	£324 (100)	£482 (100)	£247 (100)	£248 (100)

Source: New Earnings Survey, Office for National Statistics (NOMIS), from LDA and PACEC (2003) 'Understanding London's Sub-Regional Economies'.

Table 3.10 and Figure 3.7 show car ownership in the Central Sub-Region in 2001. Car ownership rates are substantially lower than the London average. 51% of all households in the sub-region do not have a car, compared to Greater London at 37%. Only 9% of households in the sub-region have more than one car, compared to the Greater London average of 20%. Better public-transport, closer public amenities and the lack of car parking provision in the sub-region are major factors behind these figures. Hence the usual positive correlation between income and car ownership is not apparent.

Table 3.10: *Central Sub-Region Car Ownership (2001)*

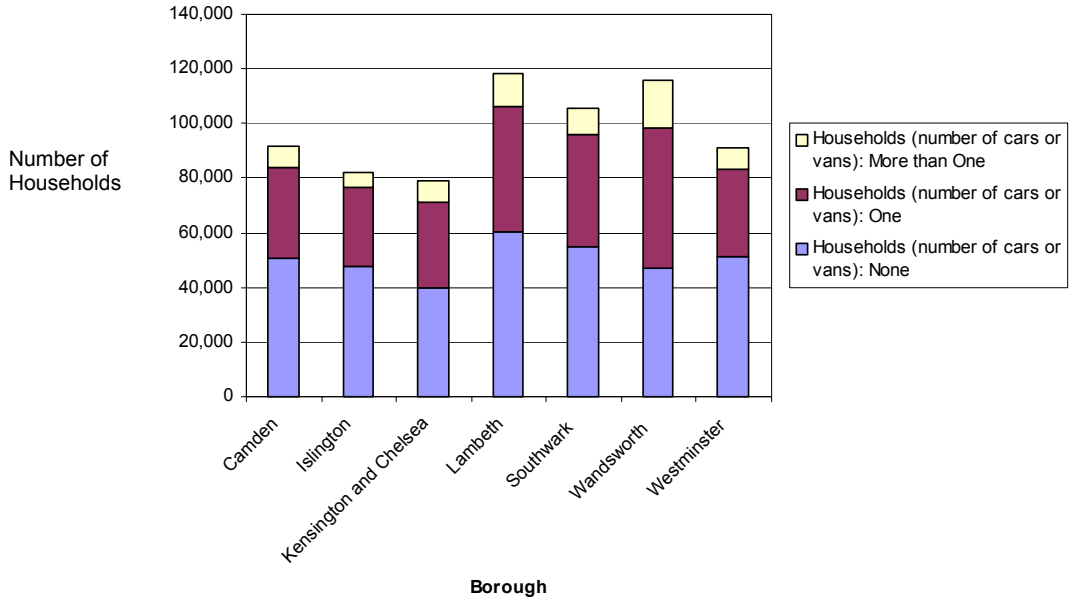
*Central Sub-Region Borough	All Households	Households (number of cars or vans): None	Households (number of cars or vans): One	Households (number of cars or vans): Two	Households (number of cars or vans): Three	Households (number of cars or vans): Four or more cars	All cars or vans in the area**
Camden	91,603	50,946	33,084	6,280	984	309	49,961
Islington	82,281	47,413	29,194	4,795	670	209	41,746
Kensington and Chelsea	79,146	39,870	31,041	6,633	1,184	418	
Lambeth	118,447	60,338	46,080	10,166	1,446	417	72,594
Southwark	105,806	54,940	40,947	8,454	1,120	345	62,773
Wandsworth	115,653	47,066	51,440	14,437	2,164	546	89,201
Westminster	91,172	51,452	32,108	6,241	1,012	359	49,316
Central Sub-Region	**684,108**	**352,025**	**263,894**	**57,006**	**8,580**	**2,603**	**365,591**
Total London	3,015,997	1,130,649	1,298,481	476,185	86,470	24,212	2,616,328

Source: Census 2001

* *Includes any company car or van if available for private use.*

** *'All cars or vans in the area' includes only those cars and vans owned by; or available for use by; households*

Figure 3.7: *Central Sub-Region Car Ownership (2001)*



Source: Census 2001. Includes any company car or van if available for private use.

3.2.4 Tourism and Culture

London is one of the world's most popular destinations for international travellers and tourists. In 1998 it attracted 13.5 million visitors who stayed for an average of seven nights, an increase of 30 per cent since 1990. The Central Sub-Region has by far the largest proportion of hotels in London, accounting for 70% of bedspaces available. Table 3.11 shows the number of hotels in the sub-region.

Table 3.11: *Hotels in the Central Sub-region*

Central	Establishments	Rooms	Bedspaces
Camden	130	13,164	25,272
Islington	15	1,478	2,898
Kensington & Chelsea	166	13,588	26,861
Lambeth	17	1,228	2,556
Southwark	21	1,582	3,346
Wandsworth	14	368	842
Westminster	427	34,478	68,421
Central Sub-Region Total	**790**	**65,886**	**130,196**
London Total	1,509	93,286	186,067

Source: BTA/LTB November 2002

Table 3.12 shows that the Central Sub-Region accounts for a vast proportion of people on the Underground whose origin of travel was a hotel. Unsurprisingly, 85% of those on the Underground who started at a hotel in London did so from the Central Sub-Region.

Table 3.12: *Underground Passengers Travelling from a Hotel*

Area	Number of passengers
Central Sub-Region	31,588
London Total	37,181

Source: London Underground Rolling Origin and Destination Survey
NB. Definition of 'Underground Passengers Staying at a Hotel': number of London Underground Passengers whose Journey Origin was from a hotel in the sub-region

3.2.5 Drivers of Change

The trends in employment, population and tourism identified above are all leading to a growth in travel. A number of other drivers of change are likely to influence future travel patterns. These include: information technology/home working/flexible working, environmental protection policies and extension of opening hours. Table 3.13 shows the extent of working at home for employed residents in the sub-region. As found in London generally, there is a positive correlation between work-at-home rates and socio-economic group.

Table 3.13: *Extent of Working from Home*

Central Sub-Region Boroughs	People who work mainly at or from home	% of employed residents in each borough
Camden	9,860	10.7%
Islington	6,711	8.4%
Kensington and Chelsea	10,259	13.6%
Lambeth	9,873	7.6%
Southwark	8,313	7.7%
Wandsworth	10,809	7.7%
Westminster	9,906	11.1%
Central Sub-Region Total	**65,731**	**9.2%**
London Total	285,935	8.6%

Source: Census 2001 KS15 (GLA, Jon Hollis)

3.2.6 Social Inclusion and Regeneration

Deprivation

Transport links are critical to supporting regeneration and promoting social inclusion by improving access for people in deprived areas to employment and other opportunities. Thirteen of the twenty most deprived boroughs, districts in the UK are in London (ONS, 2000).

Each of England's 8,414 wards is ranked according to its level of overall deprivation on the Index of Multiple Deprivation (IMD). The most deprived ward is ranked 1 and the least deprived ward is 8,414. The median rank for England is 4,208. Table 3.14 shows, for each given area, the median rank of its wards on each of the indices of deprivation and on the overall measure, the IMD. The calculation of IMD is based on a weighted summary figure of the rankings of the various indices.

The overall IMD figure for the Central Sub-Region is well below the London average, showing that, generally, deprivation is worse in this sub-region than

London as a whole. The Central Sub-Region scores worse than the rest of London in terms of income, employment housing and health. Education is similar to the Greater London area. The sub-region does score highly in the access category, reflecting the fact that a large proportion of the transport network in the London area is focussed on the Central Sub-Region.

Table 3.14: *Index of Deprivation*

Area	IMD	Income	Employment	Health	Education	Housing	Access
Central Sub-Region	1,630	1,692	1,397	2,511	3,151	351	8,175
Greater London	2,418	2,444	2,555	3,457	3,347	564	7,483
Median Rank for England	4,208						

Source: Neighbourhood Statistics, Index of Multiple Deprivation 2000, ONS, PACEC

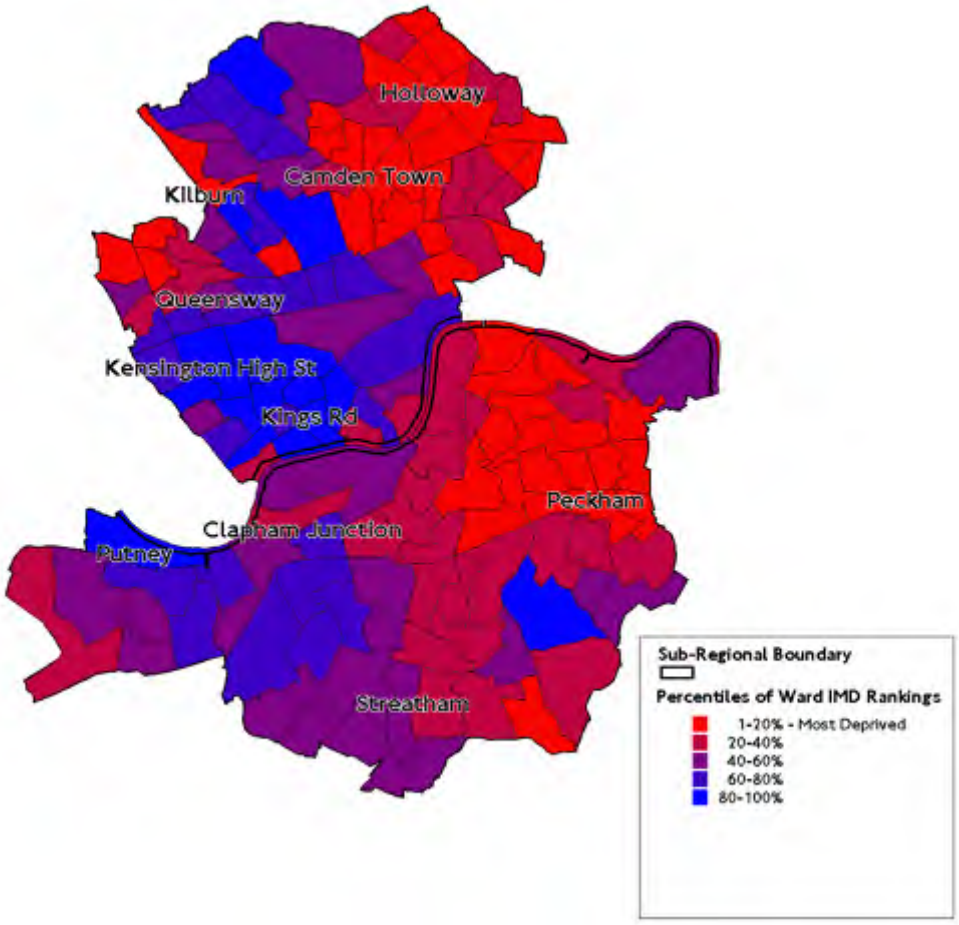
Table 3.15 shows the average ward scores in terms of deprivation. High figures indicate higher deprivation, with London's most deprived borough being Tower Hamlets (61.3) and least deprived being Richmond (7.5). The most deprived boroughs in the Central Sub-Region are Islington (45.3) and Southwark (44.5), whilst the least deprived is Kensington and Chelsea (20.7). Wandsworth and Westminster also score lower than the sub-regional average.

Table 3.15 *Indices of Deprivation – Average Ward Scores*

Borough	Indices of Deprivation 2000, (average of ward scores)
Camden	36.6
Islington	45.3
Wandsworth	23.1
Westminster	24.3
Kensington and Chelsea	20.7
Lambeth	38.3
Southwark	44.5
Average Central Sub-Region ward score	33.3
Average London-wide score	28.7

Source: ONS

Figure 3.8: *Indices of Deprivation*



(Source: Hannah Shrimpton)

Figure 3.9: *Deprivation and Travel Behaviour*
CORRELATION, awaiting data from LTS, Ian Wright/Atkins

3.2.7 Safety and Security

Within Greater London, 24,836 road traffic crashes involving personal injury were reported to the Metropolitan and City police during the first nine months of 2002. This is a 9% decrease compared with 2001. However, casualties in 2002 have shown a decrease of 8% compared with 2001.

These 24,836 crashes resulted in 30,228 casualties. Of these 203 were fatal, 3,992 were seriously injured and 26,033 were slightly injured. Fatalities have decreased by 3% from 209 to 203 compared with the first nine months of 2001. Serious injuries decreased by 5% and slight injuries decreased by 9%.

Figure 3.10 shows casualties in the Central Sub-Region, and Table 3.16 type of casualties, both in the first nine months of 2002. In terms of total casualties, the Central Sub-Region accounts for 27% of the total for London. This incorporates 42% of pedal cycle casualties, 38% of motor cycle casualties, 33% of pedestrian casualties and 17% of car occupant casualties. Camden (-16.7%), Islington (-10.6%) and Kensington & Chelsea (-13%) all had greater overall percentage decreases from 2001 than the average for London (-8.4%).

Figure 3.10: *Total Casualties in the Sub-Region (January to September, 2002)*

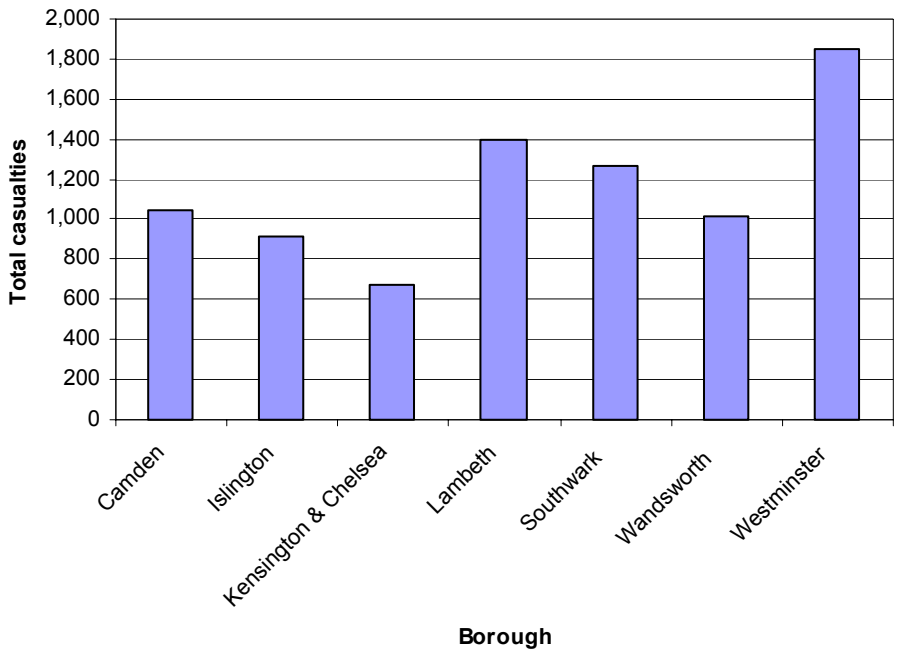


Table 3.16: *Casualties in the Sub-Region (January to September, 2002)*

Central Sub-Region borough	Total casualties		Pedestrians		Pedal cyclists		Powered two wheelers		Car occupants		Total vehicle occupants	
	Jan - Sept 2002	% change over 2001	Jan - Sept 2002	% change over 2001	Jan - Sept 2002	% change over 2001	Jan - Sept 2002	% change over 2001	Jan - Sept 2002	% change over 2001	Jan - Sept 2002	% change over 2001
Camden	1,042	-16.7%	264	-4.7%	130	-10%	243	-28.7%	296	-18%	778	-20.1%
Islington	916	-10.6%	219	-5.2%	139	-3.5%	223	-14.6%	250	-11%	697	-12.2%
Kensington & Chelsea	669	-13.0%	154	-26.0%	82	-20%	195	-1%	177	-12.8%	515	-8.2%
Lambeth	1,401	-4.5%	266	-13.4%	152	-16%	359	-1.1%	486	3.8%	1,135	-2.2%
Southwark	1,268	-2.7%	216	-17.2%	153	7.7%	291	-6.1%	452	5.1%	1,052	1%
Wandsworth	1,015	-4.3%	187	-13.8%	137	11%	279	-5.1%	327	7.2%	828	-1.9%
Westminster	1,847	-6.8%	485	-16.4%	195	1.6%	376	-16.4%	423	-5.4%	1,362	-2.9%
Total for Central Sub-Region	**8,158**		**1,791**		**988**		**1,966**		**2,411**		**6,367**	
Total for London	30,228	-8.4%	5,472	-7.8%	2,351	-8.5%	5,225	-10.7%	14,341	-8.1%	24,756	-8.5%

Source: TfL Street Management Fact Sheet – London Accident Analysis Unit, Quarterly Summary year 2002 (first nine months) January 2003

3.2.8 Environment and Health

Air Quality

London's air quality as a whole is the poorest in the UK and amongst the worst in Europe (Transport Strategy, 2001). Poor air quality is significant cause of ill health and early death in London. The Government's National Air Quality Strategy[3] sets out air quality objectives for eight air pollutants, all of which have adverse effects on health. Table 3.17 shows air emissions (tonnes of pollutant emitted per year) by borough in the sub-region, with projections for 2005 in Table 3.18. Substantial reductions are expected for all the noxious pollutants. Carbon Dioxide emissions are expected to increase however.

