TRICS.

Does Historic Site and Survey Data Remain Valid to Use?

Research Conclusions.

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1 HOW HAS THIS RESEARCH COME ABOUT?

1.1 The **T**rip **R**ate **I**nformation **C**omputer **S**ystem (TRICS) was first made commercially available in July 1989. It is owned by a Consortium of Local Authorities (Dorset, East Sussex, Kent, Hampshire, Surrey and West Sussex County Councils) who have appointed JMP Consultants Limited to administer and market the database and analysis software.

1.2 The 2003(b) version has a database of land use and trip generation information for some 1,800 survey sites and 4,200 survey days covering 93 separate land use categories. All of this data is accessible from site lists when viewed from the opening menu and can be used in trip rate analysis for transport planning and development control purposes.

1.3 When selecting surveys for trip rate calculation a default 8-year cut-off is imposed on all data, for example as 2003(b) was issued in 2003, data before 01/01/1995 is excluded from the calculation.

1.4 The cut-off date can be amended by the user at any time, so it does not preclude the use of more 'historic' (beyond 8 years) data. This flexibility is an important attribute of a system designed from the outset to be a 'tool' not a 'model'. In selective cases a trip rate calculation based upon a single site for which the information was collected 10 years ago may provide a more relevant indicator of likely trip generation than an average value established from a larger aggregated dataset.

1.5 The Consortium has always encouraged 'the user to look at all of the data that they intend to use and to see whether it is applicable to the case being studied'. This is fundamental to good practise in transport impact assessment and the development control process.

1.6 The Consortium is committed to an ongoing research programme and to maintaining a relevant and applicable database. Consequently it was felt to be appropriate ***'to understand a little more about validity over time of data that currently exists in the system'*** and to share this with users and professional colleagues. An element of repeat survey data has been collected at some sample sites in the south-east region, in anticipation that this might start to assist such a consideration. Kent County Council completed a local analysis of such datasets for their area and volunteered to lead research work on this wider brief.

1.7 Hence the concept of ***'Back Validation'*** has been adopted to investigate a process that can look back in time and verify the continued applicability or not, of historic database sites. The objective from this being to provide supplementary input and guidance as part of the 'toolkit' for the user of the system.

1.8 A considerable amount of information collation, processing, analysis and review has to be undertaken in order to progress this research study. A detailed Technical Report would be required to document all relevant source material and data calculations. In order to then highlight and focus attention on the most important elements and key conclusions to emerge a separate 'digestible' summary document was felt to be the most appropriate form of presentation for TRICS users.

1.9 This document enables an overview of the completed study work to be obtained with reference to the key background study work contained in the Technical Report (Ref 1). It aims to provide a positive steer to users when they consider how appropriate it is to use historic data.

2 INVESTIGATORY STEPS UNDERTAKEN.

2.1 The starting point has been to investigate any trends in historic data by analysing the dataset held in TRICS 2003(b). The completion of this fundamental analysis would then enable further consideration to be given as to how best to develop and promote other elements of the research study.

2.2 Land use trip rate trend analysis

2.2.1 From TRICS 2003(b) a land use selection for initial analysis was chosen using the following considerations:

Sample size;
Usefulness of land use for future use;
Age of existing data.

2.2.2 Figure 1 illustrates the generic process adopted to generate trip rate information to establish any trends in the data and to detect potentially erroneous or misleading information on the land use dataset. This methodology has been applied to a limited number of land uses that have substantial datasets:

- *Retail:* Food Superstores.
- *Employment:* Offices.
  Industrial Estates.
- *Residential:* Housing Privately Owned.
  Mixed Private Housing.
- *Education:* Primary Schools.
- *Hotel, food and drink* Hotels.

2.2.3 First an average trip rate across all surveys and dates (excluding the 8 year cut off) has been calculated for each land use to provide baseline trend information. This is a daily 'totals' trip rate. Additional trip rates have then be derived for a number of alternative scenarios depending on the number of sites available in the database.

2.2.4 Where there were a large number of sites under a particular land use sub category individual years have been chosen. This has allowed a profile of trip rates over time to be compiled. Where information is sparse, specific years have not been identified, although data has been grouped into ranges of years where possible.

2.2.5 Survey data has invariably been collected on different days of the week. Where the trip rate has not been particularly influenced by day of the week, then all days have been selected to ensure a larger sample. On other occasions the trip rate is significantly different, for instance between the weekend and a weekday, therefore further selection has been required.

2.2.6 Manual classified count surveys have formed the basis of this approach. Although where it has made sense to do so, automatic traffic surveys have been used instead; these surveys cover longer periods of time.

2.2.7 In the secondary parameters field the location of the sites can be selected. In order to reduce the number of trip rate variables only location types where there is enough data have been selected. In some cases locations have been amalgamated due to the small sample size in the first place.

2.2.8 A daily trip rate has then been calculated across a number of years to allow any trends over time to be detected. Once the average rates have been derived, individual historic sites have then been compared to allow any unusual trip rates to be detected.

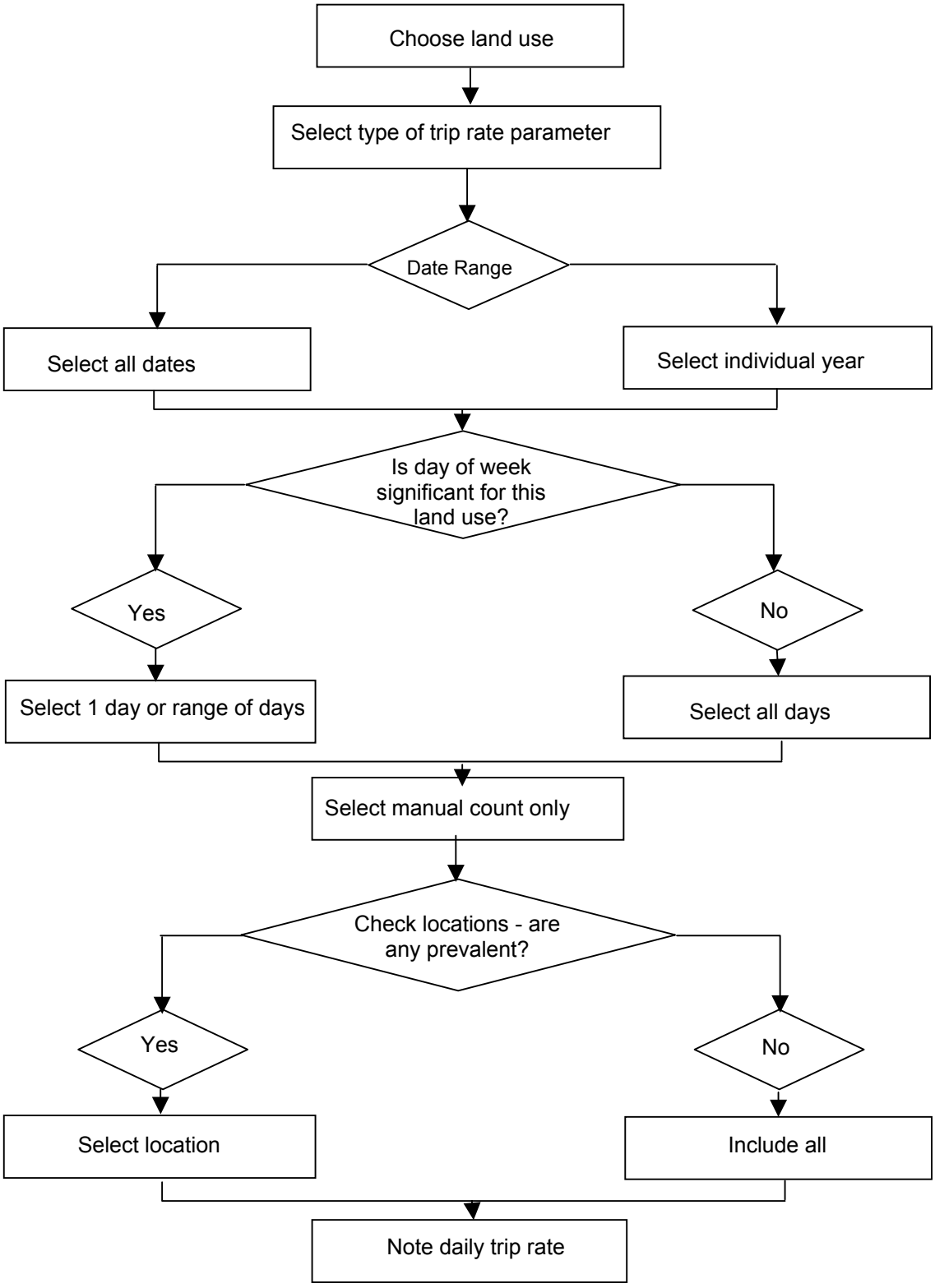
2.3 Individual site time trend analysis

2.3.1 Following earlier research into trip rates calculated for sites in Kent where surveys have been repeated over a number of years ("TRICS – Analysis of Repeat Surveys in Kent" January 2003 – Appendix C, Ref 1), further repeat survey sites in TRICS have also been analysed individually. These can be used to give an indication of the change in the number of trips whilst all other influential variables remain largely identical. Trips rates for individual sites have been calculated to provide a comparison between the original and repeat surveys. Where possible the same month and day of the week have been selected in the later survey as in the original.

2.4 It was recognised that this element of the study was being significantly influenced by the amount of data available. This quantitative approach precluded consideration of a significant number of the land use categories on the database (7 of the 16 land use categories and 18 of the 94 sub-categories were being covered). It was accepted that this was a necessity at this stage but that as the analysis evolved there may be influential factors and results emerging that can be equally well applied to these other land use categories. Hence the scope for incorporating more subjective factors in the consideration of data validity across the range of land use categories was built-in to the study once the benefit of the quantitative analysis had been established.

2.5 The way that the trend analysis methodology has then been specifically applied is documented in detail in the Technical Report (Ref 1).

Figure 1 **Methodology for checking trip rate data.**



3 TREND ANALYSIS RESULTS.

3.1 Introduction

3.1.1 Following the application of the methodology outlined in chapter 2, a summary of the key conclusions from evaluating the inter-annual trends obtained for each of the land uses and any variation by geographical location within a settlement, are presented here.

3.1.2 Full details of the trends along with illustrative graphs showing the trip rates at each of the land uses can be found in the Technical Report (Ref 1).

3.2 Trip rate trends from aggregated land use data

Retail – Food Superstores

3.2.1 In all of the locations studied (town centre, neighbourhood centre and edge of town) the specific trend that has emerged is one of a reduction or stability in the number of car trips to superstores on a Friday.

3.2.2 Sunday opening for large stores has been permissible since 28th August 1994. The increase in shops opening on this day in the late 1990s may be an important reason for the changes in Friday superstore trip rates noted over this period. Superstores are also generally open for longer on other days in the week. Whereas stores may have closed at 6pm a decade ago, many regularly open until 9pm at least. There are also some stores that are open 24 hours. People now have more time throughout the week and an extra day at the weekend to do their shopping and hence it is reasonable to suggest that they will spread out their trips to the superstore.

3.2.3 There may be other contributory factors to explain the trend described as only in some areas have trip rates fallen in the past five years. The substantial change in the town centre trip rate may be a result of:

- Increasing congestion in our towns and cities resulting in people switching to alternative modes such as ‘park and ride’ in order to do their shopping.
- Competition with suburban and neighbourhood centre stores, which have remained stable in their car trip rate. Congestion may be a factor in making these locations more attractive.
- The different areas of the country included in the trip rate calculations. 1995-1997 trip rates were based on sites across the country. 1998-2002 only included superstores from the northwest of England.
- The different superstore brands surveyed. People may shop at a particular store because of brand loyalty, an advertising promotion or perhaps the provision of an in-store restaurant rather than because it is the nearest store to their house. For instance 1998-2002’s surveys only involved Morrison’s and Tesco whilst those between 1995 and 1997 also included Somerfield and ASDA.

3.2.4 Superstore trip rates have also fallen a little at edge of town locations. It is unlikely that congestion will have had as great an impact or that people have switched to alternative modes, since the availability of public transport to these areas is often not as great as for town centres. It may be simply a function of extended opening hours leading to the stagger of trips throughout the week and the different fortunes of the superstore brands surveyed.

3.2.5 Overall, the individual location types studied somewhat resemble the trend for “all locations” apart from the town centre in 1998-2002.

3.2.6 Repeat surveys have been carried out at Tesco stores in both Maidstone and Whitstable, Kent. Although the opening hours at the Maidstone branch had been extended, when covering the same time period as previously the trip rates were found to have risen between 1993 and 1999. This could be attributed to the increase in retail floor area and more staff contributing to the trip rate with the longer opening hours. However, Tesco in Whitstable experienced a fall in the trip rate between 1987 and 1994.

Employment - Offices

3.2.7 Office trip rates are higher in the 1995-2002 period than previous years for "all locations". Whilst at the overall scale the current 8-year cut-off is valid, this is not the case when certain location types are examined.

3.2.8 In town centre locations, trip rates in 1998-2002 are around a half of those recorded in 1995-1997. From this a five-year cut-off may be more valid. There are a number of reasons for explaining the sharp fall in trip rates:

- Many organisations have reduced the amount of on site parking because it is increasingly realised that some significant savings can be made.
- Increasing congestion and the rise in the number of towns and cities with 'park and ride' may have resulted in a shift in journeys away from the car to these locations.

3.2.9 In suburban locations the average trip rate has remained fairly constant throughout the 1988-2002 period, and hence there is no need for any cut-off with this particular dataset. The pressures on town centre locations are unlikely to be as prevalent here.

Employment - Industrial Estates

3.2.10 It is difficult to draw any meaningful conclusions with the dataset because there has been a significant period during the 1990s where no data was collected. Some sites are also lacking basic geographical location and land use details, which limits the ability to include them in any analysis.

3.2.11 The majority of the count sites predate the cut-off, and as industrial estates are an important category according to an user survey, it would be useful to increase the number of sites that are readily available. Given the great fluctuation in trip rate recorded in the early and mid 1980s it is unlikely that these are still valid.

Residential - Privately owned housing

3.2.12 Trip rates in 'all locations' are at their highest in the past 2 years than they have been for much of the 1990s. Trip rates from 1995-2000 are in most cases the lowest of the 1988-2002 study period. This calls into question the validity of the 1995 cut-off, as unless the TRICS user applies some form of growth factor, they are likely to be underestimating trip generation at new sites. Trip rates in the early 1990s have more in common with today's traffic generation in this land use.

3.2.13 Analysis of reasons for the variation in the trip rate suggest that change in car ownership is likely to be more important than people's access to public transport, since the latter does not follow the general trends described. The car ownership categories used in TRICS incorporate a large enough range to explain the highest variation in trip rate noted. However variation will also be a result of other factors. Indeed car ownership is dependent on other factors such as the ability to obtain a driving licence and disposable income to buy or hire a vehicle. All the variables noted in other land use categories will have some effect on trip rates at any housing estate. For instance increasing congestion in town centres and the reduction in office parking may result in people seeking alternative modes of transport. An economic downturn may result in people having less income at their disposable affecting their decisions to go to the cinema, sports club, retail park etc. which would all require a trip to get there.

Residential - Mixed Private Housing

3.2.14 Trip rates in most locations are at their lowest of the entire study period during the last two years of data:1999-2000. Trip rates at privately owned housing were also low during this period before rising in 2001-2002. However the absence of any data from 2001-2002 in this land use does not enable an assessment on whether trip rates have risen again.

3.2.15 Trip rates prior to the cut-off in 1993-1994 are somewhat lower than much of the data afterwards, although it must be noted no different to that recorded in 1999-2000. Given that trip rates in 1989-1990 are within the bounds of variation since the cut-off, it suggests that this data is as much valid as that from 1999.

3.2.16 Unlike the privately owned housing dataset, variability in car ownership alone cannot explain changes in trip rates at this land use. Economic factors are likely to have some effect, as has been suggested in the conclusions for privately owned housing, whether in their impacts on people's decisions to make trips from their homes to certain land uses or the geographical variability in economic performance within the UK and/or within a settlement.

Education - Primary Schools

3.2.17 Trip rates for primary schools are notably higher for preparatory schools compared to state schools. These findings appear logical, as preparatory schools are fewer in number compared to their state counterparts. Parents who wish for their child to get into a private school for secondary education will often have to send them to a specific school, which may be several miles away. As a result walking is not a realistic option for many pupils. State infant and junior schools are normally prevalent in most towns and villages and thus there is a more feasible opportunity for children to walk or cycle to school. If children live over 3 miles away from the nearest school, or two miles if they are under eight, then they are entitled to free public transport. Thus compared to preparatory schools there are more opportunities for people not to use the car, explaining the markedly different trip rates.

3.2.18 Middle schools have the lowest trip rate. When one considers the age of the children going to this type of school, this is again logical. Parents who may drive a 6 year old to school are in many cases likely to feel more secure allowing a 10-12 year old to walk or cycle.

3.2.19 The information from TRICS suggests that car trips to primary schools are smaller in number since the default 8 year cut-off. This may be a function of the different locations surveyed in 1991 and 1999. Schools surveyed more recently had better public transport available, whether that is a reflection of general improvements or just of the areas studied is debatable. The former suggestion may be more valid, because analysis of the Middle School in Wareham reveals a marked decline. With new initiatives such as 'Safer Routes to School' and 'Walking Buses' it is important that more surveys are undertaken to reflect recent trends. It is unlikely that new schools will get planning permission without commitments to some of these sustainable measures. It is likely that the 8 years cut-off is valid for state schools at least. However this is less practical for preparatory schools where the dataset is considerably more limited in its extent.

Hotel, Food and Drink - Hotels

3.2.20 Looking at hotels in all locations the trip rate rose to a high in the period 1995-2000 before tailing off in 2001-02. Where hotels are in a free standing location the trip rates has remained fairly stable since 1993. As a result trip rates in the recent past are still above the long-term mean for this location.

3.3 The comparison of the aggregated land use trip data has identified some interesting trends that contribute in part to achieving the aims of the research brief. However, it has also highlighted the difficulty of drawing reliable conclusions across the whole dataset, due to the wide-ranging definition of land use and quantity of data available within them. This reflects the fact that the dataset has evolved over time to best meet the needs of the users. Consequently, this responsive approach has not necessarily led to a consistent magnitude of data collection within each land-use category, to facilitate the type of analysis attempted here.

3.4 Trip rates at other sites where repeat surveys have been carried out

3.4.1 The analysis of individual sites where repeat surveys have been carried out has given a further insight into trip rate change over time at some additional land uses and sub-categories. The sites in Kent were the subject of a previous study, "Analysis of repeat surveys in Kent" (January 2003) which focused on a rolling programme of surveys at sites in Kent.

DIY superstore without garden centre

3.4.2 Surveys undertaken at B&Q, Maidstone in 1987 and 1994 reveal conflicting patterns in trip rates. The number of trips fell on a Friday but increased on a Saturday.

Garden Centres

3.4.3 The number of trips to Garden Centres is strongly related to seasonality. Where surveys have been repeated in the Summer, for example at Stewarts Gardenland, Christchurch the number of trips has gone up over time (1988-1997). However at Kingston Garden Centre, Lewes and Kent Garden Centre, Allington surveys were originally carried out in the summer in 1990 and 1984 respectively but the resurveys were carried out in November. This resulted in a noticeable reduction in the number of trips. Thus the later surveys need to be treated with caution.

Retail Park excluding food

3.4.4 There have been two repeat surveys at Retail Parks; Queens Retail Park, Stafford and County Oak Retail Park, Crawley. The number of trips to these two retail parks appears to have remained constant over time.

Institutional hostel

3.4.5 A probation hostel in Maidstone was surveyed in 1998 and 2001. The trip rate reduced in the latter survey although there is no clear reason to explain this.

Sheltered accommodation

3.4.6 A site in Maidstone, Kent was surveyed on a weekday in 1993 and 2001. The number of trips increased in the resurvey although the distribution across the day was quite different.

Pub/restaurant

3.4.7 Only one site has had a repeat survey carried out; Brewers Fayre, Chichester. The number of trips has dropped very slightly on a Friday but more so on a Saturday between 1994 and 2000. The latter survey was carried out in December, which might have meant larger groups of people going to Christmas meals and therefore sharing transport than the earlier survey carried out in November 1994.

Multiplex Cinemas

3.4.8 Two sites have been resurveyed; UCI, Preston and Showcase Cinema, Leeds. The trend in trip rates is not consistent between the two sites. The surveys carried out at Showcase Cinema in Leeds are beyond the 8 year cut-off. However the growth in trips across all days is consistent suggesting that the data is valid. The trips at UCI Preston decreased between 1991 and 1997 although the surveys were carried out at similar times of the year.

Bowling Alleys

3.4.9 The repeat survey at the Bowling Alley in Gravesend reveals a fairly consistent number of trips over time.

Sports Centres

3.4.10 Three sports centres have been included as repeat survey sites; Bournemouth, Weymouth and Maidstone. Each of these has had a growth in the number of trips over time. However the number of trips generated by the leisure centre in Maidstone has grown much more sharply than at the other two sites. This can be attributed to the fact the survey days were different in that when it was first surveyed it was done on a Wednesday but the resurveys were carried out on a Friday, Saturday and Sunday (Friday has been plotted on the graph). This illustrates another factor that can influence the trips when looking at a specific site.

Ice Rink

3.4.11 The ice rink in Gillingham, Kent, was surveyed in 1993 and 2001. Similar trip rates were recorded on both occasions.

Country Parks

3.4.12 There is only one country park in the database that has been the subject of a resurvey. The country park at Lochgelly was surveyed first in July 1994 then again in August 1998. It was surveyed on Friday, Saturday and Sunday on both occasions. There was a fall in the number of trips on each of the days between 1994 and 1998. This may have been because there was some event on in July or that the weather was better thus attracting more visitors. Unfortunately the weather conditions were not noted for the earlier survey.

Marinas

3.4.13 Two marinas have been resurveyed; one in Hythe, Hampshire and the other in Gillingham, Kent. In this instance the repeat surveys were carried out at the same time of year as the original surveys - August at Hythe and October at Gillingham. At both locations there has been a growth in trips.

3.5 The repeat surveys confirm that any pattern in traffic growth varies between land uses and, in some cases, by site. The day of the week and time of the year when the survey is undertaken, can also affect trip rate trends.

4 FACTORS NOT CURRENTLY IDENTIFIED IN TRICS.

4.1 Overview

4.1.1 One component of the brief has been to identify any factors that may explain variation in car trip making that are not identified currently.

4.1.2 Initially a 'brainstorming' exercise was undertaken to try and understand some of the general reasons why people would use their car to make a trip to a certain destination. Four key groups of reasons that explain why trips are generated arose and these are as follows:

- 'Enablers' – things that give people the opportunity to make a car trip.
- 'Costs' – things that moderate the choice of a car trip and to a particular destination.
- 'Area characteristics' – urban design, land use and economic classifications that may have fostered the growth in car travel in the recent past.
- 'Attractors' – things that pull people into a particular site.

4.1.3 Figure 2 illustrates these groups and some of the features that they comprise.

4.1.4 The ideas contained in this diagram were investigated and developed further in three ways:

- Examination of data from the Department for Transport (DfT) and National Statistics publications to improve understanding of the enablers and costs components;
- Analysis of publications associated with the Office for Deputy Prime Minster (ODPM), the Department for Trade and Industry (DTI) and Conservation bodies to highlight recent land use changes associated with housing, the economy and the environment;
- Undertaking a literature review of print and electronic media to provide up to date details on attractors and other trends that may have affected trip generation at each of the land uses on the TRICS database. In some cases this could involve a more in depth analysis of some of the points identified from earlier work.

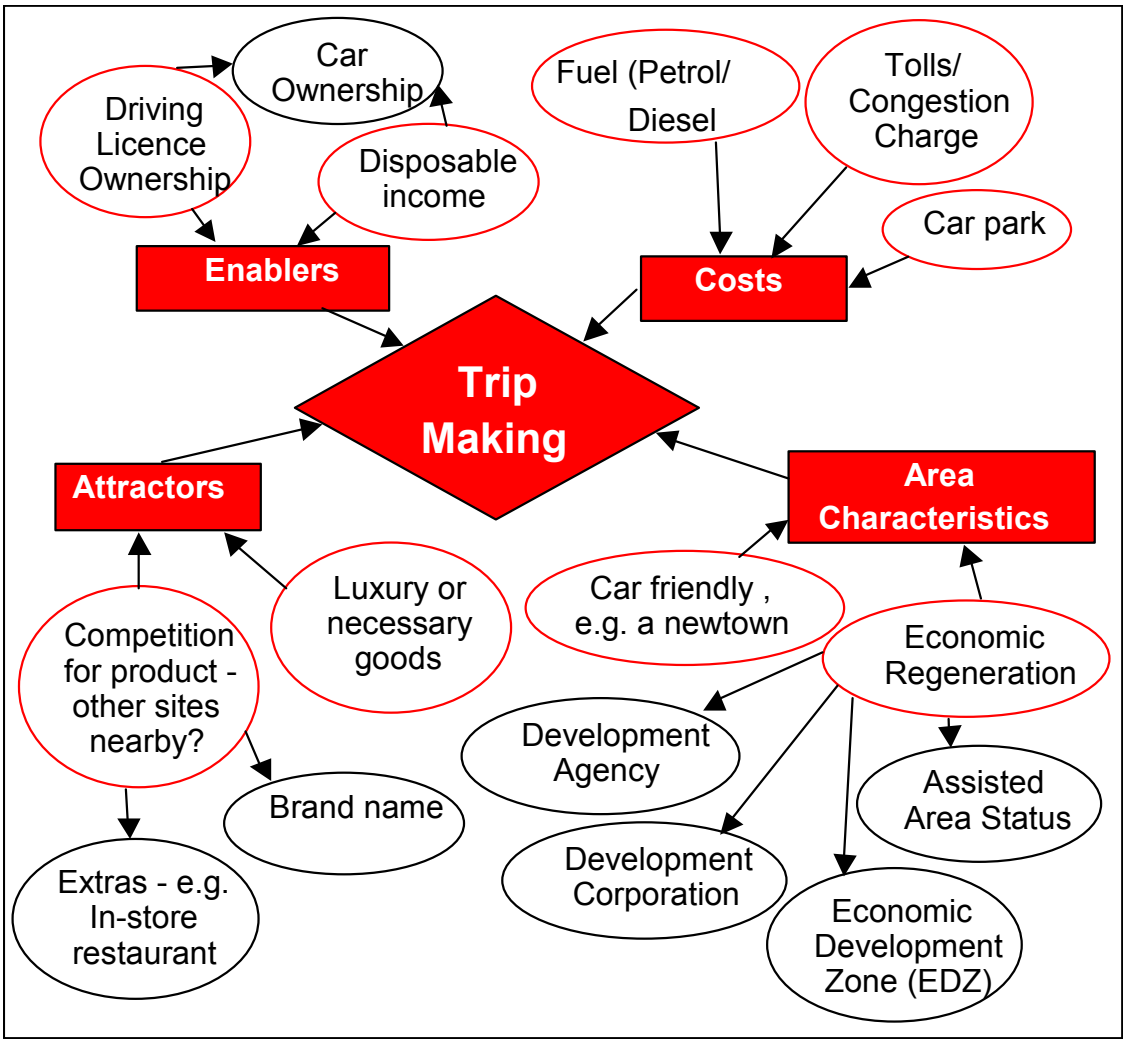
4.1.5 It was also felt that the inputs to this exercise could be maximised by tapping into the knowledge base of local Development Control practitioners and Consortium Members. Observations made and information provided by them has helped to verify and supplement those factors established from the literature.

4.2 General Transport Trends.

4.2.1 National trends in road traffic have been investigated to give some background to the data held in TRICS. These provide a basis for investigating why trip rates may have altered, including investigating trips linked to various trip purposes.

4.2.2 The Department for Transport presents an annual overview and analysis of trends in transport and travel in Great Britain over the past twenty years. A number of the potentially influential background statistics are reproduced here.

Figure 2: Other factors not identified in TRICS that may explain variations in Trip Rates



4.2.3 Road Traffic

4.2.3.1 Total traffic (passenger and freight) increased by 73 per cent between 1980 and 2001, from 277 to 478 billion vehicle kilometres. Most of this growth occurred between 1980 and 1990, since then traffic has increased by 15%.

4.2.3.2 General trends to consider are:

- light van and goods vehicle traffic has increased quite substantially;
- bus and coach traffic has seen a more modest increase;
- and motor cycle and pedal cycle traffic have both fallen.

4.2.3.3 Over the twenty years since 1980, traffic (measured by vehicle kilometres) and overall travel (measured by passenger kilometres) have grown broadly in line with Gross Domestic Product (GDP). Since 1993 they have increased more slowly demonstrating that sustainable development is being achieved more independently of economic growth.

4.2.3.4 Car occupancy varies according to journey purpose. The highest occupancy rates in 1999/2001 were for holidays and for day trips (2.2 persons per car), and for education (2.0 persons per car). The lowest rates were for commuting and business travel (1.2 persons per car).

4.2.3.5 The growth in car travel and fall in bus patronage seen over the last twenty years have been accompanied by

- little change in the real cost of motoring, despite a 12% increase in the real cost of fuel;
- rising real costs of public transport fares – bus and coach 31%, rail 37%;
- an increase in the amount of disposable income by 80% in real terms;

4.2.3.6 Driving varies in cost according to place and this could become more significant in years to come. Any development in an existing or potential congestion charge zone will have to take into account the possible effect that this may have on trip generation.

4.2.3.7 If a National Congestion Charge comes into force in future years then this will have a significant effect on the continued validity of historic TRICS data. However this is likely to be a medium to long-term prospect at the moment.

4.2.4 Variation in travel by trip purpose

To work.

4.2.4.1 69 per cent of trips to work were made by car in 1999/01. An increase reflected by a fall in trips made by bus and on foot, with cycling having remained fairly constant.

To School.

4.2.4.2 There is a marked difference in patterns of travel to school by primary age and secondary age children.

4.2.4.3 Between 1985/86 and 1999/01 the proportion of 5-10 year olds going to school by car has increased from 22 to 39 per cent and the proportion walking fell from 62 to 54 per cent.

4.2.4.4 The proportion of 11-16 year olds going to school by car has nearly doubled between 1985/86 and 1999/01, from 10 to 18 per cent, with a resulting decline in the proportion walking from 52 to 43 per cent.

4.2.4.5 Bus use has fallen for the 5-10 year olds but has increased slightly for the 11-16 year olds.

4.2.4.6 Cycle use has always been negligible amongst the 5-10 year olds but it has also been in decline amongst the older age bracket.

To retail establishments.

4.2.4.7 The proportion of shopping trips made by car has increased fairly steadily, from 42 per cent in 1985/86 to 61 per cent in 1999/01.

4.2.4.8 Over the same period, the proportion of shopping trips made on foot declined from 42 to 28 per cent and by bus from 12 to 8 per cent. Bicycle use has remained steady at about 1 per cent.

For Leisure.

4.2.4.9 Leisure trips by car have increased by 13 per cent overall between 1985/86 and 1999/01. There was a sharp increase in the late 1980's with relatively little change during the 1990's.

4.2.4.10 Over the same period leisure trips by public transport fell by about 35 per cent, with the early 1990's being particularly bad.

4.2.4.11 Leisure trips on foot have also steadily decreased to give a fall of 28 per cent since 1985/86.

4.2.4.12 Between 1985/86 and 1999/01 all trip making purposes demonstrate similar trends based around the increased use of the car. Average trip length has increased but the average time taken has reduced reflecting the greater use of the faster mode of travel.

4.2.5 Freight movement

4.2.5.1 The amount of freight moved increased by 42 per cent between 1980 and 2001. Goods moved by road accounted for the majority of the increase. Road freight now accounts for 63 per cent of all goods moved, compared with 53 per cent in 1980.

4.2.5.2 During the 1980's, the economy and goods vehicle traffic grew at the same rate. Since about 1990 freight moved and goods vehicle traffic has risen more slowly than GDP. This is partly because increased payloads have mitigated increases in tonnage carried and distances moved.

4.2.6 Key trend summary

4.2.6.1 Although the Government is keen to see an uncoupling of traffic growth from economic growth, our relative prosperity means that as a population over the last twenty years we have:

- greater car ownership;
- less households without access to a car;
- greater mobility.

4.2.6.2 Car occupancy has remained relatively stable so there has been no obvious consolidation of journey practice.

4.2.6.3 When trip making by purpose is considered it largely reflects the general national trend.

4.2.6.4 Although car trips to work have increased since 1985/86, the modal split proportions throughout the 1990's have not fluctuated significantly. Proportionately company car levels have also remained stable suggesting that an element of work trips to employment sites will have a consistent base.

4.2.6.5 Trips to school reflect increased car usage particularly to the detriment of walking and cycling. Older school children are also making greater use of the bus. This reflects growing parental concerns over child security that has reduced their personal freedom. The convenience of the car again shines through.

4.2.6.6 Car trips to shops have been steadily rising at the cost of journeys on foot. This supports the move away from the local corner shop or town centre convenience store to the large out-of-town retail outlet.

4.2.6.7 With trips made for leisure purposes the car has again dominated to the detriment of public transport.

4.2.6.8 The movement of freight has seen an increase in goods moved by road. This reflects in part the changing service requirements in the retail market.

4.2.6.9 Perhaps of greatest importance to an analysis of trip making trends over time is the fact that the average number of trips made per person per year has always been fairly stable at just above the 1,000 mark. Throughout the 1990's the car usage element has remained equally stable.

4.3 Land Use Changes.

4.3.1 It is important to consider recent trends in government policy and the associated philosophy that they are trying to bring to new development provision, because it highlights the important interrelationship between planning and transport. A different impact on people's use of transport may be inherent with historic development, provided without such guidance and 'direction'. If the government's objectives are realised then there may be a greater standardisation of trip rates for particular land uses. The theory being that they will have the same good access by all means of transport for those that need to use them.

4.3.2 It would be helpful to try to understand and confirm the type of land that is being used for development. Whether the land for new development is urban 'brownfield' or rural 'greenfield' is likely to have a substantial effect on the type of trip generation that occurs. This is of particular importance for new housing developments where policy has encouraged change in recent years.

4.3.3 Greater monitoring is taking place of transport and travel impact on the countryside as well as on health and the environment. The Government is actively trying to raise public awareness of such impacts by studying trends in greenhouse gas emissions, local air pollution, noise, energy consumption, fuel efficiency and countryside impact.

4.3.4 Public awareness of environmental transport issues is growing. The proportion of people saying that they take action to reduce the impacts on their local and global environment has increased. For instance there has been an increase from 28 per cent in 1993 to 39 per cent in 2001 stating a regular reduced use of the car for short journeys.

4.3.5 A more deliberate policy to restrict greenfield development and to conserve the countryside is involved with the designation of new National Parks. Advanced plans are being pursued for the South Downs and the New Forest. Such new designation of sizeable land areas will result in strict planning guidelines, possible intensification of existing developments and related impacts on trip rate generation within and in the vicinity of the National Park boundary.

4.3.6 Finally another policy related driver influencing a change in the location, type and quality of development, involves incentives that stimulate economic regeneration.

4.3.7 With the general consideration given to land use changes attention has been drawn to a number of government policies that could have influenced the type, location and quality of development. The drivers behind these political policy decisions have largely been social and environmental, seeking in particular to build more inclusive communities and protect an increasingly valued countryside. Whilst these have also had an element of economic reasoning behind them, it has not been as explicit as the policy of financial aid in defined economic zones. It is important for the TRICS user to consider this because whether companies in an industrial estate/ business park benefit from economic aid could affect the number and type of trips they generate.

5 ADVICE & CONSIDERATIONS FOR THE TRICS USER.

5.1 The initial work on transport, land use, economic and environmental trends has identified a number of general issues that seem important when grouped together, but no really overriding factors that would apply wholly to all land uses.

5.2 In recognition of the difference between the various land use categories it was felt that some key factors that may be very influential to trip making over time could be better substantiated by researching specific trends relevant to each category

5.3 Qualitative research of journals, academic literature and articles on the internet has enabled a number of ideas to be collated. In addition some of the economic factors such as GDP were analysed further with reference to the employment land use categories, to see if there was any statistically significant links for trip rates between them.

5.4 It should be noted that some land uses have not been studied.

- ✓ All sub categories related to health care have not been looked at. Separate research on this topic was ongoing at the same time as this and has recently been concluded (Ref 2).
- ✓ The mixed and miscellaneous land use categories have not been considered because again parallel research is also being undertaken. These uses tend to include a range of different features. It was felt that many of these were unique, and the TRICS user would be better served considering the individual factors for each of the features making up the land use. For instance it is recommended that someone calculating trip rates for a sports centre, multiplex cinema and drive through food shop should consider any particularly influential trends for each of these and then assess if any of these cancel each other out and act accordingly when deriving a collective trip rate.

5.5 As part of the presentation of the factors to be considered when establishing representative trip rates, the potential for ease of incorporation onto the TRICS system as an aid to users has also been kept in mind. Hence the following summary takes the form of a series of index cards. These provide the possibility for future system incorporation as automatic “pop-up” boxes, displayed to prompt or remind the user on the factors to take into consideration when calculating trip rates for the respective land use. A series of index cards individual to various land use sub categories have been developed, namely:

- Retail (including car boot sales, petrol filling stations and showrooms);
- Industrial (employment, civic amenity, vehicle repair and farm diversification);
- Residential;
- Education;
- Hotel, Food and Drink;
- Leisure and Tourism (including Marinas and Golf).

[The TRICS land use classification is illustrated e.g. **(1A)** *for ease of reference.]*

5.6 More detailed information on the justification and reasoning behind these guidelines can be found in Section 7 of the Technical Report (Ref 1) under the heading “Out of / into the box thinking”.

	FOOD SUPERSTORES (1A)
	**Factors that may influence trip rates**

- Sunday trading at larger stores began August 1994
- Some sites have 24 hour opening, earlier sites unlikely
- Trend for opening later in the evenings – check any earlier sites if this is significant.
- Trend for more trips with smaller top up shopping in the last 20 years
- Brand name loyalty
- Wider availability of goods other than food in more recent years.
  - Other services e.g. dry cleaners
  - In store restaurant
  - Petrol station
  - Internet shopping
- Recent trend for the larger store names to move back into town centres
- Change in the accessibility characteristics of the location type
- Congestion
- Park and ride buses improving access to some town centres
- Car park sizes
- Just in time deliveries have lead to more trips for the delivery of goods to stores.

	CASH AND CARRY [WHOLESALE AND CLUBS] (1B)
	**Factors that may influence trip rates**

- Are their restrictions on membership?
- Trips rates could link to employment rates, eg. Less self employed in economic downturns. Think about the regional/national store trends.

DISCOUNT FOOD STORES (1C)

Factors that may influence trip rates

- Sunday trading since August 1994.
- Increasing number of discount food chains opening stores.
- Consider departures over a whole day as fewer staff can lead to longer queues at checkouts resulting in fewer people exiting the store at any one time.
- NB: Although Kwik Save is included in the TRICS database this brand name no longer exists.

DIY SUPERSTORE (1D)

Factors that may influence trip rates

- Sunday trading since August 1994.
- Longer opening hours in recent years.
- Consider type of goods sold, for example Wickes is more like a builders merchants whilst stores such as Homebase sell more soft furnishes and the like. These different types of commodity/markets could affect the vehicle used to pick-up goods, for example more vans/goods vehicles for moving bulky goods.
- Discount days introduced to encourage weekday patronage.
- Just in time delivery introduction has led to more trips for the provision of goods to stores.

[Note: Do it All and Texas no longer exist although both are contained in the TRICS database.]

DIY Superstore with a garden centre (1E)

- Sunday trading since August 1994.
- DIY multiples have experienced much stronger growth that traditional garden centres.
- Likely to be linked to DIY purchases but in the future the garden centre could attract more trips in its own right.

	MOTORIST DIY STORES (1F)
	**Factors that may influence trip rates**

- All but one site in TRICS is Halfords. Use only if proposed site is similar to Halfords. Halfords have an expanding range of goods for sale whereas other motorists DIYs stock more traditional goods.

	OTHER INDIVIDUAL NON-FOOD SUPERSTORES (1G)
	**Factors that may influence trip rates**

- Think about the national/regional economic climate at the time the survey was carried out. In times of recession people have less disposable income for luxury goods.
- Take on board the impact of seasonal demands; trip rates likely to be higher in the lead up to Christmas and in the seasonal sales.
- Some stores have added intermediate storeys/levels to provide extra retail floor area.
- Sunday trading since August 1994.

	GARDEN CENTRES (1H)
	**Factors that may influence trip rates**

- Sites within the TRICS database are affected by seasonality with the busiest surveys being carried out in the Spring/Summer.
- Sales of garden products have increased by 90% from 1991-2001 nationally.
- Some stores have other attractions for example aquariums, pet centre.

	SHOPPING CENTRES – LOCAL SHOPS (1I)
	**Factors that may influence trip rates**

- The sites in the TRICS database can be categorised under four headings:
  - Scottish Town Centres
  - Shopping precinct (small mall)
  - Suburban shopping parades
  - Superstore with a few other services such as post office, fish shop etc in separate buildings.
- If possible use data from those that are most like the type of local shopping centre under study.
- Sunday trading since August 1994 and increasing opening hours.

RETAIL PARKS (1J & K)

Factors that may influence trip rates

- Sunday trading since August 1994.
- Increase in opening times in recent years.
- Trip rates may be less related to economic circumstances at retail parks with a foodstore than those where there is not one.
- Recent trend for adding intermediate floors to increase retail floor area.

