



Commuter Flows in London and the wider South East 2001 to 2016/21

Executive Summary

October 2005

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This project was commissioned by a consortium of:

- The Corporation of London;
- The Greater London Authority;
- The London Development Agency;
- Transport for London;
- The Strategic Rail Authority;
- The South East England Regional Assembly;
- The South East England Development Agency;
- The East of England Regional Assembly;
- The East of England Development Agency; and
- The Association of London Government.

The authors of this report are Cambridge Econometrics Ltd, in association with WSP Group plc and the London School of Economics and Political Science.

Key points:

The two aims of the project were:

1. To establish a common methodology and database model for estimating commuting flows into, out of and within London and its neighbouring regions of South East England and East of England.
2. To use the methodology to identify possible commuting implications of five scenarios envisaged for 2016 and 2021.

The project report gives details of the common methodology and the results of the scenario testing. The full report can be downloaded from www.cityoflondon.gov.uk/economicresearch. The project sponsors have also each been provided with a copy of the database model which can be used to test further scenarios and assumptions.

The five scenarios were based on the growth outlooks and policies of: the London Plan, The East of England Plan (two scenarios), the Consultation Draft South East Plan (Jan 2005) and Cambridge Econometrics' own forecasts.

While the scenarios showed some differences in the degree of future commuting movements, they also revealed some common patterns and characteristics:

- Commuting to workplaces in London by London Underground and rail is forecast to increase significantly by 2016 while commuting by car decreases.



- Under all scenarios, commuting to Central London by London Underground and rail is forecast to see a large increase, reaching +170,000 daily trips by 2016 under the London Plan scenario.
- There may also be a significant increase in those walking and cycling to work in Inner London with all scenarios pointing to a rise of some 60,000 trips by 2016.
- For the South East, job creation by 2016 is forecast to be higher than population increases resulting in an overall reduction in out-commuting for the Region as a whole. The main exception is rail commuting from Kent to London which is forecast to increase.
- While commuters in the South East may increasingly travel to workplaces within the Region, they would tend to do so by car. All the scenarios forecast the potential for 300,000 additional commuting car trips in the South East by 2016.
- The East of England shows a different picture. Under most scenarios jobs growth does not keep pace with local population increases, resulting in more commuting to job-rich centres including central London.
- The model forecasts an increase in the number of rail commuters from the Thames Gateway and Essex, principally to Central London, while Cambridgeshire, Peterborough and Hertfordshire see the highest increases in car commuting.