The Mayor wishes London to make a contribution to meeting the UK target of reducing CO_2 emissions by 20% below 1990 levels, by the year 2010. London's transport system is responsible for around 20% of the CO_2 emissions in the city. For transport related $C0_2$ emissions, road traffic accounts for 65%, rail and Underground for 25%, and aviation for the remaining 10%.

Table 3.17: *Air Emissions (1999)*

Central Sub-Region	Sulphur Dioxide	Nitrogen Oxide	Carbon Monoxide	Carbon Dioxide	Non-Methane Volatile Organic Compound	Benzene	Butadiene	Particulate Matter
Camden	38.4	1,225	3,680	680,137	1,734	37.6	9.5	61.2
Islington	21.2	825	2,553	481,528	1,522	25.8	6.0	34.8
Kensington and Chelsea	30.5	1,066	2,964	664,584	1,146	28.2	6.9	34.9
Lambeth	30.6	1,124	3,634	582,823	1,628	34.6	8.7	46.7
Southwark	31.0	1,169	3,586	645,312	2,077	36.2	8.5	48.3
Wandsworth	38.4	1,311	4,268	716,876	1,726	42.0	10.3	56.7
Westminster	56.4	2,078	6,495	1,090,951	2,910	59.3	15.2	93.0

Source GLA – Lucy Sadler

Table 3.18 *Projected Air Emissions (2005)*

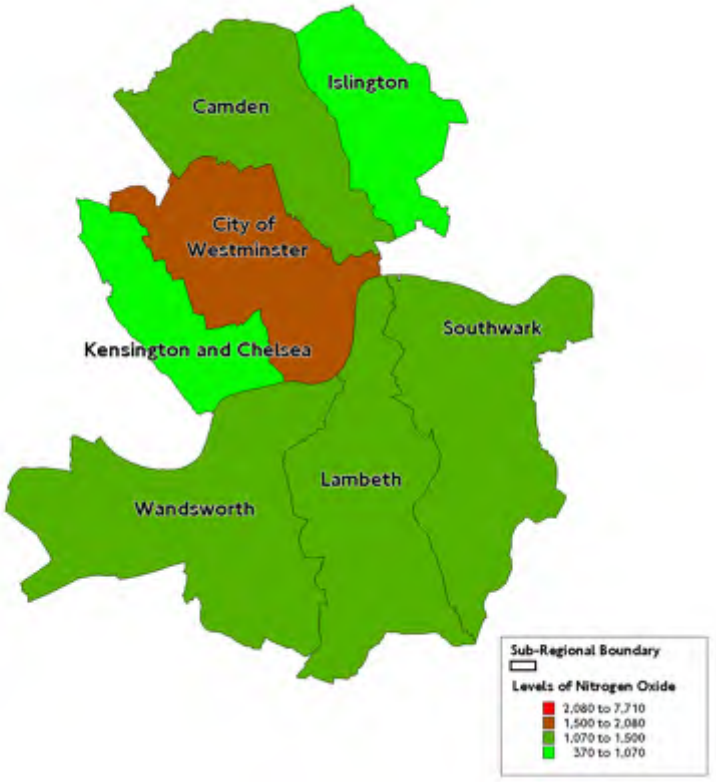
Central Sub-Region	Sulphur Dioxide	Nitrogen Oxide	Carbon Monoxide	Carbon Dioxide	Non-Methane Volatile Organic Compound	Benzene	Butadiene	Particulate Matter
Camden	18.9	1,275	2,174	868,975	1,809	26.2	4.6	51.7
Islington	6.2	750	1,347	546,209	1,474	16.2	2.3	24.2
Kensington and Chelsea	14.5	1,047	1,678	776,583	1,126	18.6	2.9	27.5
Lambeth	9.5	1,086	2,091	721,808	1,657	22.5	3.7	38.0
Southwark	17.6	1,640	2,057	954,351	2,094	24.2	3.5	42.1
Wandsworth	21.6	1,359	2,374	936,259	1,626	26.7	4.3	46.9
Westminster	13.2	1,812	3,387	1,175,416	2,619	34.8	5.8	59.6

Source GLA – Lucy Sadler

[3] DETR (2000) Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Concentration of nitrogen oxide is shown in Figure 3.11, and highest levels within the sub-region are found in Westminster.

Figure 3.11: *Air Quality: Concentration of Nitrogen Oxide (1999)*



(Source: Hannah Shrimpton)

Health

Health and environmental issues are closely linked. Tackling safety and security, air pollution, noise and stress arising from overcrowding and traffic delay, are necessary to improve health in the Central Sub-Region. By contributing to the regeneration of deprived areas, better transport can also address the aspects of social exclusion and poverty which strongly correlate with poor health.

The London Health Commission has identified health improvement through transport measures as one of four key priorities for health improvement in London. Table 3.19 reports on some high-level indicators identified as important determinants of health in the sub-region.

Table 3.19: *Indicators of Health in the Sub-Region*

Sub-Region Borough	Unemployment Rate (%)	% of Pupils (aged 15) achieving 5 or more GCSE Grades A*-C or equivalent	Proportion of Homes judged unfit to live in (%)	Burglary Rate/ 1000 Resident Population	Road Traffic Casualty Rate / 1000 Resident Population (killed, injured or slightly injured)	Life Expectancy at Birth		Infant Mortality Rate/1000	Proportion of People with Self Assessed Good Health
						Male	Female		
Westminster	4.7%	41.5%	5.1%	N/A	15.1	76.0	81.0	6.2	72.4%
Camden	6.7%	48.4%	11.9%	16.2	8.4	73.6	80.1	4.9	71.3%
Islington	7.4%	32.9%	9.9%	16.8	7.9	73.1	78.5	5.4	68.0%
Southwark	8.8%	35.7%	5.0%	13.3	7.3	72.8	79.5	7.8	70.3%
Lambeth	8.3%	40.1%	8.2%	20.3	7.2	72.9	78.9	7.6	71.6%
Kensington and Chelsea	3.9%	55.7%	5.8%	11.8	6.2	78.5	83.1	6.4	75.2%
Wandsworth	4.0%	48.6%	N/A	11.9	5.5	74.4	79.1	4.9	74.6%

(Source: London Health Commission, Health in London, 2003)
Unemployment: GLA & ONS Claimant Count (2002)
Life expectancy ONS 1999-2001
Infant Mortality ONS 1996-2001
Road Casualties: Transport for London (accident figures). ONS (mid-year estimates 2001) based on 2001 census
Burglary: Metropolitan Police Statistics: 2000/2001. ONS: mid-year estimates, 2001 based on 2001 census
GCSEs: DfES (provisional figures); January 2003
Housing: GLA: HIP data for London, April 2001
Good health: ONS 2001
Note: NO2 and PM10 are one of the 10 indicators. They have not been included in this table as the figures are shown in tables 3.17 and 3.18

3.3 Travel Patterns and Trends

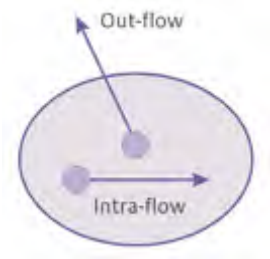
This section of the report draws together the key changes in travel patterns and trends in the Central Sub-Region over recent years. It includes data on current travel patterns, traffic congestion, public transport, walking, cycling and private vehicles.

3.3.1 Mode Share

The following tables and diagrams, based on Census and Railplan data, show the mode share patterns for weekday journeys to work in the Central Sub-Region.

Journeys to Work

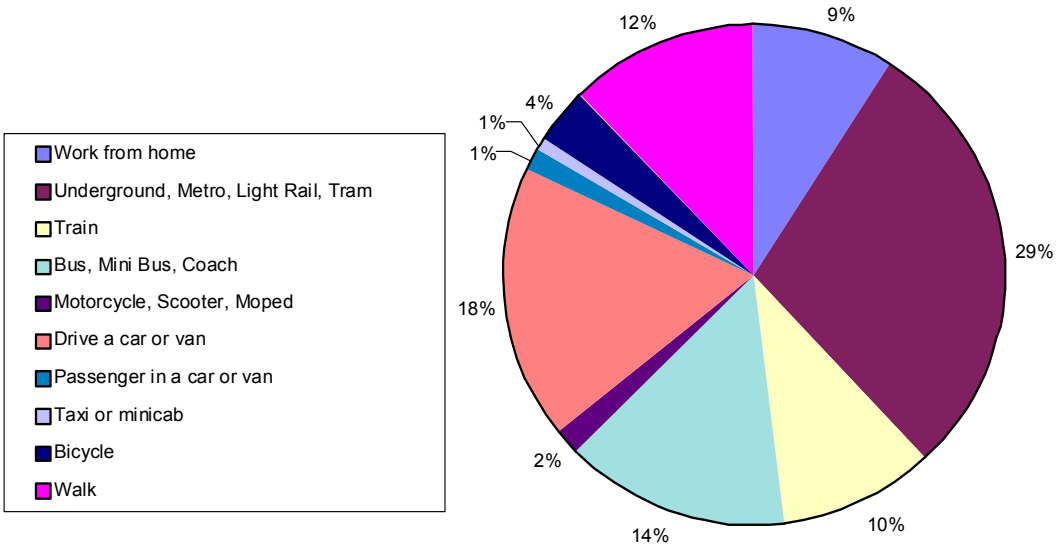
Figure 3.12 shows journeys to work by main mode for people living in the Central Sub-Region (Census, 2001). Just over half travel by public transport and one in five go by car.



Key comparisons with London-wide data are as follows:

- 29% of Central Sub-Region residents use the Underground or DLR, significantly higher than London-wide (19%).
- 18% of residents drive to work, much less than London-wide (34%).
- 10% of residents travel to work by train, similar to London-wide (12%).
- 14% of residents travel by bus, similar to London-wide (11%).
- Of the remainder, 12% of resident's walk to work, 4% cycle to work and 9% work from home.

Figure 3.12: *Journeys to Work by Main Mode for Employed Residents in the Central Sub-Region*

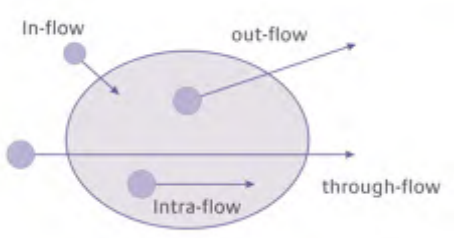


Source: Census 2001 (GLA, John Hollis)

Currently there is no data source available which shows an accurate picture of journey type by mode by sub-region in London. London Area Transport Survey data for 2001 will however be available towards the end of April/May 2003 and this will provide an accurate breakdown for 2001. There are also plans to introduce an annual household survey, starting from 2002, which again should provide a greater understanding of sub-regional breakdowns.

Public Transport Usage

Table 3.20 is based on 2001 Railplan runs for various public transport modes in the Central Sub-Region and includes journeys originating or terminating in the Central Sub-Region and through journeys.



The main focus for public transport travel in the sub-region is rail, it is of primary significance.

- 45% of public transport journeys in the sub-region are by National Rail, lower than the London-wide figure of 56%.
- The Underground has the second largest share of public transport journeys. 41% of trips take place by Underground, which is significantly higher than the London-wide figure of 28%.
- Bus usage is significantly lower than either rail or Underground (14%), but is the same as the London-wide figure (14%).

Table 3.20*: Travel in the Central Sub-Region (Passenger kms, 1000s)*

Borough	LUL		Rail		Bus	
	Count	%	Count	%	Count	%
Islington	852	59%	407	28%	179	12%
Camden	805	56%	433	30%	191	13%
Westminster	1,948	49%	1,604	41%	394	10%
Kensington & Chelsea	472	66%	108	15%	139	19%
Wandsworth	151	9%	1,421	81%	192	11%
Lambeth	411	32%	519	40%	349	27%
Southwark	313	19%	1,021	63%	295	18%
Total Central Sub-Region	4,952	41%	5,513	45%	1,739	14%
Total London	9,356	28%	18,653	56%	4,510	14%

Source: 2001 Railplan (TfL, Richard Hopkins)
The values are passenger kms inside the borough for all services that pass through the associated borough. Thus it is important to note that the shown values have a through service and a stopping service component

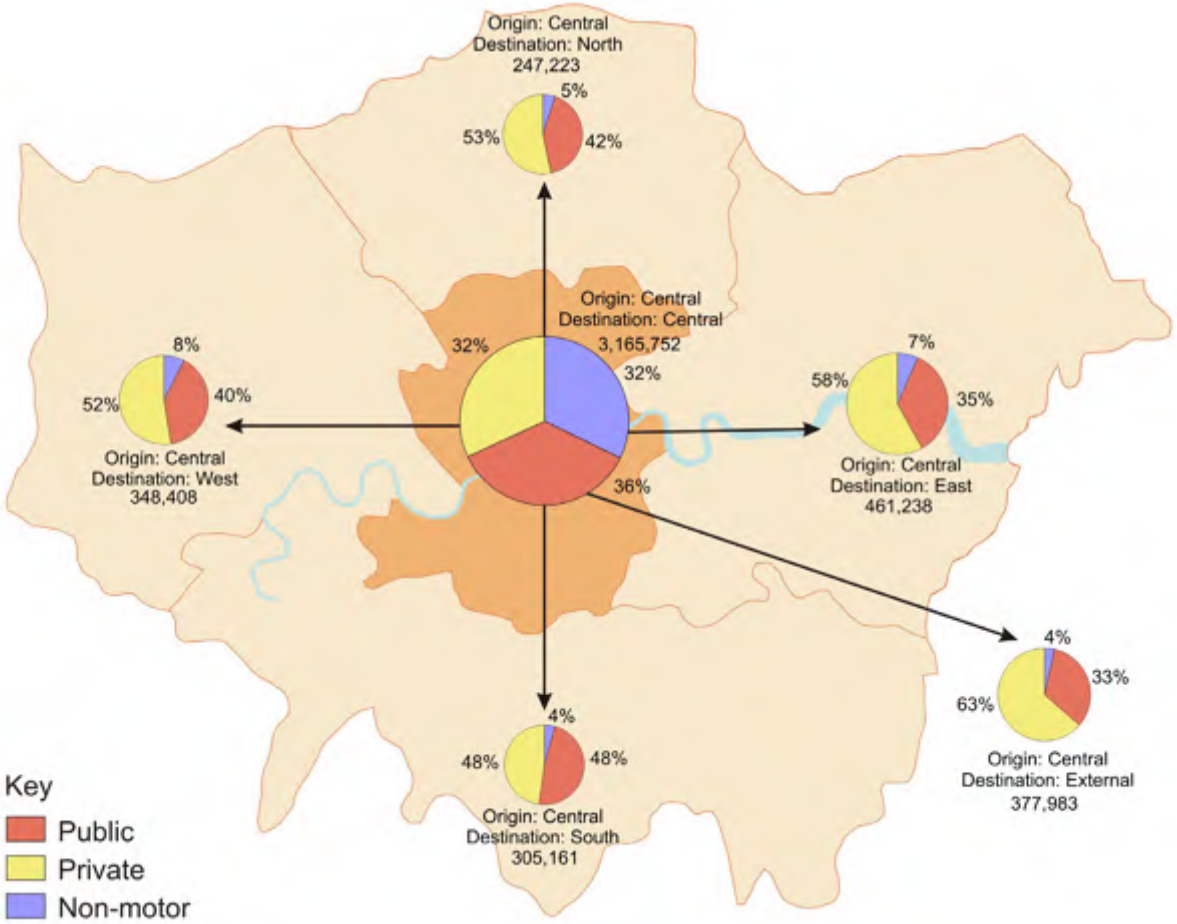
3.3.2 Weekday Travel Patterns

Weekday travel patterns in the Central Sub-Region are shown in Figure 3.13 Based on LATS data, it shows the overall travel patterns in the sub-region, distinguished by public, private and walk/cycle. It shows trips originating in the Central Sub-Region to other sub-regions and trips to areas outside London.