BUILDER'S MERCHANTS (1L)

Factors that may influence trip rates

- Consider the economic climate at the time of survey. There are strong links between a well performing economy and building.
- Consider the type of vehicle that will be using the builder's merchants (eg goods vehicles, vans).
- Data for Wickes (under DIY superstore without garden centre) could be of use under this heading.

	MIXED SHOPPING MALL (1M)
	**Factors that may influence trip rates**
• Sunday trading since August 1994 • Could also consider surveys contained under the "Local Shopping Centre" heading. • Trip rates could be affected by local competition both in town centre and larger out of town malls.	

	FACTORY OUTLET CENTRES (1N)
	**Factors that may influence trip rates**
• Not significant in the UK until the mid 1990's.	

	PETROL FILLING STATIONS (13A)
	**Factors that may influence trip rates**

- *Note* – separate category detailing petrol filling stations with retail.
- Is the brand name important? Customers may be loyal to a particular brand due to perceived quality of fuel. Some petrol filling stations run loyalty schemes.
- Consider price/competition from nearby superstores.

	PETROL FILLING STATION WITH RETAIL (13B)
	**Factors that may influence trip rates**

- *Note* – separate category for just petrol filling stations.
- Consider the brand name of the associated food store – perceived price and quality of products.

	CAR BOOT SALES (11A)
	**Factors that may influence trip rates**

- Frequency of the sale may be important in determining trip rates.
- Styles of car boot sale, frequent events offer an element of market type trading.
- Number of trips affected by weather conditions – check the conditions for each survey under the survey details.

	CAR SHOWROOMS (14A)
	**Factors that may influence trip rates**

- Linked to a specific make of car?
- Independent showroom?
- Test drives will add to the trip rate (potentially doubling it).
- Time of year of survey. Pre 1998 traditional peak for buying cars was with new registrations in August. Since then there are two registrations a year in March and September.

	OFFICE (2A)
	**Factors that may influence trip rates**

- Consider the land use classification. A2 involving financial and professional services may have different trends to B1 (any other office) because of the type of work carried out.
- Very important to consider the location of the office. For example town centre offices trip rates have halved in 1998-2002 from 1995-97 because many organisations have reduced the amount of on site parking.
- In suburban locations the average trip rate has remained fairly constant from 1988-1991 to 1995-2002. The pressures on town centres are unlikely to be as prevalent here.
- Edge of town locations have seen a steady increase in the trip rate from the period 1988-1991 to 1995-2002. These sites have good accessibility and as car ownership and traffic has grown it is perhaps unsurprising that trip rates are getting higher.
- Check the hours the survey covered – is this similar to the study site?
- The shift to more staff working flexible hours may not be included in earlier surveys.
- More recent sites record whether a travel plan is in place.
- Check the nature of the business. An increase in hot desking and/or working from home could lead to higher trips rates per GFA.

	BUSINESS PARK (2B)
	**Factors that may influence trip rates**

- Consider the make up of the business park. Business parks defined as B1 land use but offices, industrial units and industrial estates can also have this classification.
- A business park made up of a mixture of offices and light industry may generate a different level of trip making than one dominated by research and development studios and laboratories.
- If offices are an important component then consider the issues highlighted for "offices".
- A limited dataset suggests that trip rate is inversely correlated with GDP per head. As GDP per head increases, the trip rate declines and vice versa. Data pre 1995 did not fit this trend and therefore it is suggested that it is not used.

	INDUSTRIAL UNIT (2C)
	**Factors that may influence trip rates**

- If using a particular industrial unit as a proxy then consider the companies, regional, national and international economic circumstances at the time of the survey.

	INDUSTRIAL ESTATE (2D)
	**Factors that may influence trip rates**

- Specify the land use classification.
- Many of the surveys in the database took place in the 1980's, which had a different economic climate and logistical operations.
- Just in time operations have been introduced since the 1980's. The idea is that a company has goods delivered to the plant just before they are needed in the manufacturing process resulting in more small deliveries. This is unlikely to have been the case in the older data.
- Where sites are located in commercial and industrial zones (as designated in TRICS) the trip rate may be greater as Economic Development Zones or Urban Development Corporation land is deliberately freed from local authorities' land use and transport planning control.

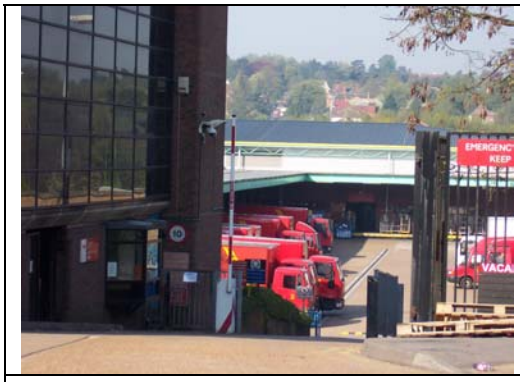
	WAREHOUSING (2E & F)
	**Factors that may influence trip rates**

Primarily distribution

- Retailers are moving towards 'just-in-time' system for the replenishment of stock. Products are delivered in smaller quantities from the suppliers to the distribution centre. This will mean there is likely to be an increase in the number of goods vehicle trips to and from the distribution centres.
- Freight distribution centres have been restructured so that they are based in regional and metropolitan warehousing depots often at accessible motorway junctions.

Primarily storage

- What is the nature of the storage? For example archive storage is long term whereas storage open to the general public will often be accessible 24 hours a day – this could make a fundamental difference to the trip rate.

	PARCEL DISTRIBUTION CENTRES (2G)
	**Factors that may influence trip rates**

- Growth in parcel business for private firms? Trips rates per GFA were very low for TNT in 1995, but 10 times higher in 1997, albeit for different areas of the country.
- Consider seasonal variation with the peak period in the lead up to Christmas.

	RECYCLING CENTRES (12A)
	**Factors that may influence trip rates**
• Kerbside collections in many parts of the country may have reduced the number of trips.	

	HOUSEHOLD WASTE SITES (12B)
	**Factors that may influence trip rates**
• Check whether site caters for commercial waste? • Are recycling bins also available? • Does your site have a similar size of catchment area.	

	LANDFILL SITES (12C)
	**Factors that may influence trip rates**

- Note the Landfill Tax came into force in August 1996 in an effort to reduce the amount of waste put into UK landfill sites. The number of trips to landfill sites may have decreased.

	VEHICLE PARTS AND REPAIR CENTRES (15A)
	**Factors that may influence trip rates**

- Trip rates in TRICS to Kwik Fit are higher than to the other brands surveyed.
- Does the centre offer MOTs?
- Are courtesy cars provided whilst customer's vehicle is being repaired – this could potentially double the number of trips at a site?
- Trip rates related to car ownership levels.

	FARM DIVERSIFICATION (16C)
	**Factors that may influence trip rates**

- All sites in TRICS under this heading are recent.
- See report in TRICS library.

	RESIDENTIAL LAND USES (3A-E, 3K-N)
	**Factors that may influence trip rates**

- All variables for all other land uses will affect the trip rate at residential sites.
- Need to take account of car ownership levels.
- Regional/national economy could alter the number of leisure-based trips.
- Consider the type of people that will be living in the development, e.g. families, young professionals, retired people. Is the trip rate calculated reflective of what you would expect these people to be doing in terms of making trips?
- An increase in the number of women working has also lead to a rise in the number of trips.
- The current elderly population is the first to have grown up during a time of mass car ownership and will want to continue to use the car for as long as possible.
- If a lot of working from home is expected then this could have different impacts on the trip rate. The daily commute will be reduced but there may be more trips overall. For example stopping at the shops and taking children to school were previously incorporated in the commute but they may have to be made separately.
- PPG3 has allowed an increase in housing density because of the supposed reduction in reliance on the car.
- New housing estates tend to have reduced parking standards because of PPG3. Consider whether this has really influenced people's trip making behaviour, people may park on the footway, in the road etc.
- Is there a controlled parking zone (CPZ) in the study area?
- Proximity of neighbouring land uses should be considered. Overspill parking could take place in the residential area thus increasing the number of trips.
- Consider when the sites in TRICS were developed. For example many of the mixed non private housing sites were built pre 1980. The design of housing estates has changed since then, so this may have affected trip rates.
- Check what other facilities are available in the residential area. Although local shops may not generate trips from outside the immediate area it is still important not to mix sites that have and don't have facilities because people living in estates without facilities will have to make a journey to buy food etc.

	SHELTERED ACCOMMODATION (3F)
	**Factors that may influence trip rates**

- Will see an increase in this land use in the future with an aging population.
- Would expect there to be higher trip rates at the weekend with people visiting.

	STUDENT ACCOMMODATION (3G)
	**Factors that may influence trip rates**

- End and beginning of term are key times as parents drop off and pick up their children.
- Is accommodation used for other purposes such as conferences out of term time?
- What are the educational establishment's policies on car ownership?
- Consider the proximity of the accommodation to educational resources.

HOLIDAY ACCOMMODATION (3J)

Factors that may influence trip rates

- Seasonality will strongly influence the trip rate.
- Consider the type of holiday market the accommodation is aimed at, for example beach resort or an area to explore (thus increasing trips).
- Think about the facilities on offer at the sites. Are they similar to the site being promoted? Are there facilities for non-residents thus increasing the number of trips?

SCHOOLS (4A & B)

Factors that may influence trip rates

- Does the study site offer out of school hours facilities such as sports centres, swimming pools, adult education classes, etc?
- Homework and sports clubs after school will alter the profile of trip making.
- Does the school have a travel plan?
- Within TRICS, data from state primary schools shows a decline in the number of trips over time.
- Within TRICS, private schools have higher trip rates than state schools.
- What is the local authorities' policy on catchment areas.
- Does the local education authority subsidise public transport travel – this could influence the number of trips.

	COLLEGE/ UNIVERSITY (4C)
	**Factors that may influence trip rates**

- Consider diversification of university facilities to allow non-students access to facilities.
- Are parking bays available to visitors?
- What is the university/college policy on car ownership?
- Is parking available for staff and students?

	NURSERY (4D)
	**Factors that may influence trip rates**

- Since 1998 Government policy has encouraged growth in this sector.
- Potential for an increased number of trips to/from nursery with Government funded places.

	RESIDENTIAL SCHOOL (4E)
	**Factors that may influence trip rates**

- Could also consider trip rates for private schools and university/college halls of residence.
- Establish the number of borders versus the number of day pupils.
- Number of children attending boarding school could relate to regional and national economic circumstances.

	HOTELS (6A)
	**Factors that may influence trip rates**

- Tourism, business or university demands will dictate when the “off-season” is and how long it lasts.
    - England and Scotland peak time is June to September
    - Wales’ peak time is July to August
    - Northern Ireland peak time is August.

  (Taken from United Kingdom Occupancy Survey).
- Do non-residents use the hotel, eg. for Sunday lunches.
- Change in popularity of cities, for example making Glasgow a City of Culture has increased the number of visitors to the area.

	RESTAURANTS (6B)
	**Factors that may influence trip rates**
Relates to national economy – the amount of disposable income is closely related to the patronage of restaurants. Is there a takeaway or delivery service associated with the restaurant – these will increase the number of trips.	

	PUBLIC HOUSE AND RESTAURANT (6C)
	**Factors that may influence trip rates**
• Pubs have longer licensing hours; all day opening on weekdays introduced 1988, all day opening on Sundays began in 1995. • Does the pub offer other attractions, for example children's play area, live sports coverage?	

	FAST FOOD – 'DRIVE-THROUGH' (6D)
	**Factors that may influence trip rates**
• Passer by trips due to signing from main roads. • Is it associated with a retail park, out of town development?	

	ROAD-SIDE FOOD SITES (6E)
	**Factors that may influence trip rates**
• These are mainly passer by trips and are influenced mainly by proximity to next nearest services. • Number of trips likely to be related to amount of traffic on the neighbouring road. • Happy Eater sites in TRICS may not be valid as ths brand no longer exists. • Collaboration of brands, for example Little Chef and Burger King, could increase the number of trips with more take away food being purchased.	

	MOTORWAY SERVICES (6F)
	**Factors that may influence trip rates**

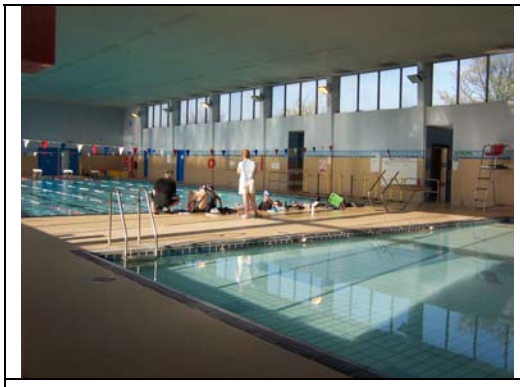
- Influenced mainly by proximity to next nearest services.
- Expect more trips where services are located at a junction thus attracting vehicles from elsewhere on the highway network.

	MULTIPLEX CINEMAS (7A)
	**Factors that may influence trip rates**

- Recent years have seen a growth in the number of ticket sales. Correlation between the number of visitors and quality of films being made.

	BOWLING ALLEYS (7B)
	**Factors that may influence trip rates**
• Are there other facilities on offer such as a restaurant, snooker or pool?	

	SPORTS / LEISURE CENTRES (7C)
	**Factors that may influence trip rates**
• What facilities are there on site, for example is there a swimming pool? Sites lacking this information should be discarded. • What other facilities are on offer, for example café, bar – these could extend the opening times? • Membership of sports clubs has increased in the 1990's. • Are there team-training nights/competitions?	

	SWIMMING POOLS (7D)
	**Factors that may influence trip rates**
• What type of pool is it – traditional 25m/50m or "fun" pool with flumes etc? • Are there competition days?	

	SKIING (7E)
	**Factors that may influence trip rates**
• Peak number of visitors could be when people are training before going on a skiing holiday. • Is there a ski shop, bar/restaurant – these could attract visitors in their own right.	

	ICE RINKS (7F)
	**Factors that may influence trip rates**
• Are there competitions held? • Is the rink used for ice hockey? • Proximity of nearest similar site – popularity of temporary outdoor rinks at Christmas could alter trip rates.	

	TENNIS CLUBS (7G)
	**Factors that may influence trip rates**
• Are there indoor and/or outdoor facilities? • Does the club have a winter season as well as the traditional summer one? • Trip rates likely to be higher when Wimbledon is on and in the summer holidays.	

	BINGO HALLS (7H)
	**Factors that may influence trip rates**

- What are the opening hours? Bingo Halls are likely to be closed during the AM peak.
- Gaining popularity and attracting younger players may increase the number of people arriving by car.

	ART GALLERIES/ MUSEUMS / EXHIBITIONS (7I)
	**Factors that may influence trip rates**

- Art Galleries/Museums/Exhibitions
- The catchment area will be related to the national significance of the museum/gallery.
- Think about the location – the trip making characteristics will be altered depending on whether it is in the city or in the countryside.

	EQUESTRIAN CENTRES (7J)
	**Factors that may influence trip rates**

- Sites may be busiest at weekends or in school holidays.
- Think about the nature of the centre. Is it driven by the local market or geared to tourism?

	5 A SIDE FOOTBALL COMPLEXES (7L)
	**Factors that may influence trip rates**

- Are the pitches inside or outside? Are they floodlit?
- Likely to be busiest in the evenings and the weekends.

COUNTRY PARKS (7M)

Factors that may influence trip rates

- Often visited by car but there are examples where alternative modes of travel are being promoted.
- Visitor numbers will be influenced by the weather. Check under survey day information for details of weather conditions, note only included for surveys post 1998.
- Does a conservation body such as the National Trust, or National Parks Authority promote the area? People will have a wider awareness of these country parks, which could increase the number of people visiting them.
- A country park may have other facilities besides countryside. Particular examples on the TRICS database include:
    - 9-hole golf
    - Orienteering
    - Windsurfing
    - Café
    - Visitors' centre
    - Miniature railway

MIXED LEISURE COMPLEX (7N)

Factors that may influence trip rates

- These are similar to Leisure Parks but may have Conference facilties in addition.
- All the sites in TRICS are pre 1994.
- Could consider the components that make up the leisure complex separately. Consider the trends highlighted for each of the different land uses.

	MARINAS (8)
	**Factors that may influence trip rates**

Facilities

- Developments associated with marinas tend to be leaning more towards mixed use with housing and restaurants. It will also be important to think about the other facilities on offer at the sites you are using e.g.
    - Chandlers;
    - Boatyard;
    - Sail manufacturers;
    - Lifeboat Station;
    - Clubhouse;
    - Yacht broker;
    - Sailing School.
- Select marinas aimed at similar markets for example river marinas for motorboats or coastal marinas attracting sailing boats.
- Seasonality will be important. The make-up and number of trips will be different according to the time of year. In spring and autumn, people will be cleaning, mending boats and perhaps transporting them to/from their home for safe winter keeping. During the summer the boat will be left in the water and journeys will be made to use it.
- The busiest time for marinas during the peak season is likely to be when regattas are occurring nearby, (e.g. Cowes Week would be a busy time for marinas alongside the Solent).

WATER SPORTS [E.G. SAILING, WATERSKIING, WINDSURFING] (7P)

Factors that may influence trip rates

- When calculating the maximum trip rate in transport modelling it will be necessary to assume that the average length of a car is longer than the default value. However, those involved in waterskiing and windsurfing may be able to put the skis and boards on a roof-rack.
- Could consider trip rates at small marinas, which involve similarly bulky equipment, if trip rates from suitable water sports clubs are not available. Important to ensure that the marina has similar facilities to the sports club to avoid unrealistic trip rates being calculated.
- The busiest time for water sports clubs during the peak season is likely to be when regattas are occurring nearby.

MUNICIPAL 9/18/18+ HOLE GOLF COURSES (9D, E & F)

Factors that may influence trip rates

- Are there other facilities available and are these open to non-members?
- Although these courses are open to everyone, there are members or season ticket holders, who get preference on playing golf. It may be useful to use sites with similar membership levels to predict trip rates at your course.
- Increasing popularity of golf is more likely to be reflected at a municipal course because it is cheaper and so more attractive to the mass market.
- It is unlikely that public transport will be an important consideration.

PRIVATE 9/18/18+ HOLE GOLF COURSES (9A, B & C)

Factors that may influence trip rates

- Are there other facilities available and are these open to non-members?
- Does the golf course organise competitions that attract competitors and fans? For example there is TRICS data for Wentworth when it held a PGA tour event in 1990.
- How long has the course been open? If it is a famous course then people will travel a lot further to play.
- Consider popular days such as 'Seniors Day' or 'Ladies Day', where trip rates may be higher.
- Results from the TRICS database suggest slightly higher trip rates for 9-hole courses in the week and 18-hole courses at the weekend.
- The golf market is said to be growing steadily, but not booming.
- Number of registered golf players is fairly stable with small annual rises.
- Daytime demand is likely to be highest where there is a large retired population, or where corporate functions are held.
- Increasing popularity of golf may not be evident at a private course, because it may have a set maximum membership level. It may be useful to use sites with similar membership levels to predict trip rates at your course.
- It is unlikely that public transport will be an important consideration, because of the bulky equipment associated with golf.

GOLF DRIVING RANGE (9G)

Factors that may influence trip rates

- Is the driving range part of a wider golf complex? If there are multiple facilities available then it may be more attractive than standard driving ranges.
- Opening hours vary from site to site. Some driving ranges have floodlit bays.

	TOURIST ATTRACTIONS (10)
	**Factors that may influence trip rates**

- Consider the nature of the Tourist Attraction.
- Consider seasonality.
- Are any corporate services supplied?
- Think about the type of tourism involved, the market for it (is it local or regional/national) and the way that people would travel to the attraction in the area. If it is local, it is likely that the area's socio-economic characteristics will play an important role in the popularity of the tourist attraction and the means of travel used to visit it.
- A local area that has been given a special tourist/ conservation designation may attract more people to the area than if there was none.
- Whilst National Parks may attract more people into the area, many authorities have attempted to ameliorate local congestion by introducing transport control and visitor management initiatives.
- Could also consider trip rates for country parks.

5.7 The investigation of the influence of economic factors did not produce any significant or meaningful results.

6 CONCLUSIONS.

6.1 Introduction

6.1.1 This document has attempted to summarise the work undertaken to fulfil the original research brief on 'Back Validation'. During the course of the study, the scope of the work has evolved but the focus has always been on providing output that can be easily interpreted and understood by the TRICS user.

6.1.2 It is to be hoped that the identification and presentation of a range of other factors that may influence trip rates, by land use (section 5 refers), will assist ongoing system development.

6.1.3 In addition, in order to complete and satisfy the fundamental research objectives, it is worth reflecting on the key study findings. Most importantly, observation is made where appropriate, on the applicability of the current default practice of introducing a cut-off period of 8 years as the starting point for data used in any trip rate calculation.

6.2 Issues arising from the land uses studied

6.2.1 *Superstores*

6.2.1.1 In all of the locations studied the trend is one of a reduction or stability in the number of car trips to superstores on a Friday. Sunday opening for large stores has been permissible since 28th August 1994. The increase in shops opening on this day in the late 1990s may be an important reason for the changes in Friday superstore trip rates noted over this period. Hence it is recommended that data prior to 1995 should not be used.

6.2.1.2 There may be other factors apart from the widespread change in opening hours that have affected superstore trip rates. The area that has experienced the most substantial change is the town centre, which may be because of:

- Congestion
- Competition between locations and brands
- A function of the different regions of the country surveyed

6.2.1.3 Overall, the individual location types studied somewhat resemble the trend for "all locations" apart from the town centre in 1998-2002.

6.2.2 *Offices*

6.2.2.1 Office trip rates are higher in the period 1995-2002 than previous years for "all locations". Whilst at the overall scale the current 8-year cut-off is valid, this is not the case when certain location types are examined. In town centre locations, trip rates in 1998-2002 are around a half of those recorded in 1995-1997. From this a five-year cut-off may be more valid. In suburban locations the average trip rate has remained fairly constant throughout the 1988-2002 period, and hence there is no need for any cut-off with this particular dataset. The pressures on town centre locations are unlikely to be as prevalent here.

6.2.3 *Industrial Estates*

6.2.3.1 For industrial estates it is difficult to draw any meaningful conclusions, because there has been a significant period during the 1990's when no data was collected. Some sites are also lacking basic geographical location and land use details, which limits their usefulness. The majority of the count sites predate the cut-off, and as industrial estates are an important category according to a user survey, it would be useful to increase the number of sites that are readily available. Given the great fluctuation in trip rate recorded in the early and mid 1980s it is unlikely that these are still valid.

6.2.3.2 With the lack of relevant industrial estate category sites contained within the database - only 9 out of a total 100 sites within this use class is dated 1998 or later - it must be difficult to assess the trip making of such development areas in terms of securing planning approval. In relation to the growing trend towards mixed-use development, the smaller B1(c) type units [units of size between 100 – 400 m^2] are becoming prevalent in applications, with the total use of the development site being dependent on the uses that occupy a significant number of smaller units. This suggests that more choice might need to be included within the category to identify the different types of industrial estate. This would allow a more analogous source of data to be assessed, as this land use category covers a wealth of different sub use classes and different types of units.

6.2.4 *Residential areas*

6.2.4.1 Trip rates at privately owned housing in all locations are at their highest in the past 2 years, far greater than they have been for much of the 1990's. Trip rates from 1995-2000 are in most cases the lowest of the study period from 1988 to 2002. This calls into question the validity of the 1995 cut-off, as unless the TRICS. user applies some form of growth factor then they are likely to be underestimating trip generation at new sites. Trip rates in the early 1990s have more in common with today's traffic generation in this land use.

6.2.4.2 For mixed private housing in most locations, trip rates are at their lowest of the entire study period during the last two years of data: 1999-2000. Trip rates at privately owned housing also were low during this period, before rising in 2001-2002. However the absence of any data in this land use from 2001-2002 does not enable an assessment as to whether trip rates have risen again. Trip rates in 1989-1990 are within the bounds of variation since the cut-off in 1995, suggesting that this data is as much valid as that from 1999.

6.2.4.3 Reasons for the variability in trip rates in residential areas are likely to be a function of many influential factors, rather than just car ownership. Economic factors are likely to have some effect, whether in their impacts on people's decisions to make trips from their homes to certain land uses or the geographical variability in economic performance within the UK and/or within a settlement.

6.2.4.4 The buoyancy of the housing market has given the propensity for greater mobility, with greater opportunity for residents to move house. However, it is highly likely that residents of say a 300 dwelling estate would in a repeat survey a few years later be similar people, with similar jobs, commuting a similar distance. Hence in general people's trip making levels would be similar, although their patterns may have changed and data validity remains acceptable. It is here that current guidance and policy, in particular the application of PPG13 and non-car accessibility will soon bring into question the validity of pre-2000 development (probably planned and developed before 1996).

6.2.4.5 Most recently within the revisions to PPG 3, the densities of residential development are encouraged to be higher. It is likely that the actual trip numbers if established on a per dwelling rate, may indeed remain similar. But the characteristics of this higher density type of development will also be different to anything currently on the database.

6.2.5 *Primary Schools*

6.2.5.1 The information from TRICS. suggests that car trips to primary schools are smaller in number since the cut-off. This may be a function of the different locations surveyed in 1991 and 1999. Schools surveyed more recently had better public transport available, whether that is a reflection of general improvements or just of the areas studied is debatable. The former suggestion may be more valid, because analysis of the Middle School in Wareham reveals a marked decline. With new initiatives such as 'Safer Routes to School' and 'Walking Buses' it is important that more surveys are undertaken to reflect recent trends.

6.2.5.2 Substantial differences in trip rate have been noted between preparatory and state primary schools, with a little difference between the latter and middle schools. It is thought that these are logical differences, given the age groups and catchment areas of these types of school.

6.3 Additional factors

6.3.1 Some additional factors have been considered as part of the brainstorming exercise that has been a part of the project. It is thought that factors such as petrol prices and disposable income will affect people's decision to make a journey and the type of transport that they would use to do so. If people do not have much money at their disposal they are unlikely to make a journey to a hotel or a cinema.

6.3.2 Other factors that are likely to be important for retail sites at least is the brand name and whether additional facilities are available – for example a restaurant in a superstore. These often have special offers to tempt people into the superstore for an evening meal in the hope that they will buy some products in the main part of the store as well.

6.3.3 General economic geography factors are likely to be important as well. Whether a site is based in an Assisted Area or an Economic Development Zone may affect the number and way people make trips.

6.4 Validity of the 8-year default cut-off application

6.4.1 In order to draw together the findings of this report a summary table detailing each of the different land uses analysed is presented. This summarises the national trends and those that have been calculated based on the TRICS data to provide information on the possible validity of the default 8-year cut off.

Table 1 – Summary Information for analysed TRICS land uses

Land use	National trends	TRICS finding	Default 8 year cut off valid?
Retail – food superstores (1A)	Increasing congestion. Introduction of maximum parking standards. Sunday trading since August 1994. Longer opening hours throughout the week. Increasing brand loyalty.	**Town centre** trip rates fallen 1998-2002.	No – use recent surveys (post 1998) onwards.
		Neighbourhood centre – trip rates fallen since 1994 then small rise 1998-2002.	Use surveys post 1995.
		Suburban areas – trip rate fallen since 1994 with growth 1998-2002.	Use surveys post 1995.
		Edge of town – different profile in trips rates to other locations. Peak trips rates 1995-1997. Decline 1998-2002 although still above the long term mean.	No - use surveys post 1997.
		1998-2002 surveys all based in NW England. Stores surveyed: 1998-2002 – only Morrison's & Tesco; 1995-1997 – Somerfield & ASDA included.	
Offices (2A)	Increasing congestion in town centres. Introduction of travel plans. Change to maximum parking standards. Recent shift to more flexible working hours.	**All locations** - Slight fall in trips 1989-1994, sharp increase 1995-1997. Trip rate has fallen 1998-2002.	Yes - 8 year cut off can be applied.
		Town centre – Increased trip rate 1984-1997.	No - use more recent counts – suggest 5 year cut off.
		Suburban areas – Trip rates similar over time.	No need for any cut off.
		Edge of town – Similar trend to all locations. Slightly lower trip rate 1995-2002.	Yes - 8 year cut off can be applied.

Land use	National trends	TRICS finding	Default 8 year cut off valid?
Industrial Estates – B2 (2D)	Just in time deliveries have been introduced since the 1980's.	Majority of surveys predate the 8 year cut off. No data 1992-1997. Increasing trip rate 1982-1992. 1997-1998 trip rate fell. 1999-2000 trip rate rose. Trip rate across all years is skewed by the data recorded in 1982-1984 when trip rates were lower.	Yes – much of the data is historic and predates the 8-year cut off but it should be noted that early data was collected under a different economic climate.
Industrial Estates – B1 or unknown classification		Substantially higher trip rate than B2. Fluctuation in the trip rate in the early to mid 1980s – unlikely that these are valid.	Yes – early counts feature fluctuations in trip rates.
Privately owned housing (3A)	Changes in parking standards. Introduction of Controlled Parking Zones (CPZ). Rising car ownership levels. PPG 13 & non-car accessibility will soon bring into question the validity of pre 2000 development. PPG 3 has allowed an increase in housing density.	**All locations** – peak early 1990's. Declining trip rate in the mid 1990's. Since 1999 the trip rate has risen to above the early 1990s peak.	No - suggest use most recent data only (2000 onwards) although early surveys have similar trip rates.
		Edge of town – similar trend to all locations although lower trip rate. Recent trip rates are above the long term mean.	As above for "all locations".
Mixed private housing (3K)	As above	**All locations** – two peaks 1991-92 and 1995-98. Trip rates are lower 1993-94 and 1999-2000.	Variable trip rates therefore suggest all data valid if choosing sites with similar characteristics.
		Edge of town – similar trend to all locations but rates slightly lower.	As above for "all locations".
		Resurveys show no defined trends.	

Land use	National trends	TRICS finding	Default 8 year cut off valid?
Primary schools (4A)	National statistics show a rise in the car being used for the school run.	Trip rates higher at preparatory schools than state schools. Middle schools have lower trip rate than primary schools.	Trips rates in TRICS do not mirror national trends.
		State primary schools – trip rate highest in 1991, fallen 1996-1999.	
Hotels (6A)		**All locations** – peak in trip rates 1995-2000. Lower rates 1987-1994 and 2001-2002.	No – variable trends. More important to match to similar site on database.
		Edge of town – Same trend as for all locations 1987-2000 but trip rate rose dramatically 2001-02.	As above for "all locations".
		Free standing – trip rate fairly stable since 1993.	Use data post 1993.

6.4.2 Table 2 summarises the findings based on the repeat survey information at a number of different land use development sites held in TRICS. In this case considerably more care needs to be placed when considering the validity of the 8-year default cut-off. The findings as presented are based upon a very selective and small sample and so the confidence in them is not so high.

Table 2 - Summary information based on resurveyed TRICS sites

Land use	National trends	TRICS findings	Default 8 year cut off valid?
DIY Superstore [without garden centre] (1E)	Discount days introduced to encourage weekday patronage. Peaks at Bank Holiday weekends.	More weekend movements, particularly on a Saturday, with a possibly related decrease on a Friday.	Yes - use most recent data.
Garden centres (1H)	Sales of garden products have increased by 90% from 1991-2001.	Trip rates have increased where surveys have been carried out in the summer (1988-1997).	Yes - trip rates increasing. Discard any surveys carried out in the winter.
Retail Park [exc Food] (1K)		Trip rates appear to be consistent over time.	No – can ignore the cut off.
Institutional hostel (3E)		Trip rate has reduced over time.	Yes - use most recent data.
Sheltered accommodation (3F)		Trips increased and hourly distribution changed.	Yes - use most recent data.
Pub/restaurant (6C)	All day opening weekdays since 1998. Sunday opening since 1995.	No trends identified.	No – there are no trends in the resurveys.
Multiplex cinema (7A)	The number of visitors has been increasing in recent years.	No consistent trends over time across the repeated surveys.	Yes - Suggest keep the cut off based on national trends.

Land use	National trends	TRICS findings	Default 8 year cut off valid?
Bowling alleys (7B)		Consistent number of trips over time.	No – can ignore the cut off.
Sports centres (7C)		Growth in the trip rate at each of the resurveyed sites.	Yes - use most recent data.
Country Parks (7M)		Trip rate fell in the resurvey – weather and event dependent.	No – no trend established. Need to take account of survey details – weather information only included from 1998 onwards.
Marinas (8A)		Rise in trip rate at each of the resurvey sites.	Yes – older sites had lower trip rates.

6.5 General

6.5.1 Where repeat surveys have been used, some do appear to illustrate that traffic patterns are broadly similar over the database, whilst others do indicate a degree of variability. The key point would seem to be that a consistent trend would ordinarily be anticipated if the most influential parameters such as floor area, site layout provision, the number of available car parking spaces, employees or indeed residents etc is of a similar order to that of the earlier survey. People do tend to be creatures of habit, making similar trip patterns – as borne out by the general transport trends (section 4.2 refers). If there is a local factor, for instance if a new supermarket has opened up in proximity, or increased car ownership, then this would give rise to potentially significant differences between original and repeat surveys in terms of overall trips. For destinations perhaps within town centres, improved access to public transport would have a similar impact.

6.5.2 The wider study of traffic patterns at each of the land uses shows that in general an element of change is taking place over time. This supports the current system practice of applying a default cut-off for data to be included in the trip rate calculation - but a word of warning. It is expected that the impact of the revised PPG13 document will bring about a more significant change, which may have already commenced, since its publication was in March 2001.

6.5.3 More developments are being built on brownfield sites, often mixed use in nature with lower parking standards than before. However practical experience suggests that currently the measures and parking restraint aims of the planning guidance have not yet been seen applied on the ground to any significant scale.

6.5.4 It is concluded that once parking restraint (reduced numbers of spaces being allowed on site) is implemented in conjunction with Green Travel initiatives, then certain land use sites surveyed even recently, will not remain of relevance to developments that are being planned now.

6.5.5 This future trend serves to emphasise the need for the user to consider carefully the use of 'average' site representations in preference to an approach based more upon the use of individual site details. It also emphasises the need for the future data collection programme to continue to be responsive to demands, trends and policy rather than necessarily maintaining the quantities of data available within each land use category/sub-category.

6.5.6 The planning process is moving on and with it the rationale for traffic attraction. This research serves to emphasise that TRICS must continue to take care that the land use types, site information and mixes of development it incorporates do not become dated.

6.5.7 The adoption of a default cut-off year is in general a valid practice for trip rate calculation purposes. **This does not remove the need for the individual user to show due thought, care and responsibility in using and interpreting the data and trip rate calculation that is made available to them on the system.**

7. REFERENCES

1. Kent County Council/Babtie, 'Back Validation – Technical Report on Research' April 2004.
2. MVA, 'TRICS Research Brief No 3 - Hospital Travel, Report' December 2003.

TRICS

Back Validation

Technical Report on Research

0002096 April 2004.

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1 Introduction

1.1 Background

1.1.1 The **T**rip **R**ate **I**nformation **C**omputer **S**ystem (TRICS) is a computerised database of land use and trip generation information providing a trip rate analysis package used for transport planning and development control purposes. It is owned by a Consortium of Local Authorities (Dorset, East Sussex, Kent, Hampshire, Surrey and West Sussex County Councils) who have appointed JMP Consultants Limited to administer and market the database and analysis software. The responsibility for the system and its development lies with a Management Group comprising representatives from each of the Consortium local authorities and from the marketing managers, JMP.

1.1.2 Through the activities of the Management Group the Consortium encourages and supports research that helps both professional awareness and education and to maintain the systems technical standing and viability in the market place.

1.1.3 Such research may be commissioned externally from other independent consultants or be tackled internally by JMP or the local authorities. In this way a broad cross-section of input is maintained to system development.

1.1.4 A potential research brief topic concerning 'Back Validation' was identified by JMP, who expressed the opinion that there was a potential role for the Consortium. Kent County Council had already undertaken a local analysis of time series data and expressed an interest on the basis that they could use the resources of their term consultant Babtie to extend and progress the work.

1.1.5 The fundamental aim of the research is ***to understand a little more about the validity over time of data that currently exists in the system***. In particular the adopted default practice of applying an 8-year cut-off for data to be included in the trip rate calculation, may not necessarily be appropriate, as some more historic data elements may remain valid. Hence the concept of 'Back Validation' emerged to investigate and establish a process that can look back in time and verify the continued applicability or not, of historic database sites.

1.1.6 The brief in Appendix A states clearly how the dataset has always been subject to a validation check, but this is a practice that has evolved and adapted to reflect the growing amount of supplementary detail requested of providers over time. Indeed within this additional factual information there may be specific items that could prejudice the applicability of the historic data if they are absent or cannot be sourced/obtained currently.

1.1.7 Following close liaison between JMP and Kent representatives, a Research Proposal produced by Babtie [Ref 1] was considered and approved by the Management Group on the 9th July 2003.

1.1.8 Analytical work commenced in August 2003, targeted on a number of key land uses initially. Preliminary investigation had already been given as part of the Research Proposal to the land use categories that should be considered first (Appendix B refers).

1.1.9 The most recent dataset in TRICS 2003(b) [Ref 2] has formed the basis of the completed technical work.

1.2 The Aim of this Report

1.2.1 A particular requirement of the research brief was to produce a short technical report to facilitate discussion on the findings.

1.2.2 This document was initially intended to fulfil that purpose by providing a summary of the technical work completed based upon:

- the process to calculate trip rates and to establish national trends in keeping with the proposal to
  - enable an understanding of any factors that strongly influence trip making that are not properly included.
  - aid the identification of any misleading and erroneous information in the database.

However, as the technical work unfolded it became clear that a separate summary document would be a more appropriate way to present the research conclusions to users. Consequently this report forms the working document, incorporating the key data from which the research findings have been finalised.

1.2.3 In collating relevant information and analysing the database care has been taken to adopt a balanced approach involving individuals directly associated with TRICS in combination with an independent view from researchers who are detached from the management and system development.

1.2.4 Acknowledgement is made of the contribution from Development Control practitioners within Kent Highways who participated in a workshop to assist the research progression.

1.2.5 A considerable amount of material has also been gathered from literature reviews and website searches. Appropriate references will be made where known and any omission of recognition is not deliberate but may arise from a lack of clarity or declaration failure at source.

1.3 The Content of this Report

1.3.1 Chapter 2 presents the methodology that has been followed in order to calculate trip rates for various land uses.

1.3.2 The results that have been obtained for each of the different land use categories are presented in Chapter 3.

1.3.3 A part of the study was to identify any factors that may influence trip making that are not properly considered at the moment. Chapters 4, 5, 6 and 7 relate to such elements with the key influences promoted and a suggested approach to their system incorporation.

1.3.4 Chapter 8 discusses the findings that have arisen during the course of this study and promotes some initial conclusions for development in the final summary report.

1.3.5 All Figures referenced in the text can be found collated in a separate section immediately following the ‘References’ and prior to the Appendices.

2 Methodology to Calculate Trip Rates

2.1 Introduction

2.1.1 The methodology proposed in the Research proposals [Ref 1] has been followed. A generic process has been developed as illustrated by the flow chart in Figure 1, to generate trip rate information to establish any trends in the data and to detect potentially erroneous or misleading information on the land-use dataset. This methodology has been applied to a number of land-uses that have substantial datasets:

- *Retail:* Superstores.
- *Employment:* Offices.
  Industrial Estates.
- *Residential:* Housing.
- *Leisure:* Hotels.
- *Education:* Primary Schools.

2.1.2 First an average trip rate across all surveys and dates (excluding the 8 year cut off) has been calculated for each land use to provide baseline trend information. This is a daily 'totals' trip rate.

2.1.3 Additional trip rates have then be derived for a number of alternative scenarios depending on the number of sites available in the database.

2.1.4 Where there were a large number of sites under a particular land use sub category individual years have been chosen. This has allowed a profile of trip rates over time to be compiled. Where information is sparse, specific years have not been identified, although data has been grouped into ranges of years where possible.

2.1.5 Survey data has invariably been collected on different days of the week. Where the trip rate has not been particularly influenced by day of the week, then all days have been selected to ensure a larger sample. On other occasions the trip rate is significantly different, for instance between the weekend and a weekday, therefore further selection has been required.

2.1.6 Manual classified count surveys have formed the basis of this approach. Although contrary to the initial proposal, where it has made sense to do so, automatic traffic surveys have been used instead. The latter use a tube placed across the road that records every instance of a vehicle passing over it, whilst the former involves an enumerator recording the number of different vehicles that pass a specified point.

2.1.7 In the secondary parameters field the location of the sites can be selected. In order to reduce the number of trip rate variables only location types where there is enough data have been selected. In some cases locations have been amalgamated due to the small sample size in the first place.

2.1.8 A daily trip rate has then been calculated across a number of years to allow any trends over time to be detected. Once the average rates have been derived, individual historic sites have then been compared to allow any unusual trip rates to be detected.

2.1.9 An earlier report, "TRICS – Analysis of Repeat Surveys in Kent" (January 2003) focused on the data collection programme in Kent. As part of this some sites in Kent have been included in a rolling programme whereby they are resurveyed after several years. The Kent data was analysed to provide a snap shot of monitoring trip rates associated with various types of land use. A copy of the Kent report can be found in Appendix C. As a continuation of the findings of the Kent based analysis the site selection has been expanded here to focus on a range of sites in the database where repeat surveys have been held. These can be used to give an indication of the change in the number of trips whilst reducing other variables. Trips rates for individual sites have been calculated to provide a comparison between the original and repeat surveys. Where possible the same month and day of the week have been selected in the later survey as in the original.

2.1.10 Some additional land uses have been analysed as part of a separate exercise to be discussed later. These have had to be excluded from this quantitative approach typically because of a small dataset, with more than 12 hours of trip information for each site rarely available. In these cases a certain time period has been specified to include the maximum amount of data available. This has then been exported from TRICS into EXCEL to produce a scatter graph and enable a broad overview to be taken of the trends that have resulted.