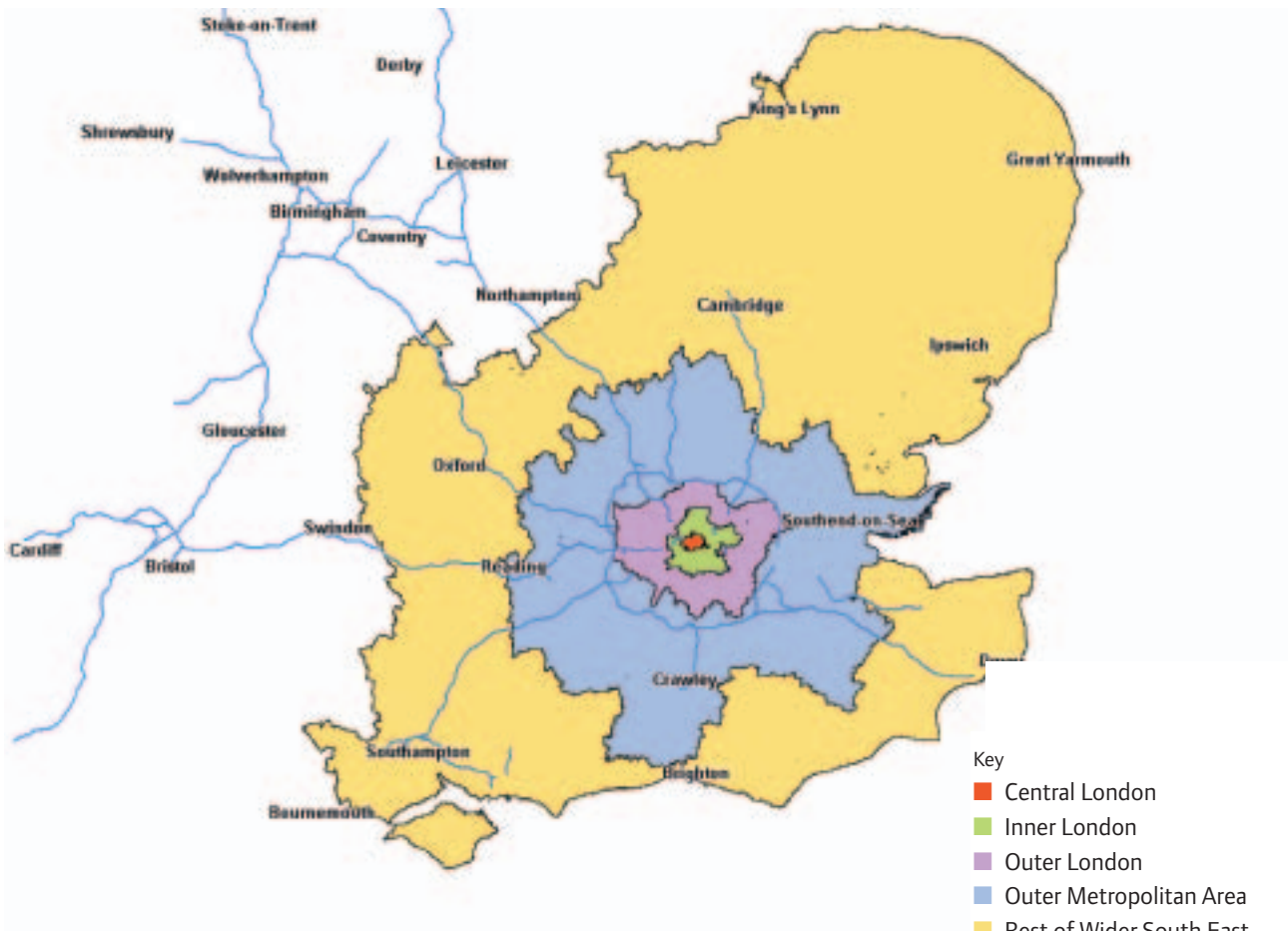
Background

The report analyses current and prospective commuting flows to 2016 and 2021 in the three Government Office regions: London, the South East and the East of England (this whole area is referred to in this report as the Wider South East). It also applies to, and draws data from, other regions which have major commuter linkages with the Wider South East.

The database has been designed for estimating and forecasting commuting flows into, out of, and within London and its neighbouring regions. The database derives its data primarily from the workfiles of the 1991 and 2001 Censuses of Population, but also from some other sources, including the Annual Business Inquiry and the Labour Force Survey. The projections are informed by the Regional Spatial Strategies of London and the two neighbouring regions.

The study developed, calibrated and then used a methodology and model (described in the full report) to provide detailed forecasts of future patterns of commuter travel and to identify the commuting implications by 2016 and

Study Area of the wider South East



2021 of certain scenarios for policy, economic and transport developments. A major difficulty faced by those carrying out this study lay in combining two different types of forecasting model: an economic forecasting model, which focuses on industrial sectors and jobs, and a transport forecasting model, which focuses on commuter flows and the factors influencing choice of commuting mode. To our knowledge, this is the first study, at least in the UK, in which two such different models have been combined.

The findings of previous studies (extensively described in Chapter 2 of the full report, 'Literature Review') can be grouped into three main themes of particular relevance to understanding and forecasting commuter flows in London and the neighbouring regions.

1. There are shifting patterns of population and employment. In reference to the present study the principal trends are the growth of employment centres outside London and the increase of employment, and to a greater extent population, in London. For the longer-term future an issue of great importance is the influence of the growth areas in the South East and East of England designated by the Office of the Deputy Prime Minister (ODPM).
2. There are changes in specialisation of employment and skills, in income and in lifestyle preferences. These have led to the choice of inner-city residence, especially in London, by professionals, graduates and childless families. They also lead to longer commuting journeys by other higher-income professionals, particularly in the financial sector, especially if they have children. There are also clear distinctions in journey length and mode of commuting between full and part-time workers, male and female and higher and lower-income groups. The geographical spread of jobs in different industry sectors across the Wider South East is an important driver of commuting. Sectors such as health and education offer a wide range of professional jobs in most localities and hence improved local job prospects, which can reduce the need for long-distance commuting.
3. It is important to distinguish between changes in commuting patterns that are short-term responses to shocks (as when a deterioration in employment prospects in London leads to a sharp fall in inward commuting) and changes that result from long-term trends.

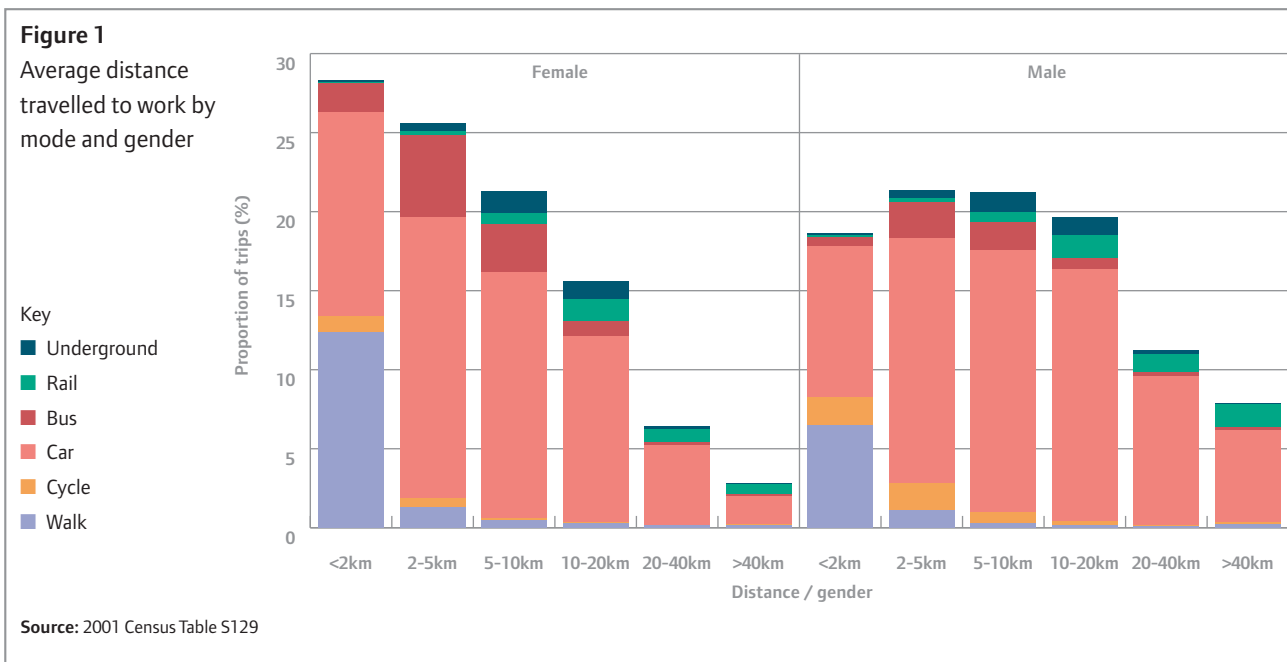
Previous studies have also shown that patterns in commuting can be analysed and understood partly through certain socio-economic distinctions:

- male/female
- full-time/part-time employment
- professional/manual occupation
- higher income/lower-income employment
- specialised/non-specialised skills
- skilled/non-skilled industries

Commuting patterns 1991-2001

The present study analysed the data in the 1991 and 2001 Censuses and revealed the separate but interlinked influences on journey-to-work distances and mode of travel of gender, manner of working, industry type, location of workplace and location of residence.