A summary of key findings follows:

- 64% of all trips originating in the sub-region are made entirely within the sub-region. This, somewhat surprisingly, is the lowest degree of "self containment" of any of the sub-regions.
- The sub-region has by a considerable margin the lowest proportion of internal trips made by car, accounting for just over a third compared to more than half in the other sub-regions.
- The proportions of walk/cycle trips and public transport trips are correspondingly higher than within the other sub-regions.
- Overall the mode split for internal trips is roughly a third each to public, private and non-motorised modes.
- For external destinations, trips to the east and west sub-regions is significantly greater than to the north and south sub-regions.
- Public transport accounts for between a third and a half of trips to the other sub-regions, reflecting the predominantly radial configuration of the rail network.

Figure 3.13: *Weekday Travel Patterns in the Central Sub-Region*



Source: 1991 LATS data (TfL, Mike Collop)
Reverse flows are assumed as equal over a full 24-hour day

Table 3.21 shows trips originating in the Central Sub-Region, classified by the main mode of transport. It shows all trips taking place on a weekday, based on the 1991 LATS survey. The daily mode share patterns are shown, together with the percentage of trips for work and the percentage of work trips taking place in the peak periods. It should be noted that the results are not comparable with Figure 2.12 of the *Mayor's Transport Strategy*. This is mainly because of the different definitions used. The published table uses trip stages, with every interchange being taken as defining a new stage of the journey.

- 36% of daily trips made in the sub-region are work-related and of these, 51% are made in the peak period.
- 71% of all daily rail trips in the sub-region are for work, and of these 73% occur in the peak period.
- 51% of daily Underground/DLR trips are for work and 56% of these take place in the peak period.
- 32% of daily bus trips are for work purposes and 49% of these take place in the peak period.
- 34% of walking trips are work-related and 51% of these take place in the peak period.

Table 3.21*: Travel in the Central Sub-Region - Trips by Origin Sub-Region*

Main mode of transport	Daily trips Million	% for work	% of work trips in peak period
Underground (including DLR)	0.92	51%	56%
National Rail	0.42	71%	73%
Bus	0.52	32%	49%
Walk	2.61	34%	51%
Car/motorcycle	1.68	23%	42%
Bicycle	0.08	35%	55%
Taxi	0.06	35%	34%
Total	6.30	36%	51%

Source: Underground, rail, car/motorcycle, taxi - 1991 LATS combined trips files
Bus, walk, bicycle - LATS 1991 Household survey (London residents)
'Peak period' includes both morning (7-10am) and evening (4-7pm) peaks
(TfL, Mike Collop)

Figure 3.14: *Key Highway Flows*
DESCRIPTIVE TEXT/DIAGRAM/waiting for LTS data/Ian Wright/Atkins

3.3.3 Summary Traffic Data and Forecasts:

Table 3.22 shows highway vehicle and passenger movements into and out of the sub-region by different time periods. The peak hour patterns are heavily influenced by the presence within the Central Sub-Region of high levels of employment in the Central Activities Zone. For example, in the morning peak the sub-region attracts more than double the number of public transport trips than it "exports" to other areas. The imbalance is smaller for highway vehicles because a relatively small proportion of work related trips in the CAZ are made by car. The number of highway vehicle trips originating in the sub-region is somewhat lower than other sub-regions, apart from North, but in terms of public transport trips originating, the Central Sub-Region is the highest. This reflects relatively good public transport accessibility compared to highway and parking availability.

The highway vehicle trip generation rate was 244 per 1,000 residents of the sub-region, 8% below the London average of 265, and the second lowest trip generation rate after East Sub-Region (derived from Tables 3.1 and 3.22 AM peak period for trips within London).

Table 3.22: *Summary Highway and Public Transport Data for the Sub-Region (2001)*

Area	2001 Morning Peak Period				2001 Inter Peak Period				2001 Evening Peak Period			
	Highway Vehicles		Public Transport Persons		Highway Vehicles		Public Transport Persons		Highway Vehicles		Public Transport Persons	
	Origs	Dests	Origs	Dests	Origs	Dests	Origs	Dests	Origs	Dests	Origs	Dests
Camden	49,853	64,085	58,710	167,335	125,737	121,633	124,010	145,312	66,561	60,212	160,307	89,736
Islington	36,075	48,973	42,370	78,887	85,654	86,086	62,536	63,250	49,208	40,767	74,850	47,837
Kensington & Chelsea	42,661	47,248	48,862	69,987	100,261	100,276	90,692	92,558	52,963	48,865	80,816	59,276
Lambeth	50,414	55,121	84,053	62,315	95,837	97,041	82,712	79,801	54,538	50,066	64,272	69,725
Southwark	51,379	58,832	59,714	78,797	112,891	109,817	67,949	66,014	58,188	48,919	75,502	51,427
Wandsworth	60,527	63,637	63,608	36,847	112,505	111,706	55,868	55,030	56,768	54,951	35,968	49,309
City of Westminster	12,511	24,958	6,708	199,014	37,921	39,361	50,798	50,352	25,349	15,092	178,028	18,048
Central	362,470	437,281	428,326	904,716	831,796	835,164	756,373	838,196	440,903	398,607	880,924	531,035
East	453,486	479,347	391,680	432,623	900,636	897,217	430,684	408,791	537,816	514,702	391,301	337,267
West	400,262	436,097	265,013	163,904	756,064	755,216	278,877	252,635	464,302	433,138	171,454	219,126
South	423,564	403,232	232,378	128,684	755,023	748,520	203,207	199,245	456,818	469,819	114,518	187,164
North	266,793	254,549	197,485	87,441	454,091	455,494	182,022	169,582	273,680	280,154	82,780	156,989
Internal (All sub-regions)	1,906,575	2,010,507	1,514,883	1,717,368	3,697,611	3,691,610	1,851,163	1,868,449	2,173,519	2,096,419	1,640,977	1,431,581
Annulus	327,783	312,370	69,440	32,253	577,100	580,406	54,674	52,800	344,074	362,139	28,686	61,681
External (All sub-regions)	967,263	878,745	295,742	130,443	1,193,611	1,196,305	182,150	166,737	877,992	937,026	135,619	312,020
Total	3,201,622	3,201,622	1,880,065	1,880,065	5,468,321	5,468,321	2,087,987	2,087,987	3,395,584	3,395,584	1,805,282	1,805,282

Source: London Transportation Studies LTS model (Ian Wright, TfL & Atkins)

Table 3.23 shows the forecast position for 2016. Public transport trips will increase by roughly 20-25%, both peak and off-peak. Highway vehicle trips will increase by less than 2% in the peak, and less than 5% in the inter-peak period, the lowest growth rate of all the sub-regions. This reflects the relatively small available capacity on the road system in the Central Sub-Region, especially in the peak periods, and contrasts with the other sub-regions where increases of up to 10% are predicted even at peak times. Highway vehicle trips in the AM peak will increase at the rate of 64 per 1000 additional population, much lower than the equivalent rate in the other sub-regions (e.g. 458 per 1,000 in West Sub-Region). Public transport trips generated in the morning peak are expected to increase at a rate of 584 per 1,000 extra population, the same rate as predicted for South Sub-Region, for example.

The highway vehicle trip generation rate is expected to decrease from 244 per 1,000 residents in 2001 to 222 in 2016, a substantial decrease of 9%. In 2016 the rate will be the lowest of all the sub-regions, 16% below the forecast London average of 263 (derived from Tables 3.1 and 3.23 AM peak period for trips within London). This reduction in the highway vehicle trip rate will mean that despite a very large increase in population (second highest of all the sub-regions), the absolute increase in traffic will be by far the lowest (13,000 extra AM peak trips, less than one third the increase in the other large growth area, the East Sub-Region).

Table 3.23: *Summary Highway and Public Transport Data for the Sub-Region (2016 on London Plan assumptions)*

	2016 Morning Peak Period				2016 Inter Peak Period				2016 Evening Peak Period			
	Highway Vehicles		Public Transport Persons		Highway Vehicles		Public Transport Persons		Highway Vehicles		Public Transport Persons	
	Origs	Dests	Origs	Dests	Origs	Dests	Origs	Dests	Origs	Dests	Origs	Dests
Camden	51,692	66,189	80,588	204,894	132,741	127,829	167,074	192,082	68,250	62,458	202,626	121,729
Islington	38,008	49,504	56,311	92,351	89,492	89,625	77,917	78,204	49,798	42,758	89,700	61,995
Kensington & Chelsea	43,553	48,184	58,630	83,353	104,394	103,955	111,727	112,226	55,407	50,513	97,033	73,275
Lambeth	54,246	58,400	102,875	74,009	103,358	104,889	98,076	95,033	58,209	53,838	75,692	86,021
Southwark	53,373	59,205	79,407	97,882	116,776	114,269	87,146	85,086	58,955	50,949	94,342	69,986
Wandsworth	62,239	65,920	79,462	43,713	117,211	116,642	68,138	66,837	59,013	56,952	43,037	62,842
Westminster	14,910	24,879	8,772	261,652	43,031	44,059	73,628	75,350	26,710	16,542	236,413	26,161
Central	375,322	444,771	546,964	1,084,008	872,857	873,980	950,639	1,045,055	452,986	414,584	1,071,738	681,679
East	497,507	520,852	527,942	589,676	980,314	976,518	573,589	551,812	581,842	559,364	541,994	460,930
West	444,234	478,757	336,959	214,585	839,856	841,314	348,453	318,087	510,015	480,304	223,047	283,956
South	466,039	432,696	284,617	150,093	816,069	810,016	242,776	237,793	487,844	511,522	135,649	231,508
North	297,459	276,185	250,504	104,233	498,255	500,028	220,467	206,363	296,542	309,873	100,059	202,067
Internal	2,080,562	2,153,261	1,946,986	2,142,595	4,007,351	4,001,855	2,335,924	2,359,111	2,329,229	2,275,647	2,072,487	1,860,140
Annulus	362,182	360,168	92,663	51,121	655,725	657,631	83,879	78,277	393,153	402,571	46,694	83,766
External	1,175,540	1,104,856	333,111	179,045	1,508,273	1,511,863	225,749	208,165	1,107,197	1,151,361	180,730	356,005
Total	3,618,285	3,618,285	2,372,760	2,372,760	6,171,349	6,171,349	2,645,553	2,645,553	3,829,579	3,829,579	2,299,911	2,299,911

Source: London Transportation Studies LTS model (Ian Wright, TfL & Atkins)

Table 3.24: *Summary Public Transport Data for the Sub-Region (Average Morning Peak Hour)*

Highway Performance	2001 Base	2011				2016			
		Reference Case	% Change	Planned	% Change	Reference Case	% Change	Planned	% Change
Central Sub-Region									
National Rail									
Passenger km	3,537,397			4,271,996	21%			5,511,748	56%
Total seats km	5,188,775			6,360,608	23%			8,581,461	65%
Crowded hours	32,976			50,107	52%			43,466	32%
Uncrowded hours	74,513			89,274	20%			115,064	54%
Underground/DLR/CTL									
Passenger km	4,051,930			4,879,103	20%			4,957,162	22%
Total seats km	3,733,947			4,091,491	10%			4,563,466	22%
Crowded hours	50,472			69,015	37%			53,642	6%
Uncrowded hours	130,198			153,908	18%			144,083	11%
Bus									
Passenger km	1,532,067			1,922,234	25%			1,738,739	13%
Total seats km	3,707,605			4,747,427	28%			4,885,567	32%
Total passenger hours	120,248			150,893	25%			134,578	12%
London									
National Rail									
Passenger km	12,571,279			15,508,087	23%			18,648,337	48%
Total seats km	19,681,200			24,160,423	23%			31,929,688	62%
Crowded hours	97,896			154,823	58%			126,154	29%
Uncrowded hours	234,305			287,196	23%			359,289	53%
Underground/DLR/CTL									
Passenger km	8,045,830			10,015,507	24%			9,879,511	23%
Total seats km	9,044,660			10,169,533	12%			11,385,886	26%
Crowded hours	88,532			124,996	41%			89,501	1%
Uncrowded hours	243,818			298,296	22%			274,303	13%
Bus									
Passenger km	3,713,015			4,824,633	30%			4,511,483	22%
Total seats km	12,216,038			15,573,514	27%			16,352,963	34%
Total passenger hours	272,468			350,775	29%			324,574	19%

Source: Morning Peak Data, Railplan (Richard Hopkins, TfL)

Table 3.25 shows forecast changes in conditions on the highway network between 2001 and 2016, assuming that the London Plan interventions are carried out. It shows an increase in vehicle kilometres of 3%, much lower than expected for London as a whole (11%). There is, however, a relatively high increase in vehicle travel time, reflecting the heavier impact of any increase on journey speeds in the central parts of London. Although the increase in vehicle delay time (12%) appears modest compared to that for London as a whole (27%), it must be remembered that the Central sub-region accounts for about a quarter of all delay time in London, and this proportion will only slightly reduce.

