

SluB 1998

MAKING USE OF POPULATION PROJECTIONS
IN TRANSPORT ANALYSIS

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WORKING PAPER 95/03

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ABSTRACT

Forecasts of the growth in transport demand which underpin the planning of new transport infrastructure generally make very simple assumptions about the future numbers and geographical distribution of the population making trips. This paper builds and evaluates a methodology for linking official population projections for subnational areas with the survey data necessary to predict transport demand. This involves reconciling the administrative geography used in demographic analysis with the settlement typology used in national travel surveys. At the end of the paper a brief account of the official forecasts for settlement types is provided.

MAKING USE OF POPULATION PROJECTIONS IN TRANSPORT ANALYSIS

1. INTRODUCTION

The planning of transport infrastructure requires as one ingredient sets of forecasts of transport demand. One of the factors that influences transport demand is the composition of the population in terms of person types, with considerable variation in trip making and trip distances between persons by age, sex, economic position, car availability and income (Siu et al 1994). Normally, attention is paid to the way trip rates for each person category are changing as a result of income or car availability changes. However, the age and sex structure of the population is also changing and may have influence on future trip making. Also of potential importance is the redistribution of the population over time, predominantly in the direction of lower density areas, which can have very different model mixes from higher density areas.

This paper describes work that attempts to link conventional category analysis based trip forecasting with knowledge of the changing demographic and geographic make-up of the British population. This should, in principle, be an easy task. Trip rates and trip mileages can be computed from one or more National Travel Surveys (NTS) for a highly diagnostic person classification. These trip rates are then trended or a scenario developed, and the forecast trip rates or mileages applied to the forecast population in each category to yield forecasts of the number of trips to be expected in the future, under the assumptions used in the two component forecasts. The 1985/86 NTS dataset is used in this study.

However, it turns out that there is relatively little to link the 1985/86 NTS sample with official forecast populations. Only two variables were common to both data sets - age and sex. Both contained geographic classifications - planning regions (P2) and settlement types (P5) in the NTS and administrative areas in the demographic projections. The matching of planning regions (P2) with the constituent administrative areas was straightforward but relatively little variation in trip making is accounted for by such geographic classification (besides compositional effects). Much more important is the settlement type (P5) classification of the NTS which recognises the sizes of the settlements in which members of the interviewed sample lived. The question asked was therefore whether a method could be developed to use the information contained in the projection of settlement type populations.

Specifically as part of a research project (Ref. No: L119251915) being undertaken under the Economic and Social Research Council (ESRC) Transport and the Environment initiative in the Institute for Transport Studies (ITS) at the University of Leeds, a need was identified to be able to transform the official mid-1989 based population projections for England, Wales and Scotland official into four area types defined in the National Travel Survey (NTS) 1985/86. The four area types are:

- (1) 'London' (includes Inner and Outer London)
- (2) 'Other Conurbations' (includes West Midlands, Greater Manchester, West Yorkshire, Glasgow, Liverpool and Tyneside)
- (3) 'Urban' areas (population over 25,000)

- (4) 'Rural' areas (includes urban areas between 3,000 to 25,000 of population and rural areas of population under 3,000)

The objectives of this paper are two:

- (1) to explain and critically evaluate the methods used to transform official OPCS subnational projections for one set of general areas into subnational projects for a transport relevant set of areas (i.e. the four broad area types defined in NTS 1985/86);
- (2) to present the projected populations for these new areas and for transport relevant age/sex/groups, interpreting and analysing the likely impact on transport demand or demographic developments.

2. THE GEOGRAPHIC TRANSFORMATION PROBLEM

It will be useful to develop a formal account of the problem of geographic transformation we are faced with. We have a vector of populations \mathbf{p} classified by administrative area i which needs to be transformed into a vector \mathbf{p} of populations classified by settlement type u .

$$\mathbf{p}^u \leftarrow \mathbf{p}^i \quad (1)$$

where the arrow signifies the transformation to be achieved. If the administrative areas could be aggregated into settlement types, then *aggregation* of the P population elements would suffice

$$P^u = \sum_i P^i \quad (2)$$

Unfortunately, none of the administrative areas fit into settlement types. The two classifications overlap in a complex way.

A second method might be to use *overlap* analysis (a technique used in the analysis of geographical information systems). However, this would only work if the distribution of population inter-administrative areas were uniform with respect to the settlement type classification. In fact, the distribution is highly uneven, so this method could not be used.

The third set of methods involves deviation of a set of conditional probabilities that the population of administrative areas fell into the settlement type categories. If such a matrix of probabilities could be devised then the transformation could be effected by multiplying the administrative area population by the conditional probabilities and summing

$$P^u = \sum_i p(u|i)P^i \quad (3)$$

where $p(u|i)$ is the conditional probability of a person being in settlement type u given residence in area i . What was needed therefore was a data source from which the conditional probabilities could be computed

$$p(u|i) = K(u,i) / \sum_u K(u,i) \quad (4)$$

where K represents a population. Several alternative 'populations' were used to derive the conditional probabilities (the details are described below).

The transformation method specified in equation (3) does make the assumption that the conditional probabilities are time-independent. It is likely that the distribution of population across settlement types within administrative areas will change over time just as the distribution of population across administrative areas changes, particularly in the direction downwards in the settlement hierarchy. No direct evidence of the magnitude of such shifts is available but it is possible to introduce shifts in the probabilities if required.

$$P^u(t) = \sum_i p_i(u|i)P^i(t) \quad (5)$$

A final assumption that this methodology involves is that the conditional probabilities for the all age/sex population apply uniformly to each age/sex group. This assumption could be relaxed by using detailed age-specific population data to compute the conditional probabilities.

The next section of the paper, Section 3, discusses the specific data sources used for measuring travel demand, population projections and deriving the conditional probability inputs needed.

3. DATA SOURCES

The primary datasets used for the study are (Table 1):

- (1) The National Travel Survey (NTS) conducted in 1985/86 by the Department of Transport (DoT) and deposited with the ESRC Data Archive at the University of Essex;
- (2) The mid-1989 based population projection data obtained from the Office of Population Censuses and Surveys (OPCS) and other bodies for all local areas in Great Britain in single year of age by sex and age for the year of 1989 to a variety of projection years;
- (3) The 1981 Census for Local Authorities and for Urban Areas in Great Britain.

3.1 The National Travel Survey data for 1985/86

The NTS is a nationally representative sample of 25,785 interviews carried out for the Department of Transport and made available for academic analysis via depositor ESRC Data Archive. The data are now ten years old and another NTS surveys (1989/91 and 1991/93) have been completed, but at time of carrying other research, these had not been released for academic use. The 1985/86 NTS data have been used in an extensive category analysis of trip rates and trip mileages (Siu et al 1994).

3.2 The Subnational Demographic Projections

Three organisations are responsible for carrying out subnational projections in Great Britain.