In relation to gender, the analysis revealed that males are more likely to commute long distances, and females to commute shorter distances (see Figure 1). This finding is related to another result of the analysis, that full-time workers have longer journeys than part-time workers, since a higher proportion of the female workforce is in part-time jobs than is the case for the male workforce.



In relation to manner of working and to industry type, the analysis revealed that greater commuting distances are associated with those in professional and higher-income occupations and shorter distances with those in manual and lower-income occupations (see Figure 2 and Table 1). More specifically, those working in the financial sector tend to travel furthest to work, followed by those in office occupations (two findings that, of course, are correlated to managerial and professional occupations), while those in factory work have commuting distances at or a little below the average, and shop and catering workers have the shortest journey distances. The striking exception to this correlation of professional and higher-income occupations with greater journey length is the construction sector, where commuting lengths are above the average, probably because construction workers do not have one fixed place of work but move from site to site.

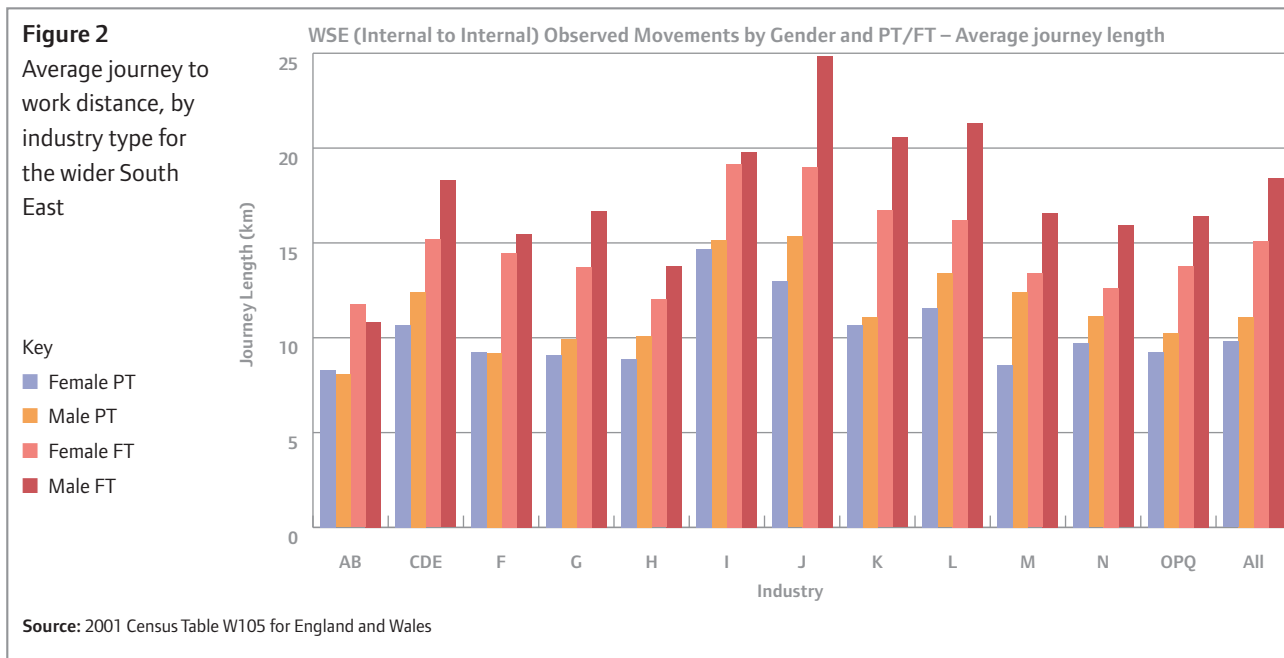
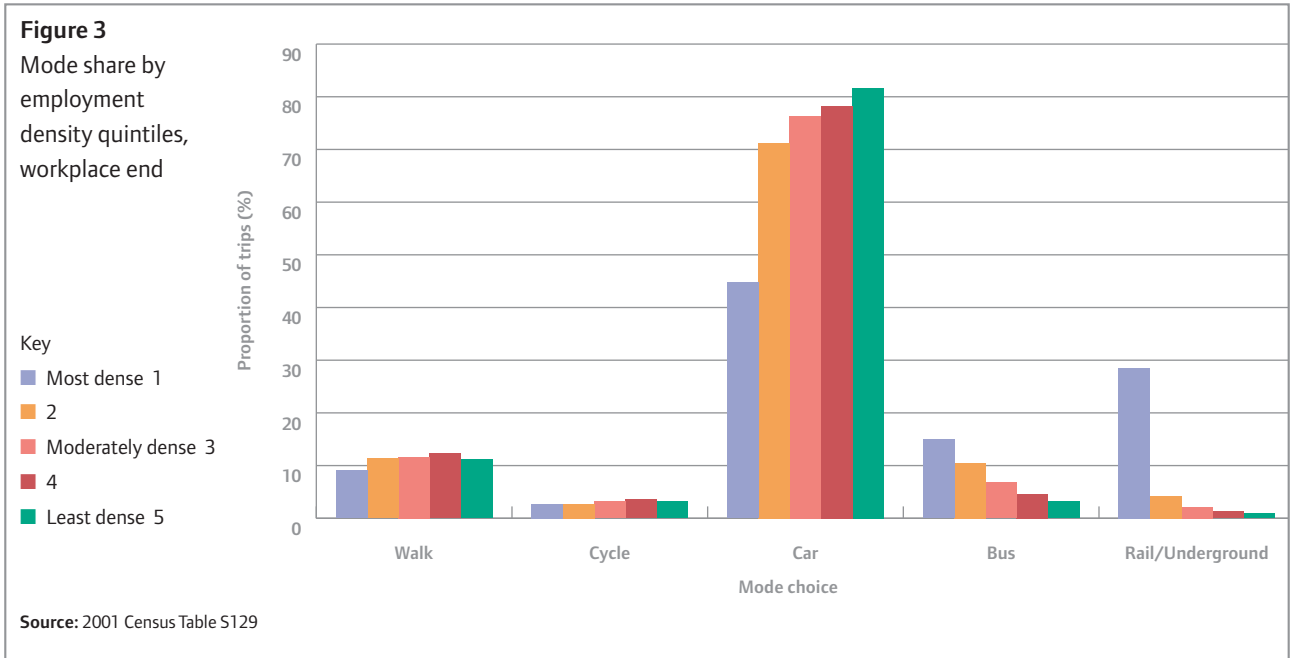