Table 3.25: *Highway Forecasts for the Central Sub-Region (Average Morning Peak Hour)*

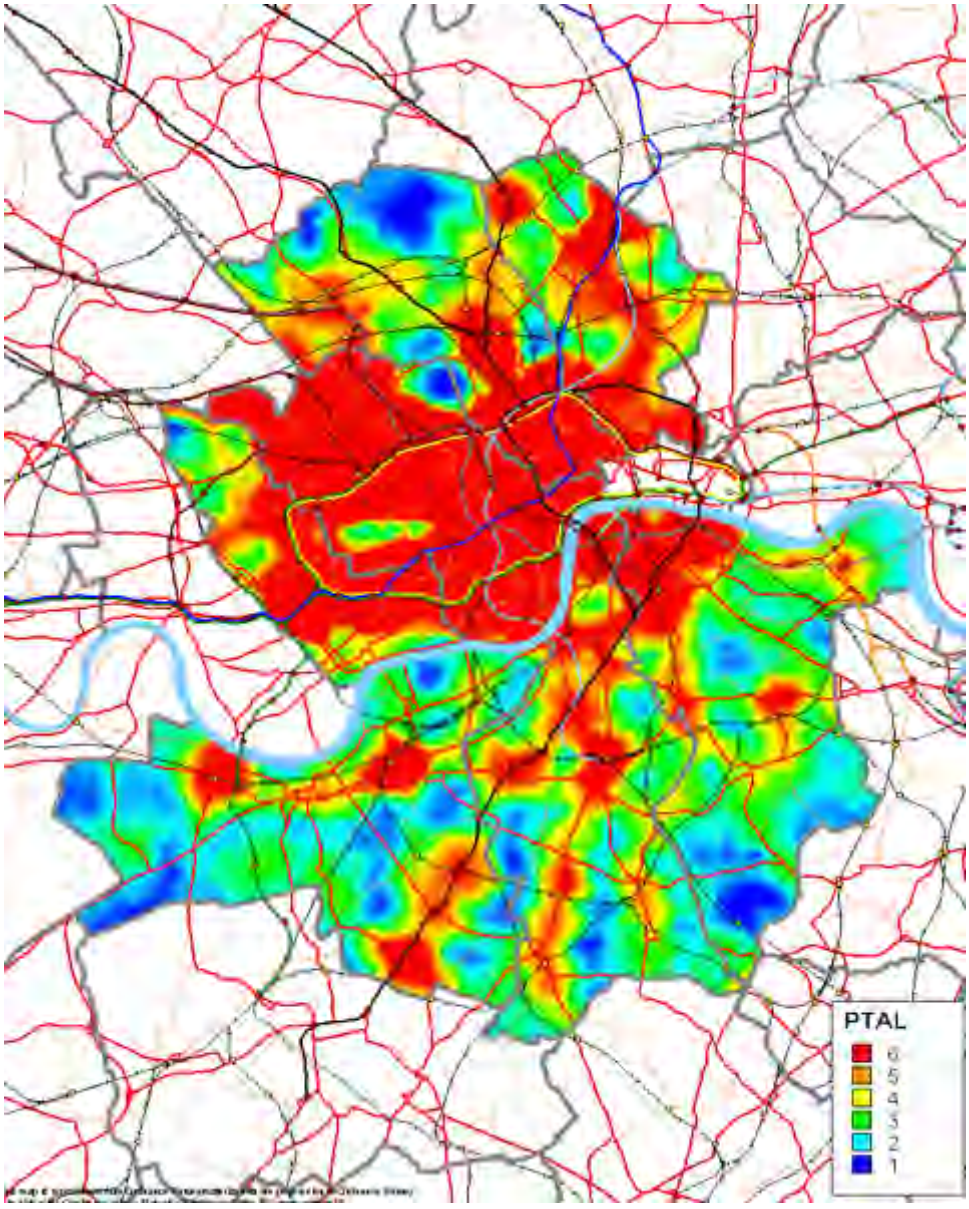
Highway Performance	2001 Base	2011				2016			
		Reference Case	% Change	Planned	% Change	Reference Case	% Change	Planned	% Change
Vehicle travel distance (km)									
Central Sub-Region	848,866							872,868	3%
London	5,114,774							5,694,543	11%
Vehicle travel time (hours)									
Central Sub-Region	49,870							53,129	7%
London	203,642							237,095	16%
Vehicle speeds (km/h)									
Central Sub-Region	17.0							16.4	-3%
London	25.1							24.0	-4%
Free-flow vehicle time (hours)									
Central Sub-Region	28,228							28,901	2%
London	125,861							138,396	10%
Delay vehicle time (hours)									
Central Sub-Region	21,643							24,227	12%
London	77,780							98,699	27%
Delay rate (mins/km)									
Central Sub-Region	1.53							1.67	9%
London	0.91							1.04	14%

NB. DRAFT data including interim 2016 forecasts, further data to fill following modelling results
(Source: LTS data, Ian Wright, Atkins & TfL)

3.3.4 Public Transport Accessibility

Figure 3.15 shows that the majority of the Central Sub-Region has good access to public transport. For example, most of Westminster has a PTAL score of 6, as do large parts of Camden, Islington and the northern parts of Lambeth and Southwark. Very few areas have a PTAL score of 1 or 2, with the exception of parts of the south of the sub-region, and where such scores do exist they tend to reflect that the area is a park or open space. Other accessible areas include Clapham Junction, Putney and Streatham. Streatham and the A23 corridor is interesting in that it provides high levels of accessibility based to a large degree on bus services. Mostly the highest PTAL scores occur in areas with high frequency rail services.

Figure 3.15: *Accessibility to Public Transport[4] in the Central Sub-Region*



Source: PTALS (TfL, Richard Hopkins)

[4] The Public Transport Accessibility Level (PTAL) method measures the amount of public transport service available, taking account of the proximity of stops and stations, the number of services available and the frequency of the services. The higher the value, the greater access provided by the public transport network.

NB. Repeat Brook Lyndhurst work: regression accessibility and employment density once LTS data available from Atkins

3.3.5 Public Transport

Table 3.26 shows public transport trips originating in the Central Sub-Region over a weekday. Both internal trips within the sub-region and external trips (to other sub-regions and areas outside London) are shown.

- Internal weekday public transport trips within the Central Sub-Region are estimated as 1,136,283.
- There is considerable movement from Central to the East, the largest share of region-region trips is in this direction, with 268,626 weekday trips taking place. However, much of this will be accounted for by trips to the City of London and to the Isle of Dogs.
- There is also significant movement outside London, with the second largest share of trips taking place in this direction. There are 239,996 trips from the Central Sub-Region to areas outside London taking place by public transport.

Table 3.26*: Weekday Public Transport Trips by Origin and Destination*

Origin	Destination													
	Central		East		North		South		West		External		Total	
Central	1,136,283	54	268,626	13	131,516	6	146,812	7	183,261	9	239,996	11	2,106,494	100%
All London	2,227,790	40%	1,230,163	22%	471,305	8%	560,213	10%	684,713	12%	445,815	8%	5,620,000	100%

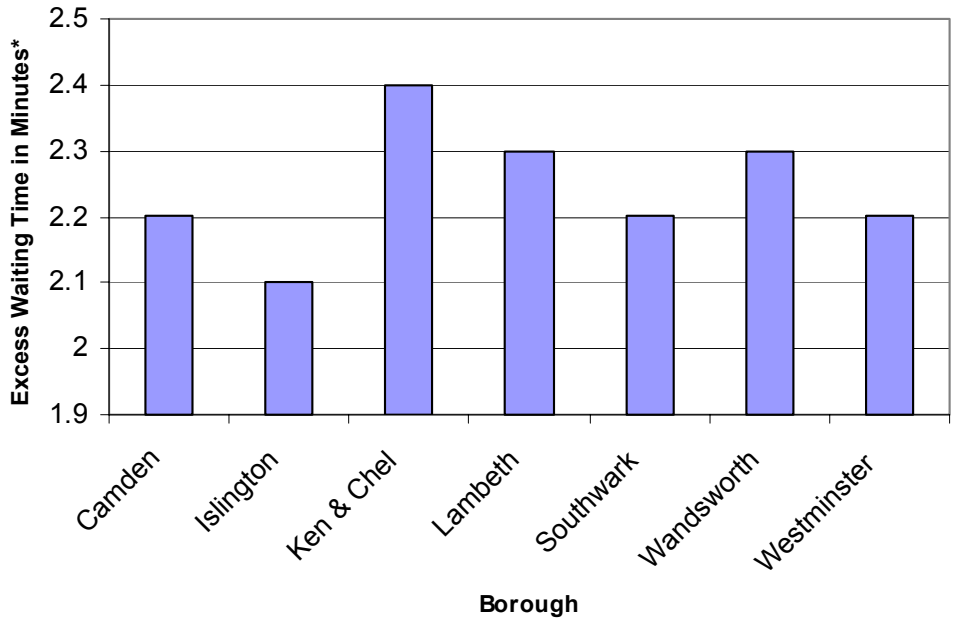
Source: LATS data (TfL, Mike Collop)
NB. The matrices are not exactly balanced, because (1) all estimates are from a sample, and (2) there are small timing differences for which adjustments have not been. The data refers to a 16-hour survey day (6 am to 10 pm). Over a full 24-hour day, flows in the opposite directions are assumed to be equal.

Buses

London-wide, every weekday, 6,000 buses carry four and a half million passengers on 500 different routes. Despite deteriorating reliability of services over the past few years, the number of bus passengers has risen 22% since 1993/94. There is evidence in the Congestion Charge zone that passenger increases occur where delays to buses are reduced. Delays to buses inside the zone fell by 50% in the first ten weeks of the charge and bus use rose by 6,000 passengers, an augmentation of 14% compared with Autumn 2002 *(Source: TfL Congestion Charge team, May 2003*).

Figure 3.16 shows the reliability of high frequency buses in the Central Sub-Region. Kensington & Chelsea has the least reliable bus services, with an average excess waiting time of 2.4 minutes. Islington has the most reliable high frequency services with excess waiting times of 2.1 minutes.

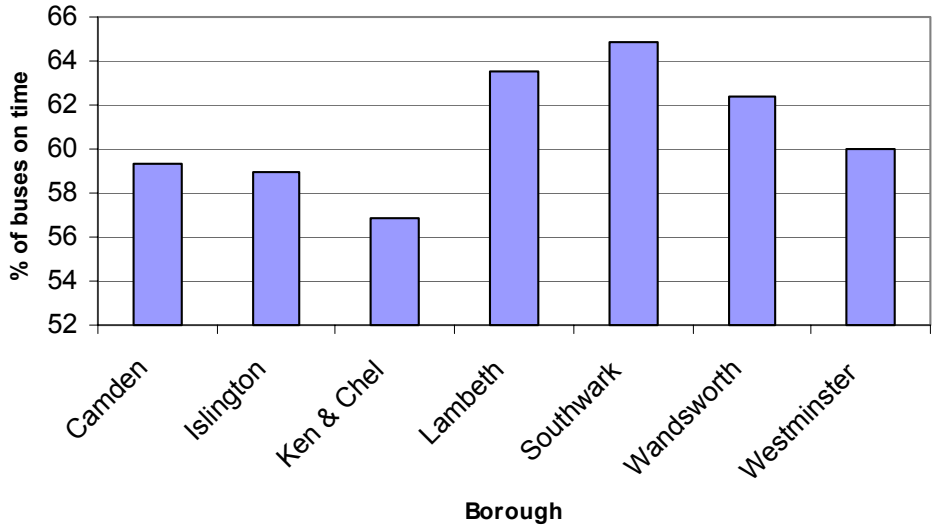
Figure 3.16: *Reliability of High Frequency Bus Services*



Source: TfL, Chris Kershaw

Figure 3.17 shows the reliability of low frequency bus services. Southwark and Lambeth have the most reliable low frequency bus services. Over 64% of Southwark's low frequency bus services are on time. In Lambeth, the figure is just below 64%. The worse performing borough is Kensington & Chelsea.

Figure 3.17: *Reliability of Low Frequency Bus Services*



Source: TfL, Chris Kershaw

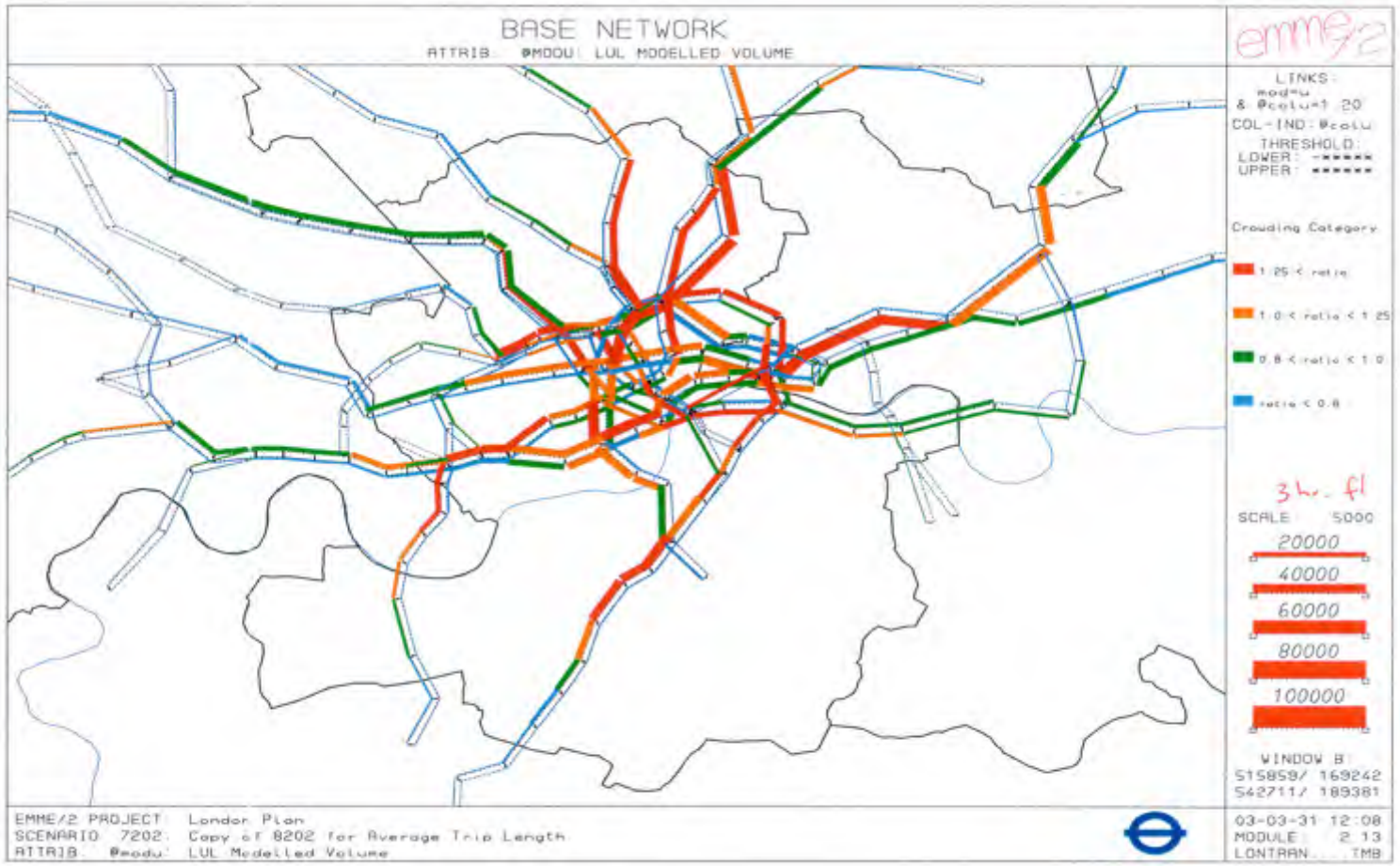
Underground

Figures 3.18-3.19 show current (2001) and forecast (2016) crowding on the Underground network in the sub-region in the morning peak hour. The central parts of the sub-region are the worst affected by crowding. This is particularly noticeable on the central sections of the Victoria Line, both northbound from Victoria and southbound from Finsbury Park, the Central Line from Mile End to Bank and the Northern Line, southbound from Camden Town to the CAZ. There are other "hot spots" such as the Northern Line between Balham and Stockwell, and the District Line inbound from Earls Court, eastbound from Baker Street, and the Piccadilly Line south of Finsbury Park.