The Office of Population Censuses and Surveys (OPCS) is responsible for producing projections for 108 local areas in England. The Welsh Office (WO) produces projections for the 8 county populations of Wales, while the General Register office (Scotland) (GRO(S)) carries out the projections for the 12 Scottish Regions and Island Areas. OPCS uses a

methodology that incorporates an analysis of the migration flows between the 108 areas, while WO and GRO(S) use simpler net migration terms tacked on to the normal cohort-component model. All three projections are controlled to the respective country projections produced by the Government Actuary's Department and OPCS in collaboration. National trends in fertility, mortality and international migration are used with appropriate differentials. However, for internal migration reliance is placed almost exclusively on the migration patterns of the 1981 Census. Revision of these projections to incorporate 1991 Census migration results came too late for incorporation in our forecasts.

The mid-1989 based population projection data was obtained in mid-1993 from the relevant offices of England, Wales and Scotland by sex and age for all regions for all years from 1989 to the latest available projection end-year. The following operational problems were encountered in integrating the projections data in our analysis.

3.2.1 Inconsistent computer formats

The three demographic offices supplied data in their own format which needed modification on incorporation into one large database for Great Britain. Work was done on creating this particular population projection database in Lotus 1-2-3 for Windows® computer readable format. The established population projection data base is by sex and age for each year for the countries, metropolitan and districts and London Boroughs in England, the counties in Wales and Scottish Regions and Island Areas in Scotland.

3.2.2 Inconsistent projection end-years

The three demographic offices end their projections in different years. The year 2006 is adopted as the projection end-year for England, Wales and Scotland for simplicity. This gives a reasonable period of 16 years for the purposes of modelling and projection. In this study, a very simple extrapolation is used to project the existing data from the base year to the specified projection end-year where this falls short of 2006. The extrapolation is mainly based on computing the proportional shares of district population by age and gender among a specific region in the base year and the computer figures are used to estimate the population projections for the subsequent projection years, assuming a constant rate of increase. For instance, for Scotland the population projection data are supplied only to the year of 2001 by the General Register Office for Scotland (GRO(S)). We need estimate data from the years of 2002 to 2006. In this case, work is done on computing the percentage change of population by age and gender for each respective district in Scotland from 2000 to 2001. Based on the year 2001, populations in the subsequent projections years are then calculated assuming a constant rate of increase/decrease.

3.3 The 1981 Census data on urban areas and local authorities

The settlement typology used in the NTS derives from a typology for classifying the built up areas of the country into urban areas of different sizes developed by the Department of the Environment (DoE) and implemented for the 1981 Census of Population by OPCS and GRO(S). A similar exercise is underway for the 1991 Census but, at the time of writing had not been completed. The published volume (OPCS 1984b) from the 1981 Census contains lists of settlements (urban areas) and their associated populations. Aggregation of the

populations in urban areas by the 4 settlement types used in the NTS (Section 1) for each administrative area can be used to product the doubly classified populations needed for the computation of the conditional probabilities needed.

The population data for local authorities (OPCS 1984a) are used to derive rural area populations (part of settlement type category 4) by subtraction.

We now describe three methods for deriving the conversion matrix of conditional probabilities.

4. METHODS FOR COMPUTING THE CONVERSION MATRIX

4.1 Method 1: use of the NTS sample numbers

The 1985/86 NTS provides a crosstabulation of respondents (Table 2) by a 15 Planning Region classification (the variable labelled P2) and a 14 Area Type classification (the variable labelled P5). Method 1 is simply to use the 1985/85 NTS sample numbers to derive the conditional probability. Dividing each table element by its row sum provides the necessary matrix of conditional probabilities. Table 3 contain the conditional probabilities of area type given residence in planning regions. Table 4 present the conditional probabilities for the 4 settlement types. The projected populations for the OPCS 126 sub-national units were summed to yield totals for the 15 planning regions into which they sum exactly. Multiplication of the planning region populations by the conditional probabilities produces estimates of projected populations by the NTS area type.

Method 1 is easy to use and the data needed can directly be obtained from the NTS which is useful when up-to-date population datasets for urban and rural areas are not obtainable. However, the drawback with this method is its reliance on the distribution of sample numbers across the non-zero cells of the planning region by NTS area type table. It was felt that there could be considerable divergence of the sample probabilities from the true population parameter because of the small size and clustered nature of the sample in any one planning region.

4.2 Method 2: use of the 1981 Census of Population urban area populations grouped by planning region

Method 2 is designed to rectify the drawback of Method 1. According to the National Travel Survey 1985/85 Document (pp 245-246), the survey area types were derived originally from the classification by the Department of the Environment (DoE) and OPCS of the Great Britain population into urban areas (OPCS 1984) using population data from the 1981 Census.

The procedure used in this method was to compile a list of the urban areas and their 1981 Census usually resident populations from the tables provided in OPCS (1984). Through map inspection each urban areas was placed into a planning region; through inspection of the population size each area was placed into an area type. The populations of each planning region-area type combination could then be computed through aggregation and placed in the

appropriate cell of the two way table and hence used to compute the conditional probabilities. One additional operation was needed to derive the final NTS area type, that of 'rural' areas. The rural area populations were computed by subtracting the sum of urban type populations from the population total for the planning region. Tables 5, 6, 7 8 and 9 shows the computed results of this method for the 1981 population.

4.3 Method 3: use of the 1981 Census of population urban area populations grouped by sub-national units used with projection

Careful inspection of the results produced using Method 2 revealed a couple of important problems.

The first problem was that of rather heterogeneous groupings of the sub-national units into planning regions. For example, the method produced a probability that a person living in Yorkshire and Humberside's metropolitan counties would reside in the West Yorkshire built-up area. This probability is, of course, very different for a person living in West Yorkshire metropolitan country (very high but not quite one) from a person living in South Yorkshire metropolitan county (the other constituent of the planning region for which the probabilities would be zero).

The second problem was the assumption that urban areas fell entirely inside only one planning region. In fact, there were a number of instances where urban areas overlapped two planning regions. For example, the Coventry-Bedworth urban area falls in to the West Midlands metropolitan county and in the West Midlands region remainder (see Figure 1).

Because of the problems as mentioned above, further refinements of method 2 are required. To solve these problems, work was carried out to compute a matrix of populations and conditional probabilities for a full 126 sub-national unit by 4 area type table. This makes maximum use of the available data. The list of urban areas to be classified by sub-national unit and NTS area type will be extended by including all urban sub-areas in the OPCS tables and by assigning appropriate weights to double entry of urban areas or sub-areas where they overlap two sub-national units. In effect, we construct what is known as, in the Geographical Information Systems (GIS) field, as a 'Gazetteer file' at the level of the smallest building block available in the OPCS tables.

Table 10 lists the derived urban/local area population ratio for the 4 NTS area type using 1981 population data for the local authorities and urban areas. Tables 11 and 12 report the computed results using the refined method 3.

5. PROJECTED POPULATIONS BY THE FOUR NTS CATEGORIES

Tables 11, 12 and 13 report the of a study of converting the mid-1989 based population projections to four NTS area types (i.e. 'London', 'Other Conurbations', 'Urban', and 'Rural') and seven age/sex groups.