2.1.11 The remainder of this chapter presents a summary of this methodology as applied specifically to calculate the trip rate for each of the chosen land use categories.

2.2 Superstores

2.2.1 Only manual counts undertaken on a Friday have been included. This day was chosen because it had the greatest amount of data. This day traditionally has different opening hours to the rest of the week, so discrepancies could result if trip rates from Mondays to Thursdays were also included. The trip rate parameter used is Gross Floor Area (GFA) and the calculation factor is 100 m^2.

2.2.2 Trip rates have been calculated for superstores in the following locations within settlements:

- All locations
- Town Centre
- Neighbourhood Centre – "local area within a town, containing local amenities, or a village", [Ref 2]
- Suburban Area
- Edge of Town

2.2.3 Trip rates have been calculated at these locations for a number of year ranges to examine whether there are any trends in the recent past.

2.3 Offices

2.3.1 Manual counts from Monday to Friday have been used. Whilst it is recognised that staff and traders may leave early on a Friday, it will not affect the basic daily trip rate. Offices have been surveyed for TRICS at two different land use classifications: A2 (Financial and Professional Services) and B1 (Any other office). Trip rates have been calculated for all locations at each of the different land classifications. The trip rate parameter used is GFA and the calculation factor is 100 m^2.

2.3.2 Variation in trip rates for B1 use class has also been analysed according to the location within a town. There have not been enough surveys at the A2 class to make it worthwhile to repeat the exercise for this type of office. Trip rates have been calculated for B1 offices in the following locations within settlements:

- All locations
- Town centre
- Suburban area
- Edge of town

2.3.3 Trip rates have been calculated at these locations for a number of year ranges to examine whether there are any trends in the recent past.

2.4 Industrial Estates

2.4.1 Manual counts from Monday to Friday have been used. Again whilst it is recognised that staff and traders may leave early on Friday, it will not affect the basic daily trip rate. Industrial estates have been surveyed for TRICS at two different land use classifications: B1 (research and development studios, laboratories, high-tech companies and light industry) and B2 (general industrial). However a significant number have been classified as unknown, which has created problems. Trip rates were initially calculated for each separate classification. The trip rate parameter used is GFA and the calculation factor is 100 m^2. However as substantially different results were obtained, it has not been possible to analyse any trends for industrial estates as a whole. For example any variation could be because more of the B1 than B2 classification was surveyed in a particular year.

2.4.2 Large numbers of sites also lack any basic geographic information regarding the position of the site within a settlement. As a consequence it has not been possible to analyse any trends relating to this parameter. Similar problems exist in most land uses, but the numbers involved are not as significant.

2.4.3 Trip rates have been calculated at these locations for a number of year ranges to examine whether there are any trends in the recent past.

2.5 Housing – Privately Owned

2.5.1 This refers to housing developments where at least 75% of households are privately owned, and at least 75% are houses rather than flats or bungalows, [Ref 2].

2.5.2 Trip rates were initially calculated for all years for each day of the week using Manual and Automatic count data separately. Table 1 illustrates the results that have been obtained using the parameter value of one household.

Table 1: Daily variation in Housing - privately owned trip rates per 1 household according to day of the week and type of survey.

Day	Automatic Traffic Count		Manual Classified Count	
	Trip Rate	Number of Survey Sites	Trip Rate	Number of Survey Sites
Monday	8.06	20	5.60	5
Tuesday	8.18	19	5.15	15
Wednesday	8.78	20	7.61	11
Thursday	7.54	21	7.75	29
Friday	8.04	24	7.75	6
Saturday	7.34	24	6.11	3
Sunday	5.99	25	4.84	1

2.5.3 Given that the variation in trip rate was less marked throughout the week it has been decided to use the Automatic count data solely for this land use type. The advantage of using this is that it will pick up all journeys to and from the housing area, as some people may be missed in a Manual count survey if they decide to come home late in the evening. There are also more survey days available to this type of count. Data from the weekend has not been used because it was felt that the type of journeys made on a Saturday or Sunday are likely to be fundamentally different to those during the week and may cloud any inter-annual trends that may arise.

2.5.4 Trip rates have been obtained for various years at the following locations within a settlement:

- All locations
- Edge of Town
- Suburban

2.5.5 However, it was found that there was not enough data for different years to make any meaningful comparisons between all locations and the subdivisions. Hence other optimal parameters have been utilised in the effort to find some worthwhile trends. Car trip making from a housing area is likely to be a function of residents' ownership of motor vehicles and the availability of any public transport alternative.

2.5.6 It has been found that all the privately owned housing surveyed had vehicle ownership levels of either 0.6-1.0 to 1.1-1.5 per household within a 5 mile radius of the site. However it was found that most of the sites were characterised by the lower of the two ownership levels. As a result it has only been possible to analyse variation in trip rate characterised by the 0.6-1.0 car ownership level.

2.5.7 Most sites in the TRICS database have a record of the "total number of buses per day that stop within 400 metres of the site frontage" and the "total number of trains per day that stop within 1km of the frontage", [Ref 2]. Separate trip rates have been calculated for sites with the following categories of public transport provision:

- <40 buses/trains
- at least 40 buses/trains

2.5.8 These splits have been chosen to ensure that there is enough data in each of the years to analyse.

2.6 Mixed Private Housing

2.6.1 This refers to housing where at least 75% of households are privately owned, and there is no 75% predominance of a particular housing type, (e.g. houses, flats and bungalows), [Ref 2].

2.6.2 Trip rates were initially calculated for all years for each day of the week using Manual and Automatic count data separately. Table 2 illustrates the results that have been obtained using the parameter value of one household.

Table 2: Daily variation in Mixed Private Housing trip rates per 1 household according to day of the week and type of survey.

Day	Automatic Traffic Count		Manual Classified Count	
	Trip Rate	Number of Survey Sites	Trip Rate	Number of Survey Sites
Monday	6.98	15	5.26	2
Tuesday	6.83	16	6.46	13
Wednesday	7.23	16	3.44	8
Thursday	6.31	20	5.91	24
Friday	6.64	21	4.93	9
Saturday	6.26	20	5.11	4
Sunday	5.19	20	3.98	1

2.6.3 Given that the variation in trip rate was less marked throughout the week it has been decided to use the Automatic count data solely for this land use type. The advantage of using this is that it will pick up all journeys to and from the housing area, as some people may be missed in a Manual count survey if they decide to come home late in the evening. Data from the weekend has not been used because it was felt that the type of journeys made on a Saturday or Sunday are likely to be fundamentally different to those during the week and may cloud any inter-annual trends that may arise.

2.6.4 Trip rates have been obtained for various years at the following locations within a settlement:

- All locations
- Neighbourhood Centre
- Edge of town

2.6.5 As described in para 2.5.5 it has been found that there is not enough data to allow meaningful inter-annual comparisons for the different locations within a settlement. As a consequence, other factors have been analysed to determine if there are any long-term trends. Car trip making from a housing area is likely to be a function of residents' ownership of motor vehicles and the availability of any public transport alternative.

2.6.6 It has been found that all the mixed private housing surveyed had car ownership levels of either 0.6-1.0 to 1.1-1.5 per household within a 5 mile radius of the site. However it was found that most of the sites were characterised by the higher of the two ownership levels. As a result it has only been possible to analyse variation in trip rate characterised by the 1.1-1.5 car ownership level.

2.6.7 Trip rates have only been calculated for one of the categories of public transport provision discussed in para 2.5.7 because of an absence of enough data throughout the years. In this case only sites with at least 40 buses and trains in the vicinity have been analysed.

2.7 Hotels

2.7.1 Manual counts have been used for this land use, as this contains the more comprehensive data. Automatic traffic counts were only undertaken at 10 survey sites, with all but one predating 1994.

2.7.2 The trip parameter that has been used is the number of bedrooms as this contains the largest dataset. Trip rates have initially been calculated for each day of the week to assess whether it is meaningful to analyse all days of the week. Table 3 illustrates the results and the number of sites in the whole of the TRICS database.

Table 3: Hotel trip rates per 1 bedroom (all years).

Day	Manual Count Trip Rate	Number of Survey sites
Monday	4.21	5
Tuesday	5.70	10
Wednesday	4.03	12
Thursday	6.60	9
Friday	7.88	8
Saturday	7.90	11
Sunday	5.80	5

2.7.3 Monday and Wednesday were found to have substantially different trip rates in comparison to the remainder of the week and so data from these days have been discarded. Average trip rates have hence been calculated for the remaining days for hotels in the following locations:

- All locations
- Edge of Town
- Free standing

2.8 Primary Schools

2.8.1 The dataset is quite small in size compared to the other land uses discussed. However the demand for new schools is likely to increase with government plans to develop certain areas of the country. Manual count data from Monday to Friday has been used, as there should not be any significant difference according to the day of the week.

2.8.2 Trip rates have been calculated for all years. Analysis of the sites surveyed suggested that there maybe variation according to the type of primary school. Different types of school are likely to have different catchment areas and age groups, which will affect the trip rate. From the names of the schools on the database it was possible to calculate trip rates for the following types of school:

- Preparatory
- Middle
- Infants/Junior/Both

2.8.3 Although data has only been collected in a few years it has also been possible to analyse inter-annual variability in trip rates. One school has been surveyed twice and trip rates have been compared to assess whether the trends arising from all primary schools are also prevalent at an individual location.

3 Trip Rate Results

3.1 Introduction

3.1.1 This chapter presents the inter-annual trends obtained for each of the land uses and any variation by geographical location within a settlement.

3.2 Superstores in town centres

3.2.1 Figure 2 illustrates the Friday trip rate per 100 m^2 of superstore GFA for "all locations", "town centres" and the "town centre 1986-2002" mean.

3.2.2 The trend for "all locations" is one of continued increase in trip rate from 1989-1991 to 1998-2002, although growth has declined in recent years.

3.2.3 In terms of the "town centre" trip rates, they increase from an average of just under 100 per 100 m^2 for 1986-1988 to a peak of 150 for 1995-1997. Growth and the trip rate is virtually the same as "all locations" for the period 1989-1997. However the data suggests that "town centre" trip rates have fallen to just over 100 for 1998-2002. This is below the mean for this location during the period.

3.2.4 One site has been the subject of repeat surveys; Tesco in Clitheroe has been surveyed three times in 1989, 1996 and 2000. Figure 3 shows that there was a rise in the number of trips across the years for a Friday but a fall in the number of trips on a Saturday between 1997 and 2000.

3.3 Superstores in neighbourhood centres

3.3.1 Figure 4 demonstrates the Friday trip rate per 100 m^2 of superstore GFA for "all locations", "neighbourhood centres" and the "neighbourhood centre 1986-2002" mean.

3.3.2 The pattern for "neighbourhood centres" is slightly different to that described for "all locations", in that the trip rate grows rapidly up to 1994 before tailing off. A small rise means that 1998-2002 rates are similar to 1992-1994.

3.3.3 Figure 5 illustrates the trip rate at Plymco, Plymouth. The survey dates for this site are both beyond the default 8 year cut off having been undertaken in 1988 and 1993. There was a growth in trips up to 1993, which according to the general trends would have continued. The trip rate at Sainsbury's in Exeter is shown on Figure 6. There was an increase in the number of trips on a Friday between 1991 and 1995 but a decrease for the same period on a Saturday, which could possibly be related to Sunday trading laws.

3.4 Superstores in suburban areas

3.4.1 Figure 7 shows the Friday trip rate per 100 m^2 of superstore GFA for "all locations", "suburban areas" and the "suburban area 1986-2002" mean.

3.4.2 The pattern for suburban areas is similar to that for "neighbourhood centres". The trip rate grows rapidly up to 1994 and then tails off before returning to previous levels in 1998-2002.

3.4.3 Two sites have been resurveyed in suburban areas; Tesco in Poole (Figure 8) and Tesco in Plymouth (Figure 9). Tesco in Poole was surveyed in April 1994 and there were 4 surveys in 2000. Although the counts in 2000 show some seasonal variation there was still a general increase on the number of trips compared to 1994. Tesco in Plymouth was surveyed in 1987 and 1993; both beyond the default 8 year cut off. Again there was a growth in the number of trips and these could possibly be extrapolated to be included in more recent data.

3.5 Superstores on the edge of town

3.5.1 Figure 10 portrays the Friday trip rate per 100 m^2 of superstore GFA for "all locations", "edge of town" and the "edge of town 1986-2002" mean.

3.5.2 The profile illustrated in Figure 10 is different to the other locations previously described. The trip rate falls from 1986-88 to 1989-91 before increasing to a peak of around 175 for the period 1995-1997. Similar to the "town centre" location there is a decline for 1995-1997 to 1998-2002, however in numerical terms it is much less marked. Trip rates are still above 150 and the long-term mean for this location type.

3.5.3 Sainsburys in Christchurch has been the subject of 3 surveys in November 1990, September 1997 and August 2000. Throughout this period there has been a steady increase in the number of trips (see Figure 11). Sainsbury's in Fareham was surveyed in 1993 and 1999. Figure 12 reveals that there has been a steady increase in the number of trips on both Friday and Saturday at this site. Asda in Brighton was surveyed 6 times between May 1988 and May 1993 (Figure 13). All these surveys are now beyond the 8-year cut off. Surveys were undertaken on Thursdays, Fridays and Saturdays and the general trends across all of these days show a steady increase in the number of trips.

3.6 Superstores – summary and conclusions

3.6.1 In all of the locations studied the trend is one of a reduction or stability in the number of car trips to superstores on a Friday.

3.6.2 Sunday opening for large stores has been permissible since 28th August 1994. The increase in shops opening on this day in the late 1990s may be an important reason for the changes in Friday superstore trip rates noted over this period. Superstores are also generally open for longer on other days in the week. Whereas stores may have closed at 6pm a decade ago, many regularly open until 9pm at least. There are also some stores that are open 24 hours. People now have more time throughout the week and an extra day at the weekend to do their shopping and hence it is reasonable to suggest that they will spread out their trips to the superstore.

3.6.3 There may be other contributory factors to explain the trend described, as only in some areas have trip rates fallen in the past five years. The substantial change in the town centre trip rate may be a result of:

- Increasing congestion in our towns and cities resulting in people switching to alternative modes such as 'park and ride' in order to do their shopping.
- Competition with suburban and neighbourhood centre stores, which have remained stable in their car trip rate. Urban congestion may also be a factor in making these locations more attractive
- The different areas of the country included in the trip rate calculations. 1995-1997 trip rates were based on sites across the country. 1998-2002 only included superstores from the northwest of England.

- The different superstore brands surveyed. People may shop at a particular store because of brand loyalty, an advertising promotion or perhaps the provision of an in-store restaurant rather than because it is the nearest store to their house. For instance 1998-2002 only involved Morrison's and Tesco whilst the 1995-1997 surveys also included Somerfield and ASDA.

3.6.4 Superstore trip rates have also fallen a little at edge of town locations. It is unlikely that congestion will have had as great an impact or that people have switched to alternative modes, since the availability of public transport to these areas is often not as great as for town centres. It may be simply a function of extended opening hours leading to the stagger of trips throughout the week and the different fortunes of the superstore brands surveyed.

3.6.5 Overall, the individual location types studied somewhat resemble the trend for "all locations" apart from the town centre in 1998-2002.

3.7 Offices – town centres

3.7.1 Figure 14 illustrates the Monday to Friday trip rate per 100 m^2 of B1 office GFA for "all locations", "town centres" and the "town centre 1984-2002" mean.

3.7.2 The trend for "all locations" is one of a slight fall from just over 10 in 1984-88 to c. 9 for 1989-94.There has been a sharp increase to over 15 for 1995-97 which has subsequently fallen away to 12.5 for 1998-2002.

3.7.3 In terms of trip rates for "town centre" locations, these have increased from less than 10 to just over 20 between 1984 and 1997. However they have subsequently fallen away sharply in the period 1998-2002, to less than that for "all locations" at just over 10.

3.8 Offices – suburban locations

3.8.1 Unlike the analysis for the "town centre" location, Figure 15 does not use as many year groups or the same ranges, because there is not as much data available for suburban areas. As a result different "all location" trip rates have been calculated for ease of comparison with the suburban data. Figure 15 demonstrates the Monday to Friday trip rate per 100 m^2 of B1 office GFA for "all locations", "suburban" and the "suburban 1984-2002" mean.

3.8.2 The trend for "all locations" is one of an increase from around 7 in 1988-91 to an average of 15 for 1995-2002. "Suburban" trip rates were very similar in 1988-91 as they are in 1995-2002.

3.8.3 Legal and General, in Kingswood, Surrey, was surveyed in 1989 and 1995. Over this period there was a decline in the number of trips although not by a significant amount as shown on Figure 16.

3.9 Offices – edge of town locations

3.9.1 The same year ranges used in the suburban analysis have been used in Figure 17 for the reasons described in para. 3.8.1. Figure 17 shows the Monday to Friday trip rate per 100 m^2 of B1 office GFA for "all locations", "edge of town" and the "edge of town 1984-2002" mean.

3.9.2 For "edge of town" locations the trend is somewhat similar to that described for "all locations" in para 3.8.2, although the trip rate is slightly lower in 1995-2002.

3.9.3 Southern Water in Worthing was surveyed in October 1992 and four times in 2000. Although there was a wide variation in the number of trips in 2000 overall there has been a general decline in the number of trips between 1992 and 2000 (Figure 18). This is contrary to the growth of trips illustrated by all edge of town office sites within TRICS.

3.10 Offices – summary and conclusions

3.10.1 Office trip rates are higher in the 1995-2002 period than previous years for "all locations". Whilst at the overall scale the current 8-year cut-off is valid, this is not the case when certain location types are examined.

3.10.2 In "town centre" locations, trip rates in 1998-2002 are around a half of those recorded in 1995-1997. From this a five-year cut-off may be more valid. There are a number of reasons for explaining the sharp fall in trip rates:

- Many organisations have reduced the amount of on site parking because it is increasingly realised that some significant cost savings can be made.
- Increasing urban congestion and the rise in the number of towns and cities with 'park and ride' facilities may have resulted in a shift in journeys away from using the car.

3.10.3 In "suburban" locations the average trip rate has remained fairly constant throughout the 1988-2002 period, and hence there is no need for any cut-off with this particular dataset. The pressures on "town centre" locations are unlikely to be as prevalent here.

3.11 Industrial Estates – Results

3.11.1 Figure 19 illustrates the Monday-Friday trip rate per 100 m^2 of B2 industrial estate GFA for all locations. Alongside the variation in the trip rate for this particular use class are the long-term means from 1982-2000 for B2, B1 and unknown types. It has not been possible to show meaningful inter-annual trends for the B1 classification, as the dataset is too small.

3.11.2 Figure 19 shows that the majority of the industrial estate data predates the 8-year cut-off. The trend surveyed is one of increasing from 4.52 to 10.79 from 1982-84 to 1985-87. The trip rate then fell away to around 7.2 for 1988-92. No data was recorded until 1997. The trip rate was 8.68 for 1997-98, which has subsequently risen to 9.44 during 1999-2000.

3.11.3 It should be noted that in all but one of the year groups surveyed, the B2 trip rate is above the long-term mean. This is because this is dominated by the 41 survey days in 1982-84 where low trip rates were recorded.

3.11.4 Sites with a B1 or an unknown (either B1 or B2) classification have been kept separate from the B2 data because of the substantially higher trip rate generated by the former. Since Figure 19 indicates that the long-term mean for B1 industrial estates is 15, the inclusion of unknown sites in the B2 dataset could prejudice the results obtained.

3.11.5 There have been no repeat surveys at any of the sites under this land use.

3.12 Industrial Estates – Conclusions

3.12.1 It is difficult to draw any meaningful conclusions with the dataset because there has been a significant period during the 1990s where no data was collected. Some sites are also lacking basic geographical location and land use details, which limits the ability to include them in any analysis.

3.12.2 The majority of the count sites predate the cut-off, and as industrial estates are an important category according to a user survey, it would be useful to increase the number of sites that are readily available. Given the great fluctuation in trip rate recorded in the early and mid 1980s it is unlikely that these are still valid.

3.13 Privately Owned Housing – Results

3.13.1 Figure 20 illustrates the Monday-Friday trip rate per household at "all locations", "edge of town" and the "edge of town 1988-2002" mean.

3.13.2 The pattern for "all locations" is one of a peak in the early 1990s where the trip rate was 8.59 which was then followed by a decline where they fell to an average level of between 7.6 and 7.9. Since 1999 however, trip rates have risen to an average level of 9.9 per household.

3.13.3 Trip rates at housing sites in an "edge of town" location follow a very similar trend to that described for "all locations" although the most recent trip rates are lower at 9.11. As a result the trip rate is now above the long-term mean for this location.

3.13.4 Figure 21 demonstrates the inter-annual trends in "all locations", sites with "0.6-1.0 car ownership per household" and the "1988-2002" mean for the latter.

3.13.5 The trend for "all locations" and sites with this level of car ownership are very similar. The trend for the latter has features common to that described for "edge of town" locations although the trip rate for this level of car ownership is higher during 1988-1991.

3.13.6 In summary there is a fluctuation between 7 and 10 per household during the period. Although the analysis is of only one level of car ownership the range in it is large enough to explain all the inter-annual variation noted. For example the largest difference has been recorded between 1998-2000 and 2001-02 where the trip rate per household has risen from 7.4 to 9.9 equating to a 34% increase. The level of car ownership can be anywhere between 0.6 and 1.0 per household. If it is assumed that ownership was at 0.6 in 1998-00 and at 1.0 in 2001-02 which is perfectly possible, then this would equate to a 67% increase in car ownership, more than enough to explain the changes in trip rate noted.

3.13.7 Figures 22 and 23 show variation in the trip rate according to differences in public transport levels in the vicinity of the housing site. It can be seen that whilst trip rates at the beginning and end of the study period are similar to that for "all locations", there is a good deal of difference with the general trend during the intervening years. This is likely to be a function of both the range in public transport provision possible for individual sites and the location of these within settlements and the country.

3.13.8 There have been no repeat surveys at any of the sites under this land use.

3.14 Privately owned housing – Summary and Conclusions

3.14.1 Trip rates in all locations are at their highest in the past 2 years, greater than they have been for much of the 1990s. Trip rates from 1995-2000 are in most cases the lowest of the 1988-2002 study period. This calls into question the validity of the 1995 cut-off, as unless the TRICS user applies some form of growth factor, then they are likely to be underestimating trip generation at new sites. Trip rates in the early 1990s have more in common with today's traffic generation in this land use.

3.14.2 Analysis of reasons for the variation in the trip rate suggest that change in car ownership is likely to be more important than people's access to public transport, since the latter does not follow the general trends described. The car ownership categories used in TRICS. incorporate a large enough range to explain the highest variation in trip rate noted.

3.14.3 However variation will also be a result of other factors. Indeed car ownership is dependent on other factors such as the ability to obtain a driving licence and disposable income to buy or hire a vehicle. All the variables noted in other land use categories will have some effect on trip rates at any housing estate. For instance increasing congestion in town centres and the reduction in office parking may result in people seeking alternative modes of transport. An economic downturn may result in people having less income at their disposal affecting their decisions to go to the cinema, sports club, retail park etc. which all would require a trip to get there.

3.15 Mixed Private Housing – Results

3.15.1 Figure 24 illustrates the variation in Monday-Friday trip rate per household at "all locations", "edge of town" and the 1989-2000 mean for the latter.

3.15.2 The "all locations" dataset is characterised by two peaks in 1991-92 and from 1995 to 1998, where trip rates were between 7.4 and 7.7 per household. However in 1993-94 and 1999-00 trip rates were around 6 per household.

3.15.3 Where there is data for "edge of town" sites the trip rates are very slightly lower but follow the same trend described for "all locations".

3.15.4 There are three sites in the TRICS database that have been resurveyed. Winchester Housing was surveyed in 1988, 1998 and four times in 2000. Figure 25 shows that at this site there has been a general increase in the number of trips. The Meadows, Stafford was surveyed in 1995 and 2000. There was a decrease in the number of trips across this period matching the general trend as shown on Figure 26. There was also a decrease in the number of trips at Chichester Housing, see Figure 27.

3.15.5 Figure 28 demonstrates a profile incorporating sites where car ownership is between 1.1 and 1.5 per household.

3.15.6 It can be seen from Figure 28 that whilst trip rates are slightly higher, the same trends are followed from 1989 to 1996. However the number of trips continues to grow to 8.55 per household in 1997-98, above the 7.4 for "all locations". Nevertheless trip rates have fallen to the level for "all locations" in 1999-2000.

3.15.7 The largest change in the trip rate that has been noted has been from 1997-98 to 1999-00 where the trip rate fell from 8.55 to 5.76, this represents a decline of 33%. The potential variability in car ownership during this period is 1.1 to 1.5. If car ownership was at it's highest in 1997-98 and then fell to the lowest possible in 1999-00 would this be enough of a change to explain the variation in trip rate reported? In actual fact it would not be enough as the decrease from 1.5 to 1.1 is only 27%. Hence other factors must be present to explain the decline in trip rate and general variability throughout the study period.

3.15.8 The possibility that trip rates may be related to public transport levels has also been examined. Figure 29 illustrates the Monday-Friday trip rate per household for "all locations", sites with "at least 40 buses/trains" and the 1989-2000 mean for the latter. It should be noted that because there is not as much data for this public transport parameter during some of the study timescale, it has been necessary to use different year ranges to those shown in Figures 24 and 28.

3.15.9 The result is that the profile for "all locations" and sites with at least 40 buses/trains is virtually the same. As the latter only represents a portion of the total dataset, the similarity with the general trend suggests that public transport availability cannot explain any significant difference in the trip rate for this type of land use.

3.16 Mixed Private Housing – Conclusions

3.16.1 Trip rates in most locations are at their lowest of the entire study period during the last two years of data:1999-2000. Trip rates at privately owned housing also were low during this period before rising in 2001-2002. However the absence of any data from 2001-2002 in this land use does not enable an assessment of whether trip rates have risen again.

3.16.2 Trip rates prior to the cut-off in 1993-1994 are somewhat lower than much of the data afterwards, although it must be noted no different to that recorded in 1999-2000. Given that trip rates in 1989-1990 are within the bounds of variation since the cut-off, it suggests that this data is as much valid as that from 1999.

3.16.3 Unlike the privately owned housing dataset, variability in car ownership alone cannot explain changes in trip rates at this land use. Economic factors are likely to have some effect, as has been suggested in the conclusions for privately owned housing, whether in their impacts on people's decisions to make trips from their homes to certain land uses or the geographical variability in economic performance within the UK and/or within a settlement.

3.17 Hotels – Edge of town

3.17.1 Figure 30 demonstrates the daily (except Mondays and Wednesdays) trip rate per Hotel bedroom at "all locations", "edge of town" and the "edge of town 1987-2002" mean.

3.17.2 It indicates that at "all locations" the trip rate was at 6.23 during 1987-1994 and then increasing to 8.15 for 1995-2000, before tailing off to 6.78 in 2001-02. The edge of town trip rate follows this trend closely from 1987 to 2000, although during 2001-02 it rose dramatically to 17.24.

3.18 Hotels – Free standing

3.18.1 There is more data available for hotels in this location, and hence it has been possible to examine four ranges of years. Figure 31 demonstrates the daily (except Mondays and Wednesdays) trip rate per Hotel bedroom at "all locations", "free standing" and the "free standing 1987-2002" mean.

3.18.2 It can be seen that "all locations" trip rates have fluctuated in the period from 1987 to 1994. Beginning at 8.69 in 1987-1990 they slumped to 4.03 before rising to 7.91 during 1993-1994. Subsequently during the period 1995-2002 they have fallen slightly to 7.09.

3.18.3 The trip rate for free standing hotels effectively mirrors this trend, although at this location it was higher during the period 1987-1990 and has remained fairly stable since 1993. As a result trip rates in the recent past are still above the long-term mean for this location.

3.18.4 There has been only one repeat survey at a hotel in the TRICS database. This was at a freestanding location in Weymouth, Dorset. The pattern in the number of trips based on all freestanding hotels shows the greatest number of trips from 1987 to 1990, there is then a dip in the number of trips up to 1991-1992 before an increase between 1993 and 2002. Figure 32 shows that the hotel in Weymouth had a decline in the number of trips between 1990 and when it was resurveyed in 1998.

3.19 Primary Schools

3.19.1 The site details for each primary has been analysed to determine what type of school it is. Average Monday to Friday trip rates per pupil have been obtained for the entire study period for the various types and Figure 33 illustrates the results obtained.

3.19.2 It has been found that trip rates are highest at preparatory schools with one of 1.9 per pupil. This compares to the 1.26 for state infant and juniors and 1.11 for middle schools. These findings appear logical, as preparatory schools are fewer in number compared to their state counterparts. Parents who wish for their child to get into a private school for secondary education will often have to send them to a specific school, which may be several miles away. As a result walking is not a realistic option for many pupils. State infant and junior schools are normally prevalent in most towns and villages and thus there is a more feasible opportunity for children to walk or cycle to school. If children live over 3 miles away from the nearest school, or two miles if they are under eight, then they are entitled to free public transport. Thus compared to preparatory schools there are more opportunities for people not to use the car, explaining the markedly different trip rates.

3.19.3 Middle schools have the lowest trip rate. When one considers the age of the children going to this type of school, this is again logical. Parents who may drive a 6 year old to school are in many cases likely to feel more secure allowing a 10-12 year old to walk or cycle.

3.19.4 Figure 34 illustrates some inter-annual variability in trip rates for primary schools. At state primary schools (i.e. Non prep) the trip rate has fallen from a high of 1.4 in 1991 to 1.1 in 1996 and 1999. Closer analysis of public transport accessibility to the schools surveyed in 1991 and 1999 reveals that this was far better in the most recent year, and this may be a significant reason to explain this trend. The difference in trip rate for preparatory schools is open to conjecture because only one of these schools has been surveyed in each of the study years.

3.19.5 A middle school in Wareham, Dorset has been surveyed twice during the study period. Figure 35 illustrates that the trip rate per pupil has fallen from 1.66 to 1.08 between 1991 and 1996.

3.19.6 All of these inter-annual trends are surprising, because they go against the message that the media and central government is putting cross. Government ministers have recently pledged £50m worth of measures over two years to tackle the perceived problem of the 'School Run', [Ref 3]. The Department for Transport has also stated that between 1985/6 and 2002 the proportion of children travelling by car to primary school rose from 22% to 39%, although signs of stability were witnessed since the mid 1990s.

3.19.7 The information from TRICS suggests that car trips to primary schools are smaller in number since the cut-off. This may be a function of the different locations surveyed in 1991 and 1999. Schools surveyed more recently had better public transport available, whether that is a reflection of general improvements or just of the areas studied is debatable. The former suggestion may be more valid, because analysis of the Middle School in Wareham reveals a marked decline. With new initiatives such as 'Safer Routes to School' and 'Walking Buses' it is important that more surveys are undertaken to reflect recent trends. It is unlikely that new schools will get planning permission without commitments to some of these sustainable measures. It is likely that the 8 years cut-off is valid at least for state schools. However this is less practical for preparatory schools where the dataset is considerably more limited in its extent.

3.20 Trip rates at other sites where repeat surveys have been carried out

3.20.1 Sites where there have been repeat surveys carried out have been identified in the TRICS database. Analysis of the specific sites is discussed here.

Retail Park excluding food

3.20.2 There have been two repeat surveys at Retail Parks; Queens Retail Park, Stafford and County Oak Retail Park, Crawley. The number of trips to these two retail parks appears to have remained constant over time (Figure 36 and Figure 37).

Garden Centres

3.20.3 The number of trips to Garden Centres is strongly related to seasonality. This is illustrated at the three sites that have been resurveyed (Figures 38-40). Where surveys have been repeated in the Summer, for example at Stewarts Gardenland, Christchurch the number of trips has gone up over time (1988-1997). However at Kingston Garden Centre, Lewes and Kent Garden Centre, Allington surveys were originally carried out in the summer in 1990 and 1984 respectively but the resurveys were carried out in November. This resulted in a noticeable reduction in the number of trips. Thus the later surveys need to be treated with caution.

Pub/restaurant

3.20.4 Only one site has had a repeat survey carried out; Brewers Fayre, Chichester. The number of trips, as shown on Figure 41, has dropped very slightly on a Friday but more so on a Saturday between 1994 and 2000. The latter survey was carried out in December, which might have meant larger groups of people going to Christmas meals and therefore sharing transport than the earlier survey carried out in November 1994.

Multiplex Cinemas

3.20.5 Two sites have been resurveyed; UCI, Preston and Showcase Cinema, Leeds. The trend in trip rates is not consistent between the two sites as shown on Figure 42 and 43. The surveys carried out at Showcase Cinema in Leeds are beyond the 8 year cut-off. However the growth in trips across all days is consistent suggesting that the data is valid. The trips at UCI Preston decreased between 1991 and 1997 although the surveys were carried out at similar times of the year.

Bowling Alleys

3.20.6 The repeat survey at the Bowling Alley in Gravesend as shown on Figure 44 reveals a fairly consistent number of trips over time.

Sports Centres

3.20.7 Three sports centres have been included as repeat survey sites; Bournemouth, Weymouth and Maidstone (Figures 45-47). Each of these has had a growth in the number of trips over time. However the number of trips generated by the leisure centre in Maidstone has grown much more sharply than at the other two sites. This can be attributed to the fact the survey days were different in that when it was first surveyed it was done on a Wednesday but the resurveys were carried out on a Friday, Saturday and Sunday (Friday has been plotted on the graph). This illustrates another factor that can influence the trips when looking at a specific site.

Country Parks

3.20.8 There is only one country park in the database that has been the subject of a resurvey. The country park at Lochgelly was surveyed first in July 1994 then again in August 1998 as shown on Figure 48. It was surveyed on Friday, Saturday and Sunday on both occasions. There was a fall in the number of trips on each of the days between 1994 and 1998. This may have been because there was some event on in July or that the weather was better thus attracting more visitors. Unfortunately the weather conditions were not noted for the earlier survey.

Marinas

3.20.9 Two marinas have been resurveyed; one in Hythe, Hampshire and the other in Gillingham, Kent. In this instance the repeat surveys were carried out at the same time of year as the original surveys - August at Hythe and October at Gillingham. At both locations there has been a growth in trips as indicated in Figures 49 and 50.

4 Factors not currently identified in TRICS

4.1 Introduction to this aspect of the research

4.1.1 One component of the brief has been to identify any factors that may explain variation in car trip making that are not identified currently.

4.1.2 Initially a 'brainstorming' exercise was undertaken to try and understand some of the general reasons why people would use their car to make a trip to a certain destination. Four key groups of reasons that explain why trips are generated arose and these are as follows:

- 'Enablers' – things that give people the opportunity to make a car trip.
- 'Costs' – things that moderate the choice of a car trip and to a particular destination.
- 'Area characteristics' – urban design, land use and economic classifications that may have fostered the growth in car travel in the recent past.
- 'Attractors' – things that pull people into a particular site.

4.1.3 Figure 51 illustrates these groups and some of the features that they comprise.

4.1.4 It was felt that the inputs to this brainstorming exercise could be maximised by tapping into the knowledge base of local Development Control practitioners. A workshop was arranged at a relevant forum in Kent, seeking an input from 25 individuals. A number of questions were posed and the key findings are summarised in Appendix D.

4.1.5 The ideas contained in this diagram and gathered at the Workshop were developed in three ways:

- Examination of data from the Department for Transport (DfT) and National Statistics publications to improve understanding of the enablers and costs components (discussed in Chapter 5);
- Analysis of publications associated with the Office for Deputy Prime Minster (ODPM), the Department for Trade and Industry (DTI) and Conservation bodies to highlight recent land use changes associated with housing, the economy and the environment (discussed in Chapter 6);
- Undertaking a literature review of print and electronic media to provide up to date details on attractors and other trends that may have affected trip generation at each of the land uses on the TRICS database. In some cases this could involve a more in depth analysis of some of the points identified from earlier work. Additionally the observations made and information provided by the Development Control practitioners has helped to verify and supplement those factors established from the literature (discussed in Chapter 7).

5 General Transport Trends.

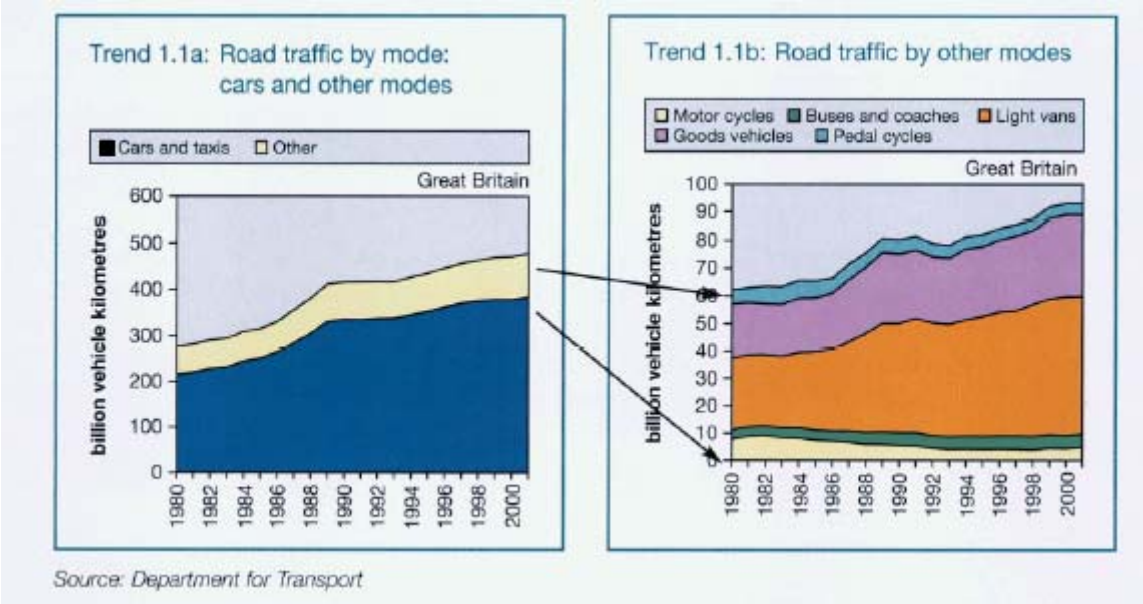
5.1 Introduction

5.1.1 The Department for Transport presents an annual overview and analysis of trends in transport and travel in Great Britain over the past twenty years [Ref 4].

5.1.2 A number of the potentially influential background statistics are reproduced here.

5.2 Road Traffic

5.2.1 Trend 1.1a illustrates that total traffic (passenger and freight) increased by 73 per cent between 1980 and 2001, from 277 to 478 billion vehicle kilometres. Most of this growth occurred between 1980 and 1990, since then traffic has increased by 15 per cent. The majority of this growth from 1980 has been in car traffic (79%).

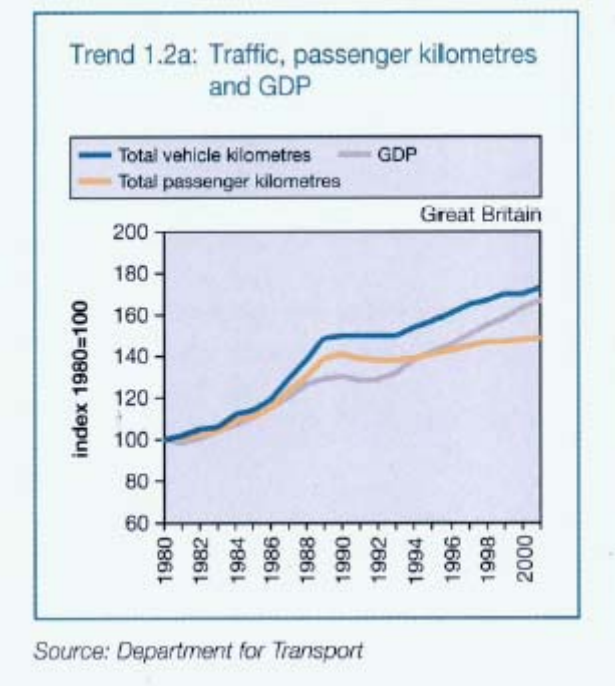


Source: Department for Transport

5.2.2 Trend 1.1b shows that:

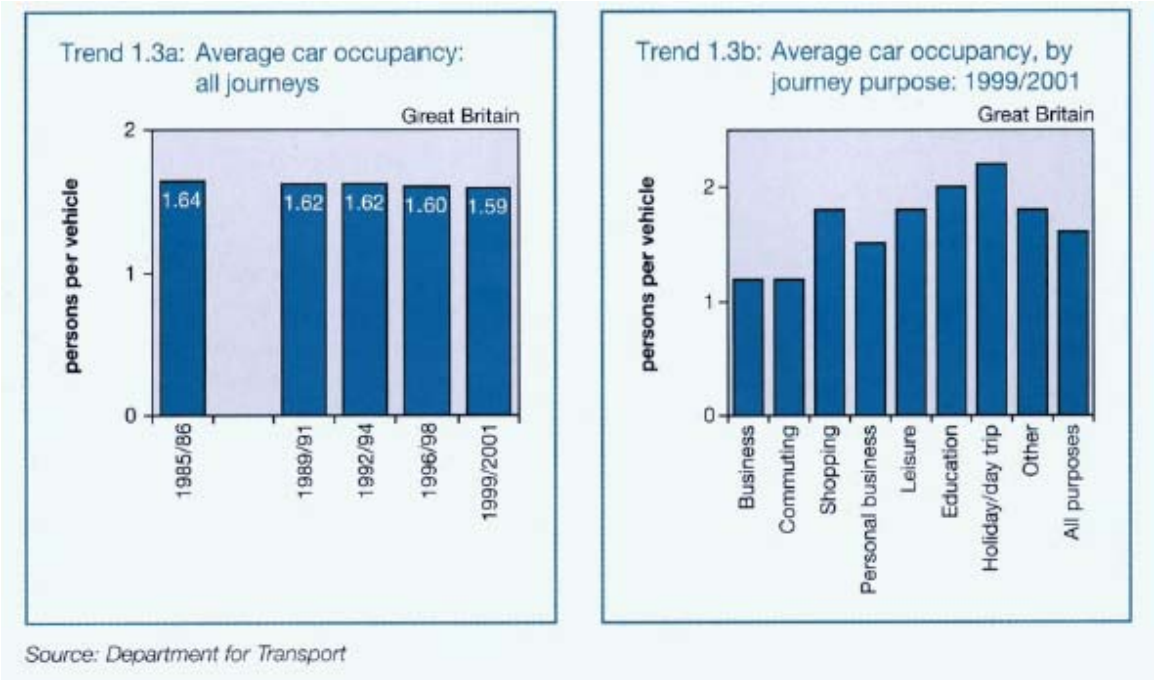
- light van and goods vehicle traffic has increased quite substantially;
- bus and coach traffic has seen a more modest increase;
- and motor cycle and pedal cycle traffic have both fallen.