Figure 3.19 shows crowding in the morning peak hour in 2016. The impact of Crossrail in reducing crowding on the Central Line is clearly seen, together with a more modest improvement on the District Line in west London. The Victoria to Green Park section of the Victoria Line is also expected to improve.

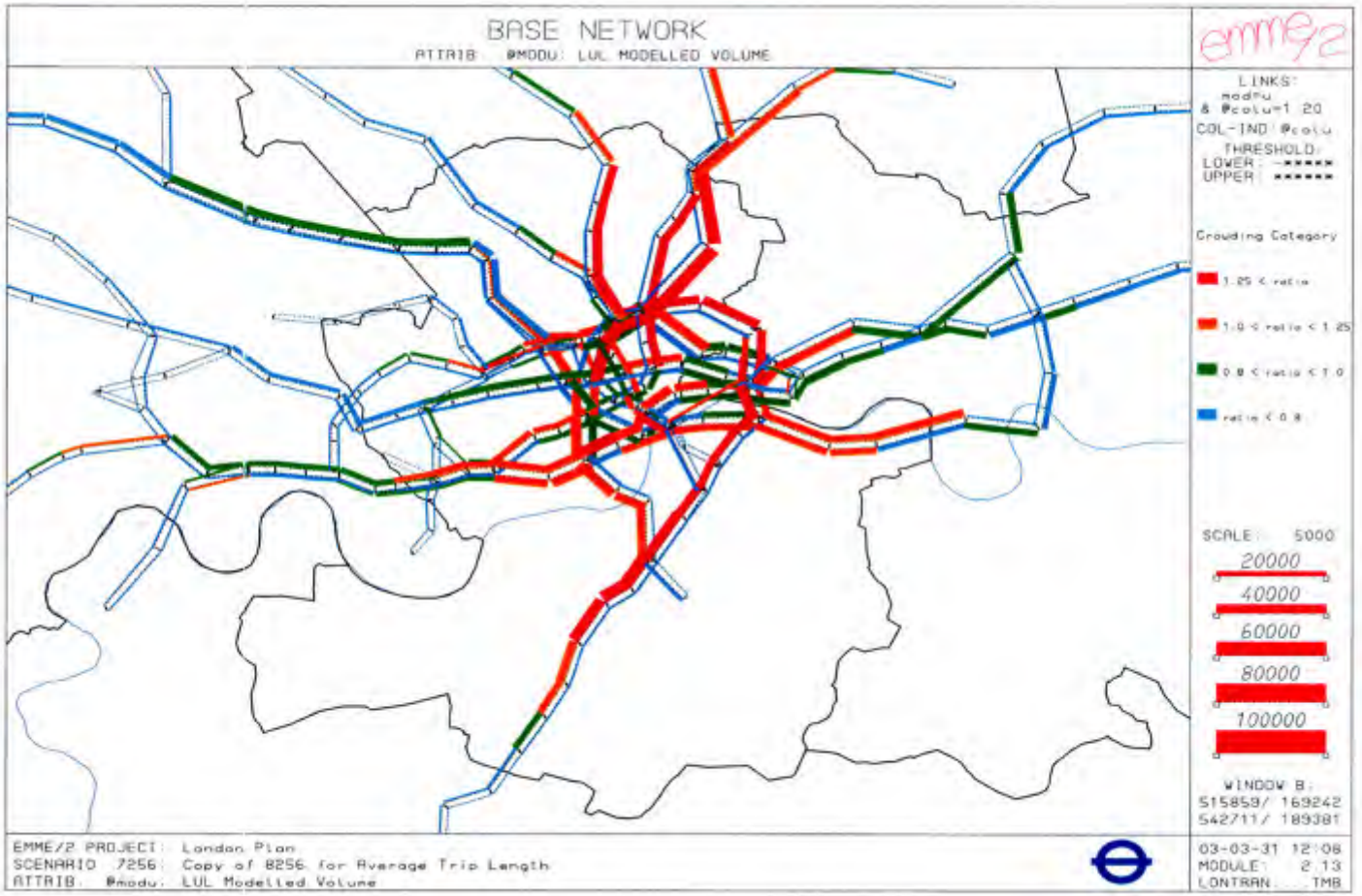
However, it must be noted that despite the addition of rail services that will provide additional capacity, including Crossrail, Thameslink 2000 and extensions to DLR, crowding in 2016 is expected to be no better, or worse on some Underground lines. In particular, the Northern Line will be very much more crowded on the Bank Branch. Also experiencing worse crowding will be the Victoria Line southbound from Tottenham Hale and the Jubilee Line eastbound between London Bridge and Canary Wharf.

Figure 3.18: *Underground Crowding 2001, AM peak (8.15 – 9.15 am)*



(Source: TfL, Richard Hopkins) **Figure to be graphically enhanced

Figure 3.19: *Projected Underground Crowding 2016 with TS, AM peak (8.15 – 9.15 am)*

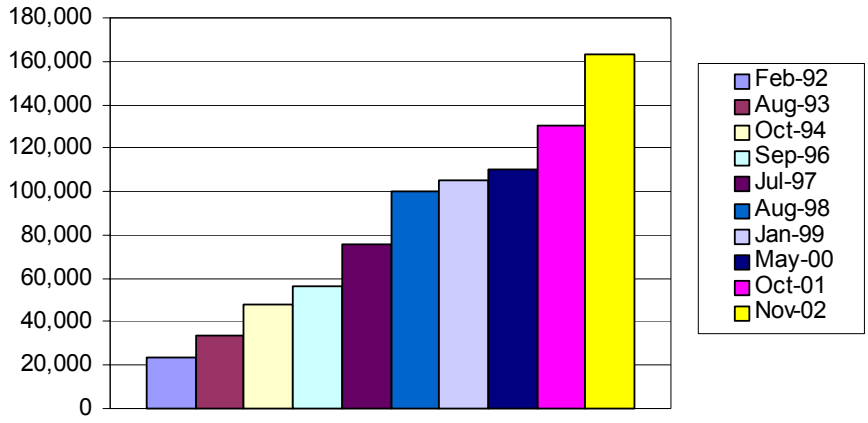


(Source: TfL, Richard Hopkins) Figure to be graphically enhanced

Docklands Light Railway

Figure 3.18 shows the steady increase in average passenger journeys per day on the Docklands Light Railway, over the period 1992 to 2002.

Figure 3.20: *Average Passenger Journeys per Day on the DLR*



(Source: TfL – DLR Market Plan Report 2002-03)

National Rail

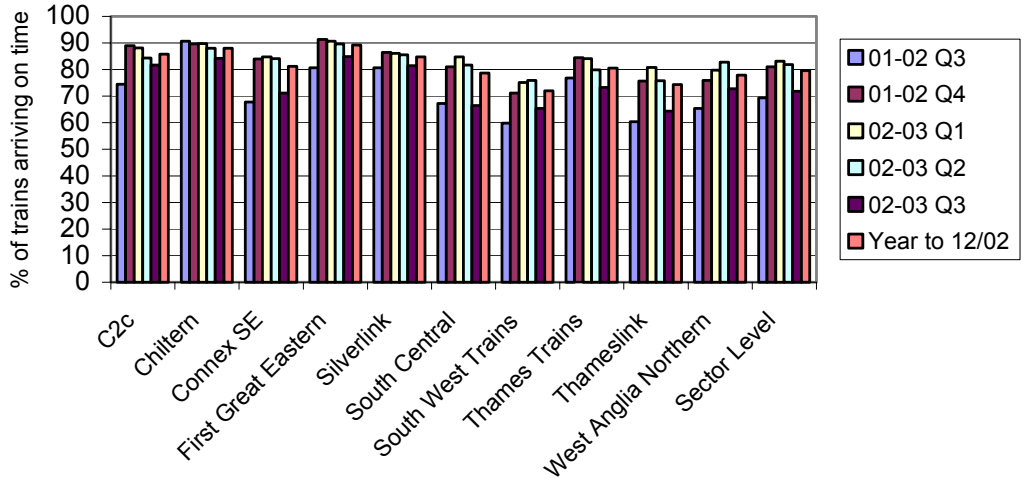
Table 3.27 highlights train service reliability all day in the Central Sub-Region. In the most recent time period (2002-03, Quarter 3), Thameslink, South West Trains and South Central have the poorest reliability records, with under 70% of trains arriving on time. The sector average is 72%.

Table 3.27: *Trains Arriving on Time 2001-02 to 2002-03*

Operator	2001-02 Quarter 3	2001-02 Quarter 4	2002-03 Quarter 1	2002-03 Quarter 2	2002-03 Quarter 3	Year to 12/02
C2C	74.5%	88.9%	88.1%	84.4%	81.7%	85.8%
Chiltern	90.6%	89.6%	89.8%	88.0%	84.2%	88.0%
Connex SE	67.8%	84.0%	84.7%	84.1%	71.2%	81.2%
First Great Eastern	80.7%	91.3%	90.6%	89.6%	84.9%	89.2%
Silverlink	80.7%	86.5%	86.0%	85.5%	81.5%	84.8%
South Central	67.3%	81.1%	84.8%	81.7%	66.5%	78.7%
South West Trains	59.9%	71.2%	75.1%	75.9%	65.4%	72.0%
Thames Trains	76.9%	84.5%	84.1%	79.9%	73.3%	80.5%
Thameslink	60.4%	75.7%	80.8%	75.8%	64.3%	74.3%
West Anglia Northern	65.4%	75.9%	79.8%	82.7%	72.7%	77.9%
Sector Level	69.3%	81.1%	83.1%	81.9%	71.9%	79.6%

London and SE operators all day, source: SRA

Figure 3.21: *Trains Arriving on Time 2001-02 to 2002-03*



London and SE operators all day, source: SRA

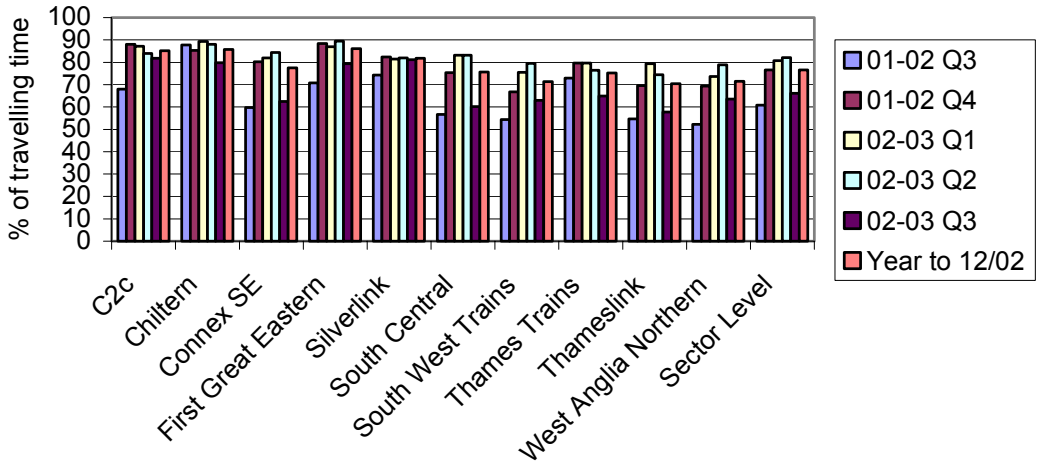
Table 3.28 highlights train service reliability in the peak period in the Central Sub-Region. In the most recent time period (2002-03, Quarter 3), Thameslink, South Central, Connex SE, South West Trains, West Anglia Northern and Thames Trains have the poorest reliability records, with under 70% of trains arriving on time. The sector average is 66%.

Table 3.28: *Trains Arriving on Time 2001-02 to 2002-03*

Operator	2001-02 Quarter 3	2001-02 Quarter 4	2002-03 Quarter 1	2002-03 Quarter 2	2002-03 Quarter 3	Year to 12/02
C2c	68.0%	88.1%	87.2%	83.9%	81.7%	85.1%
Chiltern	87.8%	85.3%	89.3%	88.1%	79.8%	85.7%
Connex SE	59.8%	80.2%	81.9%	84.4%	62.5%	77.5%
First Great Eastern	70.7%	88.3%	87.0%	89.4%	79.3%	86.1%
Silverlink	74.2%	82.4%	81.4%	81.9%	81.1%	81.7%
South Central	56.7%	75.4%	83.2%	83.1%	60.2%	75.6%
South West Trains	54.4%	66.7%	75.5%	79.5%	62.9%	71.3%
Thames Trains	72.9%	79.7%	79.7%	76.4%	65.0%	75.2%
Thameslink	54.6%	69.6%	79.4%	74.4%	57.7%	70.5%
West Anglia Northern	52.2%	69.4%	73.6%	78.8%	63.6%	71.5%
Sector Level	60.8%	76.6%	80.7%	82.1%	66.2%	76.6%

London and SE operators peak period, source: SRA

Figure 3.22: *Trains Arriving on Time 2001-02 to 2002-03*



London and SE operators peak period, source: SRA

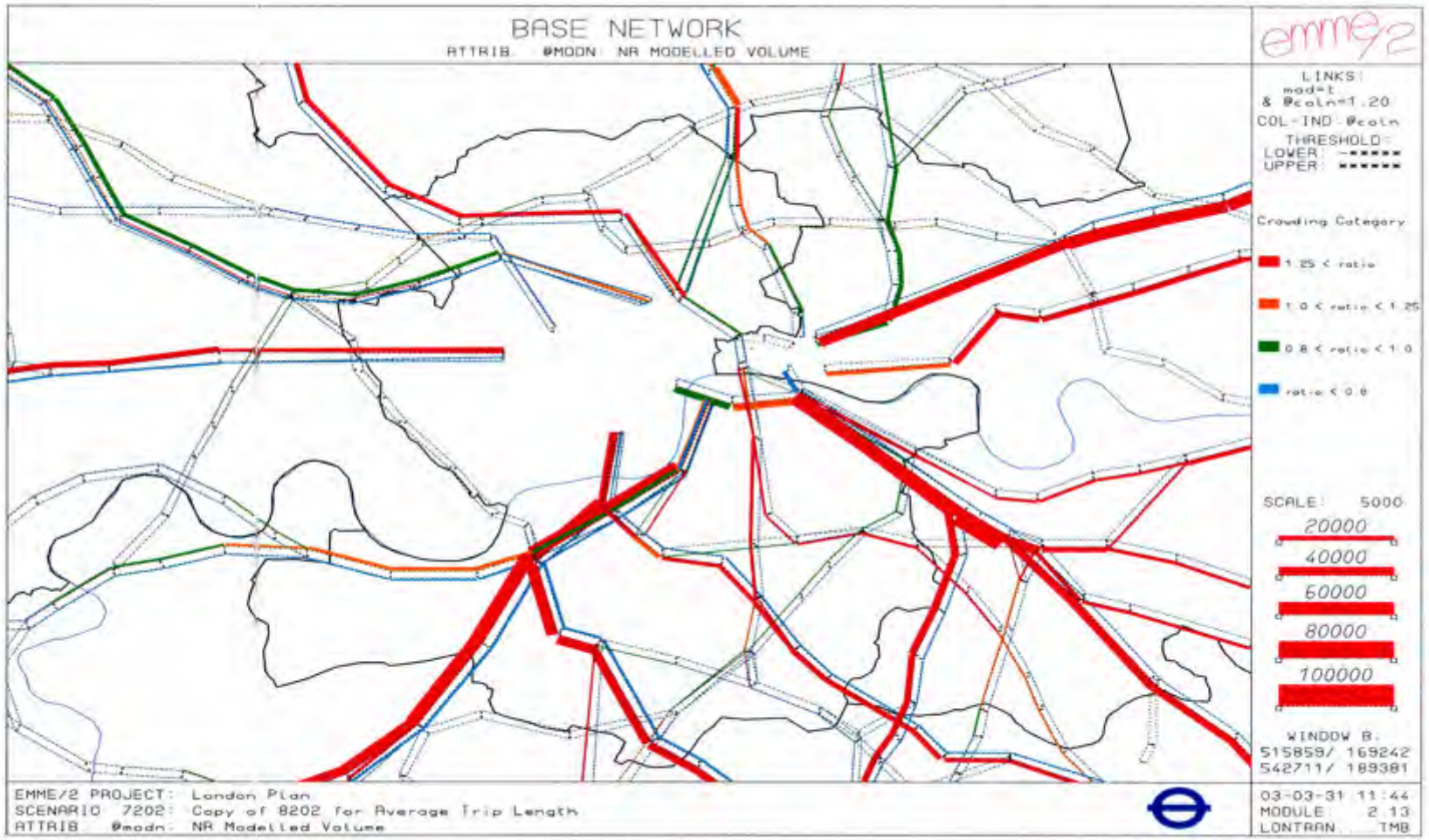
Figures 3.23-3.24 show current (2001) and forecast (2016) crowding on the National Rail network in the sub-region in the morning peak hour. Lines that are particularly affected are those approaching the Central Sub-Region from the east and south, reflecting the heavier dependence on National Rail from these areas. The line between Lewisham and London Bridge is particularly crowded as are the South Central and South West lines into Victoria and Vauxhall. Routes into Liverpool Street and Fenchurch Street are also crowded. The routes in from the north and west carry less passengers overall, but they still experience crowding, including into Paddington, Euston and the Kings Cross Thameslink services.