5.1 Comparison of 1989 and 1992 based projections

Before discussing the nature of the population changes forecast and their implications for trip making, it is useful to compare these 1989 based projections with more recent projections that use the mid-1992 population as a base. The 1989 based projections predict a Great Britain population of 58.334 millions in 2006 while the mid-1992 based projections raise this figure to 58.923 millions, an increase of 589 thousand (OPCS 1995, Table 2, p45). This increase is in small part accounted for by an upward revision of the population estimate base consequent on the 1991 Census of some 22 thousand. But the major reason for the upward revision is the improvement in elderly mortality assumptions that reflect better survival chances in late middle and early old age. Because the extra population will be old this will reduce the impact of the upward revision on trip mileage rates in the future. The 1989 based projection foresees 4.7% population growth to 2006 while the 1989-2006 growth implicit in the 1992 based projection is 5.6%.

5.2 The shifts in population across area type

Table 11 shows that the population is projected by the Census Offices to continue to shift in long established ways from higher density areas to lower. The share of the population in 'Rural' areas (small urban places between 3,000 and 25,000 and non-urban areas) continues to increase from 30.0% of the GB population in 1989 to 31.1% in 2006. The 'Urban' area type population share also increases but only from 43.0% to 43.4%. 'Other Conurbations' lose population share, moving from 14.9% to 13.8% of the GB population. 'London' also loses share from 12.0% to 11.7%, but does experience population growth, while the 'Other Conurbations' actually lose population. These shifts are in the direction of encouraging further growth in trip making and mileage because households in rural areas have much higher than average trip mileage rates.

5.3 The pattern of change by age/sex group

The pattern of age/sex group change is more complicated. The under 16 age group is projected to grow both absolutely and in share of the population from 20.0% to 20.8%. This is a result of the increase in the population at risk in the childbearing ages over the period (a baby boom echo effect) combined with an assumption of some recovery in fertility rates towards replacement. In the 1989 based projections it is assumed a total fertility rate of 2.1 is achieved, though in subsequent projection this ultimate level has been lowered to 2.0 (in 1991) and 1.9 (in 1993), as no signs of a fertility rate reprise have appeared.

Both males aged 16-29 and females aged 16-29 experience substantial declines in all area types over the 1989-2006 period as the baby boom cohorts (1957-1971) move entirely out of this age range by 2006. The flip side is a substantial increase in the 30-59 age group for both sexes as these larger cohorts move into the older workin ages.

The pattern of change for the elderly (60+) differs a little between the sexes. While males age 60+ experience gains of 5.6%, females experience some losses in intermediate years and an overall gain in 1989-2006 of only 0.9%. The explanation of this divergence of male and female trends is rooted in their different recent and assumed future mortality experience. Male death rates at ages 45-74 have been improving considerably faster over the last quarter century than those for women, though of course female mortality is still much lower at any given age. Table 14 sets out selected male and female mortality rates in 1971 and 1992. The percentage improvement in males mortality is between 7 and 12 percent more than that for females. The bottom part of the table suggests why this might be occurring. Males reduced their smoking earlier than women and this has resulted in later decreases in lung cancer rates. Ischaemic heart disease rates are also falling for males. For women the cohort of heavy smokers is now entering vulnerable ages and lung cancer and heart disease rates are on the increase. Although most other causes of death are in retreat, the table picks out two serious epidemics of cancer among men (prostate) and women (breast) which are still on the increase, the latter despite extensive screening and awareness campaigns.

5.4 The combined pattern of area type and age/sex change

5.4.1 NTS Area Type 1: 'London'

From 1989 to 2006, the 'London' population is projected to rise from 6.7 million in 1989 to 6.8 million in 2006, i.e. increasing by 1.76% within this period. In terms of population compositions, the figures show that there is a rapid decline in population between ages 16 and 29, and age 60 or over. In general, the decrease in these two age groups are 14.6% and 14.4% respectively. However, it is notable that the decline for females in London is significantly higher than for male counterparts for ages 60 and over. From 1989 to 2006, the decrease is 16.97% for females and 6.45% for males. For the age group 16-29, the decrease is 13.05% for males and 16.19% for females. For ages 15 and under, there is an increase of population by 16.4% over the projection years.

5.4.2 NTS Area Type 2: 'Other Conurbations'

From 1989 to 2006, population in 'Other Conurbations' is projected to fall from 8.3 million in 1989 to 8.0 million in 2006, i.e. by 2.96%. In terms of population compositions, the population analysis shows that there is a significant decline in population between ages 16 and 29 for both males and females. The male population between ages 16 and 29 declines by 24.38% and the female population falls by 25.04%. For ages 60 or over, the decline for the female population is 9.21% and for the male population 2.16%.

5.4.3 NTS Area Type 3: 'Urban'

Contrary to the 'Other Conurbations' area type, the population in 'Urban Area' is projected to rise from 23.99 million in 1989 to 25.29 million in 2006, i.e. by 5.43%. In terms of the structure of age and sex, population between ages 16 to 29 falls by 18.65% (-17.48% for males and -19.85% for females). For people age 60 or above, there is an increase of the population of 9.60% (14.92% for males and 5.74% for females). From our findings, it is notable that the increase of males aged 60 or above is significantly higher than females in the

same age group. For all the other age groups, there is, in general, an increase of population by 7.82% for age 15 or under, and a rise of 15.81% for age group 30-59.

5.4.4 NTS Area Type 4: 'Rural'

In 'Rural Areas', there is an increase of the overall population of approximately 8.51% for all ages. In terms of age and sex compositions, there is a decrease of total population between ages 16 to 29 (-15.91% for males and -8.72% for females) while all the other age groups experience different rates of increase. In particular, the increase of males aged 60 or above is almost three times greater than for females in the same age group (15.50% for males and 5.63% for females).

6. CONCLUSIONS

In this paper, three different methods used to transform official OPCS 1989-based subnational projection data for use in transport analysis were examined and the findings of the third transformation method were reported. A good deal of effort was expended on successively improving the way in which official projection results were converted into results of greater significance for transport analysis.

Is the future demographic and geographic evolution of the GB population going to have an impact on transport demand, that is, on trip making and trip distances covered? It is useful here to carry out some very simple calculations to get a feel for the likely order of magnitude of the effects. A more detailed analysis is in preparation. Table 15 sets out the computation of a set of trip indicators which approximate the way in which trip making varies across the Area Types and age/sex groups used in our analysis.

- (1) Population change alone, holding other things constant will add 4.7% to trip making.
- (2) The shift to lower density settlements is likely to have an additional small effect, but only of about 0.3%.
- (3) The changes in population age structure may well have a countervailing effect as population shifts from the most mobile ages to less mobile ages, but this is probably only going to be of the order of -0.8%.

These changes in trip mileage rates are very small compared with the changes in annual trip mileage per person of 25 percent or so that have occurred between the NTS Survey of 1985/86 (used in this study) and that of 1991/93. Our conclusion must be that future spatial population dynamics in Great Britain will have only marginal effects on the number and length of trips that are made in 2006.

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Table 1: Primary data used in the study

Dataset	Data Source	Study Area	Period Covered	Data Used
NTS data 1985-86	ESRC Data Archive at the University of Essex. Data depositor: DoT.	Great Britain	12 full months in 1985/86.	Variables of area, household, individual and journey records.
Mid-1989 Based Population Projection Data	OPCS WO GRO(S)	Great Britain	England: 1989-2015. Wales: 1989-2008. Scotland: 1989-2001.	Population projection data by sex, age and locations in single years.
Census 1981: Key statistics for urban areas	OPCS	Great Britain	1981	Usually resident Population for urban areas in 1981.
Census 1981: Key statistics for local authorities	OPCS	Great Britain	1981	Usually resident Population for local authorities in 1981.