Table 1

Standard Industrial classification SIC 92	A	I
B	Agriculture, Hunting, Forestry	Transport Storage and Communication
C	Fishing	J
D	Mining and Quarrying	Financial Intermediation
E	Manufacture	K
F	Electricity, Gas and Water Supply	Real Estate, Renting and Business Activities
G	Construction	L
H	Wholesale and Retail Trade, Repair of Motor Vehicles	Public Administration & Defence, Social Security
	Hotels and Restaurants	M
		Education
		N
		Health and Social Work
		OPQ
		Other

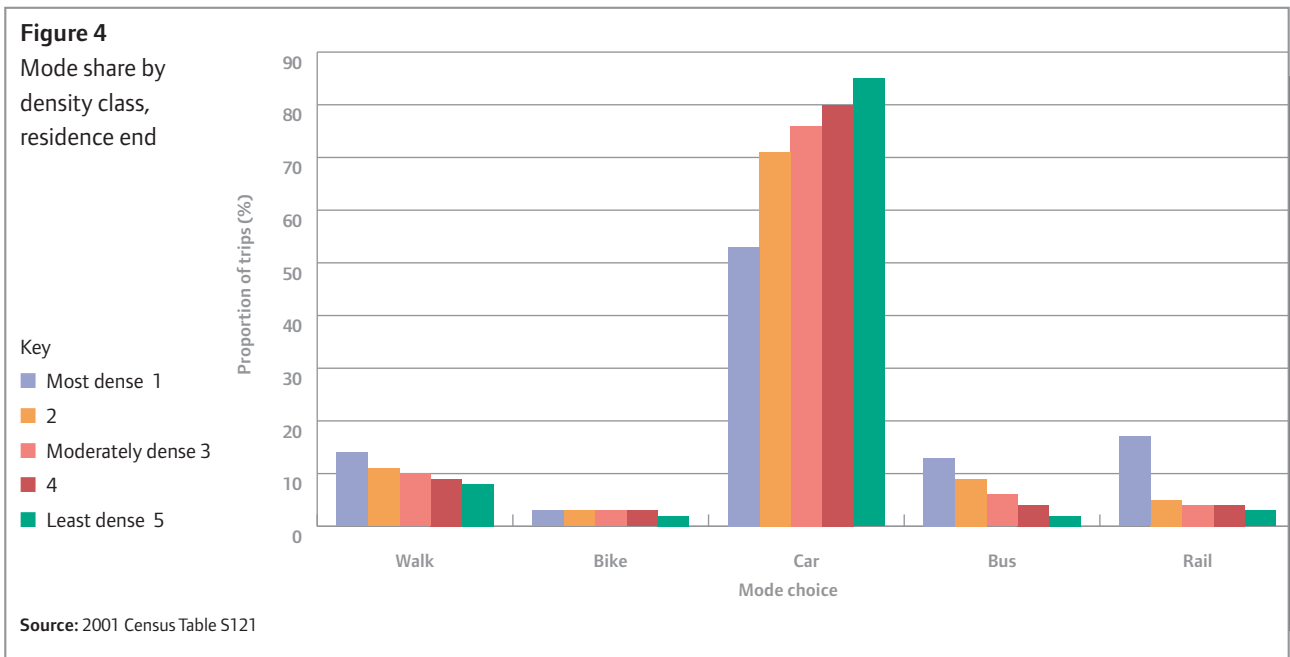
The other factor influencing the length of commuting journeys is the employment density of the workplace ward (where density is measured by the number of workplaces per hectare). As employment density increases in a workplace ward, so the length of commuting journeys to that ward decreases (see Figure 3). The exception to this is the City of London and adjacent central London business areas where a combination of the heavy agglomeration of offices and the preponderance of higher income professional jobs results in a high degree of longer distance commuting.

In relation to mode of travel, it is interesting that, for a given journey length, females are more likely to travel by bus or on foot, whereas males are more likely to travel by bicycle or car. Two more general and important determinants of travel mode, however, are the residential density of the residence ward (where density is measured by household spaces per hectare) and the employment density of the workplace ward.



Rail plus London Underground receives its heaviest usage from those who reside in the densest quintile (see Figure 4), but its usage declines only slightly as residential density declines.

In contrast, the use of bus or walking becomes far less favoured as residential densities decline, while car usage (under all conditions of residential or workplace density the most favoured mode) increases sharply. This relationship is often due to the scarcity of public transport in less densely populated areas.