Figure 3.23 shows morning peak hour crowding on the National Rail network in 2016 with the inclusion of Crossrail 1 and 2, Thameslink 2000, and other schemes. The forecast shows considerable reductions in crowding across the network, notwithstanding the increased overall increase in demand. However, parts of the network remain crowded.

On the high capacity services through the sub-region from the south there are notable improvements between Lewisham and London Bridge, on all of the Kent lines and on the lines into Victoria and Vauxhall. Crowding remains, however, on the South East lines into Lewisham, and some lines into Clapham Junction, including that from Croydon.

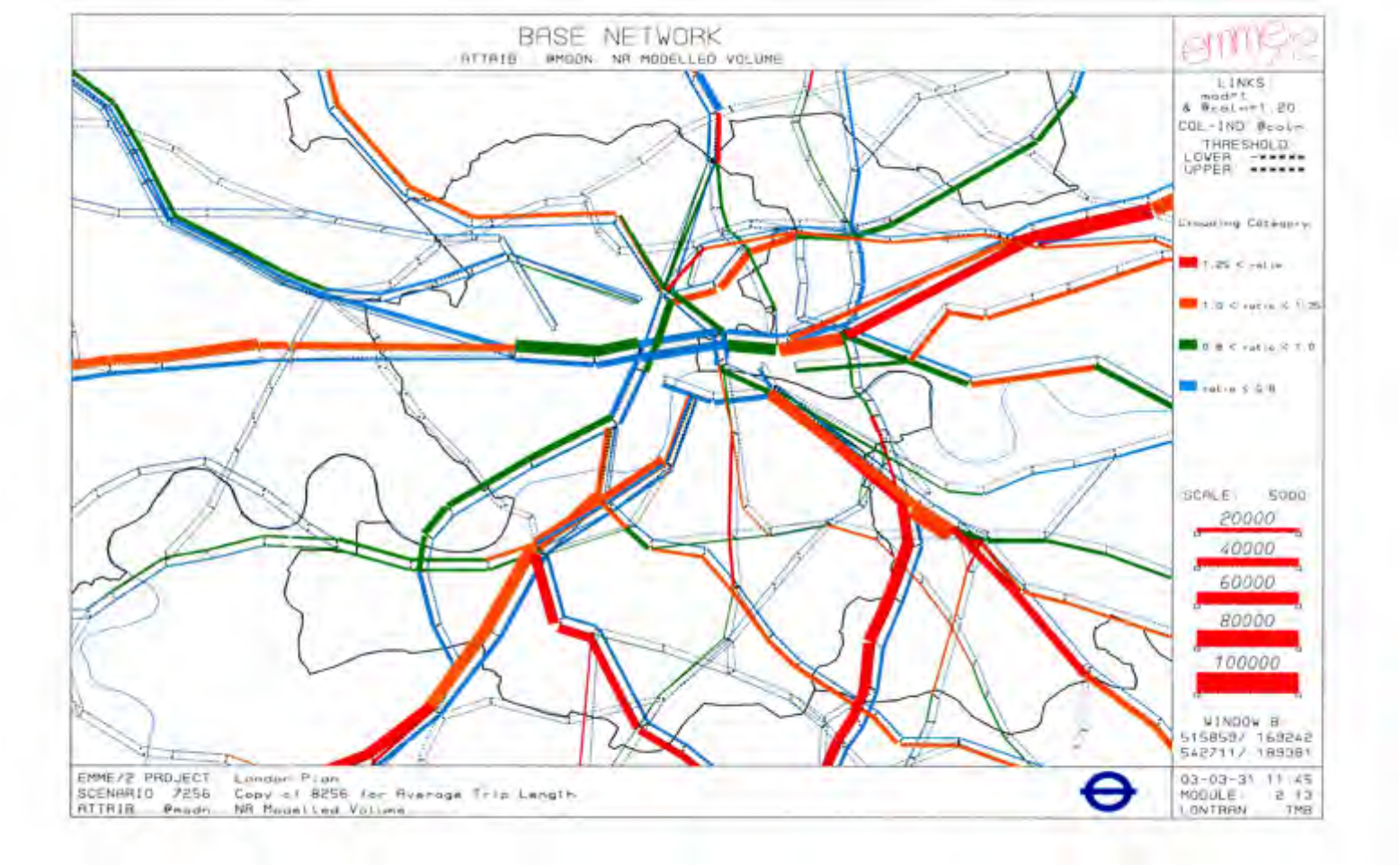
The volume of commuting will increase by 2016 on the lines from the west, especially on Crossrail services via Paddington. These services will be less crowded than current Paddington terminating services, however. Thameslionk services into Kings Cross will be less crowded. From the east, Crossrail will relieve passenger flows on lines into Liverpool Street and Fenchurch Street, though itself will become crowded in the westbound direction.

Figure 3.23: *National Rail Crowding 2001, AM peak (8.15 – 9.15 am)*



(Source: TfL, Richard Hopkins). Figure to be graphically enhanced

Figure 3.24: *Projected National Rail Crowding 2016 with TS, AM peak (8.15 – 9.15 am)*



(Source: TfL, Richard Hopkins). Figure to be graphically enhanced

3.3.6 Walking

Data showing walking patterns in London is extremely limited. The most useful information currently available is shown below in Table 3.29. Based on LRTS data, this highlights the frequency of travel by those resident in the Central Sub-Region over the period 2000-02. 61% of people surveyed in the Central Sub-Region walk 5 days a week or more and 11% walk 3 or 4 days a week. Interestingly 12% of respondents state that they have not walked in the past 12 months/never, which clearly is incorrect, and shows the fallibility of the current data on walking.

Table 3.29: *Frequency of Walking by Residents of Central Sub-Region (2000/02)*

Frequency of Travel by Walking	Central		London	
	Count	%	Count	%
No answer	6	0.3%	31	0.3%
Don't know	7	0.3%	46	0.4%
5 days a week or more	1,228	61%	5,863	56%
3 or 4 days a week	228	11%	1,208	11%
2 days a week	145	7%	795	8%
1 day a week	102	5%	590	6%
About once a fortnight	26	1%	133	1%
About once a month	16	1%	117	1%
Less often than once a month	28	1%	267	3%
Not used in the last 12 months/never	234	12%	1,455	14%
Group Total	2,020	100%	10,505	100%

Combination of data from 2000 – 01 Q1-Q4 and 2001 – 02 Q2 + Q3
Source: LRTS data (TfL, Henry Burroughs)

3.3.7 Cycling

Data showing cycling patterns in London is also extremely limited. The most useful information currently available is shown below in Table 3.30. Based on LRTS data, this shows the frequency of travel by those resident in the Central Sub-Region over the period 2000-02:

- 4% of people surveyed in the sub-region cycle 5 days a week or more. In London as a whole the figure is 13%.
- 3% of residents in the sub-region cycle 3 or 4 days a week, compared to 5% in London.

Again a high percentage of respondents (76%) state that they have not cycled in the past 12 months/never. This is clearly incorrect, and shows the fallibility of the current data on cycling.

Table 3.30: *Frequency of Cycling by Residents of Central Sub-Region (2000/01)*

Frequency of Travel by Cycling	Central		London	
	Count	%	Count	%
No answer	77	4%	258	2%
Don't know	1	0.1%	4	1%
5 days a week or more	89	4%	251	13%
3 or 4 days a week	51	3%	226	5%
2 days a week	78	4%	252	4%
1 day a week	52	3%	214	3%
About once a fortnight	21	1%	157	2%
About once a month	42	2%	236	3%
Less often than once a month	79	4%	387	5%
Not used in the last 12 months/never	1,529	76%	8,135	51%
Group Total	2,019	100%	10,503	100%

Source: 2001/02 Q1-Q4 LRTS data, by residency (TfL, Henry Burroughs)

Table 3.31 shows the weekday walk and cycle (main mode) trips by origin and destination. It shows that 91% of all main mode walk and cycle trips occur with the South sub-region.

Table 3.31: *Weekday Walk and Cycle Trips by Origin and Destination*

Origin	Destination													
	Central		East		North		South		West		External		Total	
Central	1,021,651	91%	30,815	3%	12,157	1%	12,437	1%	26,145	2%	14,013	1%	1,117,218	100%
All London	1,119,119	26%	1,106,593	26%	510,215	12%	726,763	17%	782,591	18%	61,186	1%	4,306,467	100%

Source: LATS data (TfL, Mike Collop)

NB. The matrices are not exactly balanced, because (1) all estimates are from a sample, and (2) there are small timing differences for which adjustments have not been. The data refers to a 16 hour survey day (6 am to 10 pm). Over a full 24-hour day, flows in the opposite directions are assumed to be equal.

3.3.8 Private Motor Vehicles

Road Hierarchy

The road hierarchy in the Central Sub-Region is shown in Figure 3.24. The Central Sub-Region is at the hub of London's road network. The main east-west routes, shown in Figure 3.24, are Euston Road/ Marylebone Road north of the River Thames and the A205 south of the river. The main north-south route is the A202 over Vauxhall Bridge.

Figure 3.24: *Road Network in the Sub-Region*

(Source: TfL, Hannah Shrimpton)

Table 3.32 shows all weekday private transport trips by origin (Central Sub-Region) and destination (other sub-regions and external). Columns of the matrices refer to destinations. Thus, for example, within the Central Sub-Region there are 1,007,818 trips and from the Central Sub-Region to the East sub-region there are 161,797 weekday trips. Over a full 24-hour day, the flows in opposite directions are assumed to be equal.

Table 3.32*: Weekday Private Transport Trips by Origin and Destination*

Origin	Destination													
	Central		East		North		South		West		External		Total	
Central	1,007,818	60	161,797	10	103,550	6	145,912	9	139,002	8	123,974	7	1,682,053	100%
All London	1,713,762	16%	2,330,653	22%	1,332,328	13%	2,103,122	20%	2,001,425	19%	1,012,669	10%	10,493,959	100%

Source: LRTS data (TfL, Mike Collop)
The matrices are not exactly balanced, because (1) all estimates are from a sample, and (2) there are small timing differences for which adjustments have not been. The roadside data refer to a 16 hour survey day (6 am to 10 pm). Estimates of travel during the non-survey hours are not available.

Traffic Congestion and Speed

Table 3.33 gives the time-series of average traffic speeds on the Transport for London Road Network (TLRN) in the Central Sub-Region. It shows that between 1986 to 2003 average traffic speeds have slowed down. In particular:

- In the AM peak, although speeds rose mid-way over the time period (to 12.2 mph), in 2000/03 they are slower (10.5 mph) than in 1986/90 (11.3 mph).
- In the off-peak period, the average traffic speed has slowed from 13.3 mph in 1986/90, to 11.6 mph in the 2000/03.
- Likewise in the PM peak, the average traffic speed has slowed from 12.4 mph in 1986/90, to 10.4 mph in 2000/03.
- In the 2000/03 cycle, the average speed in the off-peak period is marginally faster than either the AM or PM peak speed.

Table 3.33*: Average Traffic Speeds in the Sub-Region (TLRN network)*

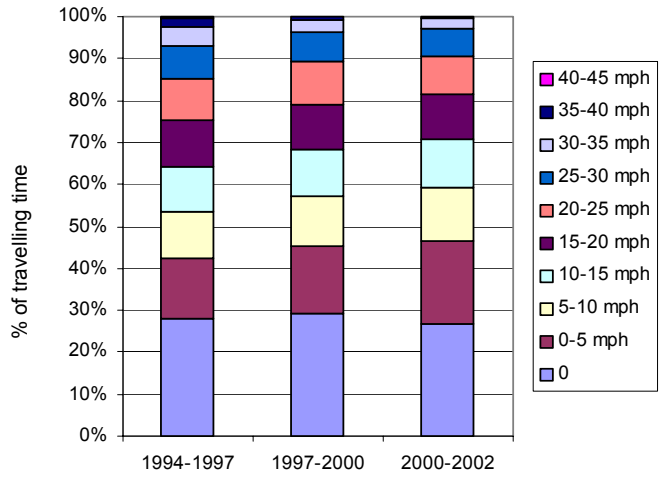
Time period	1986 to 1990	1990 to 1994	1994 to 1997	1997 to 2000	2000 to 2003
AM peak (7am to 10am)	11.3	11.5	12.2	10.8	10.5
Off-peak (10am to 4pm)	13.3	13.9	13.3	12.8	11.6
PM peak (4pm to 7pm)	12.4	12.2	12.3	11.6	10.4

Average speed in miles per hour
Source: TfL Traffic Speed Surveys (TfL, Mike Rowland)

Figure 3.25 shows the percentage of travelling time spent on the TLRN at different traffic speeds in the AM peak period (7am to 10am). It indicates that over the period 1994 to 2002, congestion and delays have increased in the Central Sub-Region.

- Travel and speeds have deteriorated over the period 1994 to 2002.
- Cars were stationary for 30% of their travelling time in the period 1994/97.
- Over 40% of travelling time is spent travelling at 5 mph or less and around 60% of travelling time is spent travelling at 10 mph or less.