Abbreviations:

NTS = National Travel Survey
ESRC = Economic and Social Research Council
DoT = Department of Transport

OPCS = Office of Population Censuses and Surveys
WO = Welsh Office
GRO(S) = General Register Office (Scotland)

Table 2: The 1985/86 NTS sample numbers by planning region (P2) and area type (P5).

	1	2	3	4	5	P5	Area	Type	8	9	10	11	12	13	14	Row Totals
P2 Planning Region Names	Inner London	Outer London	West Midlands Built-up	Man- chester Built-up	West York- shire Built-up	P5	Area	Type	8	9	10	11	12	13	14	Row Totals
1 Northern (Metropolitan)	0	0	0	0	0	0	0	0	453	0	0	95	0	0	0	548
2 Northern (Non-Metropolitan)	0	0	0	0	0	0	0	0	0	198	0	0	250	100	183	961
3 Yorkshire/Humbershire (Metropolitan)	0	0	0	0	742	0	0	0	0	339	133	62	0	362	0	1638
4 Yorkshire/Humbershire (Non-Metropolitan)	0	0	0	0	0	0	0	0	0	180	78	143	0	144	220	765
5 East Midlands	0	0	0	0	0	0	0	0	0	468	340	40	370	607	107	1932
6 East Anglia	0	0	0	0	0	0	0	0	0	0	287	79	0	327	229	922
7 South East (excluding London Boroughs)	0	560	0	0	0	0	0	0	0	589	972	920	352	829	737	4959
8 London Boroughs	882	1860	0	0	0	0	0	0	0	0	0	0	0	0	0	2742
9 South West	0	0	0	0	0	0	0	0	0	511	83	231	133	718	376	2052
10 West Midlands (Metropolitan)	0	0	969	0	0	0	0	0	0	73	0	0	0	0	104	1146
11 West Midlands (Non-Metropolitan)	0	0	27	0	0	0	0	0	0	174	0	310	32	259	335	1137
12 North West (Metropolitan)	0	0	0	1051	0	0	0	247	0	202	97	89	54	192	0	1932
13 North West (Non-Metropolitan)	0	0	0	0	0	0	0	0	0	187	377	151	111	192	113	1131
14 Wales	0	0	0	0	0	0	0	0	0	261	52	253	104	524	166	1360
15 Scotland	0	0	0	0	0	0	346	0	0	166	197	128	325	1094	304	2560

Source:

The Department of Transport, National Travel Survey: 1985/86.

Total sample size = 25785.

Table 4: Computed conditional probabilities for the 4 NTS area types using the 1985/86 NTS sample numbers (Method 1).

		The 4 NTS Area Types				
		1	2	3	4	
P2 P2 Planning Region Names		'London'	'Other Conurbations'	'Urban'	'Rural'	Row Totals
1 Northern (Metropolitan)		0.00	0.83	0.17	0.00	1.00
2 Northern (Non-Metropolitan)		0.00	0.00	0.57	0.43	1.00
3 Yorkshire/Humbershire (Metropolitan)		0.00	0.45	0.33	0.22	1.00
4 Yorkshire/Humbershire (Non-Metropolitan)		0.00	0.00	0.52	0.48	1.00
5 East Midlands		0.00	0.00	0.63	0.37	1.00
6 East Anglia		0.00	0.00	0.40	0.60	1.00
7 South East (excluding London Boroughs)		0.11	0.00	0.57	0.32	1.00
8 London Boroughs		1.00	0.00	0.00	0.00	1.00
9 South West		0.00	0.00	0.47	0.53	1.00
10 West Midlands (Metropolitan)		0.00	0.85	0.06	0.09	1.00
11 West Midlands (Non-Metropolitan)		0.00	0.02	0.45	0.52	1.00
12 North West (Metropolitan)		0.00	0.67	0.23	0.10	1.00
13 North West (Non-Metropolitan)		0.00	0.00	0.73	0.27	1.00
14 Wales		0.00	0.00	0.49	0.51	1.00
15 Scotland		0.00	0.14	0.32	0.55	1.00

Abbreviations:

'London' = Inner & Outer London.
 'Other Conurbations' = West Midlands, Greater Manchester, West Yorkshire, Glasgow, Liverpool and Tyneside.
 'Urban' = population over 25,000
 'Rural' = urban areas between 3,000 to 25,000
 of population and rural areas of population under 3,000

Table 5: The 1981 Census population classified by planning region (P2) and area type (P5) (Method 1).

	1	2	3	4	5	P5	Area	Type	8	9	10	11	12	13	14	Row Totals
P2 P2 Planning Region Names	Inner London	Outer London	West Midlands Built-up	Manchester Built-up	West Yorkshire Built-up		6	7	Tyneside Built-up	Other urban over 250K	Other urban over 100K to 250K	Other urban over 50K to 100K	Other urban over 25K to 50K	Other urban over 3K to 25 K	Rural	
1 Northern (Metropolitan)	0	0	0	0	0	0	0	0	776364	0	201008	52387	27786	0	77955	1135500
2 Northern (Non-Metropolitan)	0	0	0	0	0	0	0	0	0	381456	0	335098	244320	93452	877574	1931900
3 Yorkshire/Humbershire (Metropolitan)	0	0	0	0	0	1467412	0	0	0	634618	258810	176659	67929	20200	688072	3313700
4 Yorkshire/Humbershire (Non-Metropolitan)	0	0	0	0	0	0	0	0	0	322144	259689	197341	28426	0	689200	1496800
5 East Midlands	0	0	0	0	0	0	0	0	0	998170	526721	183697	536478	130011	1407023	3782100
6 East Anglia	0	0	0	0	0	0	0	0	0	0	525877	121226	67886	47139	1083172	1845300
7 South East (excluding London Boroughs)	0	0	0	0	0	0	0	0	0	1361442	1730832	2017212	1276298	313634	3245182	9944600
8 London Boroughs	2425600	4183000	0	0	0	0	0	0	0	0	0	0	0	0	0	6608600
9 South West	0	0	0	0	0	0	0	0	0	836539	570431	327334	344234	154318	2019044	4251900
10 West Midlands (Metropolitan)	0	0	2338841	0	0	0	0	0	0	289559	0	0	0	0	0	2628400
11 West Midlands (Non-Metropolitan)	0	0	0	0	0	0	0	0	0	373653	0	776587	223353	68010	1028597	2470200
12 North West (Metropolitan)	0	0	0	2319558	0	0	0	747772	0	280568	350358	141421	88604	65683	84536	4078500
13 North West (Non-Metropolitan)	0	0	0	0	0	0	0	0	0	258929	667497	529208	156413	45790	626563	2284400
14 Wales	0	0	0	0	0	0	0	0	0	577008	115896	196666	471308	66389	1322333	2749600
15 Scotland	0	0	0	0	0	0	754586	0	0	408822	359051	471453	747421	185899	2108068	5035300

Table 6: Computed conditional probabilities for the 14 area types (P5) using the 1981 Census population data (Method 2).