As employment density declines, there are steep falls in the proportions arriving by bus, rail or London Underground, but walking as a mode of commuting increases in favour (see Figure 3).

Thus the largest proportion of rail/Underground use is concentrated in the area of greatest employment density (central London) and is also attributable to those who live in areas of greatest residential density.

In relation to location of workplace and of residence, Central London attracts commuters from across the Wider South East (and beyond). The modes used by Londoners for their daily work trips display a pattern around central London with an identifiable relationship between journey length and travel mode (see Figure 5). Cycling and walking are popular for the shortest journeys within Central London; bus is popular for slightly longer journeys; the Underground tends to be chosen for longer journeys, particularly from the north and west of the capital. The longest journeys tend to be by rail.

Commuting journeys to Inner London are less likely than those to Central London to originate from beyond the M25. Car is equally favoured from any area within the M25 boundary for journeys to Inner London. Commuting to Outer London is predominantly from residences within Outer London, and car is the most favoured mode. Commuting to the Outer Metropolitan Area (up to 30 km beyond the M25) tends to be to local employment centres in such places as Reading, Southend-on-Sea and Crawley/Gatwick. Car is the dominant commuting mode, but bus has a presence for shorter trips within the area.

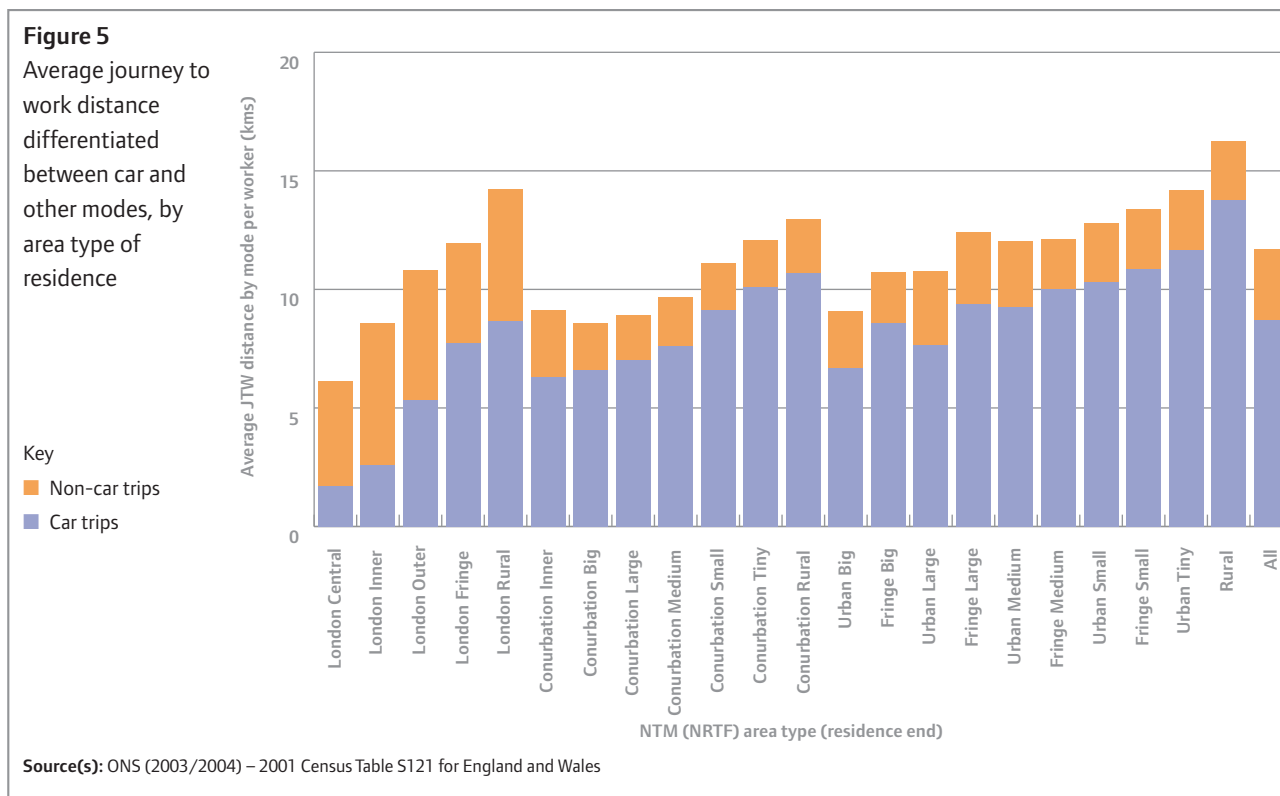
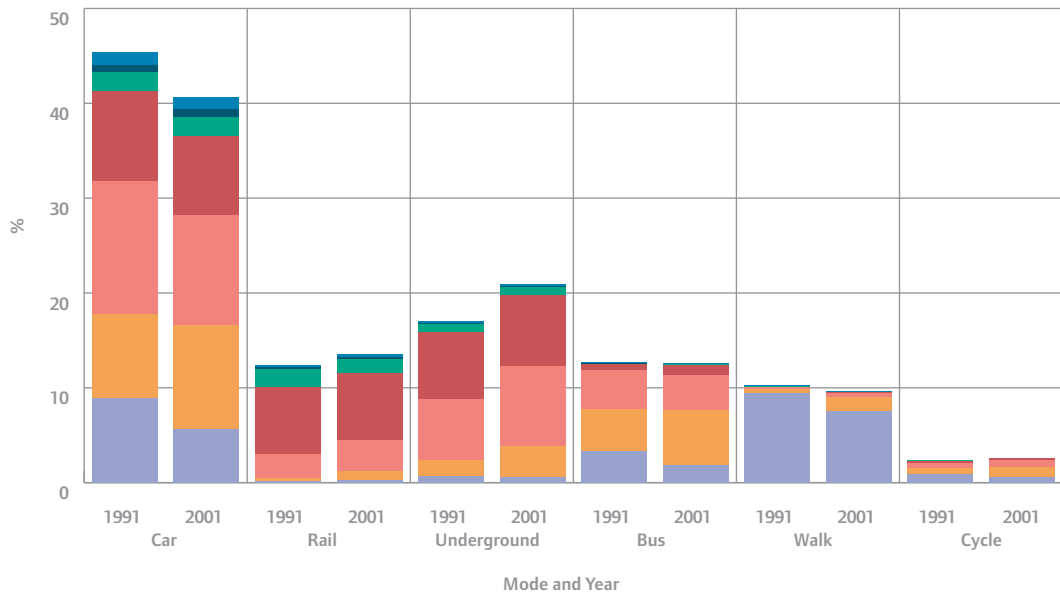