Figure 3.25: *Travelling Time Spent on TLRN by Speed (Am Peak)*

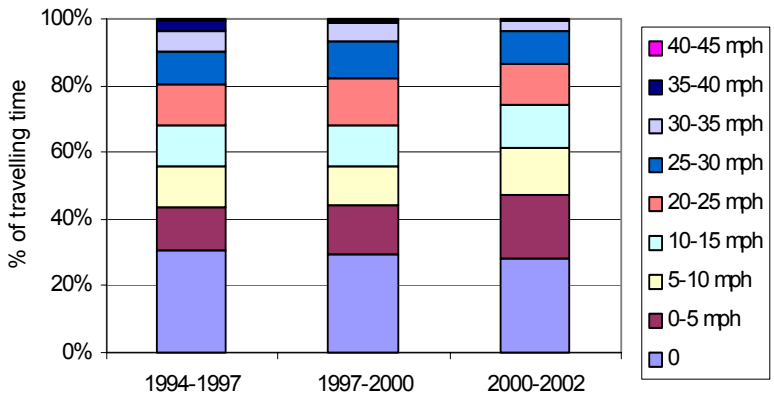


Source: TLRN Traffic Speed Surveys (TfL, Mike Rowland)

Figure 3.26 shows the percentage of travelling time spent on the TLRN at different traffic speeds in the off peak period (10am to 4pm). It highlights that in the Central Sub-Region, off peak speeds have deteriorated over the period 1994 to 2002. Off peak travel by car is slow in the sub-region and journeys are longer.

- 60% of travelling time is spent at 10 mph or less (in 2000/02).
- Over 70% of travel (in 2000/02) is at 15 mph or less, more than in 1994/97.

Figure 3.26: *Travelling Time Spent on TLRN by Speed (Off Peak, 10am to 4pm)*

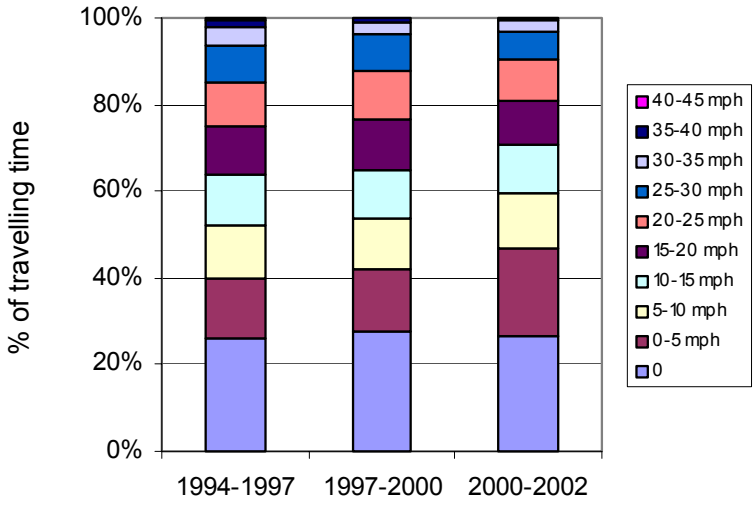


Source: TfL Traffic Speed Surveys (TfL, Mike Rowland)

Figure 3.27 shows the percentage of travelling time spent on the TLRN at different traffic speeds in the PM peak period (4pm to 7pm). Travel by car in the Central Sub-Region is slow:

- Over 40% of travelling time for drivers in cars in the Central Sub-Region is either stationary or travelling only up to 5 mph.
- In the period 2000/02, 60% of travelling time is spent travelling at 10 mph or less, compared to 50% in 1994/97.
- In the period 2000/02, 70% of journey times were at 15 mph or less, compared just over 60% in 1994/97.

Figure 3.27*: Travelling Time Spent on TLRN by Speed (PM Peak, 4pm to 7pm)*



Source: TfL Traffic Speed Surveys (TfL, Mike Rowland)

3.4 Major Transport Schemes

The Mayor's Transport Strategy sets out the proposals for major improvements to the existing Underground, rail and bus networks across the sub-region. Table 3.34 shows the major planned transport projects.

Table 3.34: *Major Transport Projects in the Sub-Region*

Transport Scheme *Major Schemes*	Description	Status	Opening Date	Cost (£Million)	Capacity Provided by 2016
Crossrail 1	High capacity rail link with the City, Isle of Dogs, the West End and Heathrow.	The scheme is currently undergoing a technical and financial review and will report in February 2003.	2012	9,000	24tph
Crossrail 2	High capacity rail link between Victoria and Kings Cross. In addition, would allow existing north-east and south west suburban rail services to be linked across London.	N/A	2016	3,000	24tph
East London Line	The project will integrate National Rail services north and south of the Thames. The project involves a northwards extension from the current LU terminus of Shoreditch to Dalston, where the route will link with the North London Line. At a later stage the route will be extended south to link with the National Rail network. This scheme forms part of whagt is known as "orbirail" which potentially could result in stronger links from Clapham Junction and Highbury and Islington to Willesden Junction.	The scheme is currently undergoing further design and development work.	2009	1,000	16tph
Thameslink 2000	This project will greatly enhance the existing Thameslink service linking north and south London. It includes capacity increases between Kings Cross and Blackfriars, platform extensions to accommodate 12 car trains and linking of the Great Northern Route into the central Thameslink section.	The scheme subject to a Transport and Works Act inquiry which if approved by the Secretary of State will result in works beginning in 2003.	2008	3100	24tph
CTRL 2	A 39km extension from the existing high	Works began in July 2001 and	2007	3600	8tph in each

	speed rail link between London and the Channel Tunnel. This route linking London St Pancras to the Channel Tunnel will further reduce journey times between London and Europe.	the scheduled completion date is the end of 2006.			direction
South London Metro	Enhancements to Connex, South Central and South West Trains TOC services in south and south west London. Includes improvements to stations as well as improvements in train service patterns.	Preliminary works on selected stations will be undertaken as pilot schemes in 2003/04. Future works remain the subject of further studies.	2003+	80	4tph off peak
Cross River Tram	This will be a tram route running from Kings Cross and Camden, via Euston and Waterloo, to Peckham and Brixton.	The scheme was subject to public consultation and is now undergoing further feasibility assessment.	2011	290	40 tph in peak hour, between Euston and Waterloo
Other Schemes					
Interchanges	Improvements to capacity of a hierarchy of public transport interchanges including Victoria, Barking, Whitechapel, Woolwich Arsenal and Belvedere/ Erith.	An Interchange Development Strategy is currently underway which is due to report in February 2003. This will firm up interchange programme.	2006+	3000	
Buses	The BusPlus improvements have been established to improve routes across London through a range of measures including clearer passenger time information, upgrading of bus fleet, more bus priority measures, increased enforcement of bus lanes, kerbside and bus shelter improvements and improved passenger and bus information.	Ongoing programme of improved bus services and infrastructure.	2002+	100	Plus 40% by 2011 and plus 50% by 2016
Congestion Charge	The main initiative relating to traffic management in Central London is the Congestion Charging Scheme as introduced in February 2003. Drivers entering the charging cordon during the daytime period are charged £5 per day.	Ongoing programme of improvement.	2003	200	N/A
Walking and Cycling	Programme of measures that aim to increase the levels of walking and cycling in the capital on both TLRN and borough roads.	Ongoing programme of improvement.	2002+	0.2	N/A
Road Safety	Road Safety Plan aimed at establishing targets for reducing the number of road accidents in London as well	Ongoing programme of improvement.	2002+	255	N/A

	implementing measures to achieve these targets.				

(Source: London Plan Appraisal Summary Sheet v.8, Martin Oaten)

3.5 Key Development Sites and Areas

Key development opportunities in the sub-region are shown below.

Central Activities Zone
The Central Activities Zone (CAZ) is the core location for international business and finance, and the focus of London's wider linkages with the rest of the South East, as well as the wider UK and world. The CAZ straddles two sub-regions, extending into the City, as part of the East sub-region.

Opportunity, Intensification and Regeneration Areas
The Central Sub-Region's opportunity areas fall into two main geographical groups, as outlined below in Table 3.35

Other Opportunity Areas – including King's Cross and Paddington
Development opportunities within the Intensification Areas and major town centres should also be maximised. In addition, the areas for regeneration – located principally around the rail termini at Paddington and King's Cross, in large parts of Islington, Southwark and Lambeth, north Kensington, and around Vauxhall – should be prioritised for additional accessibility improvements.

Table 3.35: *Key Development Areas in the Sub-Region*

Key Development Areas			
Opportunity Areas	Area (ha)	New Jobs to 2016	New Homes to 2016
Waterloo	39	15,000	500
London Bridge	30	24,000	500
Elephant and Castle	23	4,200	4,200
Vauxhall/Nine Elms/Battersea	78	7,600	1,500
King's Cross	53	11,400	1,250
Paddington	30	23,200	3,000
Areas for Intensification	Area (ha)	New Jobs to 2016	New Homes to 2016
Farringdon/Smithfield	10	2,000	100
Holborn	13	2,000	200
Euston	16	4,000	200
Tottenham Court Road	10	2,000	200
Victoria	41	2,000	200
Arsenal/Holloway	38	1,500	2,000

**Jobs and housing forecast numbers shown as minimum targets for growth (Draft London Plan, June 2002)*

Annexes

Annex 1: Submissions to the Examination in Public

A. Greater London Authority Submission

Draft London Plan, Examination in Public, March/April 2003
Sub Matter 3b
Central London
Date Published: 17th February 2003
(Source: SDS Team, Kevin Reid)

Can Central London support the scale and intensity of development envisaged in the draft Plan; what are the implications for local communities and for meeting transport needs to and within Central London?

There is strategic capacity within the Central Sub-Region to accommodate both the scale and intensity of growth envisaged, and the draft London Plan (DLP) seeks to facilitate its release. The DLP also contains clear policies to protect and enhance local communities. It also addresses the transport needs of central London and identifies key strategic transport infrastructure schemes that are needed to improve significantly the capacity of the central London sub-region to accommodate growth (see also Matter 1b and Matter 5).

Accommodating the Scale and Intensity of Development
Government policy (RPG 9, Circular 1/2000) requires the London Plan to support Central London's national roles and accommodate its growth requirements.

Offices. Over the term of the London Plan, strategic capacity for office development in Central London as a whole is likely to be more than sufficient to meet anticipated demand (DLP 3b.7 – 3b.23, SDS Technical Reports 9[5], 21[6]). This estimate takes into account vacancy and a contingency for variations in employment density. Over the term of the London Plan, it is estimated that there will be capacity for some 150,000 office jobs in central London set against projected employment growth of 140,000. Within CAZ (which includes the City) the projections indicate office employment growth of 200,000 against capacity for 240,000.

New research[7] confirms the short to medium term assessment outlined in the DLP (3B.20 – 21). This indicated that the identified pipeline for the next five years, even without taking into account further capacity that may come forward over this period, is towards the upper end of the of the annual requirement projected for the term of the London Plan.

A second report[8] tests established office monitoring benchmarks against current market trends. It vividly underscores the need for a 'plan, monitor and manage' approach to office provision and points to significant current cyclical over-capacity but not to underlying structural changes of a magnitude that could undermine the DLP's long term economic assumptions. For example, at the end of 2002 the ratio of permissions to starts was 5.6:1 against the benchmark of 3:1. The availability rate was 10.5% against the 8% benchmark. Similarly, new space was available in central but non-prime locations at no more than 50% of prime

[5] GLA (2002) SDS Technical Report 9. London Office Policy Review 2001
[6] GLA (2002) SDS Technical Report 21. Demand and Supply of Business Space
[7] GLA (2003) London Property Research. London Office Policy Review
[8] GLA (2002) SDS Technical Report 10. Lonodn Office Market Monitoring Project Stage 2

central rents and there was nearly 11 years supply of space in the development pipeline compared with the benchmark of 3.25 years.

Housing. Using information supplied by boroughs, the DLP has identified capacity in Central London for 140,000 extra homes. Particularly vibrant housing demand and cyclical variations in demand for other uses e.g. office to residential conversion, mean that, relative to other sub regions, there is more scope here to harness market pressures to achieve the DLP's objectives, including affordable housing provision. Recognising the dynamics of the London land market which bear particularly on the Centre, the DLP proposes an early review of housing capacity estimates (see also Sub-matter 4a).

Other Uses. The DLP recognises the key role played by, and the pressures facing, industry and small businesses in Central London. Informal consultation has already begun on draft Supplementary Planning Guidance to meet the needs of these sectors in the most sustainable way. Similarly, new research[9] has outlined the scale of consumer expenditure growth in Central London and CAZ. It is intended that, after further refinement and working in partnership with boroughs, this will inform assessment of future retail, leisure, tourism and other floorspace requirements and provide inputs to a Good Practice Guide on retail need assessments and the Sub Regional Development Framework (SRDF).

Accommodating Intense Development
Central London is already well-served by public transport, and many of the areas identified for development within the sub-region are based on or around existing hubs and have potential for intensification (see Issues 1.3, 1.7, 5).

An underpinning assumption in the DLP is that if London's projected growth is to be accommodated, investment in its already overstretched infrastructure including education, health and other social provision, as well as for transport is essential[10]. This case is articulated in SDS Technical Report 3[11].

To encourage higher density development the DLP uses the concept of plot ratios as strategic minima rather than local maxima as applied under historic convention. The DLP makes clear (Policy 4B.3) that the ratios are not intended for blanket application but must reflect the local context, public transport capacity and the DLP's design principles. Similarly, the DLP sets out strategic guidelines to reconcile development density, dwelling type, public transport accessibility and car parking provision (table 4b.1). These are based on an approach which is supported by government[12] as good practice and has already been endorsed by boroughs[13]. The SRDF will refine them for local application in UDPs.

The DLP is emphatic that very high standards of design in new development will be required to sustain higher density levels and bring about improvements in the local environment and public realm to the benefit of local communities, workers and visitors. Good design guidance will enable boroughs to achieve the sorts of densities which historically produced some of the most desirable housing in London as well as exploiting newer formats to optimise provision at particularly accessible locations (see also Sub-matters 4a and 6a.).

[9] GLA (2003) Consumer Expenditure in London 2001
[10] GLA (2002) SDS Technical Report 3. Planning for London's Growth
[11] GLA (2002) SDS Technical Report 3. Planning for London's Growth
[12] ODPM (2000) Tapping the Potential. Assessing Housing capacity, Towards Better Practice
[13] LPAC (1998) Sustainable Residential Quality (Small Sites), Report 20/98

Community Implications
In the face of such development pressures, the DLP seeks to maintain the existing housing stock (Policy 3A.14), which in turn will sustain existing communities. Central London will continue to be a major contributor to new housing provision, thus fostering community renewal and enlargement. The DLP's strong affordable housing policies will help ensure that these communities are broadly balanced.

The DLP recognises the unique opportunity to achieve mixed use in Central London (3B.26). This will increase overall housing provision and provide opportunities to bring work and living places closer together. It also provides scope to secure capacity for retail, leisure, civic and other services necessary to sustain communities. The planning process will have a major role in ensuring that such facilities are secured in a high value land market. The SRDF will coordinate locally sensitive applications of the mixed use principle in Central London.

The DLP provides a series of mechanisms for communities to engage in and benefit from the development process (Policies 3A.24 –27) and specifically recognises how important these could be for communities in areas, which are particularly susceptible to change, such as central London. It highlights the importance of protecting communities which could be displaced by outward pressures from CAZ and specifically attempts to limit that pressure by directing growth into defined Opportunity Areas to the East and South of the CAZ. Outside those areas, the DLP seeks to protect existing land uses and activities. This approach also enables the DLP to address one of its key target groups - black and minority ethnic people who are strongly represented in Central London.
Transport Implications

Central London is the national and regional public transport node and has a uniquely intense public transport network. It is the most accessible place in the capital. Despite decades of under-investment this to some extent has allowed people still to 'work their way around' particular congestion points. However, such a position is not sustainable. Continuing delays and degradation in the quality of commuting life are unacceptable for London's workers. They also undermine London's attractiveness and competitiveness as a business location and, in some places, compromise the realisation of development capacity necessary to accommodate employment growth. This in turn will compromise London's ability to remain a significant net contributor to the national exchequer. New investment is essential for London and the country as a whole.