	1	2	3	4	5	P5	Area	Type	8	9	10	11	12	13	14	Row Totals
P2	P2 Planning Region Names	Inner London	Outer London	West Midlands Built-up	Manchester Built-up	West Yorkshire Built-up	Glasgow Built-up	Liverpool Built-up	Tyneside Built-up	Other urban over 250K	Other urban over 100K to 250K	Other urban over 50K to 100K	Other urban over 25K to 50K	Other urban over 3K to 25 K	Rural	
1	Northern (Metropolitan)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.18	0.05	0.02	0.00	0.07	1.00
2	Northern (Non-Metropolitan)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.17	0.13	0.05	0.45	1.00
3	Yorkshire/Humbershire (Metropolitan)	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.19	0.08	0.05	0.02	0.01	0.21	1.00
4	Yorkshire/Humbershire (Non-Metropolitan)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.17	0.13	0.02	0.00	0.46	1.00
5	East Midlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.14	0.05	0.14	0.03	0.37	1.00
6	East Anglia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.07	0.04	0.03	0.59	1.00
7	South East (excluding London Boroughs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.17	0.20	0.13	0.03	0.33	1.00
8	London Boroughs	0.37	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	South West	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.13	0.08	0.08	0.04	0.47	1.00
10	West Midlands (Metropolitan)	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	1.00
11	West Midlands (Non-Metropolitan)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.31	0.09	0.03	0.42	1.00
12	North West (Metropolitan)	0.00	0.00	0.00	0.57	0.00	0.00	0.18	0.00	0.07	0.09	0.03	0.02	0.02	0.02	1.00
13	North West (Non-Metropolitan)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.29	0.23	0.07	0.02	0.27	1.00
14	Wales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.04	0.07	0.17	0.02	0.48	1.00
15	Scotland	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.08	0.07	0.09	0.15	0.04	0.42	1.00

Table 7: Computed Conditional probabilities for the 4 NTS area types using 1981 Census population data (Method 2).

		The 4 NTS Area Types				
		1	2	3	4	
P2	P2 Planning Region Names	'London'	'Other Conurbation'	'Urban'	'Rural'	Row Totals
1	Northern (Metropolitan)	0.00	0.68	0.25	0.07	1.00
2	Northern (Non-Metropolitan)	0.00	0.00	0.50	0.50	1.00
3	Yorkshire/Humbershire (Metropolitan)	0.00	0.44	0.34	0.21	1.00
4	Yorkshire/Humbershire (Non-Metropolitan)	0.00	0.00	0.54	0.46	1.00
5	East Midlands	0.00	0.00	0.59	0.41	1.00
6	East Anglia	0.00	0.00	0.39	0.61	1.00
7	South East (excluding London Boroughs)	0.00	0.00	0.64	0.36	1.00
8	London Boroughs	1.00	0.00	0.00	0.00	1.00
9	South West	0.00	0.00	0.49	0.51	1.00
10	West Midlands (Metropolitan)	0.00	0.89	0.11	0.00	1.00
11	West Midlands (Non-Metropolitan)	0.00	0.00	0.56	0.44	1.00
12	North West (Metropolitan)	0.00	0.75	0.21	0.04	1.00
13	North West (Non-Metropolitan)	0.00	0.00	0.71	0.29	1.00
14	Wales	0.00	0.00	0.49	0.51	1.00
15	Scotland	0.00	0.15	0.39	0.46	1.00

Abbreviations:

'London' = Inner & Outer London.
 'Other Conurbations' = West Midlands, Greater Manchester, West Yorkshire, Glasgow, Liverpool and Tyneside.
 'Urban' = population over 25,000
 'Rural' = urban areas between 3,000 to 25,000 of population and rural areas of population under 3,000

Table 8: The projected populations by age and sex for the four NTS area types, 1989 to 2006, using the Method 2 conditional probabilities.

NTS Area Types	Age/Sex Groups	1989	1991	1996	2001	2006
'London'	Persons < 16	1328505	1357256	1471004	1535999	1546373
	Males 16-29	789278	781699	712632	670178	686481
	Males 30-59	1254267	1272680	1338488	1396499	1396374
	Males 60 & over	552472	542948	519393	506308	516853
	Females 16-29	793682	782013	697650	651617	665374
	Females 30-59	1263783	1285489	1360067	1418389	1420757
	Females 60 & over	774424	751741	695505	654899	643099
	Total Population	6756411	6773826	6794739	6833889	6875311
'Other Conurbations'	Persons < 16	1728027	1736358	1791823	1793369	1742540
	Males 16-29	942113	905915	786652	723595	718716
	Males 30-59	1553799	1576911	1656552	1699606	1691458
	Males 60 & over	709540	710636	709973	715518	749224
	Females 16-29	918506	881268	757379	692397	690549
	Females 30-59	1525510	1547863	1632543	1680416	1674201
	Females 60 & over	1003517	994353	963679	938080	945421
	Total Population	8381012	8353305	8298601	8242981	8212109
'Urban'	Persons < 16	4560360	4632610	4879494	5009283	4981407
	Males 16-29	2537630	2471119	2219346	2066618	2102062
	Males 30-59	4253011	4357035	4693663	4949417	5009892
	Males 60 & over	2027319	2053024	2107768	2181861	2337657
	Females 16-29	2435160	2368402	2117295	1961712	1990804
	Females 30-59	4264059	4359536	4686738	4935914	4986626
	Females 60 & over	2793888	2813599	2836178	2865949	2987713
	Total Population	22871427	23055324	23540483	23970755	24396161
'Rural'	Persons < 16	3511304	3564907	3752021	3850332	3831065
	Males 16-29	1982053	1906802	1714406	1595320	1618348
	Males 30-59	3268808	3349499	3609020	3808603	3875850
	Males 60 & over	1574548	1595328	1639686	1697882	1822637
	Females 16-29	1878678	1827716	1634973	1511497	1529404
	Females 30-59	3285358	3359406	3611316	3807104	3866039
	Females 60 & over	2166330	2183671	2206207	2232214	2334818
	Total Population	17667079	17787328	18167630	18502952	18878160
	Grand Total Population	55675929	55969783	56801453	57550577	58361741

Table 9: Trends in projected population changes by age and sex for the four NTS area types, 1989 to 2006, using the Method 2 conditional probabilities.