Figure 6
Percentage of trips by mode and distance band for London residents 1991 and 2001

Key

- >40K
- 30-40km
- 20-30km
- 10-20km
- 5-10km
- 2-5km
- <2km



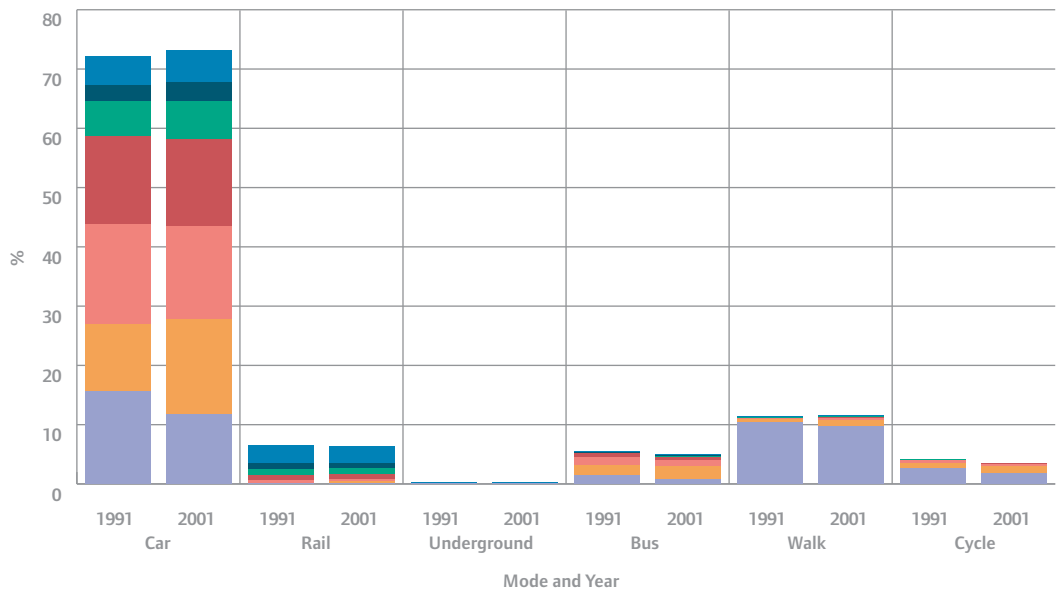
Source(s): Census 1991 and 2001

The study devoted particular attention to commuting from and within Essex and Berkshire. It found an East-West divide: counties to the west of London have a larger supply of jobs, in relation to the size of the resident workforce, than counties to the east. Consequently, there are far more commuting journeys to London from Essex than from Berkshire, and commuting from

Figure 7
Percentage of trips by mode and distance band for residents in the wider South East (excluding London) 1991 and 2001

Key

- >40K
- 30-40km
- 20-30km
- 10-20km
- 5-10km
- 2-5km
- <2km



Source(s): Census 1991 and 2001

Essex is predominantly to Central London (mainly by rail or Underground) and, to a lesser extent north-east London (mainly by car). In both Essex and Berkshire there are clusters of commuting journeys to the main urban centres in each county. These bulk larger in Berkshire than in Essex. There is, in particular, a cluster of journeys to workplaces close to the M25 ring, many connected to Heathrow.

The analysis also discovered some striking differences between 1991 and 2001 in the mode of journey to work for residents of Greater London (see **Figure 6**). In those ten years the proportion travelling to work by car fell by five percentage points, while the proportion commuting by Underground rose by four points. There was also a rise in rail usage for commuting. Outside Greater London, however, there was virtually no change in the shares of each transport mode (see **Figure 7**).

Earlier Studies (mainly by the National Travel Survey for Great Britain) had established that the average length of journey to work has been rising for many years (see **Table 2**). This can be correlated with the finding that professionals and, more generally, those in higher-income occupations tend to commute over longer distances. There has been an increase in the absolute numbers and proportions of such jobs in the Wider South East. While these facts would suggest that the average length of commuting journeys will continue to increase, two factors at least have been working in the opposite direction and are likely to continue to do so. The first is the rise in London's population and the growing professionalisation of the inner city as a place of residence. The other is the importance of immigration as a source of higher-skilled workers in London. There is evidence that these two factors in combination are substituting to some extent for commuting into Inner and Central London. Our forecasts under all of the five future scenarios (summarised immediately below, and described in detail in Chapters 4 and 5 of the full report) show a slight decline in the length of commuting journeys by 2016.