5.2.3 Over the twenty years since 1980, traffic (measured by vehicle kilometres) and overall travel (measured by passenger kilometres) have grown broadly in line with Gross Domestic Product (GDP) as trend 1.2a demonstrates. Although since 1993 they have increased more slowly demonstrating that sustainable development is being achieved more independently of economic growth.

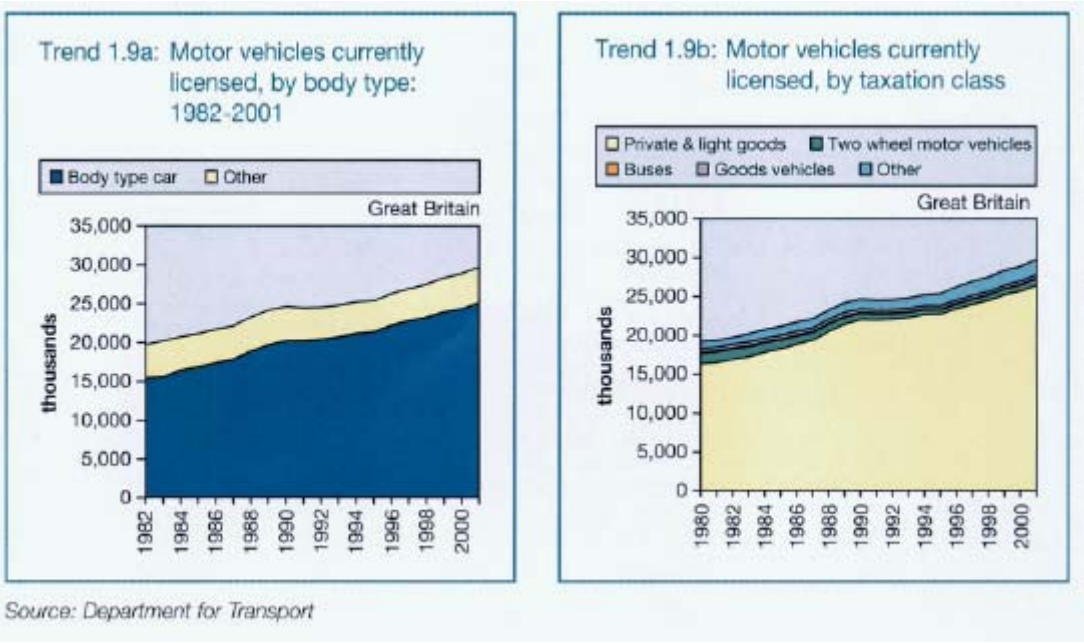


5.2.4 The average number of occupants per car has been falling slightly as trend 1.3a demonstrates. This has contributed to traffic/vehicle kilometres increasing more than travel/passenger kilometres, reflecting the smaller size of households and increasing car ownership.

5.2.5 Car occupancy varies according to journey purpose. Trend 1.3b illustrates that the highest occupancy rates in 1999/2001 were for holidays and for day trips (2.2 persons per car), and for education (2.0 persons per car). The lowest rates were for commuting and business travel (1.2 persons per car).



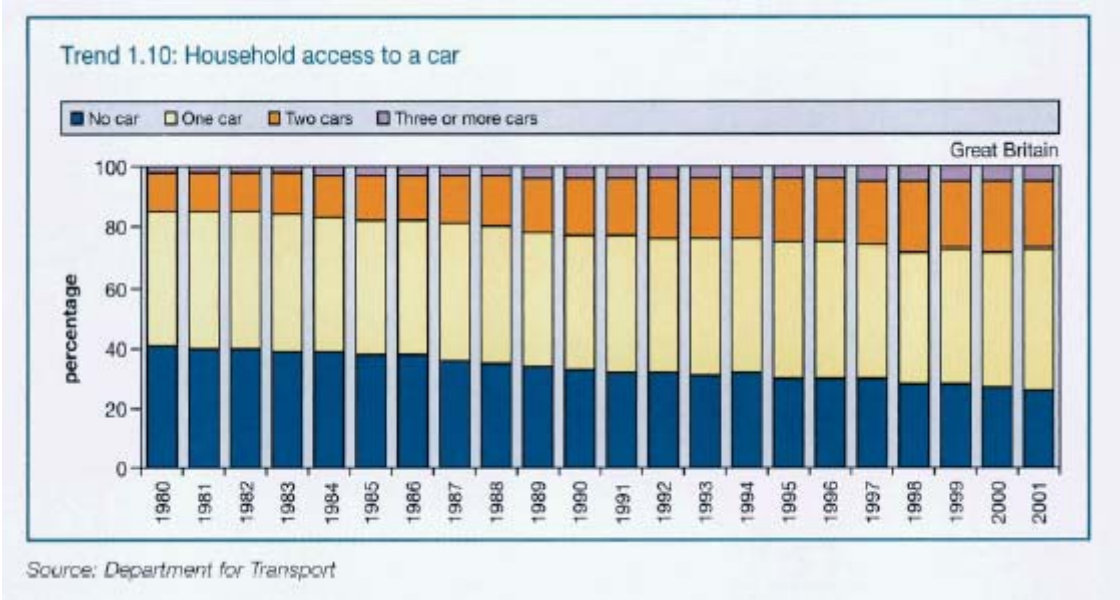
5.2.6 The number of licensed vehicles increased by 55 per cent between 1980 and 2001, from 19.2 to 29.7 million as trend 1.9a shows.



5.2.7 Trend 1.9b confirms that almost all of the increase occurred in the 'private and light goods' taxation class, with falls in the number of two-wheeled motor vehicles, buses and goods vehicles (although individual goods vehicles are now generally larger than they were twenty years ago).

5.2.8 Around 10 per cent of body type car are registered as company cars – a proportion that has remained fairly stable in recent years.

5.2.9 The substantial increase in the number of licensed cars reflects an increase in the proportion of households having access to one or more cars, as trend 1.10 demonstrates.



5.2.10 The changes since 1980 mean that there are now more households with access to two or more cars than there are households without access to a car, as Table 4 illustrates.

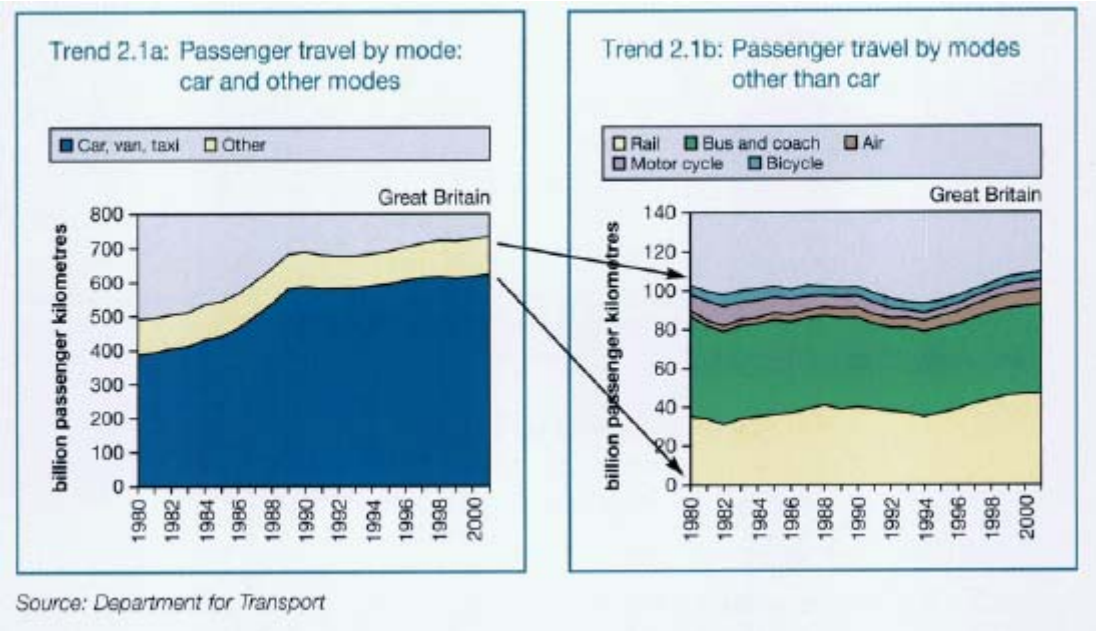
Table 4: Proportion of households with access to a car 1980/2001.

Access to	1980 (% of households)	2001 (% of households)
0 car	41	26
1 car	44	47
2 cars	13	22
3+ cars	2	5

5.2.11 Figure 52 (reproduced from the National Travel Survey – Ref 5) illustrates that in most areas the percentage of 17+ owning a driving licence has increased during the period 1992-1994 to 1999-2001. This is true for females in all locations, although in the South of England (London, SE, SW) the percentage of males with a licence has fallen slightly.

5.3 Personal travel

5.3.1 Total passenger distance travelled has increased by 49 per cent from 491 to 734 billion passenger kilometres, between 1980 and 2001. The majority of the growth has been in travel by car as trend 2.1a illustrates.



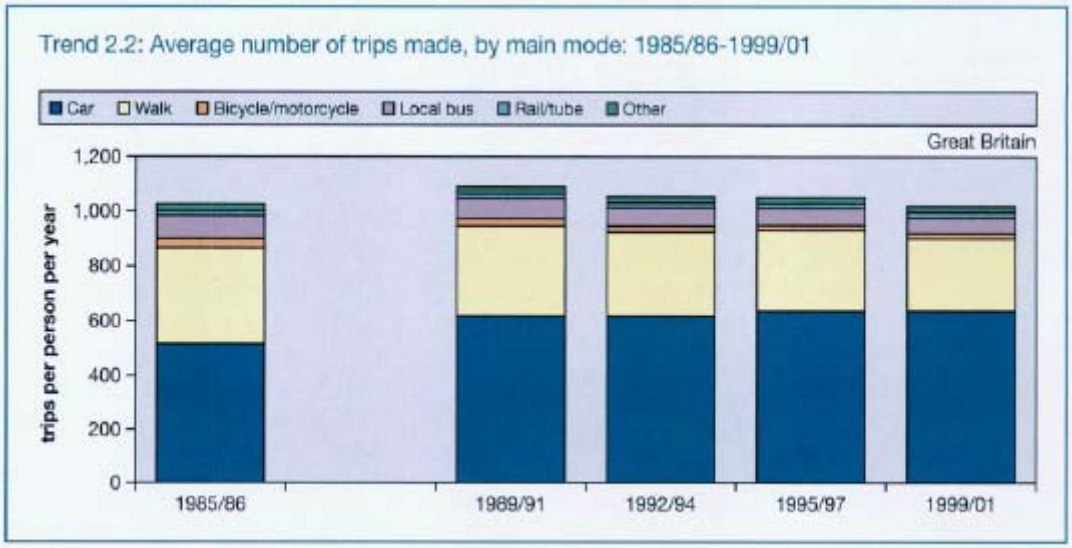
Source: Department for Transport

5.3.2 Trend 2.1b shows that there were increases in travel by rail and domestic air (34 and 157 per cent respectively). Distance travelled by bus and coach fell by 17 per cent between 1980 and 1992, but it has since increased by around 7 per cent.

5.3.3 Trend 2.2 confirms that the average number of trips being made has reduced slightly from 1,091 to 1,019 since a peak in 1989/91.

5.3.4 The average number of trips made by car has increased, whilst those made on foot, bicycle or motorcycle have fallen.

5.3.5 With public transport, trips made by rail/tube have increased slightly of late but those associated with local bus have fallen.

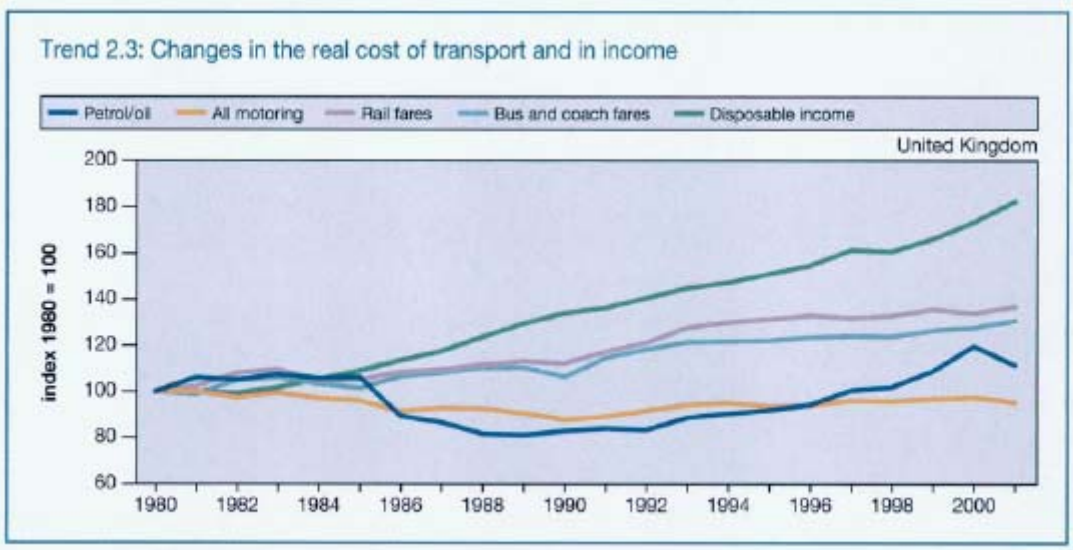


Source: Department for Transport

5.3.6 The growth in car travel and fall in bus patronage seen over the last twenty years have been accompanied by

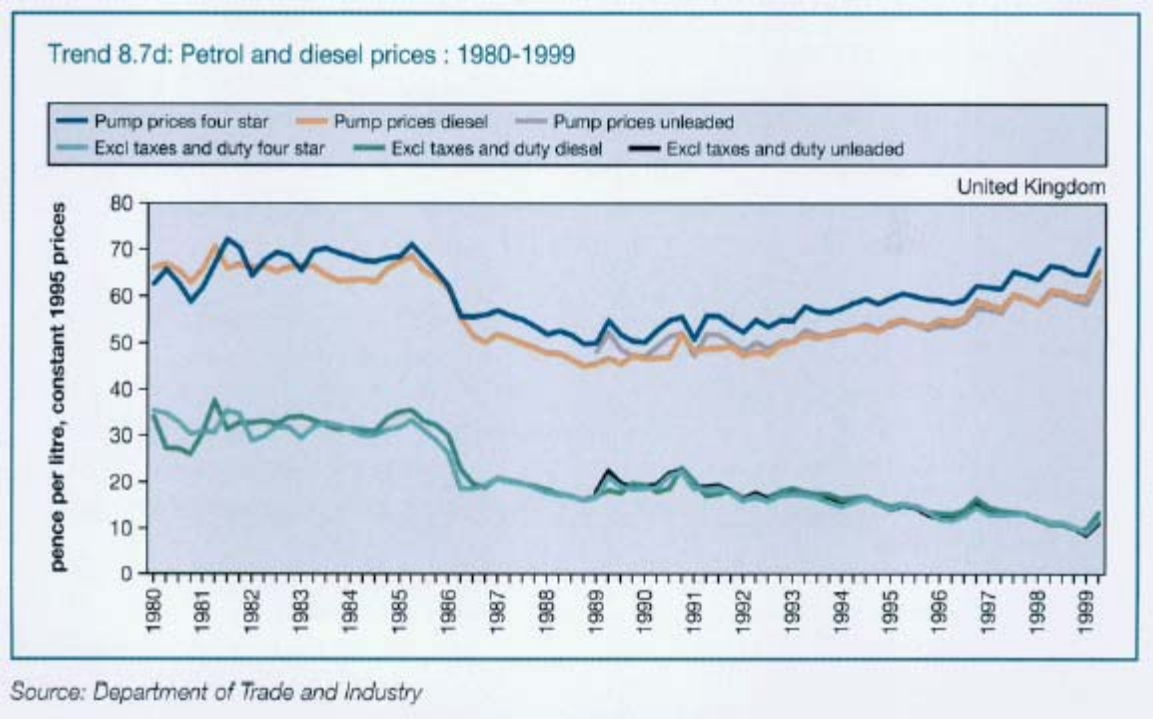
- little change in the real cost of motoring, despite a 12% increase in the real cost of fuel;
- rising real costs of public transport fares – bus and coach 31%, rail 37%;
- an increase in the amount of disposable income by 80% in real terms;

as trend 2.3 illustrates.



Source: Office for National Statistics

5.3.7 Petrol and diesel prices are now at a similar level in real terms to that in 1980, although GDP has risen by 55 per cent over the same period. The price of fuel fell in real terms between 1980 and 1990 but has risen subsequently due to increased taxes and duties, as trend 8.7d indicates.



Source: Department of Trade and Industry

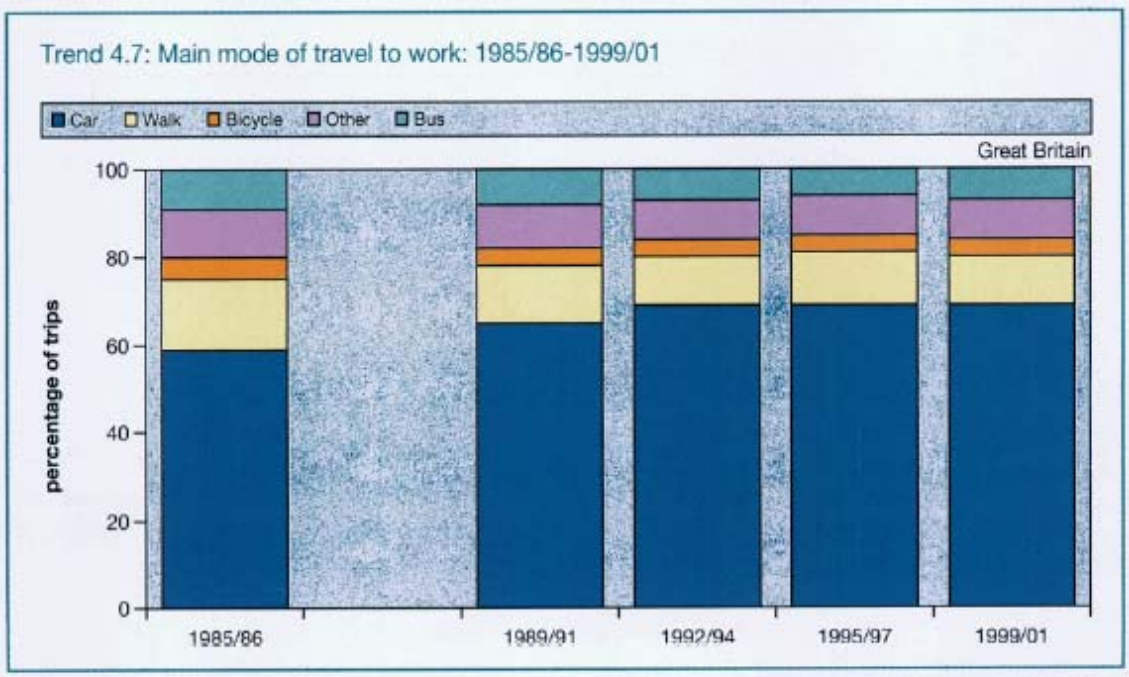
5.3.8 Driving varies in cost according to place and this could become more significant in years to come. At the moment tolls and congestion charges are only likely to be valid in areas where they are applicable. Any development in an existing or potential congestion charge zone will have to take into account the possible effect that this may have on trip generation.

5.3.9 If a National Congestion Charge comes into force in future years then this will have a significant effect on the continued validity of historic TRICS data. However this is likely to be a medium to long-term prospect at the moment.

5.4 Variation in travel by trip purpose

5.4.1 *To work.*

5.4.1.1 Trend 4.7 illustrates that 69 per cent of trips to work were made by car in 1999/01. An increase reflected by a fall in trips made by bus and on foot, with cycling having remained fairly constant.



Source: Department for Transport

5.4.2 *To School*

5.4.2.1 Comparing trends 4.8a and 4.8b demonstrates the marked difference in patterns of travel to school by primary age and secondary age children.

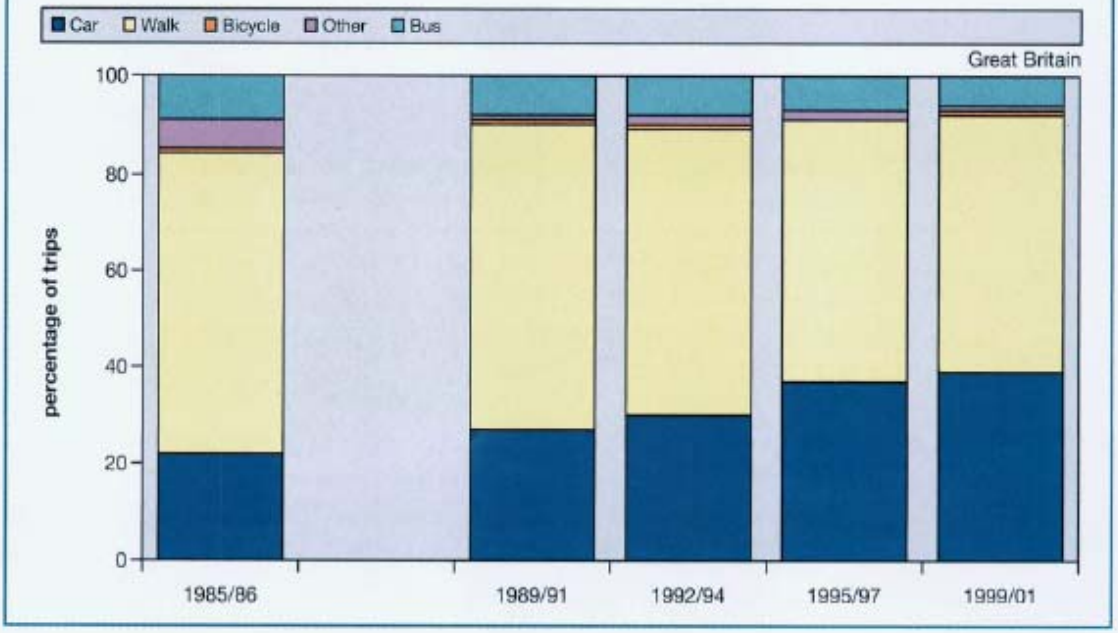
5.4.2.2 Between 1985/86 and 1999/01 the proportion of 5-10 year olds going to school by car has increased from 22 to 39 per cent and the proportion walking fell from 62 to 54 per cent.

5.4.2.3 The proportion of 11-16 year olds going to school by car has nearly doubled between 1985/86 and 1999/01, from 10 to 18 per cent, with a requisite decline in the proportion walking from 52 to 43 per cent.

5.4.2.4 Bus use has fallen for the 5-10 year olds but has increased slightly for the 11-16 year olds.

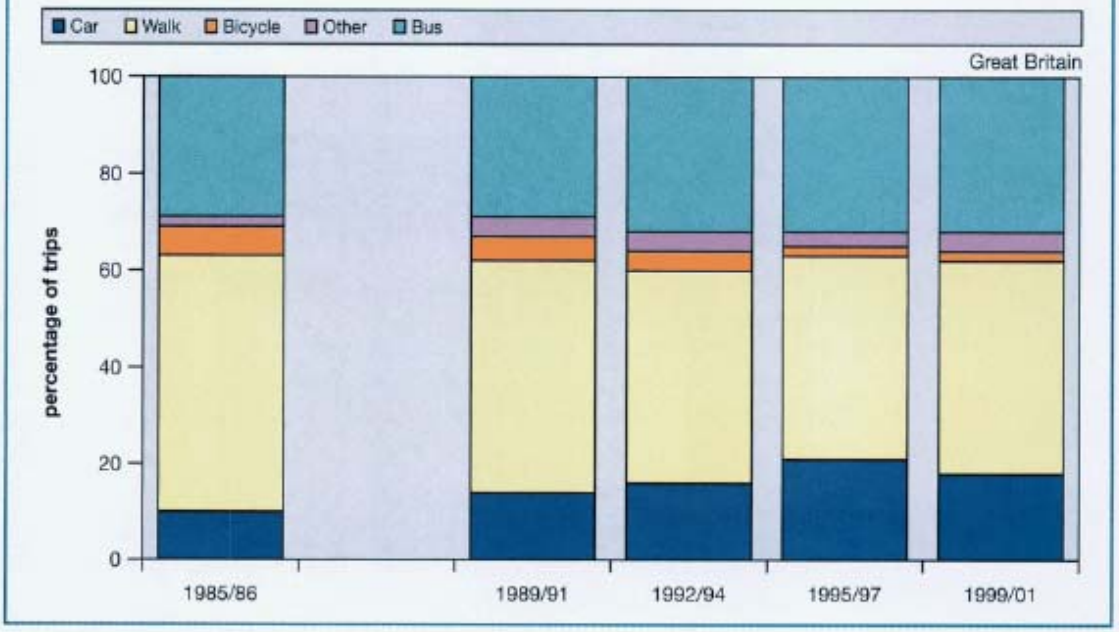
5.4.2.5 Cycle use has always been negligible amongst the 5-10 year olds but it has also been in decline amongst the older age bracket.

Trend 4.8a: Main mode of travel to school by 5-10 year olds: 1985/86 to 1999/01



Source: Department for Transport

Trend 4.8b: Main mode of travel to school by 11-16 year olds: 1985/86 to 1999/01

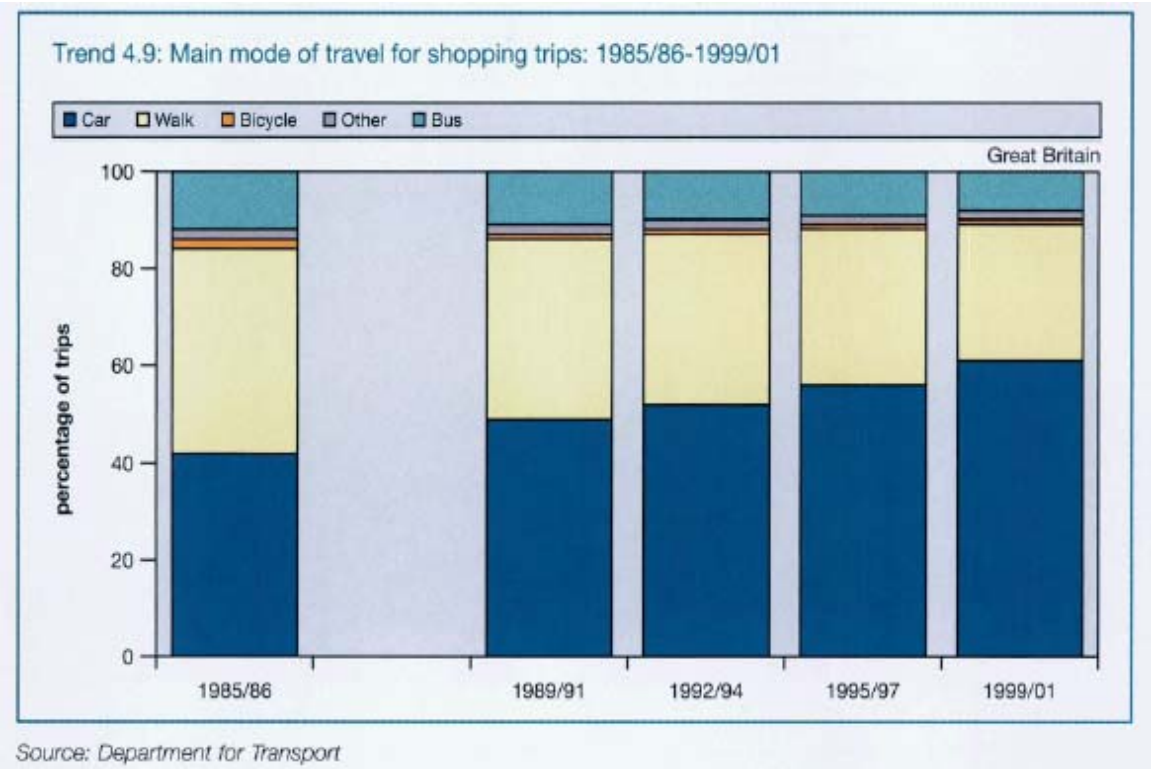


Source: Department for Transport

5.4.3 *To the Shops*

5.4.3.1 The proportion of shopping trips (trend 4.9) made by car has increased fairly steadily, from 42 per cent in 1985/86 to 61 per cent in 1999/01.

5.4.3.2 Over the same period, the proportion of shopping trips made on foot declined from 42 to 28 per cent and by bus from 12 to 8 per cent. Bicycle use has remained steady at about 1 per cent.



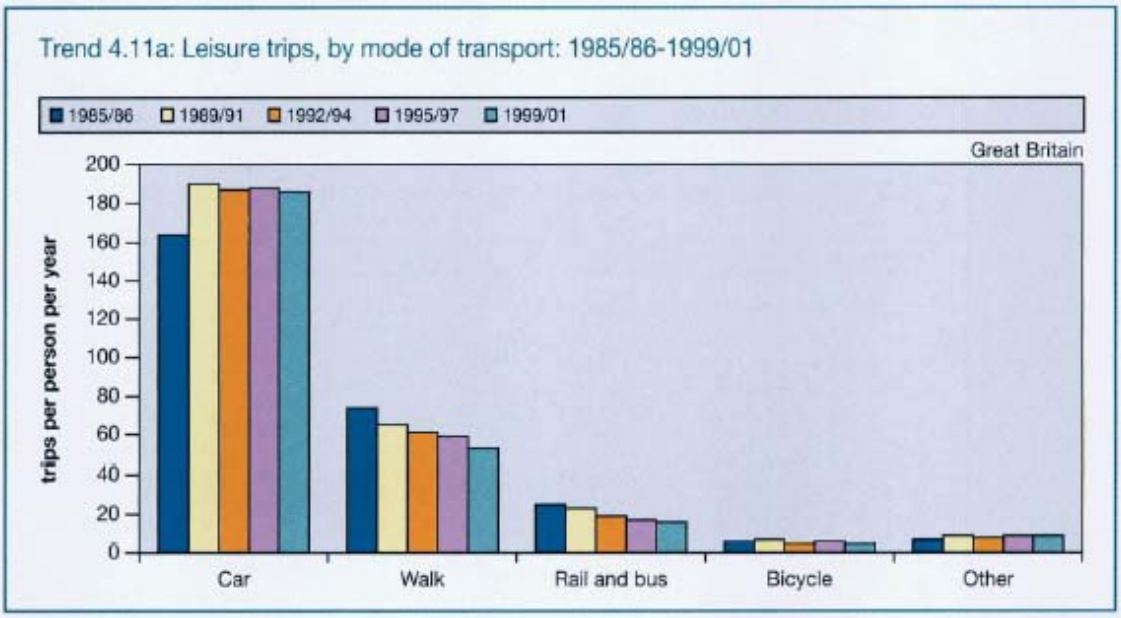
Source: Department for Transport

5.4.4 *For Leisure*

5.4.4.1 Trend 4.11a demonstrates how leisure trips by car have increased by 13 per cent overall between 1985/86 and 1999/01. There was a sharp increase in the late 1980's with relatively little change during the 1990's.

5.4.4.2 Over the same period leisure trips by public transport fell by about 35 per cent, with the early 1990's being particularly bad.

5.4.4.3 Leisure trips on foot have also steadily decreased to give a fall of 28 per cent since 1985/86.

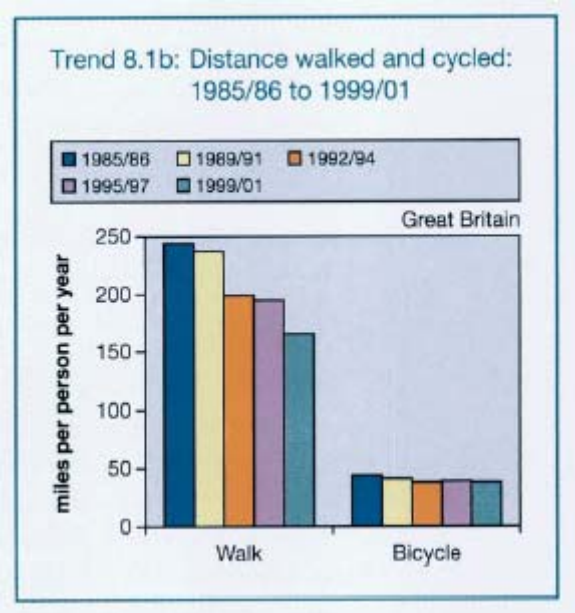


Source: Department for Transport

5.4.5 Between 1985/86 and 1999/01 all trip making purposes demonstrate similar trends based around the increased use of the car. Average trip length has increased but the average time taken has reduced reflecting the greater use of the faster mode of travel.

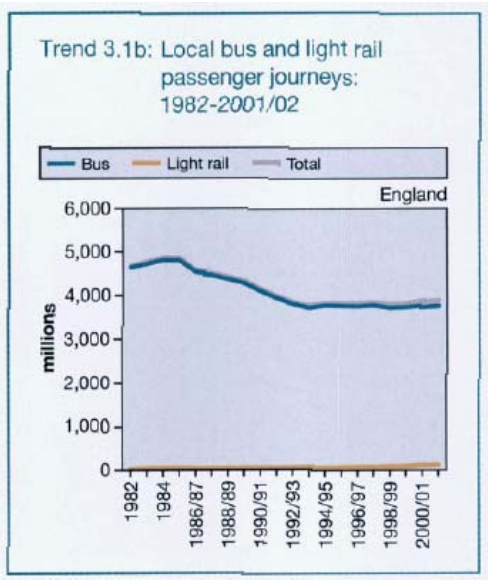
5.5 Walking and cycling

5.5.1 Walking and cycling activity has been in significant decline over the past twenty years, as Trend 8.1b illustrates, with car ownership and use increasing significantly.



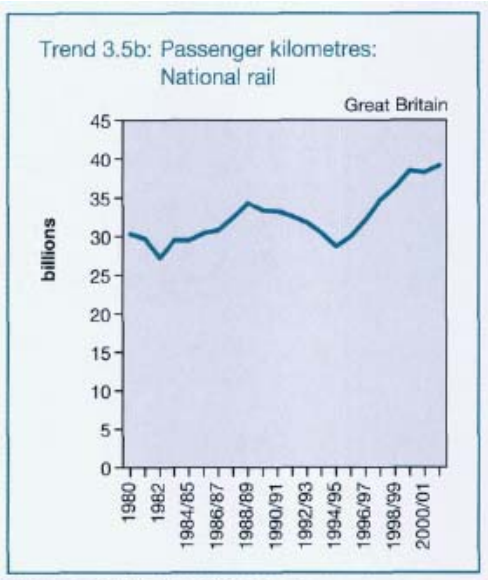
5.6 Public Transport

5.6.1 Trend 3.1b illustrates how the total number of journeys made by local bus in Great Britain fell by 21 per cent between 1982 and 2001/02. Most of the decline occurred by 1993/94, since when patronage has been fairly stable – owing largely to growth in London outstripping declines elsewhere.



Source: Department for Transport

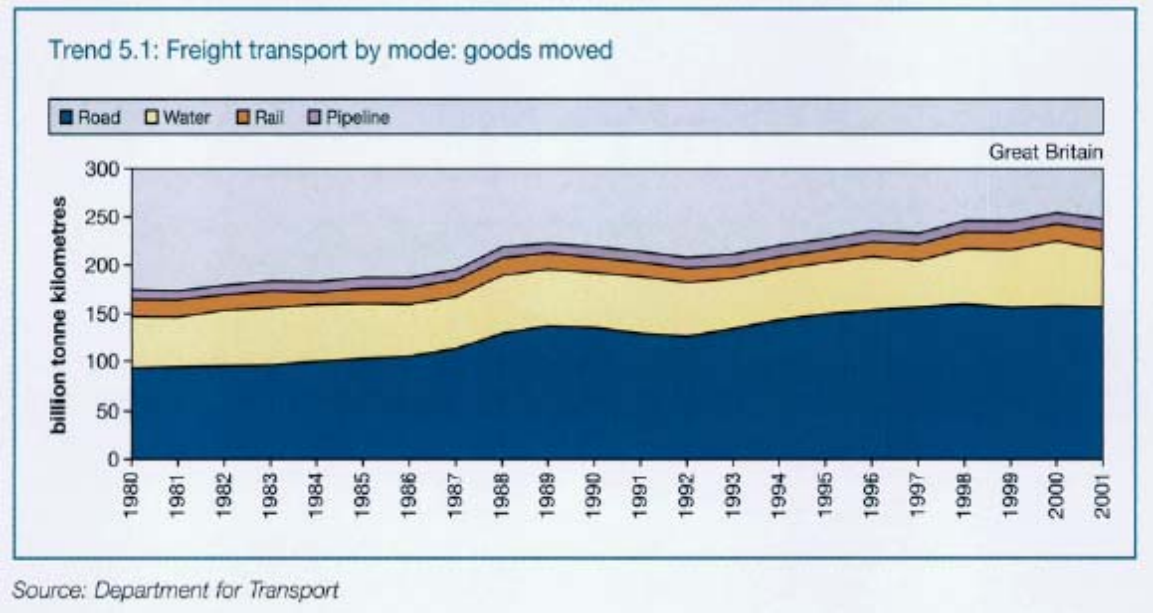
5.6.2 In contrast the total number of journeys made by rail has increased by 45 per cent since 1980, as trend 3.5b demonstrates.



Source: Strategic Rail Authority

5.7 Freight movement

5.7.1 The amount of freight moved increased by 42 per cent between 1980 and 2001. Trend 5.1 shows that the majority of the increase was accounted for by goods moved by road. Road freight now accounts for 63 per cent of all goods moved, compared with 53 per cent in 1980.



Source: Department for Transport

5.7.2 During the 1980's, the economy and goods vehicle traffic grew at the same rate. Since about 1990 freight moved and goods vehicle traffic has risen more slowly than GDP. This is partly because increased payloads have mitigated increases in tonnage carried and distances moved.

5.8 Key trend summary

5.8.1 In order to assist this report the key elements of these general national transport trends that may relate more specifically to land use development, need to be identified.

5.8.2 It is clear that there is one particular topic that emerges above all else. Neither is it anything new or shocking as it is a fact that continues to underpin all debates on existing and future transport policy in Great Britain. It is this countries' reliance upon the private motor vehicle for travel movement.

5.8.3 Annual sales of new cars in the UK surged to a record 2.45 million in 2001 as Figure 53 demonstrates [Ref 6]. With improvements in build quality the second hand car market remains equally buoyant, providing far greater opportunity for people to acquire a car now than in the 1980s and 90s. The statistics show that the population is doing so and using them to move around more and more, to the detriment of public transport (largely the bus) and the more healthier travel modes of walking and cycling.

5.8.4 Although the Government is keen to see an uncoupling of traffic growth from economic growth, our relative prosperity means that as a population over the last twenty years we have:

- greater car ownership;
- less households without access to a car;
- greater mobility.

5.8.5 Car occupancy has remained relatively stable so there has been no demonstrable consolidation of journey practice.

5.8.6 When trip making by purpose is considered it largely reflects the general national trend.

5.8.7 Although car trips to work have increased since 1985/86, the modal split proportions throughout the 1990's have not fluctuated significantly. Proportionately company car levels have also remained stable suggesting that an element of work trips to employment sites will have a consistent base.

5.8.8 Trips to school reflect increased car usage particularly to the detriment of walking and cycling. Older school children are also making greater use of the bus. This reflects growing parental concerns over child security that has reduced their personal freedom. The convenience of the car again shines through.

5.8.9 Car trips to shops have been steadily rising at the cost of journeys on foot. This supports the move away from the local corner shop or town centre convenience store to the large out-of-town retail outlet.

5.8.10 With trips made for leisure purposes the car has again dominated to the detriment of public transport.

5.8.11 The movement of freight has seen an increase in goods moved by road. This reflects in part the changing service requirements in the retail market.

5.8.12 Perhaps of greatest importance to an analysis of trip making trends over time is the fact that the average number of trips made per person per year has always been fairly stable at just above the 1,000 mark. Throughout the 1990's the car usage element has remained equally stable.

6 Land Use Changes.

6.1 Introduction

6.1.1 It is important to consider recent trends in government policy and the associated philosophy that they are trying to bring to new development provision, because it highlights the important interrelationship between planning and transport. A different impact on people's use of transport may be inherent with historic development, provided without such guidance and 'direction'. If the government's objectives are realised then there may be a greater standardisation of trip rates for particular land uses. The theory being that they will have the same good access by all means of transport for those that need to use them.