NTS Area Types	Age/Sex Groups	1989-1991 (in %)	1991-1996 (in %)	1996-2001 (in %)	2001-2006 (in %)	1989-2006 (in %)
'London'	Persons < 16	2.16	8.38	4.42	0.68	16.40
	Males 16-29	-0.96	-8.84	-5.96	2.43	-13.02
	Males 30-59	1.47	5.17	4.33	-0.01	11.33
	Males 60 & over	-1.72	-4.34	-2.52	2.08	-6.45
	Females 16-29	-1.47	-10.79	-6.60	2.11	-16.17
	Females 30-59	1.72	5.80	4.29	0.17	12.42
	Females 60 & over	-2.93	-7.48	-5.84	-1.80	-16.96
	Total Population	0.26	0.31	0.58	0.61	1.76
'Other Conurbations'	Persons < 16	0.48	3.19	0.09	-2.83	0.84
	Males 16-29	-3.84	-13.16	-8.02	-0.67	-37.14
	Males 30-59	1.49	5.05	2.60	-0.48	8.86
	Males 60 & over	0.15	-0.09	0.78	4.71	5.59
	Females 16-29	-4.05	-14.06	-8.58	-0.27	-24.82
	Females 30-59	1.47	5.47	2.93	-0.37	9.75
	Females 60 & over	-0.91	-3.08	-2.66	0.78	-5.79
	Total Population	-0.33	-0.65	-0.67	-0.37	-4.31
'Urban'	Persons < 16	1.58	5.33	2.66	-0.56	9.23
	Males 16-29	-2.62	-10.19	-6.88	1.72	-17.16
	Males 30-59	2.45	7.73	5.45	1.22	17.80
	Males 60 & over	1.27	2.67	3.52	7.14	15.31
	Females 16-29	-2.74	-10.60	-7.35	1.48	-18.25
	Females 30-59	2.24	7.51	5.32	1.03	16.95
	Females 60 & over	0.71	0.80	1.05	4.25	6.94
	Total Population	0.80	2.10	1.83	1.77	6.67
'Rural'	Persons < 16	1.53	5.25	2.62	-0.50	9.11
	Males 16-29	-3.80	-10.09	-6.95	1.44	-18.35
	Males 30-59	2.47	7.75	5.53	1.77	18.57
	Males 60 & over	1.32	2.78	3.55	7.35	15.76
	Females 16-29	-2.71	-10.55	-7.55	1.18	-18.59
	Females 30-59	2.25	7.50	5.42	1.55	17.67
	Females 60 & over	0.80	1.03	1.18	4.60	7.78
	Total Population	0.68	2.14	1.85	2.03	6.86

Table 10: Computed conditional probabilities for the 4 area types using the 1981 population data by Projection Area (Method 3).

Projection Area	London	Other Conurb -ation	Urban	Rural	Total
Cambridgeshire			0.42	0.58	1.00
Norfolk			0.41	0.59	1.00
Suffolk			0.41	0.59	1.00
Derbyshire			0.80	0.20	1.00
Leicestershire			0.64	0.36	1.00
Lincolnshire			0.35	0.65	1.00
Northamptonshire			0.60	0.40	1.00
Nottinghamshire			0.63	0.37	1.00
Cleveland			0.84	0.16	1.00
Cumbria			0.42	0.58	1.00
Durham			0.48	0.52	1.00
Northumberland			0.30	0.70	1.00
Tyneside		0.93		0.07	1.00
Sunderland			0.95	0.05	1.00
Greater Manchester		0.95		0.05	1.00
Lancashire			0.80	0.20	1.00
Cheshire			0.67	0.33	1.00
Merseyside (all except Liverpool)			0.97	0.03	1.00
Merseyside (Liverpool only)		0.96		0.04	1.00
Border Region				1.00	1.00
Central Region			0.54	0.46	1.00
Dumfries and Galloway Region			0.22	0.78	1.00
Fife Region			0.41	0.59	1.00
Grampian Region			0.40	0.60	1.00
Highland Region			0.20	0.80	1.00
Lothian Region			0.62	0.38	1.00
Orkney Islands			0.00	1.00	1.00
Shetland Islands			0.00	1.00	1.00
Strathclyde Region (except Glasgow)			0.57	0.43	1.00
City of Glasgow		1.00			1.00
Tayside Region			0.62	0.38	1.00
Western Isles				1.00	1.00
Bedfordshire			0.67	0.33	1.00
Berkshire			0.78	0.22	1.00
Buckinghamshire			0.66	0.34	1.00
East Sussex			0.52	0.48	1.00
Essex			0.64	0.36	1.00

Table 10 (Continued)

Projection Area	London	Other Conurb-ation	Urban	Rural	Total
Hampshire			0.75	0.75	1.00
Hertfordshire			0.75	0.75	1.00
Inner London		1.00			1.00
Isle of Wight			0.17	0.93	1.00
Kent			0.69	0.31	1.00
Outer London		0.99		0.01	1.00
Oxfordshire			0.36	0.64	1.00
Surrey			0.69	0.31	1.00
West Sussex			0.85	0.15	1.00
Avon			0.76	0.24	1.00
Cornwall and Isles of Scilly			0.19	0.81	1.00
Devon			0.53	0.47	1.00
Dorset			0.61	0.39	1.00
Gloucestershire			0.49	0.51	1.00
Somerset			0.27	0.73	1.00
Wiltshire			0.42	0.58	1.00
Clwyd			0.41	0.59	1.00
Dyfed			0.14	0.86	1.00
Gwynedd				1.00	1.00
Gwent			0.70	0.30	1.00
Mid Glamorgan			0.57	0.43	1.00
Powys				1.00	1.00
South Glamorgan			0.91	0.19	1.00
West Glamorgan			0.76	0.24	1.00
Hereford and Worcester			0.51	0.49	1.00
Shropshire			0.44	0.56	1.00
Staffordshire			0.70	0.30	1.00
Warwickshire			0.60	0.40	1.00
West Midlands: Birmingham		1.00			1.00
West Midlands: Coventry		1.00			1.00
West Midlands: Dudley		1.00			1.00
West Midlands: Sandwell		1.00			1.00
West Midlands: Solihull		0.47		0.53	1.00
West Midlands: Walsall		0.67		0.33	1.00
West Midlands: Wolverhampton		1.00			1.00
Humbershire			0.67	0.33	1.00
North Yorkshire			0.37	0.63	1.00
South Yorkshire			0.77	0.23	1.00
West Yorkshire: Calderdale		0.39		0.61	1.00
West Yorkshire: Leeds		0.84		0.16	1.00
West Yorkshire: Bradford		0.84		0.16	1.00
West Yorkshire: Kirkless		0.67		0.33	1.00
West Yorkshire: Wakefield		0.57		0.43	1.00

Table 11: The projected populations by age and sex for the four NTS area types, 1989 to 2006, using Method 3 conditional probabilities.