Commuting patterns 2001-2016

Following the analyses of commuting patterns and of changes between 1991 and 2001, the study then turned to making forecasts of future commuting patterns under five different scenarios of employment growth to 2016 and 2021:

- The London Plan
Two East of England variants:
- The Enhanced Growth 2021 Scenario
- The Regional Spatial Strategy Scenario
- South East Experian Forecast Scenario (SEEF)
- Cambridge Econometrics' forecasts based on the CE forecasting model, RMDM

Employment forecasts were made under each of the five scenarios. This involved: building a detailed sub-regional database framework for assessing labour market balances across the Wider South East; establishing a labour markets database for districts in the Wider South East; generating estimates of resident and non-resident employment for districts in the Wider South East. Employment forecasts (jobs) were subsequently modelled as 'Census workplace populations' by reference to industry sectors. This critical step was required to enable 'employed residents', (as derived from population forecasts) to be set against 'workplace populations' as defined in the Census. The 'zones' used for the commuting model became increasingly large as distance from London increased, involving the aggregation of districts in some counties.

						Period	Growth rate
		1985/86	1989/91	1998/2000	2002	2003	1985-2003
Trends in characteristics of journey to work trips in Great Britain	Distance (kms)	9.8	12.0	13.4	13.6	13.6	39%
	Distance growth/annum	-	4.6%	1.3%	0.4%	0.0%	2.2%
	Time (minutes)	22	24	24	25	26	18%
	Speed (kms/hour)	27	30	34	33	31	18%
	Speed growth/annum	-	2.5%	1.3%	-1.0%	-3.8%	1.0%

Source: National Travel Survey of Great Britain (DfT, 2004)

The database was divided into 48 segments. The segments were constructed by combining three characteristics:

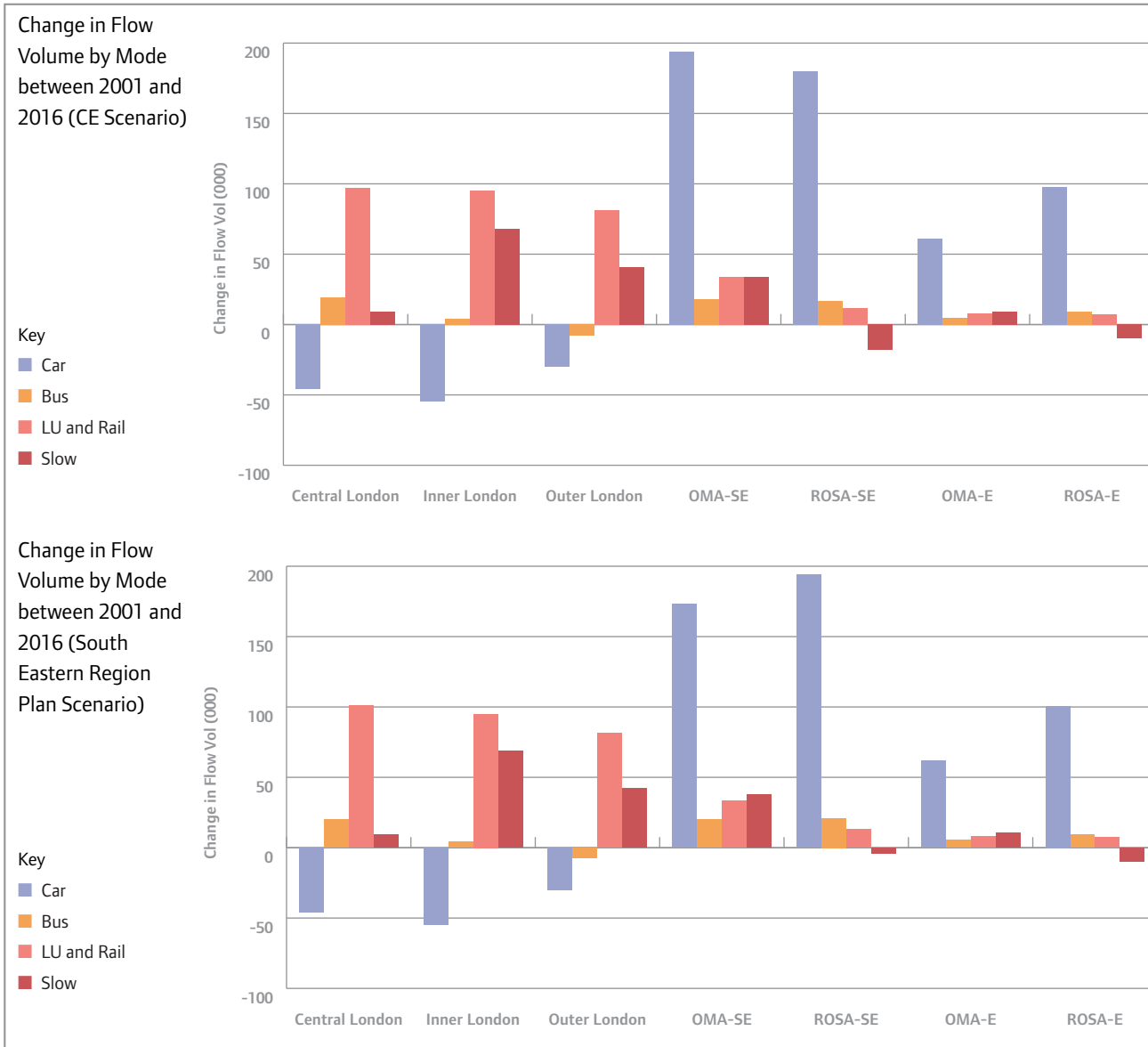
- Industry Type: 12 aggregate codes for Standard Industrial Classification (SIC 92)
- Gender: male/female
- Employment type: full/part-time.

The employment forecasts were combined with WSP's LASER land-use transport model. This model has two components: a doubly-constrained trip-distribution model that estimates the overall matrix of commuter flows between pairs of zones based on the generalised time of transport, and a logit discrete-choice model that subdivides these flows into the main modes used between each zone pair.