The DLP's proposed programme of infrastructure investment is modest relative to the demands which will be placed on it and the phasing may slip even relative to that recently set out in the Mayor's Transport Strategy. New research[14] shows that after account is taken of the relatively prudent levels of growth implied by the DLP's projections there will be a small but significant increase in overall transport capacity but some congestion points will remain.

Currently, 21% of links on the whole (surface and Underground) rail system are crowded in the morning peak, affecting more than half of passengers travelling then. In terms of worst crowding, 12% of links and a third of passengers are

[14] Berkely Hanover Consulting and GLA (2003) Phasing of Transport and Development for the Draft London Plan and TfL (2003) Transport Analysis of the London Plan, Technical Report

experiencing very crowded conditions. Over-crowding is particularly acute on sections of the District, Northern, Piccadilly, Victoria and Central line tubes, parts of the DLR and on surface rail, at most of the mainline termini and on services through SE London approaching London Bridge. With the transport improvements proposed in the DLP, there should be a 25% reduction in the number of crowded links so that the proportion, which is crowded, falls from 21% to 15%. For surface rail passengers the proportion will fall from 53% to 19%.

Further residential development close to the concentration of employment growth in Central London will help to minimise transport demand. However, the responses to Sub-Matters 1b, 1c and 5a show that some limited growth in commuting from the rest of the South East can be accommodated, complemented by major initiatives to bring unemployed and under-employed Central Londoners into its active labour market.

Conclusions on issue 3.4
At a strategic level sufficient development capacity has been identified to accommodate the pressures which Central London may face if future growth is in line with the base projections. These projections will be subject to continuous testing through the 'Plan, Monitor and Manage' approach which, if necessary, would lead to a review of the London Plan.

The distribution of growth pressures and capacity to accommodate them within Central London will take place through the SRDF. The SRDF will provide a locally sensitive vehicle to implement the DLP's broad policies and reconcile these pressures with the needs of local communities and to meet transport requirements. It is intended that the SRDF will guide change so that growth pressures and higher density development are accommodated in the most sustainable way and enhance central London's unique environmental and business attractions. Development which would compromise these attractions will be strongly resisted.

Is the definition of the Central Activities Zone and the policies within it appropriate?
The answer is Yes. The concept of the CAZ was developed in the 1970's and its definition and associated policies have been refined over the years. It is widely supported as an essential development control tool which successfully addresses the difficult dichotomy of encouraging development and change to promote London's world city role with the need to protect its environment, character, smaller land uses and residential communities. The need for such a tool is, if anything, greater now than in the past, indeed the definition of the central area and the need for relevant policies within it are a requirement of Circular 1/2000[15].

The definition
The London Plan must include a mechanism for co-ordinating UDP policies relating to the functions within this area – which is the CAZ diagram and the associated policies.

The boundary was agreed after extensive consultation with the boroughs as recently as 2000 and was reviewed during the preparation of the DLP. Given the requirement for the DLP to be strategic, and for it not to include precise boundaries, the diagram as shown is appropriate. In the adopted London Plan,

[15] Para 3.29

the CAZ diagram could be larger and clearer. However, it would still need to be diagrammatic.

The policies
The DLP is a strategic document and does not include the level of detail concerning CAZ policies that were developed by LPAC and agreed by the boroughs. That is why the DLP anticipates that further detailed work will be done in the preparation of the central London SRDF, focusing specifically on sub-regional issues which are too specific to be addressed thoroughly in the London Plan but too wide for individual UDPs. As the need for special policy areas has been raised in the DLP as a specific central London issue, it is anticipated that this will be addressed in the SRDF's refinement of the CAZ diagram. The policies that are included in the DLP are appropriate for inclusion a strategic document.

Conclusions on Issue 3.5
The definition of CAZ and the policies for it within the DLP are appropriate for a strategic document and are required by Circular 1/2000. Where these have a distinct sub-regional dimension they will be refined in the Central London SRDF and finalised in borough UDPs and other relevant plans and strategies. The Mayor will work closely with boroughs to ensure that these latter are all individually coordinated to deliver his strategic vision for Central London – in accordance with the requirements of Circular 1/2000.

B. Transport for London Summary of Submissions

Draft London Plan EIP Written Submissions – Transport Issues arising from Sub Matter 3b
Sub Matter 3b: Central London
(Source: Chris Hyde)

Can the Central London area support the scale and intensity of development envisaged in the draft Plan; what are the implications for local communities and for meeting transport needs to and within Central London

Summary of the written submissions:
In creating the summaries the reviewer has read through each organisation's submission and summarised all comments that refer to transport, or infrastructure when it implies the inclusion of transport. The reviewer has then made a comment on how he views the overall tone of the submitters' comments. For those of you that just want a very brief summary the key points for each grouping are bulleted. A more detailed summary of the organisations' submissions follows in the boxes.

The key transport issues raised in the submissions for Sub-Matter 3b 3.4 are:

- Central London has the highest levels of public transport accessibility in London
- Public transport has suffered from under-investment; investment is needed
- Scenario testing is needed
- Given the historical development and high levels of public transport capacity in Central London, it may not be possible to redirect commercial development from the centre
- The DLP should place emphasis on the Coach Strategy review

- The relationship between transport capacity and new development timing provokes conflicting opinions
- CLOA's present opportunities for a variety of different travel patterns to emerge
- The area within the Central London sub-region but outside the CAZ needs consideration of its own
- Air space above railway lines has scope for development

The submissions have been summarised in more detail under the following five groupings:

1. The GLA Family
2. London Assembly and Governmental Bodies
3. Local Authority Related Bodies
4. Key Stakeholders

In the title for each summary there is a 'P' or 'NP' representing whether the organsiation is a participant or non-participant respectively.

1. The GLA Family

- Central London has the highest levels of public transport accessibility in London
- Public transport has suffered from under-investment; investment is needed
- The proposed transport improvements will ease rail crowding problems
- Significant growth in bus capacity is planned
- Developing residential areas close to the concentration of employment growth in Central London will help to minimise demand

TRANSPORT FOR LONDON (P)
▪ Central London is well served by public transport with an extensive network of tube and bus services and it is also the hub of regional surface rail services and a key destination for (inter)national services. Hence in terms of service frequency and the range of origins and destinations served, central London has the highest levels of public transport accessibility in London
▪ The current public transport is already well used and has suffered from periods of under-investment. Hence many sections of the public transport system are crowded, with problems being particularly severe on the Underground and on significant sections of the surface rail system in weekday peak periods. Investment is needed to tackle current pressures and to accommodate future pressures arising from the forecast in growth demand
▪ The TfL technical report demonstrates that the proposed transport improvements will provide sufficient increase capacity to ease existing rail crowding problems and cater for the forecast growth although crowding will remain on some parts of the network.
▪ Significant growth in bus capacity is planned, with a 50% increase by 2016 over London as a whole. Central London will benefit from the increase in capacity, and will benefit from improvements to bus speeds as a result of improved allocation of road space and management of the road network.

MAYOR OF LONDON (P)
▪ The DLP addresses the transport needs of central London and identifies key strategic transport infrastructure schemes that are needed to significantly improve the capacity of the central London sub-region to accommodate growth

▪ Central London is the most accessible part of London. There has been a lack of investment in transport and whilst people have 'work[ed] their way round' problems, the scenario is not sustainable. Continuing delays and degradation in the quality of commuting are unacceptable. This also undermines London's attractiveness and business. New investment is essential
▪ The DLP's proposed programme of infrastructure investment is modest relative to the demands which will be placed on it and the phasing may slip even relative to that recently set out in the Mayor's transport strategy.
▪ The proposals in the DLP should lead to a reduction in current crowded spots
▪ Further residential development close to the concentration of employment growth in Central London will help to minimise transport demand

2. London Assembly and Governmental Bodies

GOVERNMENT OFFICE FOR LONDON (P)
▪ There needs to be a more detailed programme for strategically important development and growth with any link to proposed major transport improvements clearly identified

3. Local Authority Related Bodies

- The relationship between the scale and phasing of development and public transport capacity is critical
- Failure to provide adequate transport infrastructure will increase congestion
- Scenario testing is needed; if the funding & growth do not occur then the Mayor needs to have commitments to other public transport services
- Investment in transport is needed

CITY OF WESTMINSTER (P)
▪ The relationship between the scale & phasing of development and public transport capacity is critical. The scale & intensity of any development envisaged must go ahead in tandem with improvements to and additions in the capacity of the public transport system serving central London

CORPORATION OF LONDON (P)
▪ CoL support the Mayor's strategy of providing transport infrastructure to meet the increased demand resulting from economic and population growth. They recognise there may be a temporary mis-match between demand and provision, but consider that it would be potentially harmful to attempt to hold back development until all infrastructure is fully in place

LONDON BOROUGH OF CAMDEN (P)
▪ The DP recognises that TfL has concerns over phasing, yet the Plan makes little attempt to properly phase the growth in jobs and homes to match the provision of increased public transport capacity
▪ Failure to provide adequate levels of transport infrastructure and services and facilities will increase commuting, adding to existing congestion on the road network and public transport
▪ Much of the planned increase in public transport capacity is to come from major infrastructure schemes that are to be completed after much of the proposed growth in jobs and homes will have occurred
▪ The draft plan does not set out an approach to manage growth and

development if infrastructure is not provided or is significantly delayed. Camden believes the LP should take a more practical approach which plans for scenarios when funding and growth do not occur at the proposed levels

LONDON BOROUGH OF SOUTHWARK (P)
▪ The LP opposes large scale, car based retail development. Southwark supports the LP in efforts to reduce the need to travel and would itself oppose a car based retail development. However Southwark does take the view that the expansion of retail at the Elephant and Castle would be a sustainable option taking advantage of existing and future public transport connections within the Congestion Charging Zone. It would encourage more sustainable patterns of travel

LONDON BOROUGH OF TOWER HAMLETS (P)
▪ The levels of growth proposed will result in a substantial increase in people travelling to, from and within the Borough in an environment where all modes of transport are already seriously congested and unreliable
▪ The proposed levels of growth cannot be sustained without major investment in strategic public transport improvements. The proposals set out may not deliver the quantum of capacity required and they are not under the overall control of the Mayor. Their deliverability within the time frame of the London Plan must consequently be questioned.
▪ TH are concerned that if major infrastructure projects over which the Mayor has no control fail or delay in their delivery, development in these areas will be constrained. Should major projects be subject to additional delays, we feel the Mayor needs to indicate commitment to improving other public transport services, particularly improving local services
▪ Hence there is a need for more extensive scenario testing and the adoption of a 'fall back' position in the event of a failure of assumed growth and investment taking place

ROYAL BOROUGH OF KENSINGTON & CHELSEA (P)
▪ Accommodating 237,000 additional jobs in the Central London region looks very unrealistic, given factors such as the current lack of transport capacity
▪ Substantial additional private and public sector investment is implied, which in some cases, particularly on major public transport investment projects, exceeds existing expenditure plans. The provision of adequate public transport is central to the success of the London Plan. The Plan recognises that most public transport improvements will not occur in the first five years, but at the back end of the Plan. There will be a reliance on buses and cars in the first 5 years. Further high-density development in already congested areas will place additional pressure on public transport and roads. If the proposed scale of development is not re-distributed and proceeds without major transport investment there will be deterioration of Central London's environment

4. Key Stakeholders

- Transport capacity should not be used to control (or delay) the phasing (and planning) of new development
- If major projects fail, the crowding will intensify
- Without major investment in transport, the quality of the Central London environment will deteriorate

- Growth should focus on areas where transport capacity already exists or can be realistically increased
- The DLP needs to be more realistic in terms of accommodating growth within transport constraints
- Given the historical development and high levels of public transport capacity in Central London it may not be possible to redirect commercial development from the centre
- The DLP should place emphasis on the Coach Strategy review as promised in the Mayor's transport strategy
- CLOA's present opportunities for a variety of different travel patterns to emerge
- The area within the Central London sub-region but outside the CAZ needs consideration of its own
- Air space above railway lines has scope for development

ARGENT ST. GEORGE, LONDON & CONTINENTAL RAILWAYS AND EXCEL (P)
▪ Acknowledge that transport development levels must be related to available transport capacity; however do not consider that transport capacity should be used to control the phasing of development in as rigid a way as implied in Policy 3C.2
▪ Irrespective of when the transport improvements outlined in the DLP are implemented, Central London Opportunity Areas are the right places to accommodate major new development – these locations are served by a number of public transport lines and hence can accommodate more development than locations that rely on a single piece of infrastructure
▪ Central London has an employment density similar but a little higher than central Paris, but a population density less than a third its size
▪ Some CLOA's (such as Kings Cross) present opportunities for a variety of different types of trip, such that their overall trip pattern is likely to be different from that of Central London (interchange may be avoided, reverse commuting may develop)
▪ There is a 'structural imbalance' between the transport capacity of the central area and the services feeding it
▪ Kings Cross improvements (e.g. CTRL) will allow new opportunities for easy commuting into the northern part of the central area
▪ CLOA's will affect existing movement patterns in complex ways and are likely to help make the case for further infrastructure improvements to benefit the central area

LONDON FIRST (P)
▪ It might be theoretically desirable to link development to capacity increases, as proposed in 3C.2, in reality it is not practical to hold up the planning of new development on the basis of the timing of infrastructure. Policy 3C.2 should be removed or amended.
▪ Whilst there may be short-term concerns, it should be noted that the analysis of the Transport Programme by TfL confirms that the planned schemes will provide sufficient transport capacity in 2016 to support the forecast growth. If significant developments such as Crossrail 1 are not provided, then crowding will intensify.

CENTRAL LONDON PARTNERSHIP (P)
▪ If the proposed development proceeds without major transport and public realm investment, the quality of the Central London environment will

deteriorate for local communities, businesses, visitors and investors
▪ The LP should be clearer about what development milestones can be achieved if the anticipated level of investment in major transport infrastructure is not delivered
▪ Growth should be focused on those areas where existing public transport capacity exists or can be increased at realistic cost
▪ The LP needs a greater sense of realism in terms of accommodating growth within transport and environmental constraints

WESTMINSTER PROPERTY OWNERS ASSOCIATION
▪ Given the historical development of Central London and the continuing relatively high levels of public transport accessibility in the centre, the Association has reservations as to the extent to which commercial development can be readily redirected away from Central London to other parts of London.
▪ Even if the scale and intensity of commercial development envisaged for central London cannot be fully accommodated, due to transport infrastructure constraints (or any other reason), this does not mean that such development can necessarily be transferred to another London sub-region. Furthermore, transport infrastructure investment is as much required in other sub-regions as in central London, if not more so.
▪ The Association has concerns over the relationship between transport investment and making the most of the potential capacity of Central London, for example in Areas of Intensification

GROSVENOR (P)
▪ Coach travel to, and within, the Capital is a key component of the transportation network and is of vital importance to the populations mobility, especially the poor, elderly and the young.
▪ The plan needs to place appropriate emphasis on ensuring the Coach Strategy review promised in the Mayor's Transport Strategy is commenced as a matter of priority. A solution for Victoria Coach Station will act as a kick-start.

LONDON FORUM OF AMENITY & CIVIC SOCIETIES (P)
▪ There is a need to have a policy to cover the part of the Central London sub-region which lies outside the Central Activities Zone as they have different characteristics, such as poor accessibility by public transport
▪ The central area has considerable scope for developing air space above railway lines and Underground Stations. This needs to be investigated as long as any development does not compromise long-term measures to improve public transport
▪ 2B.29: This should become a policy and it should be made clear that improved accessibility to the town centre based services is defined as meaning accessibility by modes other than car use

NB. East London Line Group & Non-Participants still to be added

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