NTS Area Types	Age/Sex Groups	1989	1991	1996	2001	2006
'London'	Persons < 16	1320106	1348671	1461757	1526330	1536601
	Males 16-29	784554	776962	708196	665978	682202
	Males 30-59	1246218	1264561	1330026	1387706	1387579
	Males 60 & over	548888	539414	515990	502984	513478
	Females 16-29	789029	777406	693433	647632	661279
	Females 30-59	1255692	1277317	1351540	1409594	1412031
	Females 60 & over	769396	746839	690925	650555	638827
	Total Population	6713883	6731169	6751867	6790779	6831997
'Other Conurbations'	Persons < 16	1710462	1722400	1785824	1787473	1734232
	Males 16-29	940688	901401	776318	711490	711384
	Males 30-59	1521192	1543114	1620105	1662160	1649530
	Males 60 & over	701872	699367	690781	689520	717015
	Females 16-29	915746	876042	749745	684673	686415
	Females 30-59	1491890	1513356	1593759	1640768	1630881
	Females 60 & over	1004869	990345	947997	911801	912297
	Total Population	8286718	8246024	8164530	8087885	8041755
'Urban'	Persons < 16	4789470	4856711	5110147	5243242	5163840
	Males 16-29	2641204	2572228	2306017	2144353	2179502
	Males 30-59	4456264	4549285	4894450	5153197	5217887
	Males 60 & over	2113506	2127519	2186714	2264709	2428868
	Females 16-29	2567384	2496291	2228098	2060924	2057639
	Females 30-59	4502258	4599535	4938283	5193058	5156995
	Females 60 & over	2919713	2942320	2969899	3003649	3087314
	Total Population	23989798	24143888	24633609	25063133	25292046
'Rural'	Persons < 16	3322264	3362739	3536102	3631995	3708772
	Males 16-29	1856432	1817501	1644041	1534906	1561058
	Males 30-59	3138478	3196825	3451683	3650065	3738933
	Males 60 & over	1537867	1534972	1582665	1643855	1776300
	Females 16-29	1754100	1709886	1536224	1424185	1601164
	Females 30-59	3089277	3162501	3407525	3598866	3622268
	Females 60 & over	2044437	2064115	2093004	2125393	2159463
	Total Population	16742855	16848539	17251244	17609265	18167959
All area types	Person < 16	11142302	11290521	11893830	12189040	12143445
	Males 16-29	6222878	6068092	5434572	5056727	5134146
	Males 30-59	10362152	10553785	11296264	11853128	11993929
	Males 60 & over	4902133	4901272	4976150	5101068	5435661
	Females 16-29	6026259	5859625	5207500	4817414	5006497
	Females 30-59	10339117	10552709	11291107	11842286	11822175
	Females 60 & over	6738415	67443619	6701825	6691398	6797901
	Total population	55733254	55969620	56801250	57551062	58333757

Table 12: Trends in projected population changes by age and sex for the four NTS area types, 1989 to 2006, using Method 3 conditional probabilities.

NTS Area Types	Age/Sex Groups	1989-1991 (in %)	1991-1996 (in %)	1996-2001 (in %)	2001-2006 (in %)	1989-2006 (in %)
'London'	Persons < 16	2.16	8.38	4.42	0.67	16.40
	Males 16-29	-0.97	-8.85	-5.96	2.44	-13.05
	Males 30-59	1.47	5.18	4.34	-0.01	11.34
	Males 60 & over	-1.73	-4.34	-2.52	2.09	-6.45
	Females 16-29	-1.47	-10.80	-6.60	2.11	-16.19
	Females 30-59	1.72	5.81	4.30	0.17	12.45
	Females 60 & over	-2.93	-7.49	-5.84	-1.80	-16.97
	Total Population	0.26	0.31	0.58	0.61	1.76
'Other Conurbations'	Persons < 16	0.70	3.68	0.09	-2.98	1.39
	Males 16-29	-4.18	-13.88	-8.35	-0.01	-24.38
	Males 30-59	1.44	4.99	2.60	-0.76	8.44
	Males 60 & over	-0.36	-1.23	-0.18	3.99	2.16
	Females 16-29	-4.34	-14.42	-8.68	0.25	-25.04
	Females 30-59	1.44	5.31	2.95	-0.60	9.32
	Females 60 & over	-1.45	-4.28	-3.82	0.05	-9.21
	Total Population	-0.49	-0.99	-0.94	-0.57	-2.96
'Urban'	Persons < 16	1.40	5.22	2.60	-1.51	7.82
	Males 16-29	-2.61	-10.35	-7.01	1.64	-17.48
	Males 30-59	2.09	7.59	5.29	1.26	17.09
	Males 60 & over	0.66	2.78	3.57	7.25	14.92
	Females 16-29	-2.77	-10.74	-7.50	-0.16	-19.85
	Females 30-59	2.16	7.36	5.16	-0.69	14.54
	Females 60 & over	0.77	0.94	1.14	2.79	5.74
	Total Population	0.64	2.03	1.74	0.91	5.43
'Rural'	Persons < 16	1.22	5.16	2.71	2.11	11.63
	Males 16-29	-2.10	-9.54	-6.64	1.70	-15.91
	Males 30-59	1.86	7.97	5.75	2.43	19.13
	Males 60 & over	-0.19	3.11	3.87	8.06	15.50
	Females 16-29	-2.52	-10.16	-7.29	12.43	-8.72
	Females 30-59	2.37	7.75	5.62	0.65	17.25
	Females 60 & over	0.96	1.40	1.55	1.60	5.63
	Total Population	0.63	2.39	2.08	3.17	8.51
All Area Types	Persons < 16	1.33	5.34	2.48	-0.37	8.99
	Males 16-29	-2.49	-10.44	-6.95	1.53	-17.50
	Males 30-59	1.85	7.04	4.93	1.19	15.75
	Males 60 & over	-0.02	1.53	2.51	6.56	10.88
	Females 16-29	-2.77	-11.13	-7.49	3.92	-16.92
	Females 30-59	2.07	7.00	4.88	-0.17	14.34
	Females 60 & over	0.08	-0.62	-0.16	1.59	0.88
	Total Population	0.42	1.49	1.32	1.36	4.67

Table 13. Annual rates of population change by age and sex for the four NTS area types, 1989 to 2006, using the Method 3 conditional probabilities.

NTS Area Types	Age/Sex Groups	1989-91 (% pa)	1991-96 (% pa)	1996-2001 (% pa)	2001-06 (% pa)	1989-2006 (% pa)
'London'	Persons < 16	1.08	1.62	0.87	0.13	0.90
	Males 16-29	-0.49	-1.84	-1.22	0.48	-0.82
	Males 30-59	0.73	1.01	0.85	-0.00	0.63
	Males 60 & over	-0.87	-0.88	-0.51	0.41	-0.39
	Females 16-29	-0.74	-2.26	-1.36	0.42	-1.03
	Females 30-59	0.86	1.14	0.84	0.03	0.69
	Females 60 & over	-1.48	-1.54	-1.20	-0.36	-1.09
	Total Population	0.13	0.06	0.11	0.12	0.10
'Other Conurbations'	Persons < 16	0.35	0.73	0.02	-0.60	0.08
	Males 16-29	-2.11	-2.94	-1.73	-0.00	-1.63
	Males 30-59	0.72	0.98	0.51	-0.15	0.48
	Males 60 & over	-0.18	-0.25	-0.04	0.79	0.13
	Females 16-29	-2.19	-3.07	-1.80	0.05	-1.68
	Females 30-59	0.72	1.04	0.58	-0.12	0.53
	Females 60 & over	-0.73	-0.87	-0.78	0.01	-0.57
	Total Population	-0.25	-0.20	-0.19	-0.11	-0.18
'Urban'	Persons < 16	0.70	1.02	0.52	-0.30	0.44
	Males 16-29	-1.31	-2.16	-1.44	0.33	-1.12
	Males 30-59	1.04	1.47	1.04	0.25	0.93
	Males 60 & over	0.33	0.55	0.70	1.41	0.82
	Females 16-29	-1.39	-2.25	-1.55	-0.03	-1.29
	Females 30-59	1.07	1.43	1.01	-0.14	0.80
	Females 60 & over	0.39	0.19	0.23	0.55	0.33
	Total Population	0.32	0.40	0.35	0.18	0.31
'Rural'	Persons < 16	0.61	1.01	0.54	0.42	0.65
	Males 16-29	-1.05	-1.99	-1.36	0.34	-1.01
	Males 30-59	0.93	1.55	1.12	0.48	1.04
	Males 60 & over	-0.09	0.61	0.76	1.56	0.85
	Females 16-29	-1.27	-2.12	-1.50	2.37	-0.54
	Females 30-59	1.18	1.50	1.10	0.13	0.94
	Females 60 & over	0.48	0.28	0.31	0.32	0.32
	Total Population	0.32	0.47	0.41	0.63	0.48
All Area Types	Persons < 16	0.66	1.05	0.49	-0.07	0.51
	Males 16-29	-1.25	-2.18	-1.43	0.30	-1.12
	Males 30-59	0.92	1.37	0.97	0.24	0.86
	Males 60 & over	-0.01	0.30	0.50	1.28	0.61
	Females 16-29	-1.39	-2.33	-1.55	0.77	-1.08
	Females 30-59	1.03	1.36	0.96	-0.03	0.79
	Females 60 & over	0.04	-0.12	-0.03	0.32	0.05
	Total Population	0.21	0.30	0.26	0.27	0.27