The result was an operational, calibrated model of commuting flows for 2001 and 2016 covering London, the South East and the East of England. The model was then used to examine the impacts on patterns of commuting under each of the five scenarios.

The report presents and compares the results for 2016 under all five scenarios and across the three regions of the Wider South East. It also examines in detail the projections for each region based on the Regional Spatial Strategy for that region.

The scenarios



London had a 15% excess of workplaces over resident labour force in 2001. The projected percentage growth in the labour force resident in London is more rapid than the percentage growth in the numbers in employment in workplaces within London. This lessens the proportionate increase in commuting into London from outside in all scenario projections to 2016. The London Plan Scenario includes the highest growth in workplaces and implies an absolute increase in net in-commuting volume.

In outer London, workforce growth is projected to grow significantly faster than jobs; while further commuting to central London will occur, a continuation of the 1991-2001 increase in out-commuting to locations where strong employment growth in the Outer Metropolitan Area is forecast (to west, south-west and north-west of London) appears likely.

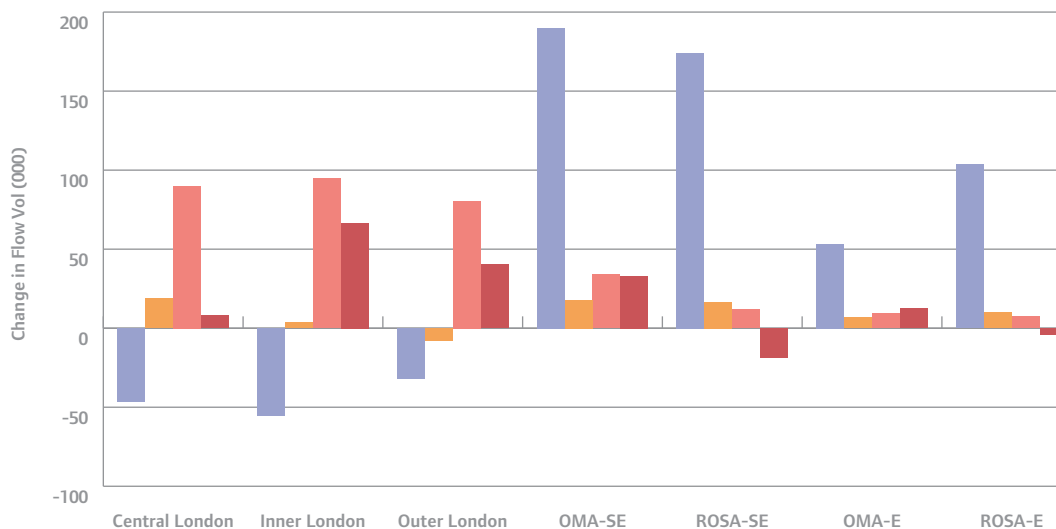
Change in Flow Volume by Mode between 2001 and 2016 (London Plan Scenario)

Key
 Car
 Bus
 LU and Rail
 Slow



Change in Flow Volume by Mode between 2001 and 2016 (Eastern Region Plan Scenario)

Key
 Car
 Bus
 LU and Rail
 Slow



Although the model assumes substantial increases in rail and underground capacity around and within London, a considerable growth in demand for these modes is forecast as a result of population and job increases in urban centres. Consequently, rail overcrowding on commuter journeys to and from Central London is expected still to be a major issue in 2016.

Within the South East there was a 5% excess of resident labour over workplaces in 2001. This imbalance has reduced from previous decades due in part to the recent and rapid increase in employment in areas west of London. In each of the scenarios for 2016 the rate of growth of workplaces within the South East is greater than that of resident labour, so that the past excess of resident labour in the region has largely been cancelled out by 2016. Resident labour and the number of workplaces are broadly in balance by 2016 in the South East under all scenarios, but most of all under the South East Experian Forecast Scenario.

- The East of England had an 8% excess of resident labour over workplaces in 2001, a greater excess than in the South East. Under the Enhanced Growth and the CE scenarios the resident labour force is forecast to grow more rapidly than the workplaces in the East of England. This implies a greater level of net out-commuting in 2016 than in 2001. In contrast net out-commuting is reduced in 2016 within the East of England RSS scenario which depicts job growth in the East of England outstripping growth in the number of employed residents.
- Under all the scenarios net in-commuting to the Wider South East as a whole increases from its level of 1.4% in 2001, and the greatest increase is to 2.1% in the London Plan Scenario.
- In general there is not expected to be major change in overall trip lengths under any of the scenarios. Under each there is a small increase in part-time trip lengths and a small decline in full-time trip lengths. This results in a slight decline overall in trip lengths. This forecast, it should be noted, represents a reversal of the historic trend of growth in commuter trip lengths. The net overall decline in trip lengths is smallest under the London Plan Scenario.
- The greatest absolute and proportional increase in the resident workforce under all scenarios is within the London region, which is also the region in which average commuting trip lengths in the 2001 Census are one-third less than those for residents in either the South East or the East.
- There are strong increases in the use of rail/LU by residents in almost all areas by 2016. The exception is for residents in the Outer Metropolitan Area of the South East, especially in the south-west quadrant outside London, where the growth in local jobs reduces the need to commute into Central London. The number of trips by slow modes also increases substantially because of increases in local employment. This is also the case for London residents.
- In the Wider South East the overall commuter distance travelled by car decreases by 5% in 2016. There is a 31% increase in passenger kilometres by rail and Underground and a 15% increase in bus kilometres.
- The SEEF Scenario has a greater proportion of its job growth in the outer part of that region than the other three scenarios. This shifts some of the growth in commuting travel by car further outwards beyond the Outer Metropolitan Area to the rest of the South East, and also offsets the decline in slow modes of commuting.