6.1.2 A brief overview of the kind of developments that local authorities have been approving in recent years may start to indicate any land use changes resulting from new policy direction. It could also usefully assist those organising data collection programmes, because they can then be tailored to better match the kind of developments going ahead. This should enable TRICS to have enough recent data for the land uses in current favour with developers.

6.1.3 It would be helpful to try to understand and confirm the type of land that is being used for development. Whether the land for new development is urban 'brownfield' or rural 'greenfield' is likely to have a substantial effect on the type of trip generation that occurs. This is of particular importance for new housing developments where policy has encouraged change in recent years.

6.1.4 Greater monitoring is taking place of transport and travel impact on the countryside as well as on health and the environment. The Government is actively trying to raise public awareness of such impacts by studying trends in greenhouse gas emissions, local air pollution, noise, energy consumption, fuel efficiency and countryside impact.

6.1.5 Public awareness of environmental transport issues is growing. The proportion of people saying that they take action to reduce the impacts on their local and global environment has increased. With an increase from 28 per cent in 1993 to 39 per cent in 2001 stating a regular reduced use of the car for short journeys.

6.1.6 A more deliberate policy to restrict 'greenfield' development and to conserve the countryside is involved with the designation of new National Parks. Advanced plans are being pursued for the South Downs and the New Forest. Such new designation of sizeable land areas will result in strict planning guidelines, possible intensification of existing developments and related impacts on trip rate generation within and in the vicinity of the National Park boundary.

6.1.7 Finally another policy related driver influencing a change in the location, type and quality of development, involves incentives that stimulate economic regeneration.

6.2 Planning policy objectives

6.2.1 The Government's objectives for national planning policy have been a key influence upon land use changes in recent years. These are identified and addressed through Planning Policy Guidance Notes (PPG's – see Table 5), together with other documents such as the Urban and Rural White Papers (Refs 7 & 8).

Table 5: Schedule of Planning Policy Guidance Notes.

Planning Policy Guidance Note		Date
PPG 1	General policy and principles.	1997
PPG 2	Green Belts	1995
PPG 3	Housing	2000
PPG 4	Industrial, commercial development and small firms	1992
PPG 5	Simplified planning zones	
PPG 6	Town centres and retail development	1996
PPG 7	Countryside	1997
PPG 8	Telecommunications	1992
PPG 9	Nature Conservation	1994
PPG 10	Planning and waste management	1999
PPG 11	Regional Planning	2000
PPG 12	Development plans	2000
PPG 13	Transport	2002
PPG 14	Development on unstable land	1990
PPG 15	Planning and the historic environment	1994
PPG 16	Archaeology and planning	1990
PPG 17	Planning for open space, sport and recreation	1991
PPG 18	Enforcing planning control	1991
PPG 19	Outdoor advertisement control	1992
PPG 20	Coastal planning	1992
PPG 21	Tourism	1992
PPG 22	Renewable energy	1993
PPG 23	Planning and pollution control	1994
PPG 24	Planning and noise	1994
PPG 25	Development and flood risk	

6.2.2 The overarching objective of land use planning is to make a contribution towards the achievement of more sustainable development. PPG1: General Policy and Principles states that '*to comply with sustainable development principles, the land use planning system needs to be positive in promoting competitiveness while being protective towards the environment and amenity*'.

6.2.3 PPG1 recognises that the achievement of greater sustainability is related to:

- the efficient use of land and buildings;
- the management of the demand for travel and the promotion of the use of appropriate modes.

6.2.4 A key emphasis of recent policy statements is the desire to limit the amount of 'greenfield' land taken for development, particularly for housing. Development of previously used land and buildings ('brownfield' sites) and at higher densities (where appropriate), has been promoted as a viable alternative.

6.2.5 'A New Deal for Transport' [Ref 9] reaffirmed the overall planning policy for transport, seeking integration with land use planning at the national, regional, and local level, so that transport and planning work together to support more sustainable travel choices and reduce the need to travel. It is further stated that the overall approach to planning is aimed at concentrating development in specific areas so reducing the need to travel.

6.2.6 The desire to combat 'social exclusion' has begun to influence the promotion of planning policy objectives in recent years. It is about improving the accessibility of jobs, shopping, health facilities, etc. for those that need to use them by means other than just the car. Decisions on the location of land uses need to focus on providing equitable accessibility across all social groups.

6.2.7 PPG's 1, 6, 12 and 13 all include relevant statements that can be read as objectives. These include:

- to concentrate development for uses that generate a large number of trips in areas well served by a variety of means of transport – especially town centres.
- to promote mixed-use development in town centres and local centres to reduce the need to travel and journey distance, and linking the home and workplace.
- to locate day to day facilities which need to be near their clients in local centres so that they are accessible by walking and cycling.
- to integrate land-use plans and transport programmes to actively manage the pattern of urban growth and the location of major travel generating development in order to make the fullest use of public transport.
- to encourage forms of transport with reduced environmental impact, while reducing those with high impact.

6.2.8 PPG13 contains policy guidance on the integration of transport with specific land uses. Some of the relevant statements for types of land uses are:

- to adopt a positive, plan-led approach to identifying preferred areas and sites for B1 uses which are as far as possible highly accessible by public transport, walking and cycling.
- to use retail and leisure to increase the vitality and viability of existing town centres, which should be the preferred locations for new retail and leisure developments.
- to locate developments generating substantial freight movements away from congested central and residential areas.

6.2.9 The Urban White Paper [Ref 7] has a vision for towns and cities based upon delivering an urban renaissance through encouraging people to move back by raising the standard of urban living. This would involve a better use of space and buildings with a range of services and facilities.

6.2.10 The Rural White Paper [Ref 8] provides a vision of a living, working, protected and vibrant countryside. Two specific objectives are "the development of dynamic, competitive and sustainable economies" and an aim "to secure access to services which is equitable in all circumstances".

6.2.11 Hence both White Papers see land use planning as a key tool in improving the quality of life and prosperity. This involves concentrating development in urban areas to restrict urban sprawl, promoting mixed use, with housing, leisure uses, employment and shops easily accessible from each other. In rural areas it means locating most new development in local service centres. All of which are in keeping with the stated policy objectives in PPG6.

6.2.12 It would be hoped that the promotion of such policy objectives would be accompanied by appropriate monitoring measures to determine their effectiveness in practice. If these policy objectives are proved to be effective then in an ideal world it would be best to use TRICS data for new developments that have been influenced by them rather than previous policy.

6.2.13 A review of the available statistical information has been undertaken to try to gauge the associated national trends in land use change. With these confirmed, greater consideration can be made of the influence upon and the implications for trip making.

6.3 Development Control Statistics

6.3.1 'Development Control' is the process for regulating the development of land. Most forms of development, such as the construction of new buildings, alterations of existing buildings or changes in land use, require planning permission from the relevant planning authority.

6.3.2 'Development Control Statistics: England 2001/02' [Ref 10] establishes that district planning authorities in England received 582 thousand planning applications in 2001/02 (see Table 6). This is 7 per cent more than in the previous year and as Figure 54 demonstrates, this is the highest since 1989/90.

Table 6: Planning applications received and decided by district planning authorities, by Government Office Region and type of authority 2001/2.

Thousands/*per cent*

Government Office region [2]	On hand at start of year	Received	Withdrawn	Decided	Granted		*Percentage of total decisions* [4]	
					Number	*Per cent* [3]	*within 8 weeks*	*within 13 weeks*
North East	5.4	20.5	0.8	19.0	17.1	*92*	*69*	*89*
North West	13.7	60.7	2.7	55.3	48.2	*89*	*68*	*88*
Yorkshire and the Humber	12.1	47.6	2.0	44.1	38.4	*89*	*62*	*81*
East Midlands	11.0	46.3	1.7	42.9	37.8	*90*	*68*	*85*
West Midlands	12.5	51.5	3.4	47.3	39.4	*87*	*67*	*86*
East of England	19.5	73.3	3.0	67.6	57.6	*87*	*64*	*83*
London	27.9	85.2	6.5	75.6	53.7	*80*	*62*	*79*
South East	32.9	118.2	6.1	109.5	90.7	*86*	*66*	*83*
South West	21.4	79.2	4.3	72.8	61.3	*87*	*62*	*82*
England	**156.4**	**582.5**	**30.5**	**534.1**	**444.2**	***87***	***65***	***83***
of which:								
London	27.9	85.2	6.5	75.6	53.7	*80*	*62*	*79*
Other Metropolitan	18.9	81.2	4.3	74.5	63.9	*88*	*64*	*84*
Non-Metropolitan (including Unitary Authorities)	109.7	416.0	19.7	383.9	326.6	*88*	*66*	*84*

1 Includes metropolitan and non-metropolitan districts, unitary authorities, London boroughs and national park authorities. Figures exclude 'county matters' applications and decisions. These are shown in Chapter 4.
2 Statistics are presented for Government Office regions. See Annex A for composition.
3 These exclude applications which cannot be granted or refused.
4 The precise definitions used are 'up to and including 56 days' and 'up to and including 91 days'. The percentages in these two columns are cumulative not additive.

6.3.3 Figure 55 confirms that the number of applications received increased in all Government Office Regions between 2000/01 and 2001/02. The largest increases were in the North West (up 12 per cent) and the North East (up 11 per cent). The smallest were in London and the South East (both up 6 per cent).

6.3.4 District planning authorities went on to make 534 thousand planning decisions (see Table 7) in 2001/02, 6 per cent more than in the previous year. This is the highest since 1989/90 and is the sixth consecutive year in which the number has increased. As with applications, the number of decisions increased in all regions (see Figure 56). The largest increases were in the North East (up 10 per cent), Yorkshire and the Humber and the North West (both up 8 per cent). The smallest was in the South West (up 4 per cent). A total of 444 thousand applications were granted in 2001/02 giving an approval rate of 87 per cent. This compares with 87 per cent in 2000/01 and 88 per cent in each of the previous six years.

Table 7: Planning decisions by district planning authorities, by speed of decision and type of development, England 2001/2.

Thousands/*per cent*

Type of development [2]	All decisions	*Percentage of all decisions*	Applications granted		*Percentage of total decisions* [3]	
			Thousands	*Per cent*	*Within 8 weeks*	*Within 13 weeks*
MAJOR DEVELOPMENTS						
Dwellings	6.8	*1.3*	5.2	*77*	*18*	*35*
Offices/research and development/light industry	1.4	*0.3*	1.3	*93*	*32*	*52*
Heavy industry/storage/warehousing	1.4	*0.3*	1.3	*94*	*35*	*59*
Retail, distribution and servicing	1.0	*0.2*	0.9	*85*	*23*	*42*
All other major developments	3.2	*0.6*	2.8	*88*	*26*	*48*
All major development	**13.8**	***2.6***	**11.5**	***83***	***23***	***43***
MINOR DEVELOPMENTS						
Dwellings	50.6	*9.5*	36.2	*72*	*43*	*68*
Offices/research and development/light industry	6.8	*1.3*	6.2	*91*	*58*	*78*
Heavy industry/storage/warehousing	5.1	*0.9*	4.7	*93*	*59*	*79*
Retail, distribution and servicing	12.8	*2.4*	11.2	*88*	*61*	*80*
All other minor developments	62.3	*11.7*	55.5	*89*	*59*	*80*
All minor development	**137.5**	***25.8***	**113.9**	***83***	***54***	***76***
Change of use	37.8	*7.1*	31.1	*82*	*51*	*76*
Householder developments	261.5	*49.0*	235.2	*90*	*76*	*92*
Minerals	0.2	-	0.1	*86*	*31*	*49*
Section 70 developments [4]	**450.8**	***84.4***	**391.8**	***87***	***65***	***84***
Advertisement	26.7	*5.0*	21.4	*80*	*72*	*88*
Listed building consents	31.5	*5.9*	28.4	*90*	*53*	*74*
Conservation area consents	3.0	*0.6*	2.6	*86*	*43*	*64*
All developments excluding 'Other'	**512.0**	***95.9***	**444.2**	***87***	***65***	***83***
Other (not included above) [5]	22.1	*4.1*	..	..	*67*	*67*
All other development	**382.7**	***71.7***	**318.9**	***72***	***70***	***88***
ALL DEVELOPMENT	**534.1**	***100.0***	..	..	***65***	***83***

1 Includes metropolitan and non-metropolitan districts, unitary authorities, London boroughs and national park authorities.
2 Full definitions of development type are given in the Notes and Definitions.
3 The percentages in these two columns are cumulative not additive.
4 Decisions under section 70 of the Town and Country Planning Act 1990.
5 Includes applications which cannot be granted or refused.

6.3.5 From this monitoring information on the Planning Application process further information is provided on the type of development. Figure 57 illustrates that householder developments accounted for 49 per cent of all decisions in 2001/02 compared with 11 per cent for new dwellings and 18 per cent for commercial and industrial development. Change of Use accounted for 7 per cent of all decisions while decisions on applications for listed building and conservation area consents accounted for 6 per cent and applications for advertisement consent accounted for 5 per cent of all decisions. Approval rates were highest for heavy industry, storage and warehousing - 94 per cent for major developments and 93 per cent for minor developments. They were lowest for applications for minor dwellings (72 per cent) and major dwellings (77 per cent) and advertisements (80 per cent).

6.3.6 Detailed information similar to this has not been collated in the past when performance monitoring did not have such a high priority. Consequently it is not possible to draw historical comparisons that would be useful to this study. However such information does help us to understand the current position and provide a marker against which historical trends can be set.

6.4 Greenfield v Brownfield

6.4.1 The former Department of the Environment, Transport and the Regions recognised [Ref 11] that '*Land is a finite resource. While some land can only be used for a limited range of purposes, other land can accommodate many potentially competing uses. The amounts of land used for each purpose are constantly changing and the nature and extent of these changes are of crucial importance for those developing, implementing or monitoring planning policies. Issues that are currently of particular interest include:*

- *the proportion of new housing that is on previously developed land;*
- *the transfer of agricultural land to housing or other development;*
- *the development of vacant land in urban areas; and*
- *the density at which housing is developed.'*

6.4.2 In response to the demand for information about changes in land use to inform policy makers and others, the former Department of the Environment started to obtain land use change data from Ordnance Survey (OS) in 1985. Annual Land Use Change Statistics (LUCS) have been published for each year since 1986. These are of increasing interest, and have been used in formulating and monitoring a national target for the percentage of housing that should be built on reused sites.

6.4.3 Comprehensive and consistent information about the total amount of land devoted to different uses is not currently available. However, a National Land Use Database is being developed.

6.4.4 Over the period 1985 to 1994, a total of 285,000 hectares of land (about 2 per cent of the area of England) was affected by change. Rural to urban changes amounted to 68,000 hectares over the same period.

6.4.5 In the publication 'Land Use Change in England to 2002 [Ref 12] it is established that over the period 1996-1998 there was an average net loss of 5,400 hectares a year of undeveloped (formerly rural) land to developed (formerly urban) uses. Figure 58 illustrates that the largest net increase in land was to forestry, open land and water, closely followed by residential. Whilst agriculture had the largest net decrease in land use, amounting to 11,400 hectares per year.

6.4.6 Figure 59 demonstrates that over the period 1996 and 1998, an annual average of around 31,100 hectares changed to undeveloped uses, compared to around 16,400 hectares changing to developed uses.

6.4.7 Of the 47,500 hectares a year that were recorded to have changed use, around 28,400 hectares (60 per cent) were between one undeveloped land use and another. This compares to 2,700 hectares changing from developed land to undeveloped land over the same period.

How big is a hectare?

1 hectare = 100 metres by 100 metres = 10,000 square metres (= 2.47 acres)
1 square kilometre = 100 hectares (= 0.39 square miles)
A typical football pitch would be around three-quarters of a hectare
The Isle of Wight covers around 38 thousand hectares
The Greater London Authority covers around 158 thousand hectares
England is around 13 million hectares

6.4.8 Over the period 1996 to 1999 an average of around 16,400 hectares were estimated to have changed to developed uses per year. Of this, around 8,300 hectares per year (51 per cent) were between developed uses.

6.4.9 Over the same period, around 8,100 hectares (49 per cent) were estimated to have changed from undeveloped to developed uses. Around 5,900 hectares (36 per cent) were estimated to have changed from agricultural land to developed uses.

6.4.10 Figures 60 and 61 illustrate change in usage, showing that over the period 1996 to 1999, around 40 per cent of all changes to developed uses were to residential use.

6.4.11 Between 1996 and 1999, 70 per cent of land for retailing was provided from previously-developed land compared with 46 per cent of residential land (see Figure 62). Provisional figures published in May 2003 indicate that 56 per cent of residential land was previously-developed in 2002.

6.4.12 Some 67 per cent of land that changed to all industry and commerce came from previously-developed land. In terms of land area, industry contributes to approximately half of this figure.

6.4.13 It is difficult to make meaningful comparisons from data that covers such a short time period. However the general trends noted appear to be consistent over time. Table 8 illustrates the total net change in land use to and from all land use groups for the period 1989-1998. It is not particularly illuminating other than to confirm the switch from agriculture to residential use.

6.4.14 In 1988, 41 per cent of land changing to residential use was previously developed. By 1998 this had increased to 47 per cent. The largest source of recycled land for housing was 'previously developed vacant and derelict land', followed by existing residential land and land in other urban uses. In 1998, about 40 per cent of the land changing to residential use was agricultural.

6.4.15 These figures do indicate and confirm that the concept of ‘urban recycling’ is being successfully enacted. It has reduced the level of impact of change on undeveloped land but the pressure to develop on Greenfield sites still remains, particularly as agricultural practices change and become less economic.

Table 8: Total net change in land use to and from all land use groups: 1989-1998.

hectares

	New uses													
	Undeveloped Land					Developed Land								
Previous uses	Agriculture	Forestry, open land and water	Outdoor recreation	Urban: not previously-developed	**All Undeveloped land**	Minerals and landfill	Defence	Residential	Transport and utilities	Industry and commerce	Community services	Vacant: previously-developed	**All Developed land**	**All uses**
Undeveloped Land														
Agriculture	0	30,370	21,355	150	**51,875**	3,975	-370	24,485	11,155	6,170	2,340	415	**48,165**	**100,040**
Forestry, open land and water	-30,370	0	675	-215	**-29,910**	-1,600	335	1,365	695	640	530	-775	**1,185**	**-28,725**
Outdoor recreation	-21,355	-675	0	-260	**-22,290**	-1,170	-45	1,785	235	375	805	-735	**1,250**	**-21,045**
Urban not Previously-developed	-150	215	260	0	**330**	25	15	6,525	635	2,210	570	30	**10,010**	**10,340**
All Undeveloped Land	**-51,875**	**29,910**	**22,290**	**-330**	**0**	**1,230**	**-70**	**34,165**	**12,725**	**9,390**	**4,240**	**-1,065**	**60,610**	**60,610**
Developed Land														
Minerals and landfill	-3,975	1,600	1,170	-25	**-1,230**	0	-30	300	220	280	110	1,705	**2,590**	**1,360**
Defence	370	-335	45	-15	**70**	30	0	175	15	420	100	320	**1,065**	**1,135**
Residential	-24,485	-1,365	-1,785	-6,525	**-34,165**	-300	-175	0	-260	-2,275	-1,745	-9,840	**-14,595**	**-48,760**
Transport and utilities	-11,155	-695	-235	-635	**-12,725**	-220	-15	260	0	730	55	-450	**360**	**-12,365**
Industry and commerce	-6,170	-640	-375	-2,210	**-9,390**	-280	-420	2,275	-730	0	-45	-615	**180**	**-9,215**
Community services	-2,340	-530	-805	-570	**-4,240**	-110	-100	1,745	-55	45	0	805	**2,330**	**-1,905**
Vacant: previously-developed	-415	775	735	-30	**1,065**	-1,705	-320	9,840	450	615	-805	0	**8,070**	**9,135**
All Developed Land	**-48,165**	**-1,185**	**-1,250**	**-10,010**	**-60,610**	**-2,590**	**-1,065**	**14,595**	**-360**	**-180**	**-2,330**	**-8,070**	**0**	**-60,610**
All uses	**-100,040**	**28,725**	**21,045**	**-10,340**	**-60,610**	**-1,360**	**-1,135**	**48,760**	**12,365**	**9,215**	**1,905**	**-9,135**	**60,610**	**0**

1 The information relates only to map changes recorded by Ordnance Survey between 1989 and 2001 for which the year of change is judged to have been 1989-1998. Some changes which occurred in 1989-1998 will not have been recorded.

2 Land Use Change Statistics are best suited to analyses of change between urban uses and urban recycling. The data are less suitable for analysing change between rural uses.

3 Significant under-recording of changes to Urban: not previously developed mean that the figure of net change is inflated for that category.

6.5 Residential

6.5.1 In February 1998, the Government policy document 'Planning for the Communities of the Future' [Ref 13] set the target:

- ✓ *to raise the national proportion of new homes to be built on previously developed land to 60% over the next 10 years.*

6.5.2 The published Land Use Change Statistics are particularly focussed on providing a means of monitoring progress towards this target, since they record the numbers of dwellings built and the previous uses of the land.

6.5.3 The proportion of new dwellings built on previously developed land is also one of the Government's headline sustainable development indicators. These indicators are intended to make up a 'quality of life barometer', which will be used to measure overall progress towards sustainable development.

6.5.4 Land Use Change Statistics also show the proportion of land changing to residential uses that was previously developed. This is important in monitoring the rural land-take for new housing.

6.5.5 The percentage of new homes built on previously developed land has increased to 61 per cent in 2001 from about 55 per cent in 1989. There has been an increase in this figure each year since 1997. The percentage is much higher in urban areas (70 per cent in 1991-95) than in rural areas (25 per cent).

6.5.6 In 2002, 56 per cent of the land area changing to residential use was previously-developed. This compares with less than 50 per cent prior to 2001. The proportion in terms of land is lower than in terms of dwellings because densities are higher on previously-developed land than on not previously-developed land (Figure 64).

6.5.7 In 2002, new dwellings were built at an average density of 27 dwellings per hectare. This density had previously remained unchanged since 1996 at 25 dwellings per hectare.

6.5.8 In 2002, there was an increase in density both on previously-developed land and not on previously-developed land, to 29 and 23 dwellings per hectare respectively.

6.6 Conservation land uses

6.6.1 Thirteen National Parks have been created in the UK from 1951 to 2003. National Parks have strict planning guidelines that restrict development. Hence it is likely that many of the land uses will have to be maximised to their full potential, which could mean that trip generation at supermarkets, etc. could be higher because there is no scope to build any new ones. This effect may extend to neighbouring areas where development is allowed.

6.6.2 Figure 65 [Ref 14] illustrates the location of National Parks in the UK. Note that it does not include the newest designation of Cairngorms, Northern Scotland.

6.6.3 Table 9 illustrates how the number of visitors to each of England and Wales' National Parks varies. Data from the National Parks at Loch Lomond & Trossachs and the Cairngorms was not available because they were designated in July 2002 and September 2003 respectively.

Table 9: Variation in the number of visitor days per hectare at each of England and Wales' National Parks [Ref 15].

National Park	Visitor Days (in millions) per hectare
The Broads	178.26
Peak District	132.10
Lake District	95.99
Pembrokeshire Coast	75.81
North York Moors	55.71
Brecon Beacons	51.80
Yorkshire Dales	50.89
Snowdonia	49.03
Dartmoor	41.85
Exmoor	20.21
Northumberland	14.29

6.6.4 The Broads is the smallest of the National Parks, yet has the highest number of visitor days per hectare. Interestingly it was created in 1989, whilst the remainder date from the 1950s. There is a large variation in visitor densities between the parks, suggesting that an assumption of similar trip rates for a certain land use in each one is doubtful.

6.6.5 There are advanced plans to create two new national parks for the 'New Forest' and the 'South Downs'. These will probably be 2007 at the earliest. Perhaps these designations will attract an increase in the number of visitors to these areas. If the TRICS user is looking at a tourist attraction in the proposed South Downs National Park area of East Sussex then by looking at a similar attraction from another National Park area a more representative trip rate may be obtained than simply looking at a site in the south east of England.

6.6.6 Care will have to be exercised to ensure that the most appropriate dataset is used, as Table 9 has indicated that National Park data from Northumberland may be unrepresentative of places in Southern England. What it may show though is that trip generation in the National Park area of Northumberland is substantially different to the rest of that county/the Northeast. This could enable factoring of data in other parts of the country where a National Park is proposed. More research would be needed to examine whether there is a clear link between National Park status and an increase in general trip rate.

6.7 Land uses with a special economic designation

6.7.1 Some areas of the UK have not prospered as well as the rest of the country in recent decades. Whether it has been because of a decline in traditional heavy primary (e.g. coal, mineral extraction) or secondary industry (e.g. steel manufacturing) or through geographical isolation from major towns and cities, some areas have experienced at least one of the following:

- High unemployment;
- Low employment;
- Lack of services.

6.7.2 Government policy has sought to address this geographical imbalance in the economy through a number of designations that entitle an area to varying levels of financial aid. Figure 66 illustrated a number of these economic zones, including:

- Economic Development Zones (EDZ's);
- Urban Development Corporations (UDC's);
- Assisted Areas.

6.7.3 Economic support from the government and European agencies may encourage more economic activity in an area than otherwise expected. TRICS has considered this to a certain extent with commercial and industrial zones.

6.7.4 Traffic growth is expected in areas designated as either an EDZ or UDC [Ref 16]. These are deliberately freed from local authorities' land use and transport planning so their development is not restricted by red tape. They tend to be medium-term designations and are wound up when the aims have been fulfilled. For instance London's Docklands is a former Development Corporation.

6.7.5 Other key economic designations include Assisted Area Status and businesses applicable to Enterprise Grants. These may have different trip rates to those without help. In all the cases the economic aid may give these businesses an initial competitive edge, improve road accessibility, and these may combine to increase trips to/from the industrial estate.

6.7.6 Figure 66 illustrates the areas of "Assisted Status" that the government proposed in 1999 [Ref 16]. It is thought that the different economic conditions inherent in these locations may affect people's ability to make as many vehicle trips as in other areas of the UK. There are three different types' of area highlighted on the map and these refer to different levels of economic problems and grants available from the EU.

- Article 87 (a) – e.g. Cornwall – gains the highest maximum grant levels;
- Article 87 (c) – e.g. Highlands and Islands Enterprise Area – problems imposed by its sparse population.

6.7.7 Additional Enterprise Grant areas – e.g. Isle of Wight – assistance is available to businesses employing less than 250 people. These are local authority districts that have high unemployment, low employment, coalfield areas or Rural Development Areas.

6.7.8 With the general consideration given to land use changes attention has been drawn to a number of government policies that could have influenced the type, location and quality of development. The drivers behind these political policy decisions have largely been social and environmental, seeking in particular to build more inclusive communities and protect an increasingly valued countryside. Whilst these have also had an element of economic reasoning behind them, it has not been as explicit as the policy presented here in section 6.7. It is important for the TRICS user to consider this because whether companies in an industrial estate/ business park benefit from economic aid could affect the number and type of trips they generate.

7 'Out of/into the Box' thinking

7.1 Initial Work

7.1.1 The initial work on transport, land use, economic and environmental trends has identified a number of general issues that seem important when grouped together, but no really overriding factors that would apply wholly to all land uses.

7.1.2 In recognition of the difference between the various land use categories it was felt that some key factors that may be very influential to trip making over time could be better substantiated by researching specific trends relevant to each category.

7.1.3 Qualitative research of journals, academic literature and articles on the internet has enabled a number of ideas to be collated. In addition some of the economic factors such as GDP were analysed further with reference to the employment land use categories, to see if there was any statistically significant links for trip rates between them.

7.1.4 It is to be noted that some land uses have not been studied. All sub categories related to health care have not been looked at, because it is appreciated that research on this topic is currently ongoing. The other land use that has not been researched is mixed and miscellaneous categories, where again parallel research is being undertaken. By name and nature these latter uses tend to include a range of different features. It was felt that many of these were unique, and the TRICS user would be better served considering the individual factors for each of the features making up the land use. For instance it is recommended that someone calculating trip rates for a sports centre, multiplex cinema and a drive through food shop should consider any particularly influential trends for each of these and then assess if any of these cancel each other out and act accordingly when deriving a collective trip rate.

7.1.5 This chapter presents the results of this review with the key findings and any recommendations for the TRICS user summarised in a series of boxes individual to each land use sub category, namely.

- Retail (including car boot sales, petrol filling stations and showrooms);
- Industrial (employment, civic amenity, vehicle repair and farm diversification);
- Residential;
- Education;
- Hotel, Food and Drink;
- Leisure and Tourism (including Marinas and Golf).

The idea being that this presentation concept may be easily adapted for incorporation as part of the TRICS system, if desired.

7.2 Retail

*Factors that may influence trip rates at **Food Superstores***
Change in the opening hours: • Sunday opening for large stores since 28/08/1994 [Ref 17]. • 24hr opening on certain days. • General trend of opening later in the evenings. *These have all spread out shopping trips across the day and week.* • ESRC funded research by Clarke et al. (2002) in the Portsmouth area suggests that people shop more often making smaller purchases than 20 years ago [Ref 18]. This is possibly because they are using the superstores to top up rather than use a corner shop. Shoppers are thought to be purchasing more fresh and chilled foods than they used to do, which only keep for a couple of days. The changes in opening times noted have aided these trends, *leading to increased trip movement.*
Brand name: • Affinity to a superstore for a number of reasons such as the quality of food, special offers, general marketing, loyalty cards, e.g. Nectar. This is likely to have changed over time and vary according to place. The research by Clarke et al. (2002) [Ref 18] suggests that people seem to be more 'loyal' to an individual store than 20 years ago. • Morrison's possible takeover of Safeways will be important to monitor. Will existing trip characteristics at Safeways' stores become more like Morrisons or remain different?
Wider availability of goods other than food: • Increasing ability to *buy many non-food products/use minor services* at one visit to a superstore, e.g. CDs, dry cleaning, travel agents, post office, pharmacy, etc. • *In-store restaurant* – people may visit the superstores specifically to have Friday fish n chips, Sunday roast dinner, tea/coffee time social gatherings, singles dating etc. • *Petrol filling station* – fuel has traditionally been discounted and is generally cheaper than oil companies' stations, e.g. Safeway has a deal whereby you get money off petrol if you spend a certain amount in the food store. • *Internet shopping* (varies according to place – wealthy areas are more likely to have greater access to the internet). • Increase in the number of express/ smaller format stores owned by the big superstores.
Town Centre Stores • Return of supermarkets to the town centre. The way that they have been branded, e.g. Tesco Metro may attract a different customer base and demand to previous stores from the early 1990s. *Change in the accessibility characteristics of the location type* • E.g. congestion. • Park and Ride buses improving access to some town centres. • Car park size.
Competition: • New stores nearby. Wider availability of quality large stores mean that people do not have to travel as far – research by Clarke et al. (2002) [Ref 18] indicated that people tend to be shopping closer to home. Details are held in TRICS indicating the next nearest similar site. • Town Centre loyalty schemes may take trade away from superstores, e.g. 'Loyal to Leominster' was developed as a rival to the Safeway ABC loyalty card initiative (described in greater detail by Action for Market Towns [Ref 19]). • Conclusions from a Competition Commission Report from 2000 [Ref 20] indicate that it is unlikely that a nearby discounting store such as Lidl will affect trip rates considerably.

*Factors that may influence trip rates at **Food Superstores** cont'd.*

Individuality of each superstore

- It is useful to consider the individual characteristics of the sites one is using in trip generation. Try and get as much information as possible. A store not quite in the right location in a suburban area may not attract as much custom and trips as if it was 200m away in the same part of the town.
- In a town centre / area of mixed retail use, people may use the superstore but park elsewhere. On the other hand people may park in the car park even though they do not wish to use the superstore.

Consider the land use designation

- Hallsworth & Clarke [Ref 21] discuss trends common to North America that may apply to the UK now that Wal-Mart has acquired ASDA. Relaxation of planning guidelines could affect the retail geography of towns.

Deliveries

- Fernie [Ref 22] describes logistical developments that are underway in the UK. Retailers are moving towards a 'Just-in-time' system for the replenishment of stock. Products are delivered in smaller quantities from factories to distribution centres and then on to stores. This is because it is more cost effective to have space devoted to sales rather than storage.
- The typical supermarket had c 4,000 product lines in 1980, now it is nearer 20,000 (e.g. growth of organic foods, international cuisine). This has been made possible by improved delivery systems such as 'Just-in-time', [Ref 23]. The likely result is that there are more frequent smaller deliveries = higher trip rates.

Future changes

- Potential for superstores to sell other non-food items, such as cars. See 'car dealership' box for details.

*Factors that may influence trip rates at **Cash and Carry (Wholesale and Clubs).***

- In order to buy anything one usually has to be a member. Matalan used to charge a small sum, but now membership is free, which may have increased its potential market and the number of trips to/from the site.
- For places such as Costco and Makro, there are certain criteria that need to be fulfilled to be a member, such as being self-employed or a current/retired civil servant. Different categories of membership enable the person to shop at certain times. (e.g. at Costco a trade member can shop before 12pm).This may vary from chain to chain and possibly have changed over time.
- During downturns in the economic cycle the number of self- employed has declined. Labour Force Survey data [Ref 24] shows that self-employment reached a peak at 1989-1990, before declining until 1993. Another decrease was experienced from 1997-2000. This would reduce the potential market for these stores.

*Factors that may influence trip rates at **Discount Food Stores.***

- Change in Opening Hours and Sunday trading since August 1994 (see food superstores)
- Increase in number of discount food stores. More chain stores opening.
- Location likely to be important. Public transport links could be key for those without access to a vehicle although some of these food stores are more based on bulk buying.
- These stores often have few staff to keep prices low. People have to queue longer so fewer people will be exiting at the same time…hence lower departures than normal food stores may be expected.
- Takeovers raise considerable doubts about the validity of historic data e.g. Kwik Save no longer exists as it has been annexed by Somerfield.

*Factors that may influence trip rates at **a DIY Superstore.***

Brand name is likely to be important because of:

- Cost.
- Advertising campaigns.
- Type of goods sold. Wickes is similar to a builder merchant, whilst Homebase sells more home furnishings and furniture. Hence it would be advisable to only use data from a similar type of DIY store. They have different markets and may result in different types of transport used, e.g. Light Goods Vehicles (LGVs) and Medium Goods Vehicles (MGVs) will be more likely where there are bulky goods to transport.
- The particular niche of the market that Homebase, Wickes etc. use has changed over time and is likely to continue, as these firms adjust to the wider economic situation. Findings from AMA Research [Ref 25] show that Homebase has refurbished many of its stores with mezzanine floors to enhance its range of furniture, furnishings and kitchens. It is now owned by Argos' parent company, which may allow it to make better use of the Argos supply chain and increase its product range and customer base. This finding has been confirmed in Kent [Ref 26]. Previous owners in the 1990s included Sainsbury's.
- A trend of more focussed market positions from the various brands is expected in forthcoming years [Ref 25].
- Some companies such as Do-it-all and Texas no longer exist, and that raises the question of whether the data collected at these sites is still valid. To use this data it would be important to find out what type of goods these firms sold, and see whether that is similar to the goods for sale in the superstore of current interest.
- The DIY multiples seem to have an ability to out perform other competitive retail sectors, even in times of economic downturn e.g. AMA research [Ref 25] states that there was circa 8% growth in sales in 1999 despite the economic uncertainty of the time. Whether that equates to an 8% increase in trips is open to question.
- 'Just-in-Time' deliveries.
- Change in Opening Hours and Sunday trading since August 1994 (see food superstores).

*Factors that may influence trip rates at **a DIY Superstore with a garden centre.***

Consider the DIY Superstore aspects and the following.

AMA Research [Ref 27] has provided a summary of the state of the Garden product market in 2002. They state that:

- The DIY multiples have experienced much stronger growth than traditional garden centres since 1993, and since 1997 have the dominant market share. Overall sales in the Garden products market have risen by 90% from 1991-2001.
- DIY multiples only have a limited share of the horticultural market. However from the AMA research it is evident that the DIY multiples are now providing advice centres and more knowledgeable support to customers, which is expected to increase their share of the market.
- At first this may mean that people buy impulse purchases with general DIY goods, but over time their satisfaction with the service may lead them to go to the DIY centre first, rather than the traditional garden centre.
- DIY multiples are expected to have medium to high growth levels for garden products over the next few years.

*Factors that may influence trip rates at **Motorist DIY stores.***

All but one of these is Halfords. Suggest trip rates will be related to the firm's retail fortunes over the past decade. Also Sunday trading since August 1994.
There has been some expansion in the range of goods for sale, for example Halfords are selling an increasing number of bicycles. Some stores offer car servicing too.

*Factors that may influence trip rates at **Other Individual Non-food superstores.***

E.g. Toys 'R Us, MFI, Courts. (Luxury goods)

- It is likely that trips to these places will be dependent on the underlying economic climate. In times of recession people will have less disposable income to spend on toys, furniture, televisions etc.
- Seasonal demand, e.g. Christmas presents, 'January Sales'. The competitive nature of retailing has resulted in all year round sales and special offers becoming the norm in recent years.
- Retailers such as Courts have responded to the planning restrictions associated with out of centre stores, by adding mezzanine floors inside suitable existing stores, which increases the trading floor space. As this is an internal alteration it does not require planning permission, [Ref 26]. This has the potential to attract additional people into the stores and hence increase trips.
- Change of use for non-food retail from furniture stores to discount stores such as Matalan and T.K. Maxx.
- Change in opening hours and Sunday trading since August 1994 (see food superstores)

*Factors that may influence trip rates at **Garden Centres.***

AMA Research [Ref 27] has provided a summary of the state of the Garden product market in 2002. They state that:

- Sales of Garden products have increased by 90% from 1991-2001 nationally, although the DIY multiples have experienced much stronger growth than the traditional garden centres.
- As a result the Garden centre market has shifted in emphasis from high volume/low margin products such as seeds towards higher value and non-garden products.
- Larger multiple stores have steadily acquired smaller independent centres.
- Other attractions are incorporated, e.g. aquarium, pet centre, to add to the recreational element of the shopping/purchase experience. Hence weekend use is particularly popular.
- The gardening season used to influence purchase but it is now an all year round activity.
- Nevertheless the Garden Centres market is still buoyant with forecasts of 4-5% growth. Whether these trends reflect people buying more products at one visit or making more frequent visits is open to question.
- Increase in the popularity of gardening as a result of more television make over type programmes.

*Factors that may influence trip rates at **Shopping Centres – Local Shops.***

The database contains four types, although not named explicitly as such:

- Scottish Town Centres.
- Shopping precinct (small mall).
- Suburban shopping parades – i.e. a line of small shops such as newsagents, bakers, charity shop etc.
- Superstore with a few other services, such as a post office, fish shop, etc. in separate buildings.

If possible, use data from those that are most like the type of local shopping centre under study.
The restricted population catchment and reasonably low purchasing power that typify these areas is unlikely to have changed. However the increasingly wider choice outside of the area may draw people away from these centres.
Change in opening hours and Sunday trading since August 1994 (see food superstores).

*Factors that may influence trip rates at **Retail Parks.***

- Guy [Ref 28] suggests that non town centre retailing may be subject to rapid changes at the moment, as developers and financial institutions seek to maximise the value of existing retail parks. This is related to concerns regarding the scarcity of land for future off-centre development.
- For instance retailers such as Asda-Walmart, Courts and Homebase have responded to the planning restrictions associated with out of centre stores, by adding mezzanine floors inside suitable existing stores, which increases the trading floorspace. As this is an internal alteration it does not require planning permission, [Ref 26]. This has the potential to attract additional people into the stores and hence increase trips.
- 'Just in time' deliveries.
- Change in opening hours and Sunday trading since August 1994 (see food superstores).
- Consider the stores in the complex. Are they broadly similar in your development to the TRICS data?

With food stores

- Trip rates may be less related to economic circumstances than those where food cannot be bought. This is because food is a necessity rather than a luxury and so trips will still have to be made whatever the economic climate.

*Factors that may influence trip rates at **Builder's Merchants.***

- A report by AMA Research [Ref 29] summarises recent trends in the UK Builders and Plumbers Merchants market. In recent years, its overall value has been affected by the rate of growth in new house-building market (in terms of the number of homes completed).
- This builders merchant market in 2002 was benefiting from a buoyant level of consumer confidence and the readiness of householders to spend on home improvements. For instance more people are committing to extensions, additional bathrooms, etc. This may mean that additional trips are being made to these facilities.
- Consider the type of vehicles that will be using the builder's merchants (e.g. goods vehicles), as these will utilise more road space than cars.
- Wickes is considered to be a form of builder's merchant. Data for this is found in DIY without Garden centre. This could be used if the existing builders merchant data was not suitable. However TRICS trip rates are higher at Wickes, because they sell other goods for the mass market as well.
- Could be directly related to the national economy where self-employed small building companies suffer in any recession.

*Factors that may influence trip rates at **a Mixed Shopping Mall.***
• Consider Local Shopping Centre trends, since in some cases they will be similar. The only difference being whether the shops are in separate buildings or not. • Trends from Langney Shopping centre in Eastbourne suggest a decline in trip rate. However during this time the competition for food sales has increased with new stores in the Eastbourne area and changes in opening hours and Sunday trading.

*Factors that may influence trip rates at **Factory Outlet Centres.***
Where branded designer goods are sold at a discount. They did not become significant in the UK until 1995. Catchment areas are large and compete with the larger regional town centres, although the impact is often spread over a wide area, [Ref 30].