Table 14. Selected male and female mortality rates in 1971 and 1992

Sex and age group	1971	1992	1992 as % of 1971
Male			
45-54	7.1	4.3	56
55-64	20.1	13.4	67
65-74	50.5	37.3	74
Female			
45-54	4.3	2.7	63
55-64	10.0	7.9	79
65-74	26.1	21.5	82
Causes of death			
Male			
Lung cancer	105.2	90.3	86
Prostate cancer	16.9	32.7	193
Ischaemic heart disease	347.5	315.5	91
Female			
Lung cancer	22.2	42.0	189
Breast cancer	44.3	52.2	118
Ischaemic heart disease	237.9	254.9	107

Notes:

1. The age-specific mortality rate = deaths per 1,000 population.
2. The cause-specific mortality rates = deaths per 100,000 population.

Source: OPCS (1995), Table 13, p.57 and Table 14, p.58.

Table 15. A hypothetical calculation of trip mileage indicators

Category	Population 1989	Population 2006	Change	Trip indicator (hypothetical)
All groups	55,733	58,334	+4.7%	
	% 1989	% 2006	Change in %	
London	12.0	11.7	-0.3	100
Other Conurbation	14.9	13.8	-1.1	104
Urban	43.0	43.4	+0.4	109
Rural	30.0	31.1	+1.1	124
Total	100.0	100.0	0.0	
Trip indicator average	111.6	111.9	+0.3%	
	% 1989	% 2006	Change in %	
Persons < 16	20.0	20.8	+0.8	80
Males 16-29	11.2	8.8	-2.4	100
Males 30-59	18.6	20.6	+2.0	80
Males 60+	8.8	9.3	+0.5	50
Females 16-29	10.8	8.6	-2.2	80
Females 30-59	18.6	20.3	+1.7	60
Females 60+	12.1	11.7	-0.4	50
Total	100.0	100.0		
Trip indicator average	72.3	71.5	-0.8%	

Figure 1: The boundary problem encountered in the classification of populations by planning regional area type: the case of Coventry-Bedworth urban area.

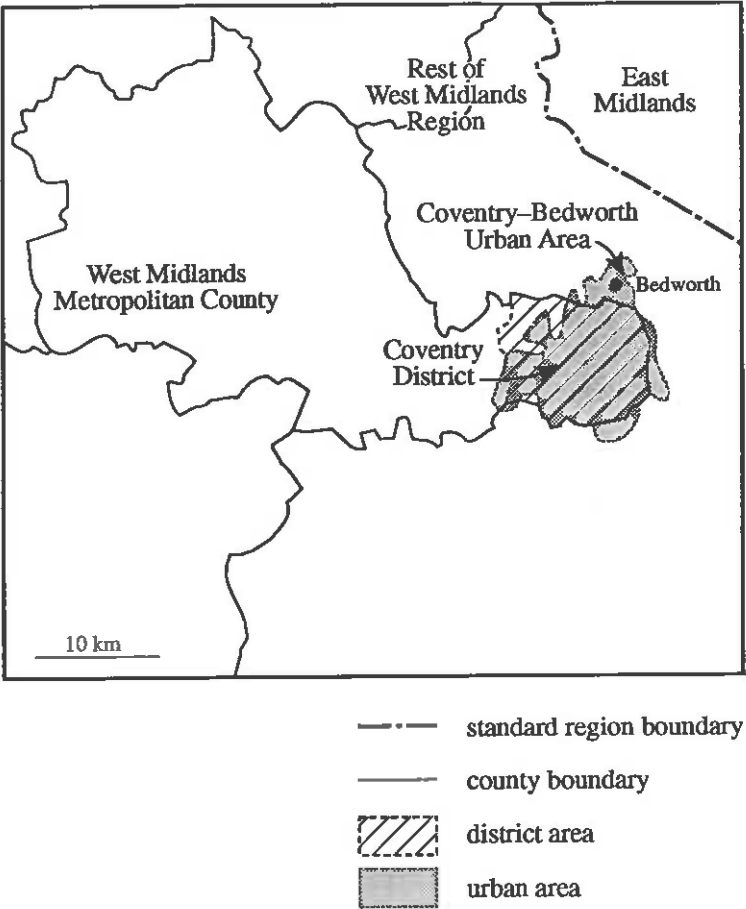
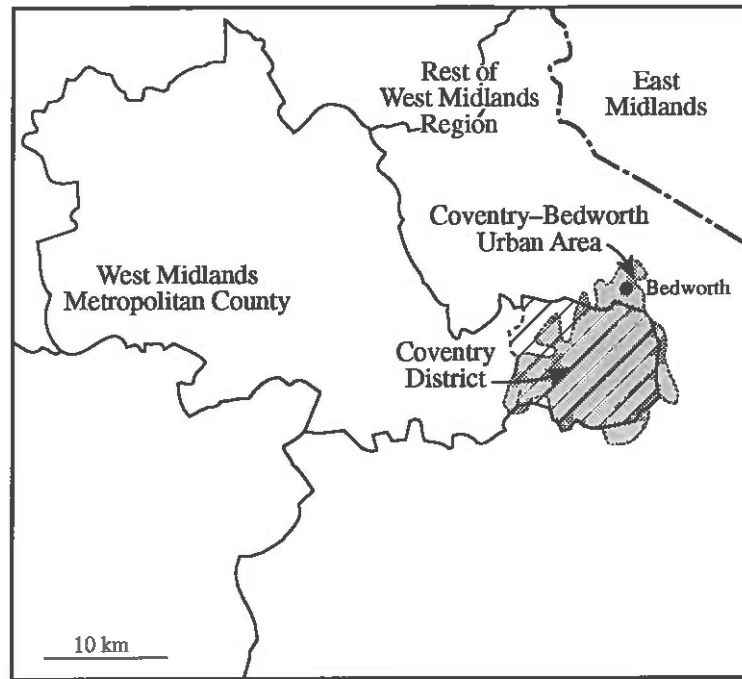


Figure 1: The boundary problem encountered in the classification of populations by planning regional area type: the case of Coventry-Bedworth urban area.



- standard region boundary
- county boundary
- ▨ district area
- urban area