*Factors that may influence trip rates at **Petrol filling stations.***
Brand name • Perceived quality of petrol. • Price/ competition from superstores, e.g. Safeway gives people who buy say £50 of food a discount off petrol from their filling station at that particular visit. • Loyalty cards, e.g. BP is part of the Nectar Scheme, Shell has at various times run collect stamp schemes to get free model cars/ towels/ air miles, etc. • Closure of many independent garages. *Diversification* • Of existing filling stations to perform more of a village shop type role, with basic food provisions, newspapers, cash points, etc. *Demand* • Cars tend to be more economical and need to fill up less. • More cars on the road than in the early 1990s. • Increase in the average annual mileage. • Fewer filling stations than in the early 1990s. • Impulse buying. Amount of custom will reflect the amount of traffic on the neighbouring road.

*Factors that may influence trip rates at **a Petrol filling station with retail.***
As with petrol filling station, but also need to consider: • The brand name of the food store. • Within a few years local filling stations could change into a mini-shopping centre, complete with dry cleaners, video rental club and banking facilities. Market Analyst Data monitor suggest that petrol stations will eventually no longer be stop-off points on the way to somewhere else, but destinations in their own right, [Ref 31].

*Factors that may influence trip rates at **Car Boot Sales.***
• Frequency of the sale may be important in determining trip rates. A site which has infrequent events may attract more customers, as people don't necessarily want to go to one every week. It may be perceived that the quality/ diversity of the goods will be better at infrequent sales. • Media scare stories about stolen goods on sale may have dampened enthusiasm for these events in recent years. • Regular car boot sales offer feature an element of market type trading.

*Factors that may influence trip rates at **Car Showrooms.***
There is a great deal of potential for substantial change in journeys to/from car showrooms because of EU reforms, price of cars and changes by the DVLA to registration of new vehicles. Previously people would travel to a showroom because of the car marque sold there. *1992+ Changes* • Increasing number of cars sold from 1992-2001. This is likely to be reflected in an increase in the number of journeys to the showrooms. • Think about whether the showroom has a policy of incentives or free test-drives. Potential to add an extra 2 trips per customer. • Second-hand cars available?
August 1998+ Changes • Increase in purchasing cars via the internet, especially cheaper cars imported from Europe. • Change to 2 registrations a year during 1998-99. Previously there was a rush to buy a new car every August, but new registrations were switched to March and September in an effort to spread car sales across the year. Hence the peak month for travelling to car showrooms is likely to have changed since 1998-99.
2003 Changes [Ref 32] • Under recent European Commission Car Dealership reforms, dealers will be able to sell cars of more than one marque in the same showroom. In theory a single shopping trip to one dealership could replace a previous two to decide between different products. From October 2002, all dealers must choose whether to be **selective** or **exclusive**. Car manufacturers have been given a year to comply, so those selective dealerships should be receiving their range of cars now. This will be key information for any new surveys of car dealerships. • Under these reforms, the driver will also be able to go to a wider range of authorised repair outfits rather than the authorised dealership. However dealers will no longer have to provide repair services. • All of these reforms will make it easier for car supermarkets to be set up. Potential for other retailers such as the food superstores to become involved.
October 2005+ Changes • Potential for further revolution in the car market from October 2005, when under these EU reforms, car dealers from anywhere in the EU will be able to open in the UK. As prices are generally significantly higher in this country, these firms will have the ability to reduce prices and attract more customers. • The reduced prices will also make new cars more affordable, and possibly lead to an increase in traffic nationally.

7.2.1 TRICS data for Take Away shops (e.g. fish and chips) was briefly analysed. It is felt that this category should be reviewed with a view to possible deletion for two reasons. Firstly most data is from 1985 and is too historic, secondly no parameters such as parking or floor area have been recorded.

7.3 Industrial

*Factors that may influence trip rates at **an Office.***

Land use classification

- Important to consider the land use classification. A2 involving financial and professional services may have different trends to B1 (any other office) because of the type of work carried out.

Location of the office

- Very important to consider the location of the office, e.g. accessibility of town centre offices –trip rates in 1998-2002 are half those from 1995-97, because many organisations have reduced the amount of on site parking.
- Increasing congestion – resulted in a switch to 'park and ride' modes. When using data from another town it will be useful to consider whether it has a well developed 'park and ride' service, since this will be likely to have an effect on trip rates.
- In City Centres, 'Congestion Charging' may be a feature in years to come as other places build on the initial success of the London experiment. This has reduced the amount of car trips and so, if using data for a congestion charge zone, then that is something to consider. However London has fundamentally better public transport than elsewhere in the UK, so the need to travel by car is reduced anyway.
- Suburban locations – average trip rate has remained fairly constant from 1988-1991 to 1995-2002. The pressures on town centres are unlikely to be as prevalent here.
- 'Edge of town' locations – average trip rates have risen steadily from the period 1988-1991 to 1995-2002. These sites continue to have good accessibility, and as car ownership and traffic has grown it is perhaps unsurprising that trip rates are higher today.

Office Management and the type of staff employed

- There is now much more flexibility than previously for workers in terms of the days and hours they work. Reference to a *travel plan* for the site of interest will be useful to assess if there is likely to be a lot of shift working, casual staff, working mothers, etc. which will have their own particular travel patterns. A real commitment to a car-sharing scheme may also have an effect on trip rates.
- Travel Plans are said to make developers think more about what they are doing and how to manage it. However travel plan targets are not always monitored.

Call Centre Growth

- There has been a growth in this type of office work in recent years. Even though some jobs are moving to South East Asia, there is still likely to be continued growth in the UK for the foreseeable future. These offices tend to have a higher density of staff per gross floor area compared to other office types. The 24 hr operation of these businesses and the comparatively low pay means that these may have different travel patterns to other offices.

*Factors that may influence trip rates at **an Office** cont'd.*
Change in the nature of business • Reduction in office space for many offices through an increase in 'hot desking' and working from home. Hence higher trip rates per GFA may be expected. • Tele-activities, such as videophone conferencing, working from home, etc. Its effect is open to question at the moment. • Banister & Berechman [Ref 33] state that the reactions of business to the new technology is much more subtle than simply substituting IT for travel. It gives them more flexibility and choice in the decision to travel. It is also expensive so it will not be available to all businesses.
Correlation between trip rate and GDP? • TRICS data from 1989 to 1999 was analysed to assess if there was any significant correlation between trip rate and GDP. Figure 67 shows that there was no significant correlation during the period under study.

*Factors that may influence trip rates at a **Business Park.***

General Trends

- Regional GDP per head and TRICS data was analysed to assess if there was any significant correlation between the two variables. Figure 68 illustrates the results.
- The limited dataset suggests that trip rate is inversely correlated with GDP per head. As GDP per head increases, the trip rate declines and vice a versa. This trend is relevant for 1995-97 for all areas with data. A lack of regional GDP data for years post 1999 means that it cannot be determined whether this trend is still the case.
- Data from pre 1995 did not fit the trend described, suggesting that the 1995 cut-off is a valid one.
- Consider the make-up of the business park. Business parks are defined as B1 land use, but offices, industrial units and industrial estates can also have this classification. If the business park is a mixture of offices and light industry this may generate a different level of trip making than one dominated by research & development studios and laboratories.
- If offices are an important component then consider the issues presented in the 'Office' land-use box.

*Factors that may influence trip rates at **an Industrial Unit.***

- These tend to be one company's building, such as Samsung, where they would undertake a range of manufacturing, light industrial and general office activities.
- If using a particular industrial unit as a proxy, think about the economic circumstances of the company, region, the UK and the world at the time. The relative importance of each of these will depend on the company concerned. If the unit is producing goods for the local market, then the global economic situation is likely to be unimportant. If goods are produced for export, then local circumstances are likely to be insignificant. The advice is to research the recent company history and be aware of economic variability that could result in lower or higher than average trip rates for the time the survey was undertaken.
- See information on industrial estates for general points on economic trends.

*Factors that may influence trip rates at **an Industrial Estate.***

Land use classification

- Will be important to specify the land use classification involved. B1 involving research and development studios, laboratories, high-tech companies and light industry were found to have substantially different trip rates to B2 (general industrial). This is likely to relate to the types of industrial activity involved and their vulnerability to economic changes.

The effect of economic downturns and government intervention

- Many industrial estate surveys date from the 1980s, which had a different economic and logistical climate. It is important to consider the linkages between industrial estates and large manufacturing plants. Goods are supplied to the factories, which in recession would not require as many and hence fewer trips would be made to/from the industrial estate.
- Economic support from the government and European agencies may encourage more economic activity in an area than otherwise expected. TRICS has considered this to a certain extent with commercial and industrial zones.
- Traffic growth is expected in areas designated as either an Economic Development Zones (EDZs) or Urban Development Corporation, [Ref 34]. These are deliberately freed from local authorities' land use and transport planning control so their development is not restricted by red tape.
- Other key economic designations include Assisted Area Status and businesses applicable to Enterprise Grants. These may have different trip rates to those without help. In all the cases the economic aid may give these businesses an initial competitive edge, improve road accessibility, and these may combine to increase trips to/from the industrial estate.

Innovation in the Logistics Industry

- Development of the logistics industry since the 1980s is important to consider. Japanese car manufacturers introduced the 'Just in Time' concept when they arrived in the UK. This gave them a competitive edge and led to its adoption by other companies in the following years. The idea is that a company has goods delivered to the plant just before they are needed in the manufacturing process. So lots of small deliveries from industrial estates are more likely today.

*Factors that may influence trip rates at **Warehousing.***

Primarily distribution

Logistical Development

- Since the 1970s, most UK retailers have had a number of centres where they received stock from suppliers. This is then distributed to the shops for sale, rather than have large stockrooms in the back of the store.
- Now retailers are moving towards a 'Just-in-Time' system for the replenishment of stock. Products are delivered in smaller quantities from the suppliers to the distribution centre, so that they require less space to hold stock. This will mean that there is likely to be an increase in the number of goods vehicle trips to and from the distribution centres.
- In recent years, freight distribution centres have been restructured so that they are based in regional and metropolitan warehousing depots often at accessible motorway junctions, [Ref 33]. This could have increased the competitiveness of the company increasing sales and trips to/from the warehouse in the process.

Primarily storage

- Are the storage facilities aimed at commercial bodies, e.g. so they can store archives for the long-term?
- Are they aimed at the general public, such as Big Yellow storage, where people have 24-hour access to their property and can have storage space ranging from a small locker to a large-room? This service is marketed at people moving house, so it is seen perhaps as more of a short-term facility.
- The fundamentally different nature of these services means that there is likely to be dissimilar trip rate characteristics. The user should try and only use data that fits the type of warehousing they are studying.

*Factors that may influence trip rates at **Parcel Distribution Centres.***

- A mixture of Royal Mail distribution centres/sorting offices and private parcel firms such as UPS.
- Royal Mail has decided to end the transport of post by rail during 2003/04. The underground mail railway in London and the travelling mainline sorting trains are to be scrapped. From March 2004 mail will travel exclusively by road or air, [Ref 35]. This could result in an increase in the number of trips made by road vehicles.
- Growth of e-communications during the mid to late 1990s has reduced the number of letters being sent by post.
- Growth in parcel business for private firms? Trip rates per GFA were very low for TNT in 1995, but 10 times higher in 1997, albeit for different areas of the country.
- May experience some seasonal variation especially in the lead up to Christmas.

*Factors that may influence trip rates at **Recycling Centres.***
• Kerbside collections in many parts of the country would presumably reduce the need for people to visit recycling centres. TRICS could state what the council policies on recycling are.

*Factors that may influence trip rates at **Household Waste sites.***
• Does it cater for commercial waste? • Are recycling bins also available? • Size of catchment area likely to be important.

*Factors that may influence trip rates at **Landfill Sites.***
• The Landfill Tax came into force on 01/08/1996 in an effort to reduce the amount of waste put into UK landfill sites. The fact that people have to pay a tax to dispose of waste is supposed to make them think about ways to minimise the cost by being more economical with the design of new highway schemes and developments, etc. Data from before this date is unlikely to be valid. • Some instances of people dodging the tax have been brought to light during a year long study by The Guardian Newspaper and Channel 4 Television. Some people were found to be dumping waste in areas not designated as landfill sites, [Ref 36]. • Landfill tax is increasing automatically from £1 per tonne to try and deter people dumping waste, but from 2005, it will increase by £3 per tonne each year up to a long-term rate of £35. In 2003-4 the rate is £14 per tonne, [Ref 37].

*Factors that may influence trip rates at **vehicle parts and repair centres.***
• Brand name, e.g. Kwik-Fit. Trip rates per site area were higher at Kwik-Fit than the other brands surveyed. • Consider the services provided. Are they things that can be repaired quickly, which will increase the potential number of vehicles that can be serviced in a day? Not all the sites on the TRICS database offer MOTs for instance. MOTs take longer than the replacement of tyres etc. • Are courtesy cars provided whilst the customer's vehicle is being fixed? If so this has the potential to add an extra 2 trips per customer. • Trip rates are likely to be related to car ownership levels because the market is motor vehicles.

*Factors that may influence trip rates **for Farm Diversification.***
Reuse of agricultural buildings as: • Holiday homes, light industrial premises (B1/B8), offices, freight haulage storage and distribution, barn conversions to residential use, children indoor play areas, riding schools/stables, etc. • For further details see recent report on the subject in the TRICS library.

7.4 Residential

*Factors that may influence trip rates at **Residential Land uses (general comments).***

Reasons for variability and variation in trips between sites

- Variation in trip rates will be a result of other factors besides car ownership and public transport. All the variables noted in other land use categories will have some effect on trip rates at any housing estate e.g. increasing congestion in town centres and the reduction in some office parking may result in people seeking alternative transport modes from home to work.

Economic circumstances

- An economic downturn may result in people having less disposable income affecting their decisions to go to the cinema, sports centre, retail park, etc. which would all require a trip to get there.
- Disposable income is variable according to geographic location within a town, region and the country and is changeable over time.

Employment and Demographic Trends

- Decline in the average number of people in a household may mean more travel for personal/ household requirements [Ref 38] e.g. the number of 'lone parent' households and 'one person' households has been predicted to increase in England by 31.1% and 20.7% respectively during the period 1991-2001 (ODPM, 1996 in Ref 26).
- Concept of a traditional household composing a married couple and two children is no longer valid [Ref 33] and so it is important to consider the type of people expected to live in a development. The marketing brochures for the new development should provide some clues as to the type of people the developers expect to live there. Are the houses predominantly for families, executives, young professionals, students, retired etc. Is the trip rate calculated reflective of what you would expect these people to be doing in terms of making trips?
- More working women = more households with multiple workers. This makes the household's decision of where to live more complicated, since it will be more difficult for both people to live close to their workplace [Ref 38]. People may be more likely to move jobs than home, because the transport network has improved accessibility in recent years e.g. completion of M25, M3, M20, M40 etc.
- The current elderly population is the first to have grown up during a time of mass car ownership and is reasoned by Banister & Berechman [Ref 33] to want to continue to use the car for as long as possible.

Increasing if slow trend of people working from home.

- Research has shown that while this may reduce the number of trips to/from the office, it may actually increase trips to/from a housing area. Local Transport Today [Ref 39] reports on work by Sustel, which finds that savings in travel commuting are offset by 'rebound' effects such as non-work travel to/from home that was previously undertaken as part of commuting trips. The rebound effect was found to be around 25% for people working at BT and BAA.
- Banister & Berechman [Ref 33] state that tele-working gives people more choice and flexibility if they are working from home. For instance a parent can allow their child to do after school activities and then drive to pick them up. Previously the child had to go home on the bus, because the parent was at work in an office.
- Glaister et al. [Ref 34] argue that 'living and working' at home is a fallacy in some areas. For example those who live in villages will probably find themselves driving into the neighbouring town because rural communities are no longer sufficient. A message for the TRICS user is to think broadly about the local services on offer in the area you are studying.

*Factors that may influence trip rates at **Residential Land uses (general comments)** cont'd.*

Urban Design

- Recent housing developments tend to have produced urban designs that are more pedestrian friendly e.g. 'Places, Streets and Movements' [Ref 40] and associated publication has affected layouts. Introduction of safety audit. 'Homezones'.
- Switch from TIA to TA has resulted in a greater need for sustainability in recent developments. More attention to walking and cycling, public transport provision than before.
- PPG 3 has allowed an increase in housing density because of the supposed reduction in reliance on the car.
- Increase in smaller housing and live/work units over the past decade. However many live/work units are being converted back to residential.

Parking Standards

- New housing estates tend to have reduced parking standards because of PPG 3. However it is debatable if this has influenced people's behaviour. People may park on the footway and lawn if there is not enough space, rather than not have two cars.
- 'Courtyard' style of parking spaces has become more popular. Residents do not have a specific place allocated.
- Road Traffic Act 1991 [Ref 41] – Decriminalisation of Parking – allowed development of Controlled parking Zones (CPZs). Before parking was managed by the Police and restrictions were not always tailored to traffic management objectives.

Location

- Greenfield versus Brownfield sites. These have different transport requirements. Current trend of focussing on Brownfield sites for development. Hence Greenfield sites from the early 1990s are not necessarily likely to be applicable.
- Proximity of site to neighbouring land uses such as business parks may be important to consider. In some instances parking may overspill on to the neighbouring housing estate, which will increase trip rates.
- Urban and predominantly rural sites also have different transport needs.

*Factors that may influence trip rates at **Houses Privately Owned.***

Refers to housing developments where at least 75% of households are privately owned, and at least 75% are houses rather than flats or bungalows, [Ref 2].

General trends to consider

- During the period of study (1988-2002) trip rates at all locations are highest in 2001-2002. However rates from 1995-2000 are lower than those of the early 1990s. This calls in to question the validity of the 8-year cut-off.
- Research findings suggest that the reasons for variation in trip rates between sites are more likely to be related to car ownership instead of public transport availability.

*Factors that may influence trip rates at **Mixed Private Housing.***

Refers to housing where at least 75% of households are privately owned, and there is no 75% predominance of a particular housing type (e.g. houses, flats and bungalows), [Ref 2].
General trends to consider

- Trip rates in 1999-00 are the lowest of the period under study. Similar patterns were observed for privately owned housing but then trip rates increased in 2001-02. The absence of mixed private housing data for the last 2 years does not allow evaluation of whether that trend has been repeated here.
- Trip rates in 1989-90 are within the bounds of the variation since the 1995 cut-off.
- Variation in car ownership cannot explain variability in trip rates alone.

*Factors that may influence trip rates at **Mixed Private / Non Private Housing.***

Refers to housing developments where there is no 75% predominance of houses, flats or bungalows, [Ref 2].

- Some of the sites in TRICS have other facilities, such as supermarkets and primary schools. However it is noted in many of these that they do not tend to generate many trips from outside of the housing estate. Increasing choice may have increased the number of journeys to supermarkets outside of the area.
- No consistent upward or downward trend from 1988-2002 when all locations are considered, apart from an increasing range between minimum and maximum trip rates per single household.

*Factors that may influence trip rates at **Mixed Non Private Housing.***

Housing developments where at least 75% of households are non-privately owned, and there is no 75% predominance of a particular housing type (e.g. houses, flats, bungalows etc.) [Ref 2].

- Consider when the site was developed. Many of the sites were built before 1980. The design of housing estates has changed since then, so this may have affected trip rates.
- Some of the sites are large and contain other land uses such as shops. However it is argued that these do not generate external traffic. It is still important to not mix these sites with those without these facilities, because people living in estates without facilities such as shops will have to make a journey to buy food, etc.

*Factors that may influence trip rates at **Flats Privately Owned.***

Housing developments where at least 75% of households are privately owned, and at least 75% of households are flats as opposed to houses [Ref 2].

- Flats are becoming an increasing part of mixed-use developments, such as town centre redevelopments and marinas.
- Growing trend of people renting (especially flats) from a private landlord. If students are likely to be a key market, e.g. university towns/cities then a proportion of the flats may be vacant for part of the year. Research by the Royal Institution of Chartered Surveyors (RICS) found that demand for rental property in 2003 is at a two-year high, [Ref 42]. This is because people wishing to buy are increasingly forced out by high house prices.
- Think about the type of flats. Are they mostly studios or larger 2 bedroom apartments? Household size and trip rates are likely to be smaller for the former category.

*Factors that may influence trip rates at **Renting Affordable/ Housing Association Homes (general comments).***
The properties classed as houses and flats for rent are developments where at least 75% of properties are non-privately owned, i.e. rented from the local council/housing association, rather than from a private landlord. • Think about how many of the dwellings are empty. Trip rates are likely to vary most when comparing sites with different levels of occupancy. • Consider the type of people living in the rented accommodation. The government is committed to building affordable homes for key workers such as teachers. These people may have more income than those traditionally associated with council owned housing. Hence trip making may be somewhat different.

*Factors that may influence trip rates at **Institutional Hostels.***
• Fleming House in Maidstone, Kent was surveyed in 1998 and 2001. The number of residents and staff and the size of the site area were the same in both years, but trip rate per resident had declined from 0.72 to 0.52 during the 3-year period. • According to site information for the Maidstone site, Monday tends to be the busiest day.

*Factors that may influence trip rates at **Sheltered Accommodation.***
• Include facilities for the elderly. Hence will see an increase in this land use in the future with an aging population. • Friends and families arriving by vehicles. Also health visitors. • Banister & Berechman [Ref 33] argue that what people experience everyday with transport will shape their future aspirations. Hence the elderly who are the first generation to have experienced mass car ownership are likely to want to be able to use the car for as long as possible. Consequently the potential to see an increase in trips made by the residents. • Loss of individual mobility and the need for care is often the fundamental reason for using such facilities.

*Factors that may influence trip rates at **Student Accommodation.***
Includes halls of residence, student flats, etc. If sharing a site with an educational land use, only the accommodation element should be included in the site and survey details (Ref 2). • The end and beginning of term are key times as parents drop off and pick up their children with all their belongings. During term times will vary according to university and location. • Is accommodation used for other purposes such as conferences out of term time? • University policies on car ownership • Proximity to University resources, such as libraries, departments, sport centres.

*Factors that may influence trip rates at **Holiday Accommodation.***

- Seasonality. The peak season will have extra employees and visitors.
- Composition of the Site?
  - Chalets/Fixed Caravans.
  - Touring Caravans. Note that Caravans and trailers will add to the length of the average vehicle accessing the site.
- The type of holiday market the accommodation serves. The two below are just some examples.
  - Beaches of Cornwall have always been popular with 18-24 age group. These people may travel by train or one car and spend much of the time on the beach nearest their resort.
  - The forests and woodlands of Dorset and Hampshire are more suited to families and older adults who would drive their car to various places of interest.
- Think about the type of market your site is aimed at. If it is in East Anglia but aimed at a youthful market, then it would make sense to look at a similar type of holiday site, even if it is in Cornwall to assess what the trip making would be if the site was successful in attracting the tourists it wanted. However if that did not prove a success, then there would not be anything in planning guidelines to stop the site being marketed for a different age group, which could have different trip making characteristics. Internet site www.ukparks.com is useful in illustrating the type of market particular caravan sites cater for. However for some of the older TRICS sites, this information will not necessarily be accurate because facilities, owners and the market catered for may have changed.
- Holiday Camps such as Butlins or Haven are open to day visitors. The TRICS site at Minehead, Somerset has some of the lowest trip rates per site area/units of any of the holiday accommodation places on the database. This is probably because people visiting the park have no need to make trips to/from the site during their stay. People tend to purchase all inclusive packages, and everything is provided for them on site.
- Think about the facilities on offer at the more typical sites. Are they similar to the site being promoted? Are any of the facilities open to non- residents of the site? If there are lots of facilities on offer then people will be less likely to leave the site to do other things during the day. However extra facilities may attract more people in the first place.

7.4.1 There is only one non-holiday caravan park on the database. The data is for a site in Dorset from 1988 so its continued validity is open to doubt.

7.5 Education

*Factors that may influence trip rates at **Schools (general comments).***
• Diversification of school sites to act as public sports centres, swimming pools and libraries outside school times. • After school 'Homework' and 'Sports' Clubs encouraged by the Government since 1997. However not always at the school e.g. The London Borough of Kensington and Chelsea run them at various libraries. • "More than two thirds of schools in England have increased their provision of out-of-hours learning activities in the past two years, researchers say. A survey suggests that 71% of schools lay on more than seven different activities out of lesson time. The Mori poll of 204 primary and secondary schools indicates that subjects offered include sports, music, creative and performing arts, homework and computer clubs." [Ref 43]. • Does the School have a Travel Plan?

*Factors that may influence trip rates at **Primary Schools.***
• The information from TRICS suggests that car trips to primary schools are smaller in number since the cut-off. This may be a function of the different locations surveyed in 1991 and 1999. Schools surveyed more recently had better public transport available, whether that is a reflection of general improvements or just of the areas studied is debatable. The former suggestion may be more valid, because analysis of the Middle School in Wareham reveals a marked decline. • With new initiatives such as 'Safer Routes to School' and 'Walking Buses' it is important that more surveys are undertaken to reflect recent trends. • Substantial differences in trip rate have been noted between preparatory and state primary schools, with a little difference between the latter and middle schools. It is thought that these are logical differences, given the age groups and catchment areas of these types of school. Information on the type of school can be obtained from its name.

*Factors that may influence trip rates at **Secondary Schools.***
• By 2006, the government wants all secondary schools to provide out-of-school clubs, either in the form of breakfast clubs, summer schools or homework clubs [Ref 44]. • Maximum and Minimum trip rates per pupil seem to be higher prior to the 8-year cut-off in 1995. The range in trip rate was 0.34 to 1.07 compared to 0.22 to 0.83 per pupil since 1995. • Local Education Authority transport policy – increasing trend among local authorities to charge parents for travel on public transport, if not nearest school. This may influence the mode of transport used. • There is one private school in this trip rate category. This has the highest trip rate per pupil and gross floor area of all the schools. This reflects the pattern noted for private schools at primary age.

*Factors that may influence trip rates at **College / University.***

- Diversification of university facilities to allow non-students access to facilities?
- How does the college cater for visitors? Parking bays set aside or are they asked to make alternative arrangements?
- Bicycle culture? Some university cities such as Oxford have a bicycle culture engrained.
- University policy on car ownership.
- Increase in number of students in higher education during the 1990s.
- Tuition fees since 1998-9 has reduced disposable income for students to spend on things such as cars.

*Factors that may influence trip rates at **a Nursery.***

- Increase in the number of day care centres/ nurseries for pre-school children over the past decade.

Changes since 1998

- Government policy (voucher system for free nursery places for 4 year olds) on nursery education encouraged growth in this sector.
- In Scotland this has been extended to every 3 year old from April 2002. In February 2002, two thirds of 3 year olds in England had a free nursery place and a 100% target is set for September 2004. [Ref 45].
- Previously some parents may have been put off by the cost of pre school education. Hence there is a potential for an increased number of trips to/from nursery.

*Factors that may influence trip rates at **a Residential School.***

Applicability of data

- Consider preparatory school data (note: classified as primary school, but preparatory status is obvious from site details) if residential school data is not available for your area. Average trip rate per pupil is 1.90 and 1.96 for preparatory and residential schools respectively.
- Number of boarders. If most are day pupils then there are likely to be more trips. If most are boarders, then peak demand may be the start / end of term.

Has popularity of boarding schools risen? Factors to consider include:

- Economic circumstances – expensive to send children to boarding schools, so numbers would be lower during a recession, which would have an effect on the type and number of trips made.
- Has the image of boarding schools changed? According to the Boarding Education Alliance (represents 170 schools), the Harry Potter books have contributed to the levelling off of the long-term decline in boarding, by making it seem fun. Previously sending children away was seen as negative, [Ref 46].
- Type of boarding has changed in the 1990s, with a higher proportion of part-time boarders. Almost 40% of boarders at a school are within an hour's drive of their homes [Ref 46]. This would enable pupils to go home more often increasing the number of trips, although probably not at peak times.

7.6 Hotel, Food and Drink

*Factors that may influence trip rates at **Hotels.***

- *The quality of the hotel*, e.g. number of stars, is it Tourist Board or AA/RAC Commended. The AA handbook shows settlements with recommended hotels on the road map. AA Members may have used this as their guide to choosing the hotel they wanted.
- The *market* for the hotel? Tourism, business or university demands will dictate when the 'off-season' is and how long it lasts.
- Some interesting statistics on variation in hotel occupancy according to the time of the year and part of the UK have been obtained from the United Kingdom Occupancy Survey [Ref 47].
    - England and Scotland peak time is June to September.
    - However occupancy in Scotland is noticeably higher than England in August.
    - Wales peak time is July to August.
    - Northern Ireland peak time is August, although occupancy is lower at this time than England during January.
- Hotels half empty are going to have fundamentally different trip rates to those in busier parts of the country.
- Does the *market* of the hotel include non-residents? For example it may have a large restaurant that caters for corporate functions or Sunday lunches.
- *Consider if this market has changed or is expected to in the near future.* The market is tourism can be quite variable over time. Proposals for National Parks in the South Downs and the New Forest may lead to more tourism and use of hotels in the area than currently. Hence it may be useful to use TRICS data from other National Parks to forecast trip rates.
- *Towns and cities can also experience changes in popularity* e.g. since Glasgow has been made European City of Culture, the number of people visiting has increased. A new museum or shopping centre could have a smaller but similar effect.
- People tend to have more time to spend on leisure than in previous decades. British Tourist Authority data presented in [Ref 48] suggests that there is a trend within domestic holiday making towards shorter holidays (e.g. short breaks), which have shifted from conventional coastal resorts to inland urban and rural locations from the 1970s to the mid 1990s.

*Factors that may influence trip rates at **Restaurants.***

- Restaurants all over the UK are battling with a downturn in customer numbers, as consumer spending has slowed down and fewer tourists are visiting Britain. [Ref 49]
- Tourist and business market for restaurant food in key centres has been hit by September 11 and the global economic slowdown. However the industry's core domestic market has also ground to a halt. For instance Britons spent £20.8bn on eating out in 2001, according to the British Hospitality Association (BHA), the same amount as in 1997-98, now seen as the market peak. (Ref 50).
- The type of restaurant is likely to be important since there are numerous fads and dietary impacts that influence the popularity of certain foods. The recent popularity of the Atkins diet may have resulted in fewer people visiting pasta/pizza restaurants. It has also been possible to buy Pizza Express products widely in supermarkets during 2003. As this is cheaper, this may have contributed to a decline in numbers visiting restaurants of this type.
- Is there a takeaway or delivery service associated with the restaurant? The effect on local traffic will vary depending on whether the restaurant uses motorcycle couriers or vans.

*Factors that may influence trip rates at **a Public House and Restaurant.***

General Trends since the 1980s

- Tougher drink driving laws than during the 1980s. Increase in alcohol duty. Decline in number of rural pubs.

Diversification and changing opening hours

- Pubs having longer licensing hours with many open all day.
- Themed pubs, e.g. showing football on a Saturday lunchtime and Sunday afternoon.
- The potential for 24 hr opening of pubs in the next few years may influence the arrival and departure of trips to/from the pub car park. Realistic to expect departures to be spread out as people will no longer have to leave at 11pm. However it will not be economic for all pubs to open 24 hours, especially in rural areas. In future the different opening hours will have to be considered in TRICS.

Competition

- Many more pubs are selling food even though a separate restaurant is not explicitly mentioned in the database.

*Factors that may influence trip rates at **Fast Food – 'Drive thru'.***

- Suggest that some of these are passer-by trips, as some 'drive-through' restaurants are signposted off major roads as services. Number of trips may be related to amount of traffic on the neighbouring major road.
- Other drive through restaurants serve suburban areas, retail parks. These are different markets and it is realistic to expect different trip patterns. Some of these restaurants can be found grouped with other outlets under the retail park category.

*Factors that may influence trip rates at **Roadside Food sites.***

General trends

- Suggest that these are passer-by trips and are influenced mainly by proximity to next nearest services.
- Increase in the number of services.
- Recent Government campaigns and road signs reminding people to take regular rests when driving.
- Number of trips may be related to amount of traffic on the neighbouring major road.

Trends within the Roadside food industry

- Happy Eater sites on the TRICS database may be invalid, because the brand does not exist anymore.
- Increasing competition with drive through fast food stores.
- Collaboration of Little Chef and Burger King at some sites since the late 1990s. Wider choice, but people will spend less time in the restaurant if taking away food from Burger King. This means that there is higher potential for arrivals/ departures for any one hour where the site is mixed.

*Factors that may influence trip rates at **Motorway Services.***
• Suggest that these are passer-by trips and are influenced mainly by proximity to next nearest services. • Increase in number of motorway services. • Recent Government campaigns and road signs reminding people to take regular rests when driving. • Number of trips may be related to amount of traffic on the neighbouring motorway. • Expect more trips at services located next to a junction because traffic on the rest of the highway network also has access. • Diversification of facilities with growth in associated on-site motels and the availability of meeting rooms for 'centralised' conferencing.

7.7 Leisure and Tourism

*Factors that may influence trip rates at **Multiplex cinemas.***
• Thought to be a strong correlation between visitors and the quality of films being made. Recent years have seen a growth in the number of ticket sales. Multiplex cinemas have reinvigorated the cinema experience after years of falling investment. In the 1990s, admissions have increased by 58%, to 139 million in 1999, according to the Cinema Advertising Association [Ref 51], which promotes and monitors advertising in UK cinemas. • Growing enthusiasm among the film going public in Britain, visiting the cinema more in 2002 and 2003 than at any other time since 1972, according to the CAA [Ref 51].

*Factors that may influence trip rates at **Bowling Alleys.***
• Other facilities apart from bowling on offer, such as snooker and pool?

*Factors that may influence trip rates at **Sports / Leisure Centres.***

Features of the Centre

- Think about the sports catered for at the centre. One that includes a swimming pool is likely to have vastly different trip rates to a site without. Sites lacking this basic information should probably be discarded.

Trends within the industry

- Fitness boom during the 1990s resulting from increased disposable income and rising concerns about obesity and health worries.
- This may mean that people decide to walk or cycle to the sports centre as well.
- Increased female participation in sports activities has resulted in greater demand for health and fitness activities [Ref 52].
- Places away from the home and the office such as sports centres have become a particular focus for social interaction and leisure activities in recent years, [Ref 52].
- Until the 1980s the majority of sports / leisure centres were run by local authorities, but since then many have been privatised. With companies seeking to make money some of the less profitable ones with lower attendances (and trip rates) may have closed. Additionally by seeking to make a profit, improved marketing may have attracted more people to these centres. Hence some of the earlier sites on the database may not be valid for this reason.

*Factors that may influence trip rates at **Swimming Pools.***

- It is important to consider the facilities on offer, such as the:
    - Number of Pools;
    - Size of pools - Olympic size (50m) or 25m for example;
    - Diving Pools;
    - Number of Water Flumes. People are attracted to the centre on the strength of these alone;
    - Open air or indoor?
    - Competitions.
- As with sports/leisure centres the majority of these were local authority run until the late 1980s. Since then privatisation may have resulted in the loss of sites with smaller attendances (and trip rates). This is still a concern with pools in Nottingham and York for example under threat. Marketing to increase profits may have attracted more people into the swimming pools.

Factors that may influence trip rates ***for Skiing Land uses.***
Facilities • Type of ski slope – artificial or snow covered. • Think about the peak season for skiing. Artificial slopes are likely to be different to the snow covered parts of Scotland, such as the Cairngorms. • Will the development have a ski shop, bar/restaurant? Depending on the area these may attract people not wishing to ski at the slopes. *Popularity of Winter sports* • People have more disposable income and may prefer to sample the real thing in France, Switzerland etc. Hence trip rates may have declined slightly since the mid 1990s. • Increase in popularity of snow events after Winter Olympics in 1994,1998, 2002 etc. Interest may fade after each event before returning immediately after the next Olympics. • Increase in popularity of extreme winter sports such as snowboarding has grown in recent years. *Future Changes* • Ski slopes may begin to use real snow if the Snow Park at Rochester, Medway is successful. This site uses a snow-generating machine to create an environment for skiers and snowboarders. As this opened in December 2003 it is too early to say how popular it will be in the long –term. For further details see www.thesnowpark.co.uk

Factors that may influence trip rates at ***Ice Rinks.***
• Ice Hockey games to attract crowds? If so investigate the seating capacity and whether it is regularly filled. • Increase in popularity of ice based events after Winter Olympics in 1994,1998, 2002, etc. Interest may fade after each event before returning immediately after the next Olympics. • Temporary outdoor ice rinks becoming more common in cities during the build-up to Christmas. This may attract skaters away from traditional ice skating centres.

*Factors that may influence trip rates at **Tennis Clubs.***
Features • Indoor and/or outdoor facilities? • Floodlights? • Type of court? Clay, cement, grass or hardcourt. A diverse mix of courts may increase the demand for tennis. • Does the Club have a winter season as well as the traditional summer one? Trends within the Sport • In the early 90s a trend of declining membership of tennis clubs. The sport was perceived as elitist. Then Tim Henman and Greg Rusedski came on the professional scene in the mid 1990s increasing interest and participation in the game. • City Tennis Clubs formed in recent years in an effort to encourage all social backgrounds to play the game. These may have different demand and travel patterns to traditional clubs. • Lawn Tennis Association (LTA)'s Play Tennis Recruitment campaign from April to end September 2003. Over 1,100 clubs participated by offering free tennis to kids. This may have an impact in the future.

*Factors that may influence trip rates at **Bingo Halls.***
• Think about the opening hours. They are likely to be closed during the AM peak. Sometimes closed in the PM peak (1700-1800) (e.g. Riva Bingo at Ancoats, Manchester), but people will be leaving and arriving at the beginning and end of this period. • Increasing popularity? No longer seen as something aimed at pensioners. Bingo halls often having promotions to attract younger people, with free gifts, drinks and/or admission. • Increasing prizes. National Lottery has been running since 1994 and may have increased tendency for people to gamble.

*Factors that may influence trip rates at **Art Galleries/ Museums / Exhibitions.***
• Entrance cost. • A temporary exhibition may result in an increase in visitors. • Catchment area will be related to the national significance of the museum/ gallery. • Location – A museum within a settlement such as Aberdeen is likely to have different trip making characteristics to one in the countryside since the ease of getting to one or the other will vary.

*Factors that may influence trip rates at **Equestrian Centres.***

- According to a TRICS survey, October is the busiest month in the Equestrian calendar. These sites may be busiest at the weekend or in holidays, such as autumn half term.
- Think about the nature of the centre. Is it driven by a local market or geared to tourism? This could affect the trip rates.
- Consider how much movement of horses in and out of the centre goes on. Horseboxes should be considered in trip rate calculations, as these will increase the length of the vehicle.

*Factors that may influence trip rates at **Sports Clubs.***

Features of the Club

- Think about the facilities on offer as they vary according to club.
- Brand Name, e.g. David Lloyd, Dragons, etc. because of their position within the market, e.g. cost, facilities. If someone is a member of a particular brand's health club in Maidstone they should be able to use the same brand's facilities in Brighton free of charge.
- The performance of each brand will react differently to economic downturns, because of the type of market they serve and decisions they make.

Trends within the Industry

- Fitness boom during the 1990s resulting from increased disposable income, rising obesity and health worries. But several health clubs have experienced slower than expected membership growth, because of increasing competition. Market is becoming saturated in some areas, especially London, [Ref 53].

*Factors that may influence trip rates at **5 a side football complexes.***

Facilities

- Floodlights?
- Do the pitches cater for additional sports such as hockey?

Trends

- Likely to be busiest in the evenings and weekends when people have free time.
- The age groups using the facility may influence the type of transport used. If used predominantly by teenagers, it may well be that fewer use a car to travel to/from the site, than if used by primary school age children or adults.
- Football has become increasingly popular since the introduction of the FA Premier League in 1992, which widened the appeal of the game to more women and children. This may have been reinforced by international competitions, such as Euro '96, which was held in the UK. Hence the market for 5 a side football is likely to be an increasing one.

*Factors that may influence trip rates at **Country Parks.***

- Due to their location these are often visited by car. However there are examples where alternative modes are being promoted, e.g. Seven Sisters near Eastbourne.
- Influenced by the weather, therefore expect increase in visitors in the summer.
- Local authority promotion of country parks.
- Is the area promoted by a conservation body, such as the National Trust or National Parks Authority? People will have wider awareness of these country parks, which could increase the number of people visiting them.
- Cost to park and visit.
- A country park may have other facilities besides countryside. Particular examples on the TRICS database include:
  - 9-hole golf;
  - Orienteering;
  - Windsurfing;
  - Café;
  - Visitors Centre;
  - Miniature Railway.
- All of these may contribute to an increased level of trip making.
- Mixed trends found on 'Before and After' studies on the TRICS database. Trips to Lochgelly Park in Fife were lower in 1998 than 1994, whilst at Ferndown, Dorset they were higher in 1994 than 1988.

*Factors that may influence trip rates at **a Mixed Leisure complex.***

- From the sites in the TRICS database, it is evident that these are similar to Leisure Parks but may have Conference facilities in addition. Facilities are together in one complex rather than found in individual sites. All of these are past the customary 8-year cut-off.
- Possibly consider the components that make up the leisure complex separately e.g. calculate trip rates for a hotel, health club etc. and collate them. Consider the trends highlighted for these individual land uses.

*Factors that may influence trip rates at **a Leisure Park.***

Cinema, sports club, restaurant(s), hotel. Many individual units.

- Consider the facilities at the surveyed sites. Are they broadly similar to the ones in the leisure park you are studying?
- Think about recent use trends in the facilities you are studying. For instance cinema patronage has gone up in recent years and sports club membership rose.
- General trend for increase in leisure time and disposable income. Increased participation by females in sports activities has resulted in greater demand for health and fitness activities [Ref 52].

Factors that may influence trip rates at ***Water sports land uses, e.g. sailing, waterskiing, windsurfing, sailing.***

- These sports may involve bulky equipment, which often has to be brought on a trailer. Those involved in sailing will need a trailer to transport a yacht/boat; waterskiing requires a motorboat. Depending on the facilities on offer they may be able to leave these at the club during the season. However when calculating the maximum trip rate in transport modelling it will be necessary to assume that the average length of a car is longer than the default value. Those involved in waterskiing and windsurfing may be able to put the skis and boards on a roof-rack.
- Hence it may be worthwhile to consider trip rates at small marinas, which involve similarly bulky equipment, if trip rates from suitable water sports clubs are not available. However it will be important to ensure that the marina has similar facilities to the sports club to avoid unrealistic trip rates being calculated.
- It is important to consider the means of transport to water sports clubs. Travel by clubs and youth organisations have been altered somewhat because of the licence rules since 1/1/97 for anyone wishing to drive a minibus (9-16 people). Now a driver has to be between 21-70 and have had a licence for 2 years. Many organisations also wish to see that those driving minibuses have a certificate showing that they can drive a vehicle of this type. Hence it is likely that use of these has declined in recent years. Instead people may be taking 3-4 cars instead.
- The busiest time for water sports clubs during the peak season is likely to be when regattas are occurring nearby

*Factors that may influence trip rates at **Marinas.***

Facilities

- Developments associated with marinas tend to be leaning more towards mixed use with housing and restaurants. It will also be important to think about the other facilities on offer at the sites you are using e.g.
  - Chandlers;
  - Boatyard;
  - Sail manufacturers;
  - Lifeboat Station;
  - Clubhouse;
  - Yacht broker;
  - Sailing School.
- There are two basic types of marina. (1) Jetties, etc. may be built into an existing water body, such as an estuary. (2) In some locations land has been excavated and flooded to form a marina. These are often called 'yacht harbours' and these tend to offer more protection to the boats during stormy conditions. The latter could be more popular.
- Marinas can be aimed at one of a number of different markets. Some in the TRICS database are based on inland rivers, such as the Thames in Surrey, where the demand will be for motorboats. Others are found on estuaries and inlets, which are attractive to a wider range of vessels such as yachts, tall ships, etc.
- Consider cars with trailers when calculating trip rates, as this will increase the length of the average vehicle.

Local characteristics

- Some areas of the coastline are more attractive to sailing than others because of the natural environment e.g. the Solent. Marinas in these locations are likely to be more popular which could result in them having higher trip rates.
- Seasonality will be important. The make-up and number of trips will be different according to the time of year. In spring and autumn, people will be cleaning, mending boats and perhaps transporting them to/from their home for safe winter keeping. During the summer the boat will be left in the water and journeys will be made to use it.
- The busiest time for marinas during the peak season is likely to be when regattas are occurring nearby, (e.g. Cowes Week would be a busy time for marinas alongside the Solent).

*Factors that may influence trip rates at **Private 9/18/18+ hole golf courses.***

What other facilities are available and are these open to non-members?

- Pro shop, bar / restaurant, driving range.
- Some golf courses also have additional sporting facilities such as tennis, gym and fishing to attract people to the club.
- Some golf courses may also offer conference facilities.

Type of Course

- Golf courses are generally classified as 'links' or 'parkland' courses. The style of golf on the former is slightly different to the latter, and if people have a choice of a links or parkland course they may opt for one over the other.
- Does the golf course organise competitions that attract competitors and fans. For example there is TRICS data for Wentworth when it held a PGA tour event in 1990.
- How long has the course been open? If it is a famous course then people will travel a lot further to play. The course may be at capacity all day. People may also visit and treat it as a tourist attraction.
- Consider popular days such as 'Seniors Day' or 'Ladies Day', where trip rates may be higher.
- Results from the TRICS database suggest slightly higher trip rates for 9-hole courses in the week and 18-hole courses at the weekend. This perhaps reflects the amount of leisure time that people have at their disposal at these times of the week.

Popularity of the sport

- The golf market is said to be growing steadily, but not booming.
- Number of registered golf players in England rose from 1991 to 1995 from c600,000 to c800,000 and has since remained fairly stable with small annual rises [Ref 54]. Perhaps this suggests that the 8-year cut-off is valid.
- In Scotland the number of players was lower in 2000 than 1986/7. However there has been some slight growth since the early 1990s.
- Daytime demand is likely to be highest where there is a large retired population, or where corporate functions are held. It is possible that the growth in popularity of the sport is related to the increase in people taking early retirement. These people with income and leisure time at their disposal are likely to patronise the game. With pension worries, this trend may well reverse in future years.
- Increasing popularity of golf may not be evident at a private course, because it may have a set maximum membership level. It may be useful to use sites with similar membership levels to predict trip rates at your course.
- It is unlikely that public transport will be an important consideration, because of the bulky equipment associated with golf.

*Factors that may influence trip rates at **Municipal 9/18/18+ hole golf courses.***

What other facilities are available?

- Pro shop, bar/ restaurant, driving range
- Golf courses are generally classified as 'links' or 'parkland' courses. The style of golf on the former is slightly different to the latter, and if people have a choice of a links or parkland course they may opt for one over the other.

Popularity of the sport

- Although these courses are open to everyone, there are members or season ticket holders, who get preference on playing golf. It may be useful to use sites with similar membership levels to predict trip rates at your course.
- The golf market is said to be growing steadily, but not booming, [Ref 54].
- Increasing popularity of golf is more likely to be reflected at a municipal course because it is cheaper and so more attractive to the mass market.
- It is unlikely that public transport will be an important consideration, because of the bulky equipment associated with golf.

*Factors that may influence trip rates at **a Golf Driving Range.***

- Is the driving range part of a wider golf complex? If there are multiple facilities available then it may be more attractive than standard driving ranges. For instance parents may take part in driving range practice, whilst the children play on the putting green.
- Opening hours vary from site to site. Some driving ranges have floodlit bays, which allow opening hours up until 10pm, whilst others are only open in the daytime.

*Factors that may influence trip rates at **Tourist Attractions.***

The *nature* of the Tourist Attraction

- Will a heritage railway have the same trip generation as a National Trust house?
- Consider seasonality.
- Are any corporate services supplied? For instance wedding receptions are arranged at some National Trust properties.

Socio-economic characteristics of the area

- Think about the type of tourism involved, the market for it (is it local or regional/national) and the way that people would travel to the attraction in the area. If it is local, it is likely that the area's socio-economic characteristics will play an important role in the popularity of the tourist attraction and the means of travel used to visit it. People's leisure time and the value that they attach to it, is variable according to their amount of disposable income. For instance Hoyle and Knowles [Ref 55] argue that recreational travel is one area where the locality's social characteristics form an important part of transport analysis.

Environmental characteristics of the area

- A local area that has been given a special tourist/ conservation designation may attract more people to the area than if there was none. Examples include National Parks (Peak District), National Trust areas (Box Hill, Dorking), English Heritage, Forest Park (Forest of Dean).
- Whilst National Parks may attract more people into the area, many authorities have attempted to ameliorate local congestion by introducing transport control and visitor management initiatives. Page [Ref 48] provides the example of the summer 'park and ride' service and Sunday/bank holiday car bans in some parts of the 'Peak District'.

8 Conclusions

8.1 Introduction

8.1.1 Section 8.2 presents a summary of the main findings, with the applicability of the current cut-off period of 8 years considered for each of the different land uses that have been studied in detail.

8.1.2 Some additional factors that may add extra value to the TRICS. database have been considered and evaluated during the course of this exercise. The findings are presented in section 8.3.

8.1.3 There are some general aspects and messages that have also emerged and provide opportunities for the future data collection programme and development of TRICS. These complete the research findings in section 8.4.

8.2 Issues arising from the land uses studied

8.2.1 *Superstores*

8.2.1.1 In all of the locations studied the trend is one of a reduction or stability in the number of car trips to superstores on a Friday. Sunday opening for large stores has been permissible since 28th August 1994. The increase in shops opening on this day in the late 1990s may be an important reason for the changes in Friday superstore trip rates noted over this period. Hence it is recommended that data prior to 1995 should not be used.

8.2.1.2 There may be other factors apart from the widespread change in opening hours that have affected superstore trip rates. An area that has experienced the most substantial change in the last five years is the town centre, which may be because of:

- Congestion;
- Competition between locations and brands;
- A function of the different regions of the country surveyed.

8.2.1.3 Overall, the individual location types studied somewhat resemble the trend for “all locations” apart from the town centre in 1998-2002.

8.2.2 *Offices*

8.2.2.1 Office trip rates are higher in the period 1995-2002 than previous years for “all locations”. Whilst at the overall scale the current 8-year cut-off is valid, this is not the case when certain location types are examined. In town centre locations, trip rates in 1998-2002 are around a half of those recorded in 1995-1997. From this a five-year cut-off may be more valid. In suburban locations the average trip rate has remained fairly constant throughout the 1988-2002 period, and hence there is no need for any cut-off with this particular dataset. The pressures on town centre locations are unlikely to be as prevalent here.

8.2.3 *Industrial Estates*

8.2.3.1 For industrial estates it is difficult to draw any meaningful conclusions, because there has been a significant period during the 1990s when no data was collected. Some sites are also lacking basic geographical location and land use details, which limits their usefulness. The majority of the count sites predate the cut-off, and as industrial estates are an important category according to a user survey, it would be useful to increase the number of sites that are readily available. Given the great fluctuation in trip rate recorded in the early and mid 1980s it is unlikely that these are still valid.

8.2.3.2 With the lack of relevant industrial estate category sites contained within the database - only 9 out of a total 100 sites within this use class is dated 1998 or later - it must be difficult to assess the trip making of such development areas in terms of securing planning approval. In relation to the growing trend towards mixed-use development, the smaller B1(c) type units [units of size between 100 – 400 m^2] are becoming prevalent in applications, with the total use of the development site being dependent on the uses that occupy a significant number of smaller units. This suggests that more choice might need to be included within the category to identify the different types of industrial estate. This would allow a more analogous source of data to be assessed, as this land use category covers a wealth of different sub use classes and different types of units.

8.2.4 *Residential areas*

8.2.4.1 Trip rates at privately owned housing in all locations are at their highest in the past 2 years, far greater than they have been for much of the 1990s. Trip rates from 1995-2000 are in most cases the lowest of the study period from 1988 to 2002. This calls into question the validity of the 1995 cut-off, as unless the TRICS user applies some form of growth factor then they are likely to be underestimating trip generation at new sites. Trip rates in the early 1990s have more in common with today's traffic generation in this land use.

8.2.4.2 For mixed private housing, in most locations trip rates are at their lowest of the entire study period during the last two years of data: 1999-2000. Trip rates at privately owned housing also were low during this period, before rising in 2001-2002. However the absence of any data from 2001-2002 in this land use does not enable an assessment as to whether trip rates have risen again. Trip rates in 1989-1990 are within the bounds of variation since the cut-off in 1995, suggesting that this data is as much valid as that from 1999.

8.2.4.3 Reasons for the variability in trip rates in residential areas are likely to be a function of many influential factors, rather than just car ownership. Economic factors are likely to have some effect, whether in their impacts on people's decisions to make trips from their homes to certain land uses or the geographical variability in economic performance within the UK and/or within a settlement.

8.2.4.4 The buoyancy of the housing market has given the propensity for greater mobility, with greater opportunity for residents to move house. However, it is highly likely that residents of say a 300 dwelling estate would in a repeat survey a few years later be similar people, with similar jobs, commuting a similar distance. Hence in general people's trip making levels would be similar, although their patterns may have changed and data validity remains acceptable. It is here that current guidance and policy, in particular the application of PPG13 and non-car accessibility will soon bring into question the validity of pre-2000 development (probably planned and developed before 1996).

8.2.4.5 Most recently within the revisions to PPG 3, the densities of residential development are encouraged to be higher. It is likely that the actual trip numbers if established on a per dwelling rate, may indeed remain similar. But the characteristics of this higher density type of development will also be different to anything currently on the database.

8.2.5 *Primary Schools*

8.2.5.1 The information from TRICS suggests that car trips to primary schools are smaller in number since the cut-off. This may be a function of the different locations surveyed in 1991 and 1999. Schools surveyed more recently had better public transport available, whether that is a reflection of general improvements or just of the areas studied is debatable. The former suggestion may be more valid, because analysis of the Middle School in Wareham reveals a marked decline. With new initiatives such as 'Safer Routes to School' and 'Walking Buses' it is important that more surveys are undertaken to reflect recent trends.

8.2.5.2 Substantial differences in trip rate have been noted between preparatory and state primary schools, with a little difference between the latter and middle schools. It is thought that these are logical differences, given the age groups and catchment areas of these types of school.

8.3 Additional factors

8.3.1 Some additional factors have been considered as part of the brainstorming exercise that has been a part of the project. It is thought that factors such as petrol prices and disposable income will affect people's decision to make a journey and the type of transport that they would use to do so. If people do not have much money at their disposal they are unlikely to make a journey to a hotel or a cinema.

8.3.2 Other factors that are likely to be important for retail sites at least is the brand name and whether additional facilities are available – for example a restaurant in a superstore. These often have special offers to tempt people into the superstore for an evening meal in the hope that they will buy some products in the main part of the store as well.

8.3.3 General economic geography factors are likely to be important as well. Whether a site is based in an Assisted Area or an Economic Development Zone may affect the number and way people make trips.

8.4 General

8.4.1 Where repeat surveys have been used some do appear to illustrate that traffic patterns are broadly similar over the database, whilst others do indicate a degree of variability. The key point would seem to be that a consistent trend would ordinarily be anticipated if the most influential parameters such as floor area, site layout provision, the number of available car parking spaces, employees or indeed residents etc is of a similar order to that of the earlier survey. People do tend to be creatures of habit, making similar trip patterns – as borne out by the general transport trends (section 5). If there is a local factor, for instance if a new supermarket has opened up in proximity, or increased car ownership, then this would give rise to potentially significant differences between original and repeat surveys in terms of overall trips. For destinations perhaps within Town centres, improved access to public transport would have a similar impact.

8.4.2 The wider study of traffic patterns at each of the land uses identified demonstrates that in general an element of change is taking place over time. This supports the adopted system default practice of applying a cut-off for data to be included in the trip rate calculation. The warning that emerges is one for consideration in the next few years. It concerns the expectation that a potentially more significant change will have materialised since the revised PPG13 document came into force in March 2001.

8.4.3 There are lower parking standards being applied and more developments involve mixed use schemes and are being constructed on Brownfield sites. However practical experience suggests that currently the measures and parking restraint aims of the planning guidance have not yet been seen on the ground to any significant scale.

8.4.4 It is concluded that once parking restraint, in terms of reduced space numbers being allowed on site, is implemented in conjunction with Green Travel initiatives, then certain land use sites surveyed even recently, will not remain of relevance to developments that are being planned now.

8.4.5 This future trend serves to emphasise the need for the user to consider carefully the use of 'average' site representations in preference to an approach based more upon the use of individual site details. It also emphasises the need for the future data collection programme to continue to be responsive to demands, trends and policy rather than necessarily maintaining the quantities of data available within each land use category/sub-category.

8.4.6 The planning process is moving on and with it the rationale for traffic attraction. This research serves to emphasise that TRICS must continue to take care that the land use types, site information and mixes of development it incorporates do not become dated.

8.4.7 The adoption of a default cut-off year is a valid practice but this does not remove the need for the individual user to show due thought, care and responsibility in using and interpreting the data and trip rate calculation that is made available to them on the system.

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FIGURES 1 - 68

Figure 1 Methodology for checking trip rate data.

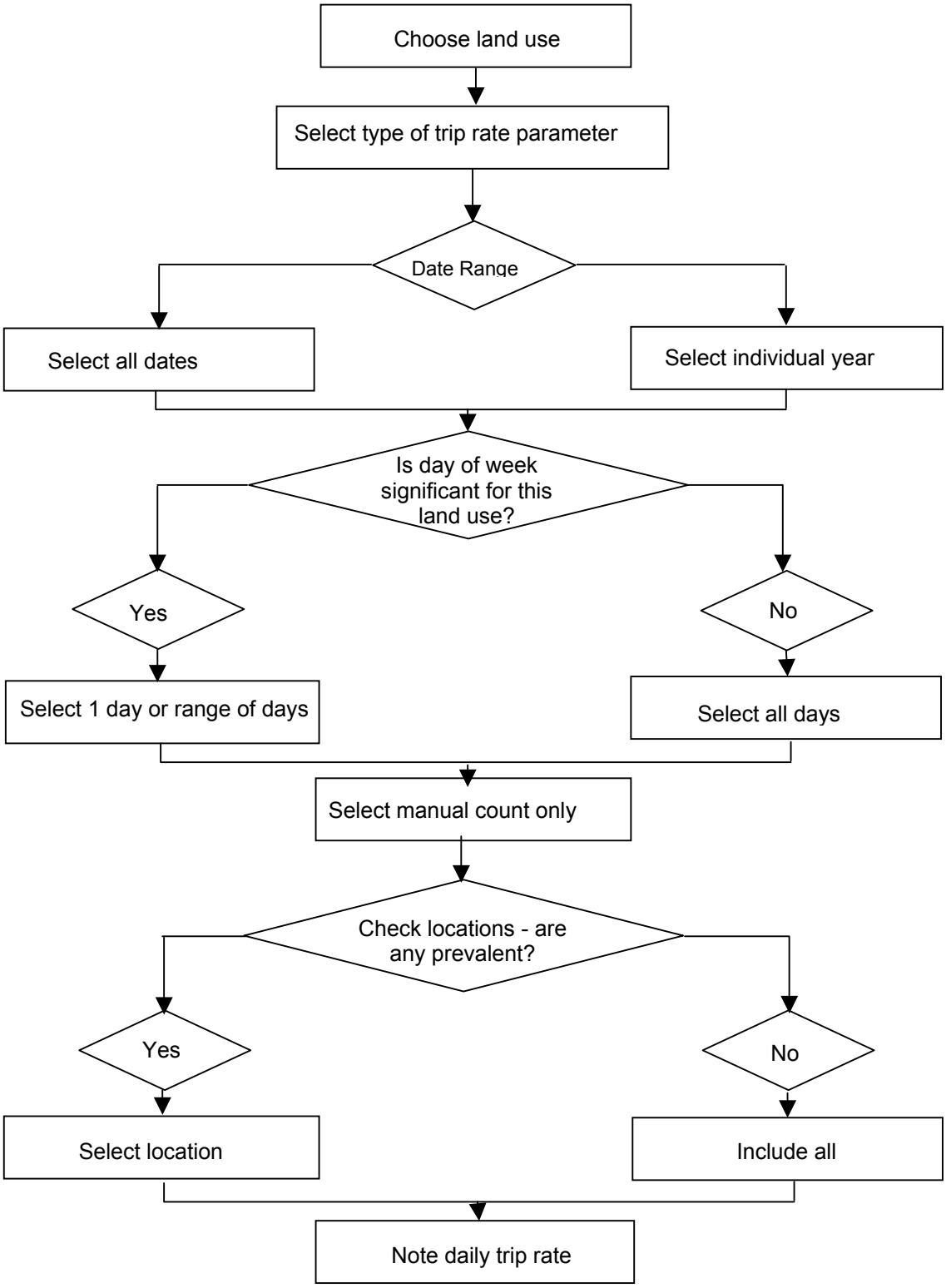


Figure 2: Superstore trip rates for town centre locations over the period 1986-2002

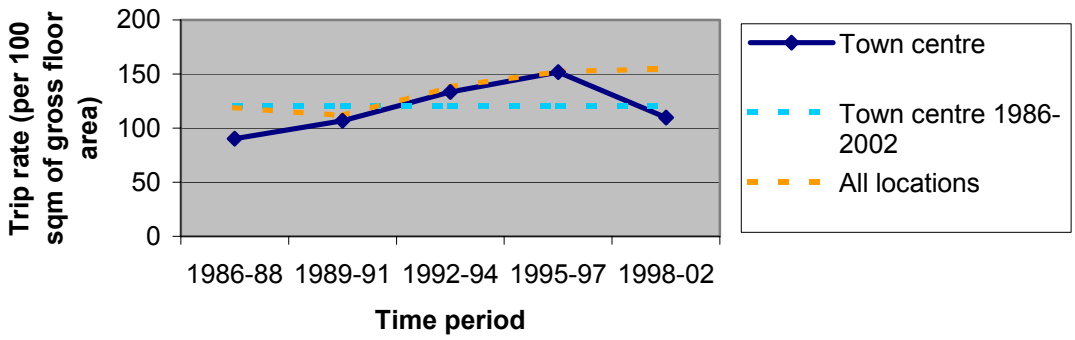


Figure 3: Superstore trip rate analysis at Tesco, Clitheroe

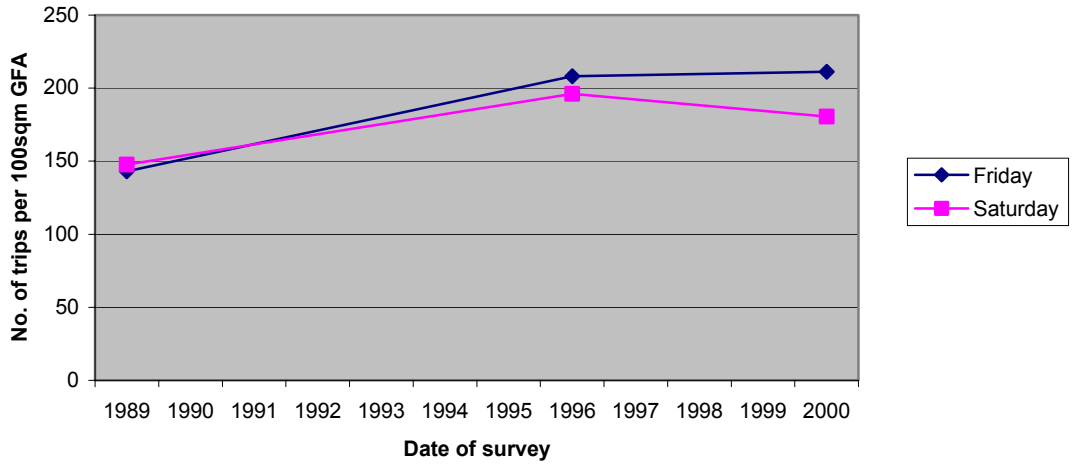


Figure 4: Superstore trip rates for neigbourhood centre locations over the period 1986-2002

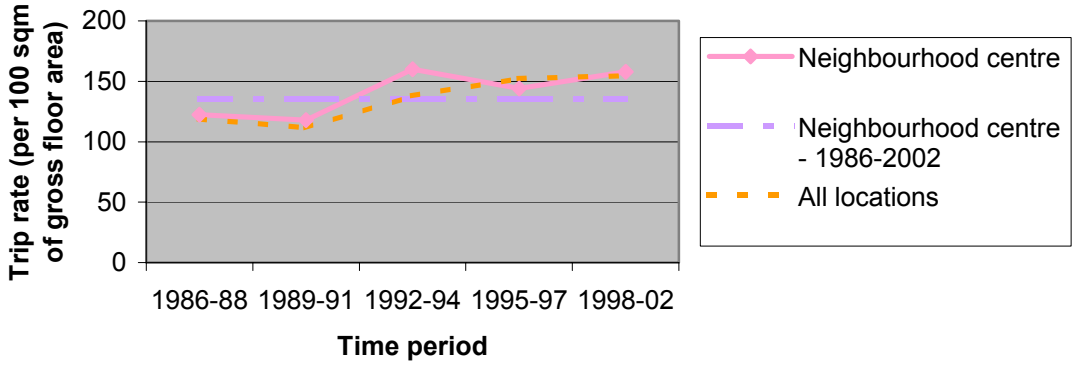


Figure 5: Superstore trip rate analysis at Plymco (Co-op), Plymouth - Saturday

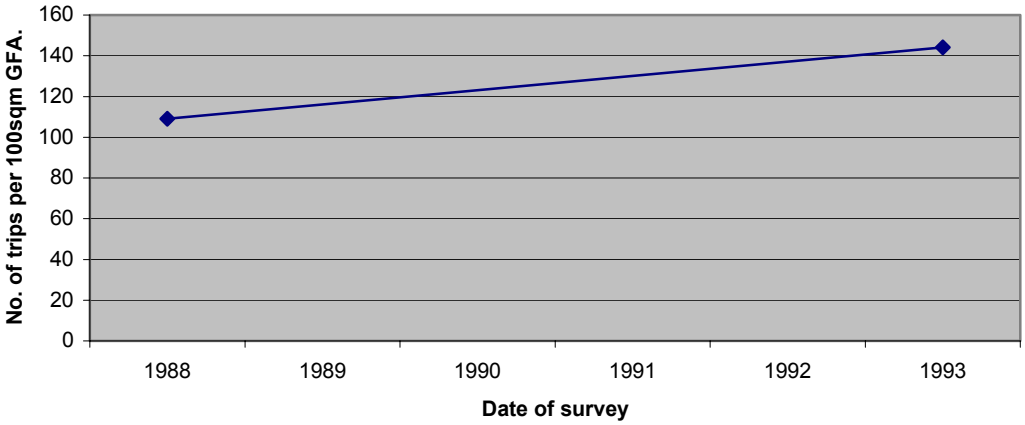


Figure 6: Superstore trip rate analysis at Sainsburys, Exeter

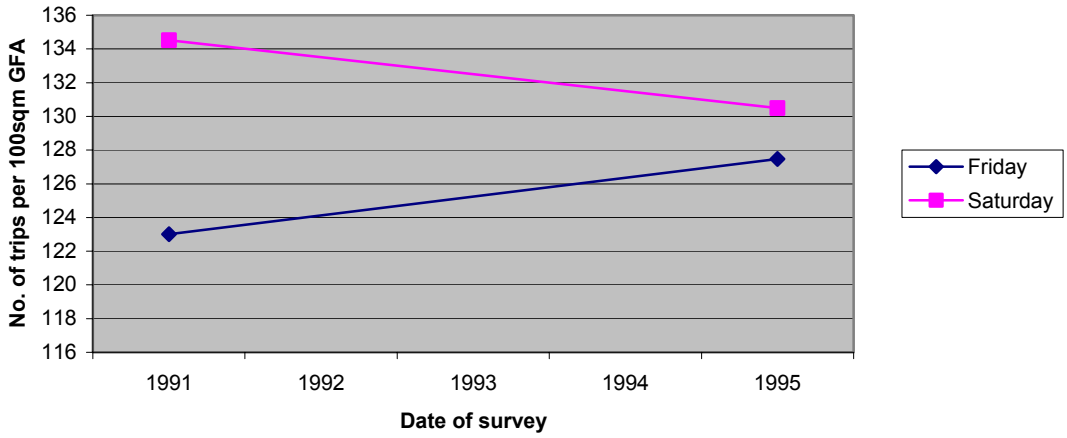


Figure 7: Superstore trip rates for Suburban locations over the period 1986-2002

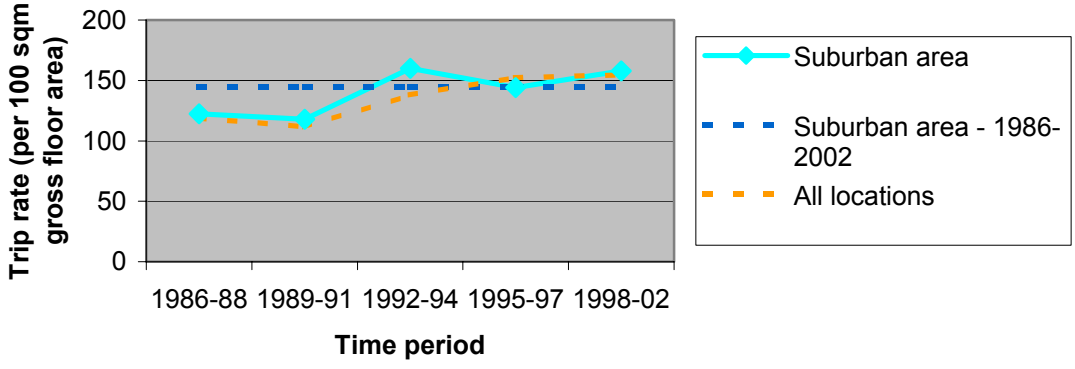


Figure 8: Superstore trip rate analysis at Tesco, Poole

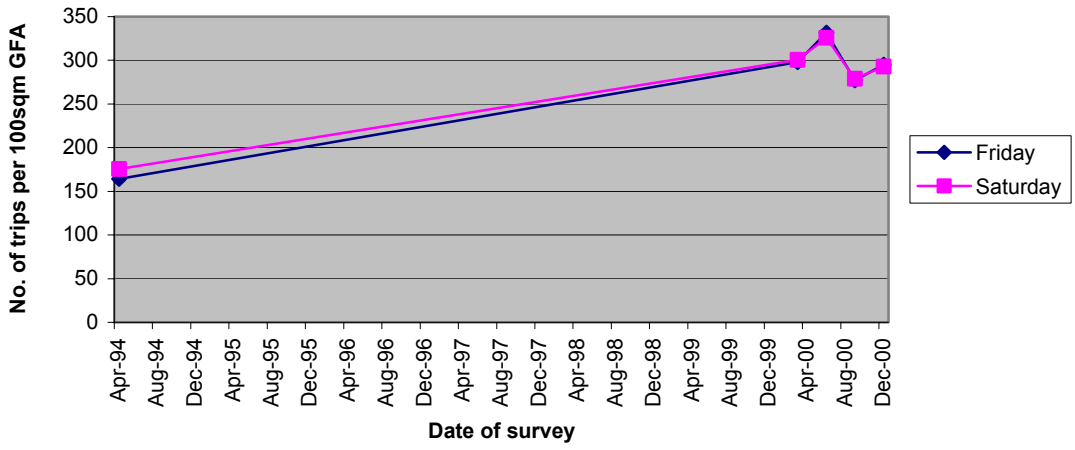


Figure 9: Superstore trip rate analysis at Tesco, Plymouth - Saturday

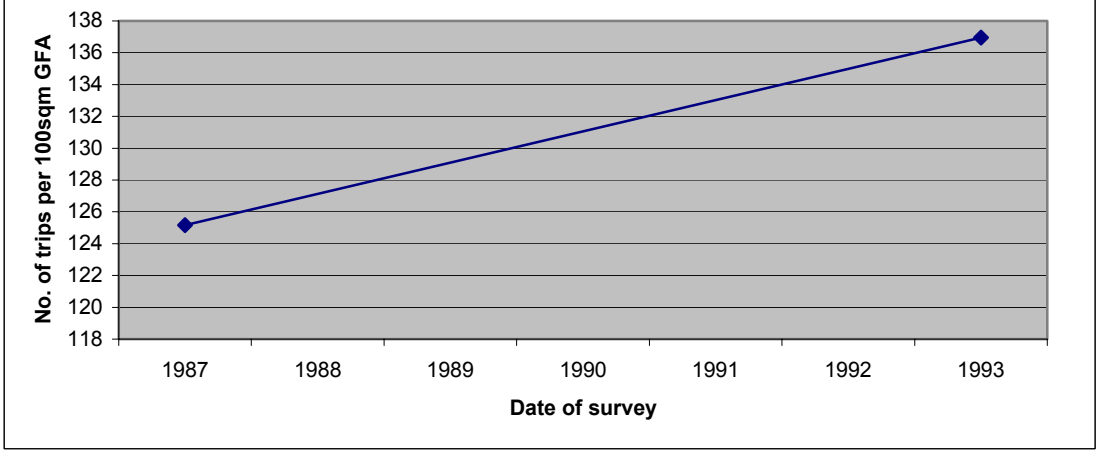


Figure 10: Superstore trip rates at edge of town locations over the period 1986-2002

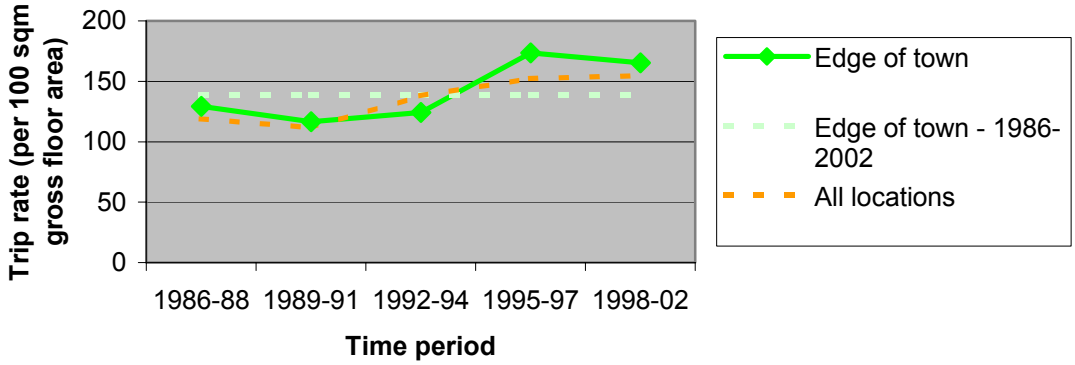


Figure 11: Superstore trip rate analysis at Sainsburys, Christchurch

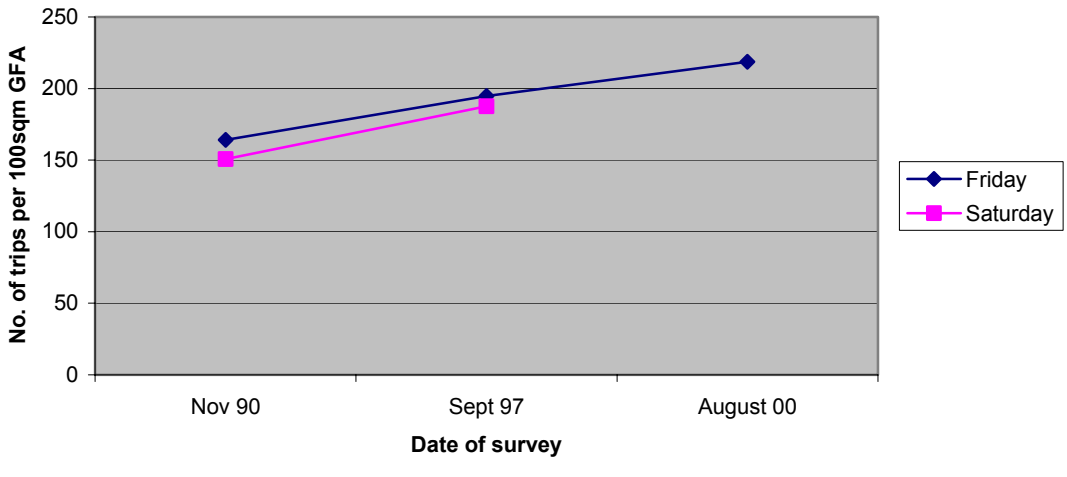


Figure 12: Superstore trip rate analysis at Sainsburys, Fareham

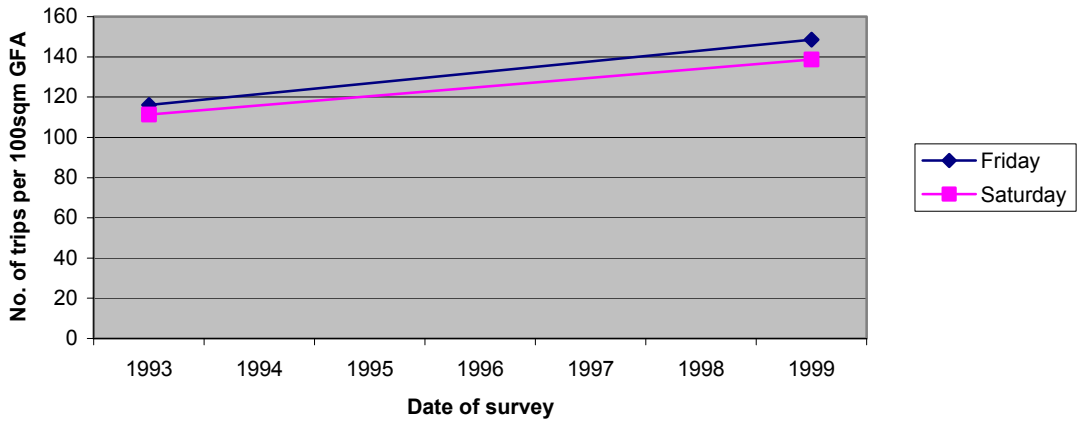


Figure 13: Superstore trip rate analysis at Asda, Brighton

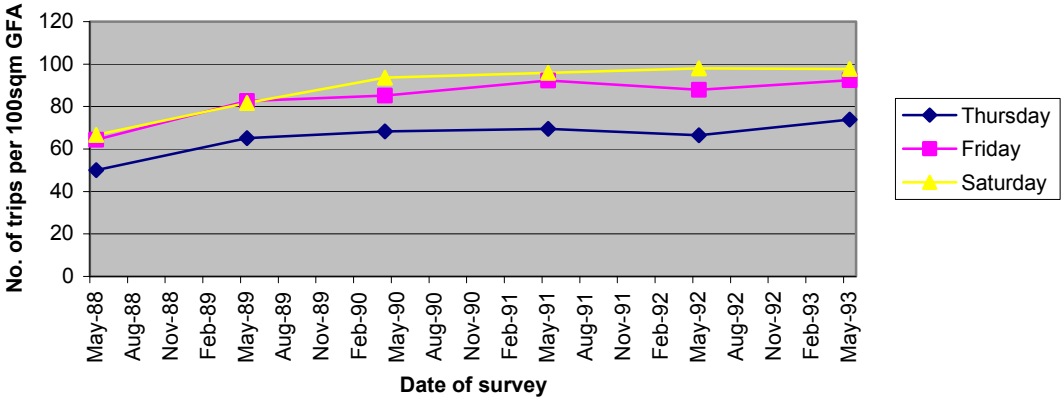


Figure 14: Office (B1 use class) trip rates for town centre locations over the period 1984-2002

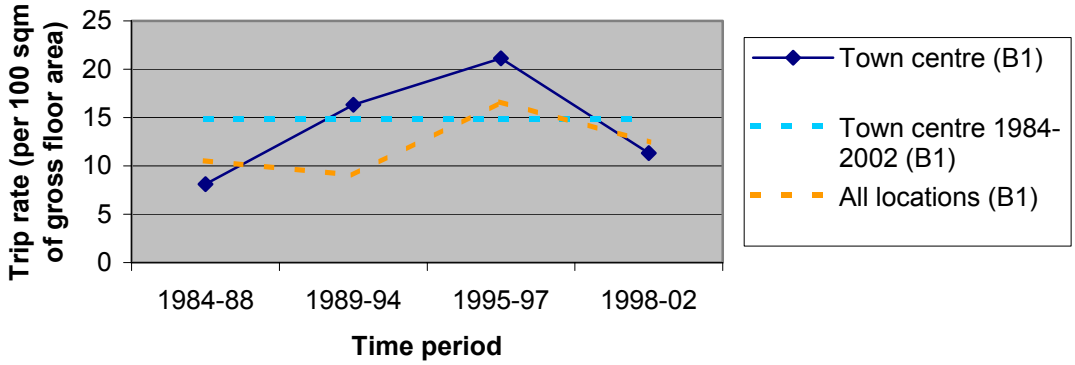


Figure 15: Office (B1 use class) trip rates for suburban locations over the period 1989-2002

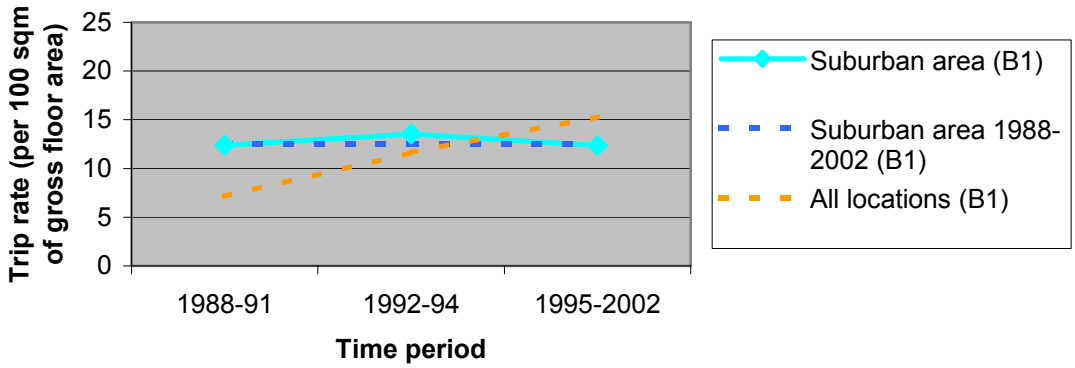


Figure 16: Office trip rate analysis for Legal & General, Surrey - Thursday

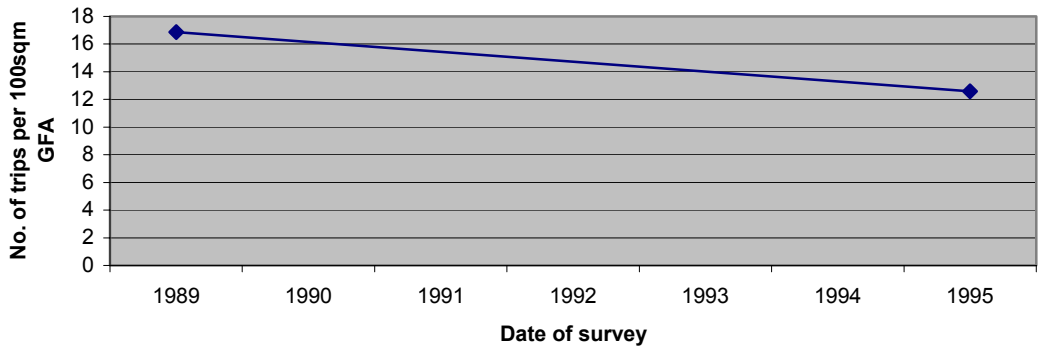


Figure 17: Office (B1 use class) trip rates for edge of town locations over the period 1986-2002

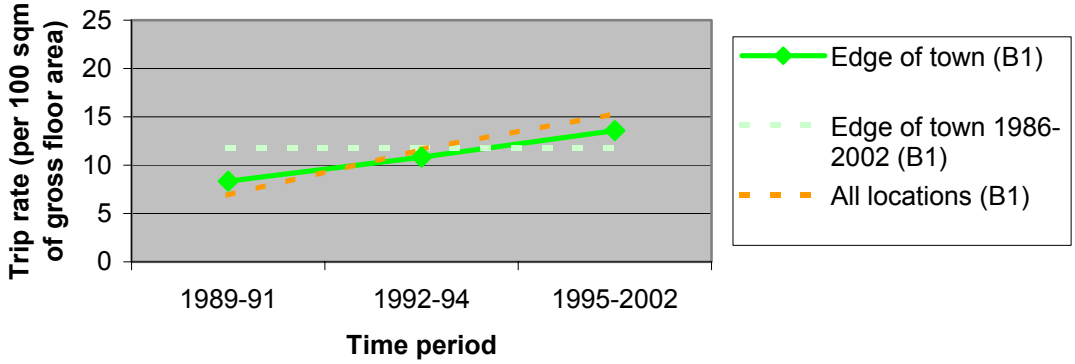


Figure 18: Office trip rate analysis for Southern Water, Worthing - week day

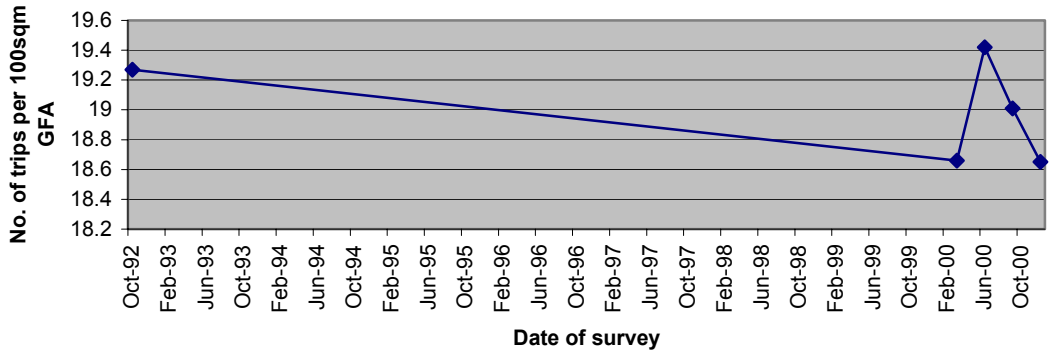


Figure 19: Industrial estate trip rates over the period 1982-2000

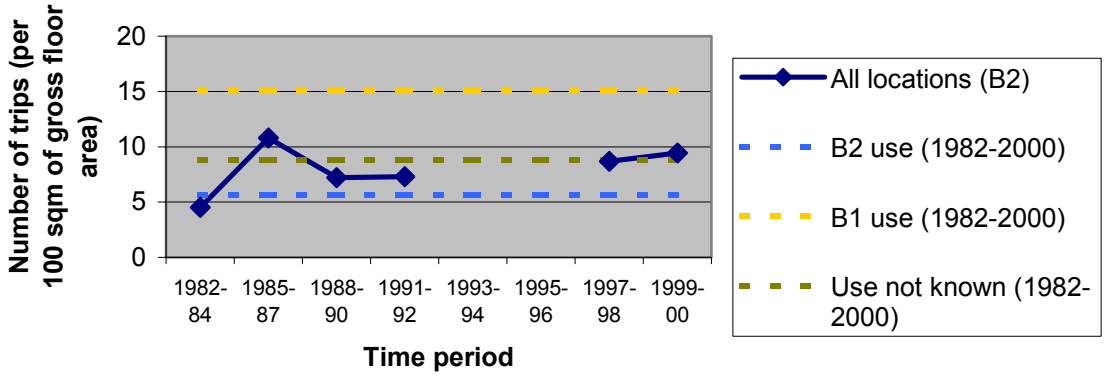


Figure 20: Trip rates at houses privately owned in edge of town locations over the period 1988-2002

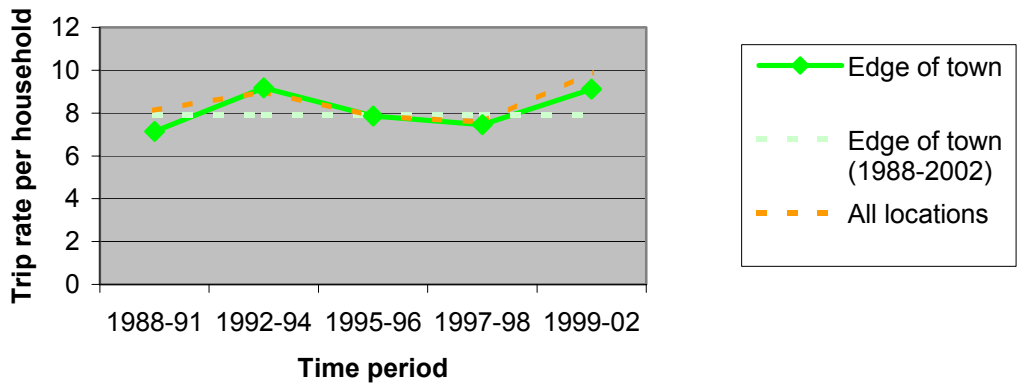


Figure 21: Trip rate per household at privately owned houses from 1988 to 2002 - variation according to car ownership

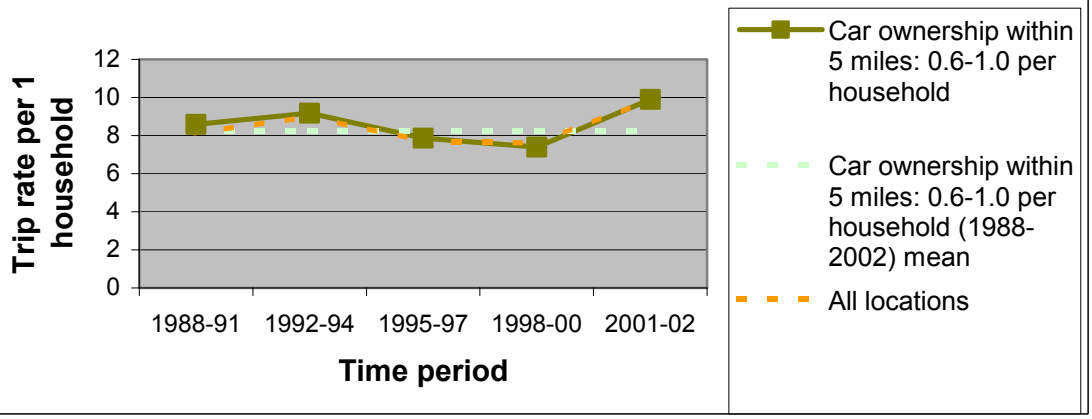


Figure 22: Trip rates at houses privately owned with access to under 40 buses/trains per day over the period 1988-2002

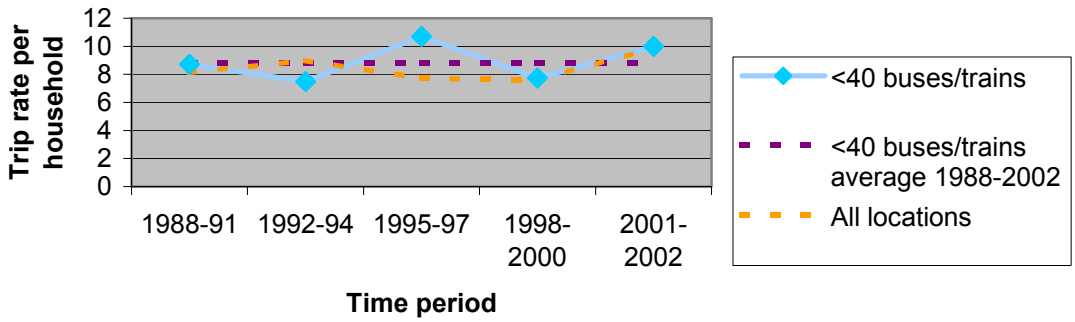


Figure 23: Trip rates at houses privately owned with access to at least 40 buses/trains per day over the period 1988-2002

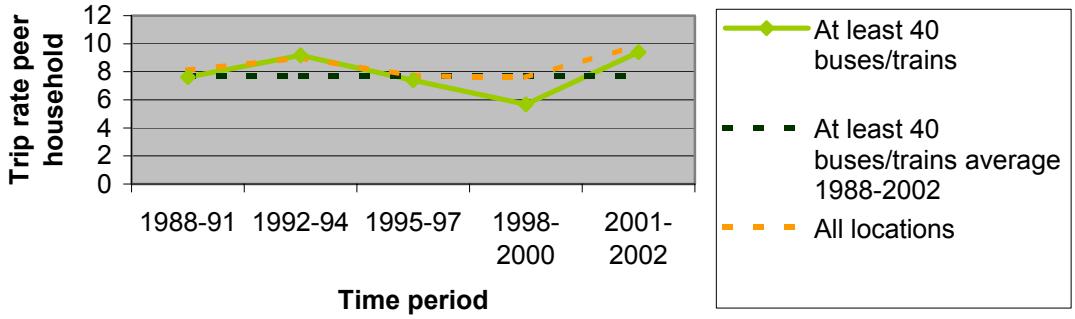


Figure 24: Mixed Private Housing in edge of town locations over the period 1989-2000

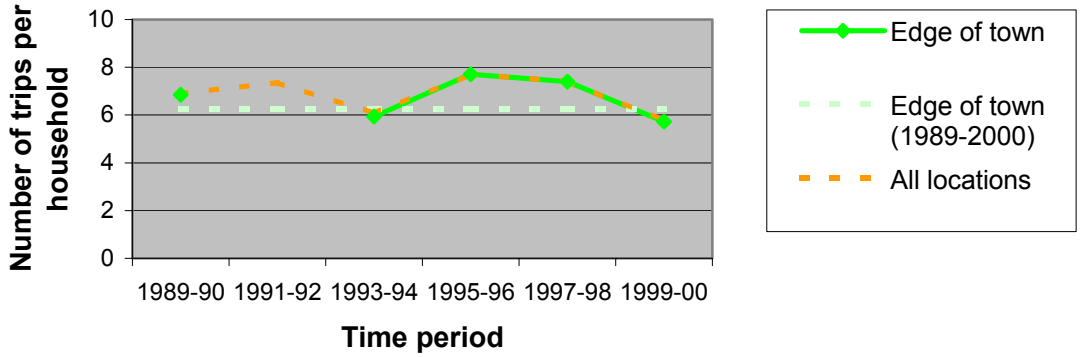


Figure 25: Mixed Private Housing trip rate analysis for Winchester Housing - weekday

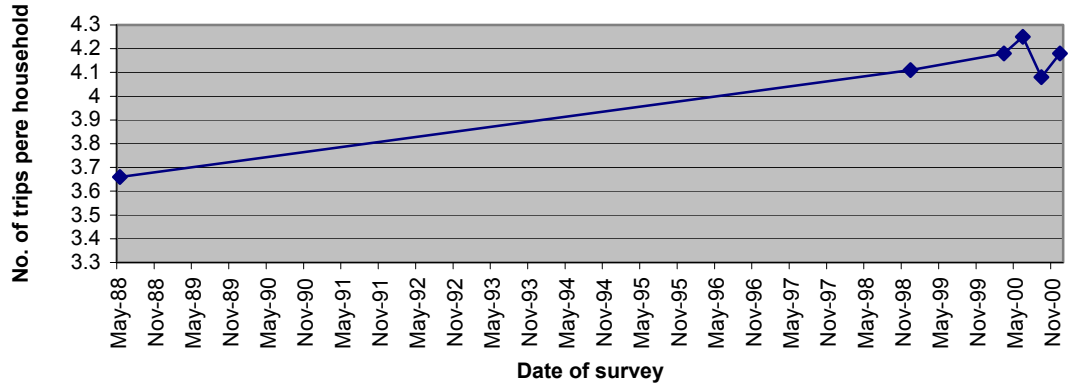


Figure 26: Mixed Private Housing trip rate analysis for The Meadows, Stafford - Tuesday

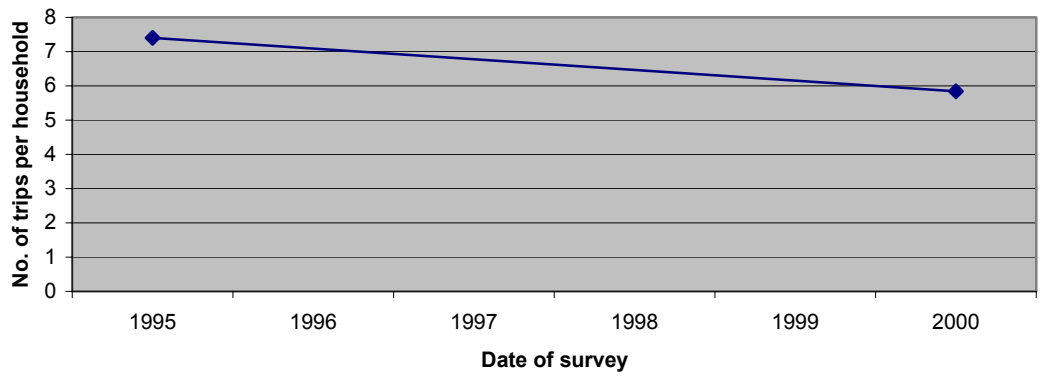


Figure 27: Mixed Private Housing trip rate analysis for Chichester Housing - weekdays

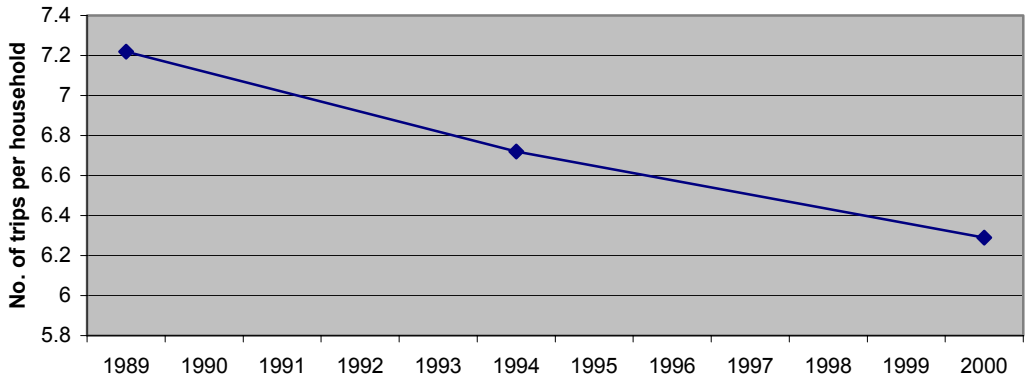


Figure 28: Trip rates at mixed private housing from 1989 to 2000 - variation according to car ownership

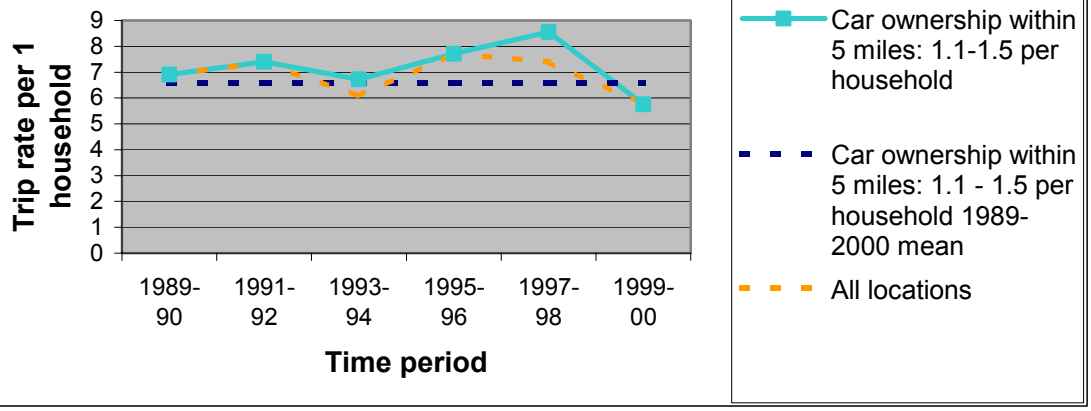


Figure 29: Mixed private housing trips rates over the period 1989-2000 where there is access to at least 40 buses/trains per day

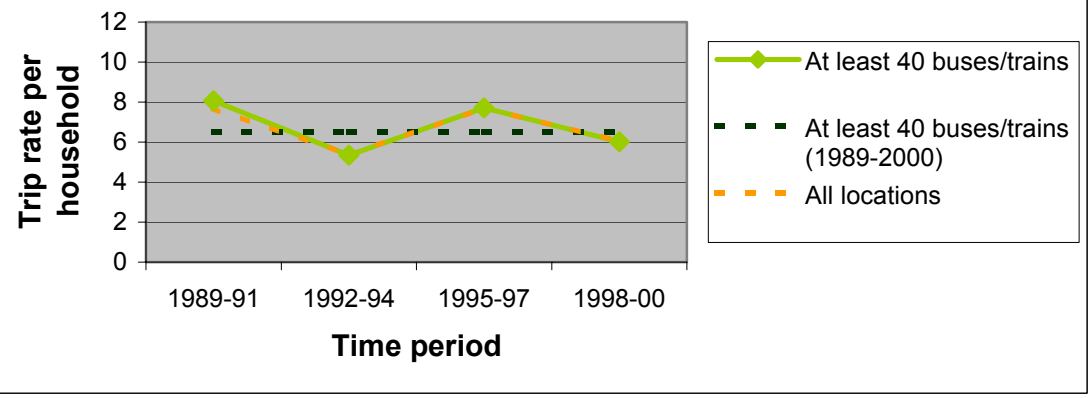


Figure 30: All days * Edge of town Hotel Trip rates per bedroom over the period 1987-2002

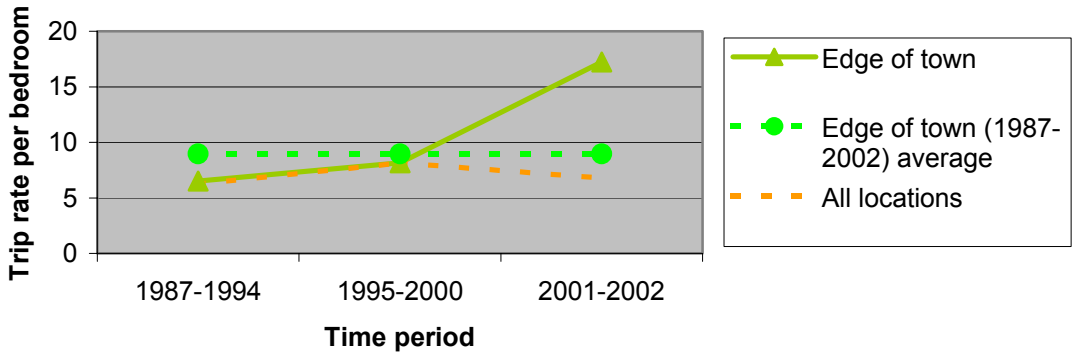
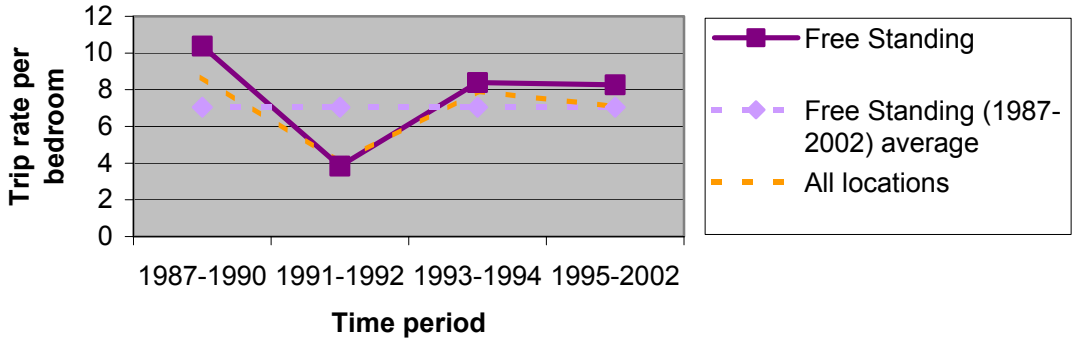


Figure 31: All days * Free Standing Hotel Trip rates per bedroom over the period 1987-2002



* Except Monday and Wednesday.

Figure 32: Hotel trip rate analysis for Weymouth - Saturday

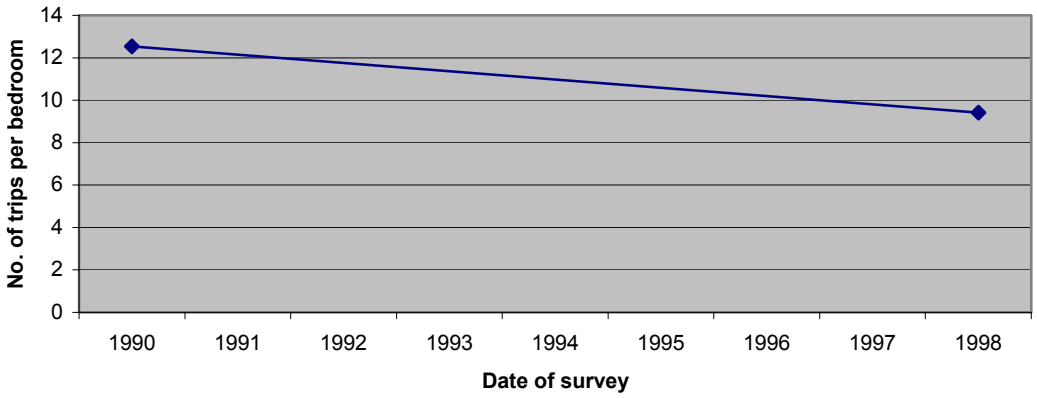


Figure 33: Trip rates per pupil at different types of primary school over the period 1991-2000

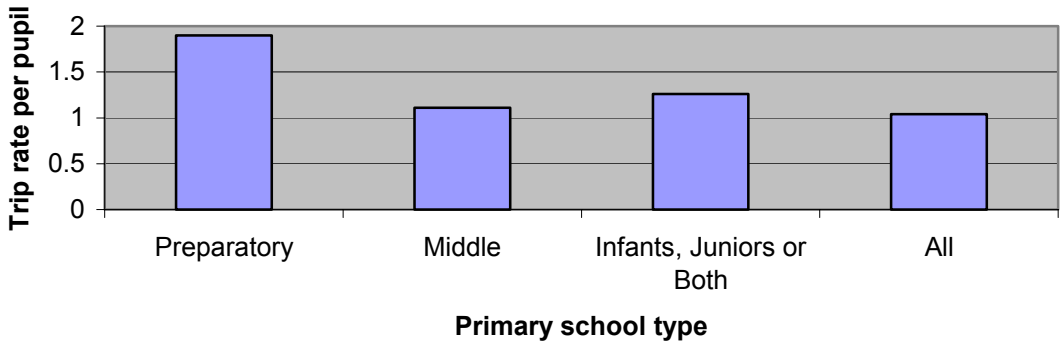


Figure 34: Inter-annual variation in Trip Rates per pupil at different types of Primary School

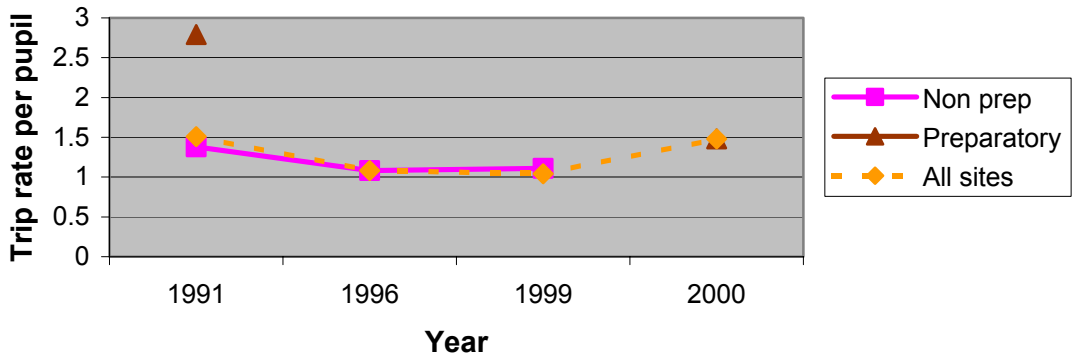


Figure 35: Monday-Friday Trip rate trends at a Middle School in Wareham, Dorset

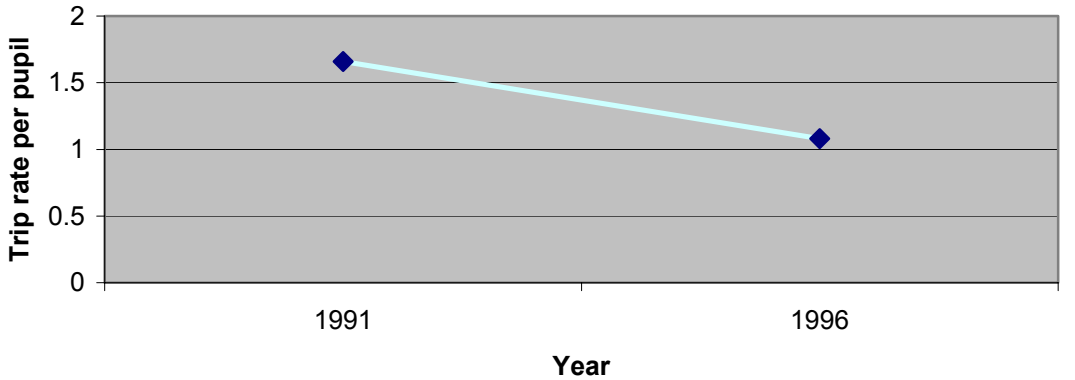


Figure 36: Retail Park (excluding food) trip rate analysis for Queens Retail Park, Stafford

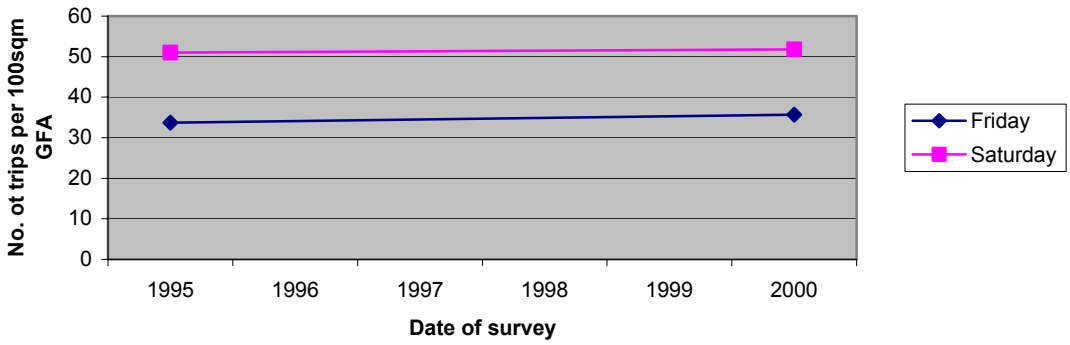


Figure 37: Retail Park (excluding food) trip rate analysis for County Oak Retail Park, Crawley

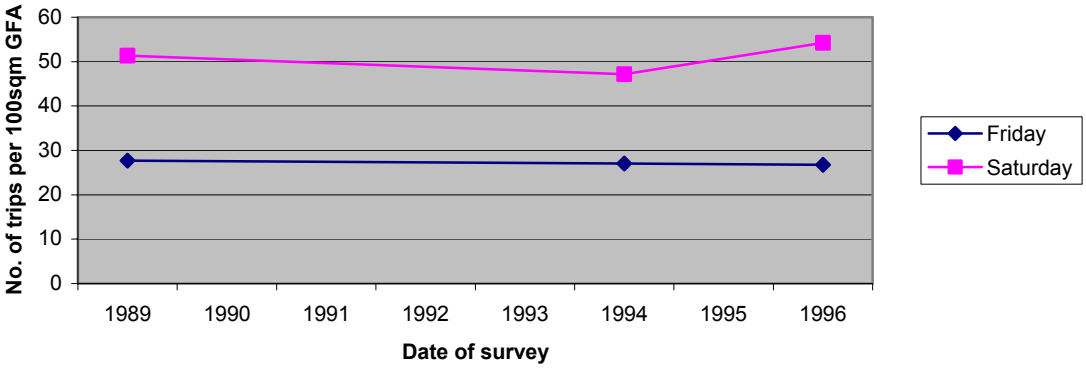


Figure 38: Garden Centre trip rate analysis for Stewarts Gardenland, Christchurch

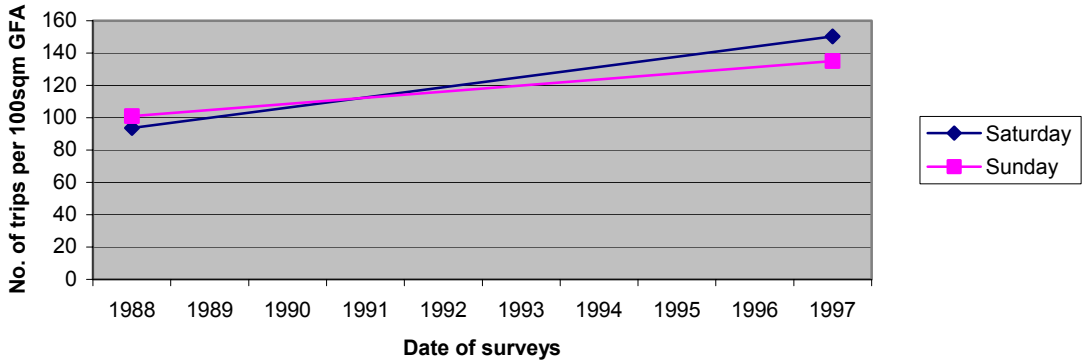


Figure 39: Garden Centre trip rate analysis for Kingston Garden Centre, Lewes

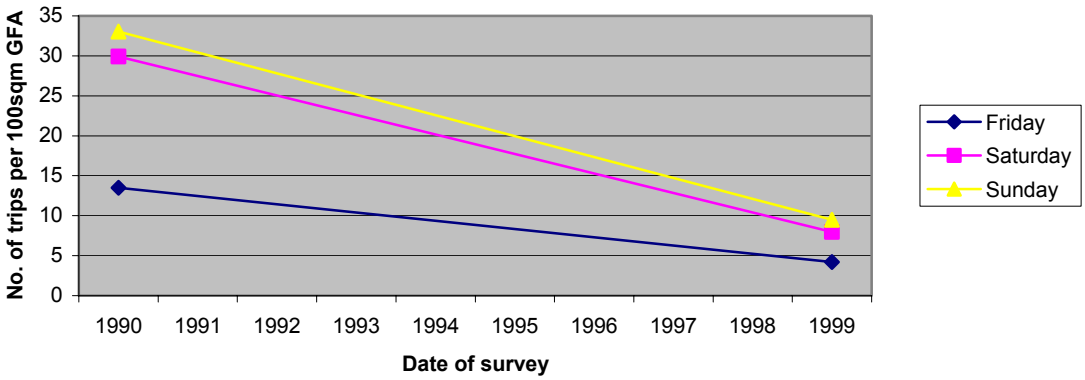


Figure 40: Garden Centre trip rate analysis for Kent Garden Centre, Allington

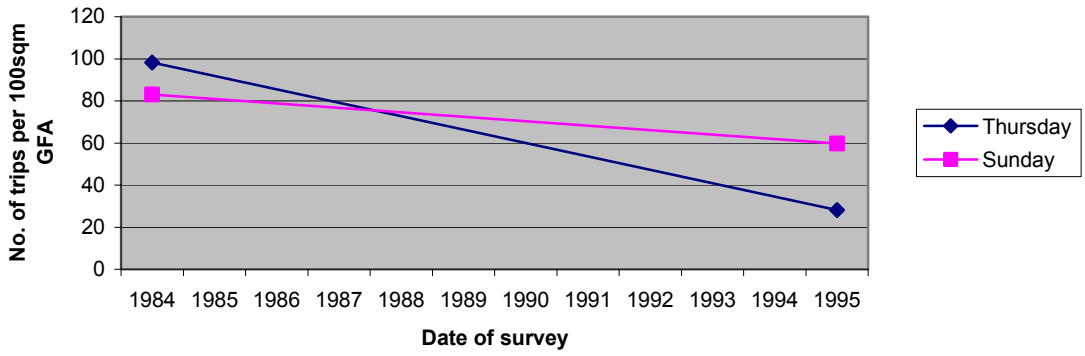


Figure 41: Restaurant trip rate analysis for Brewers Fayre, Chichester

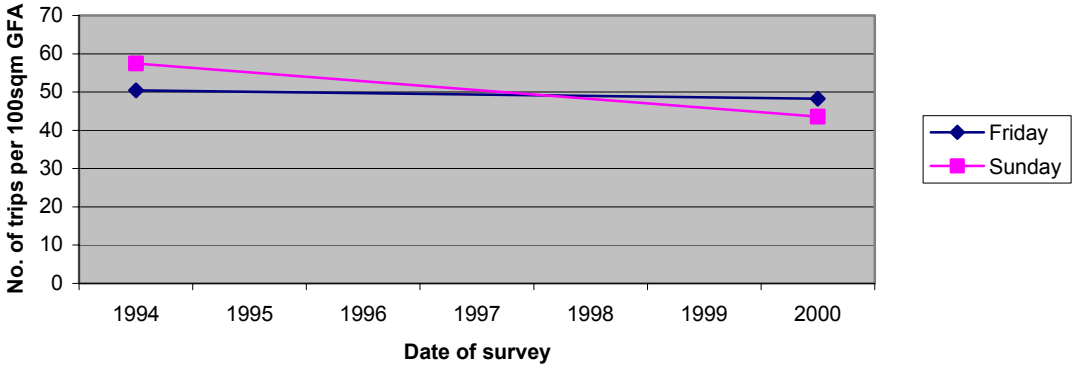


Figure 42: Multiplex Cinema trip rate analysis for UCI, Preston - Saturday

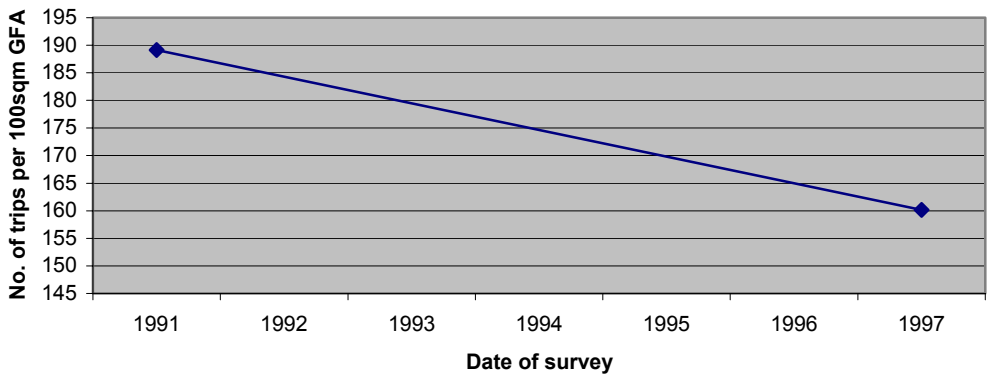


Figure 43: Multiplex Cinema trip rate analysis for Showcase Cinema, Leeds

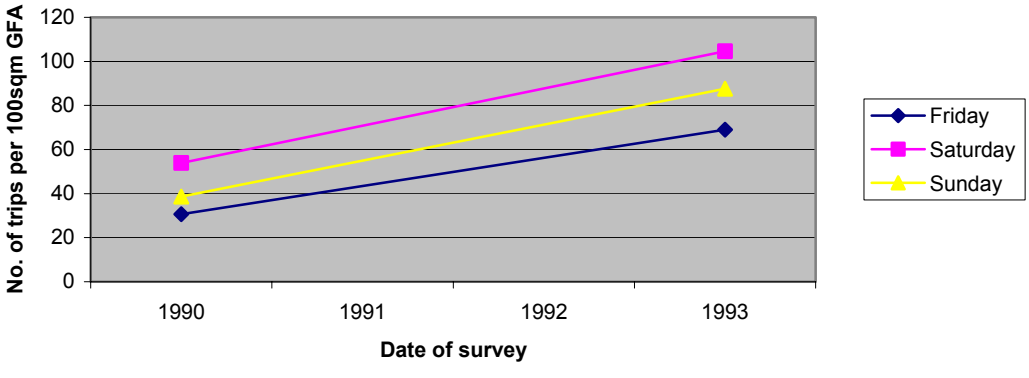


Figure 44: Trip rate analysis for Bowling Alley, Gravesend

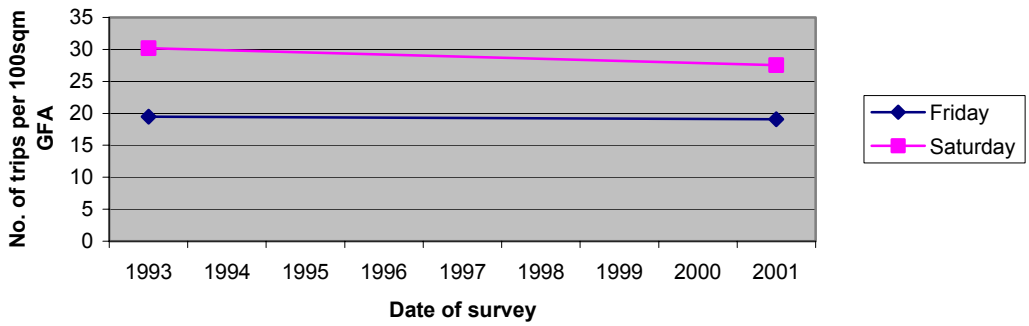


Figure 45: Trip rate analysis for Sports Centre, Bournemouth

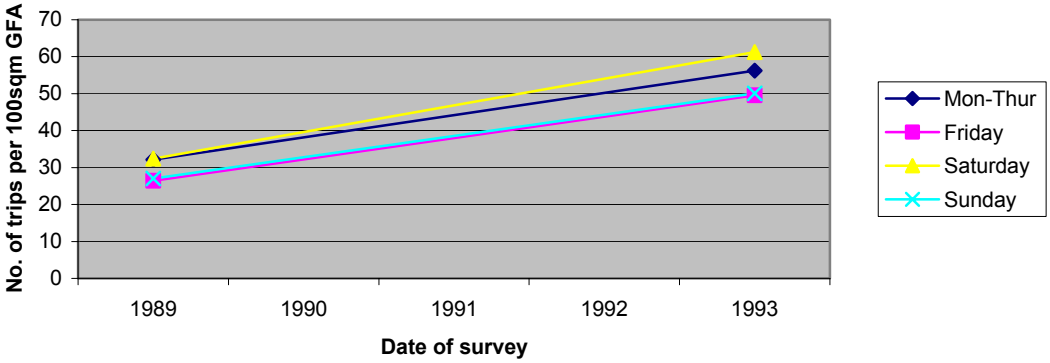


Figure 46: Trip rate analysis for Sports Centre, Weymouth

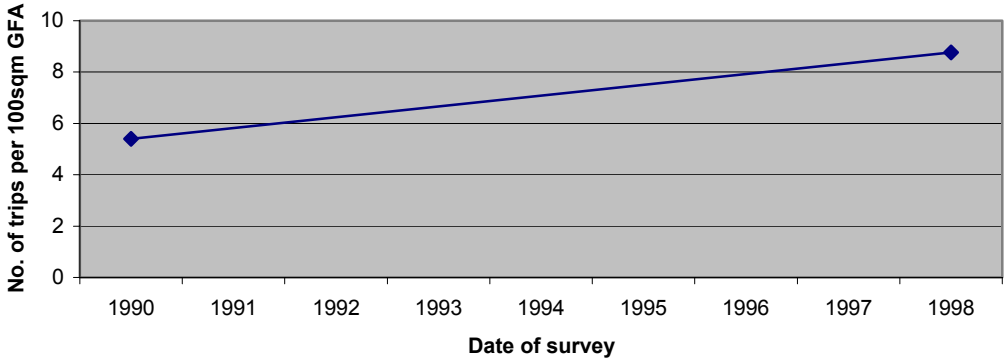


Figure 47: Trip rate analysis for Leisure Centre, Maidstone

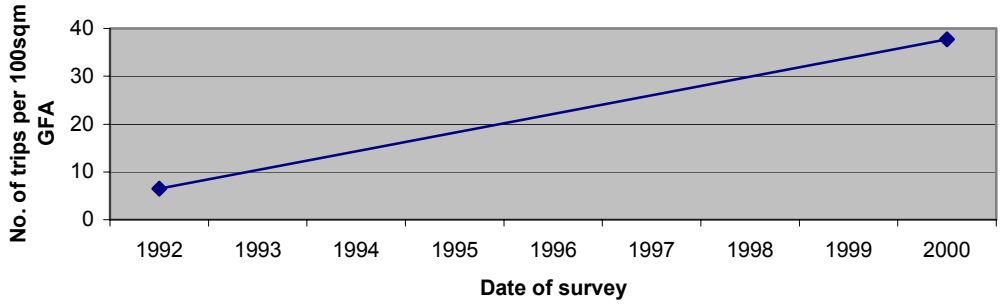


Figure 48: Trip rate analysis for Country Park, Lochgelly

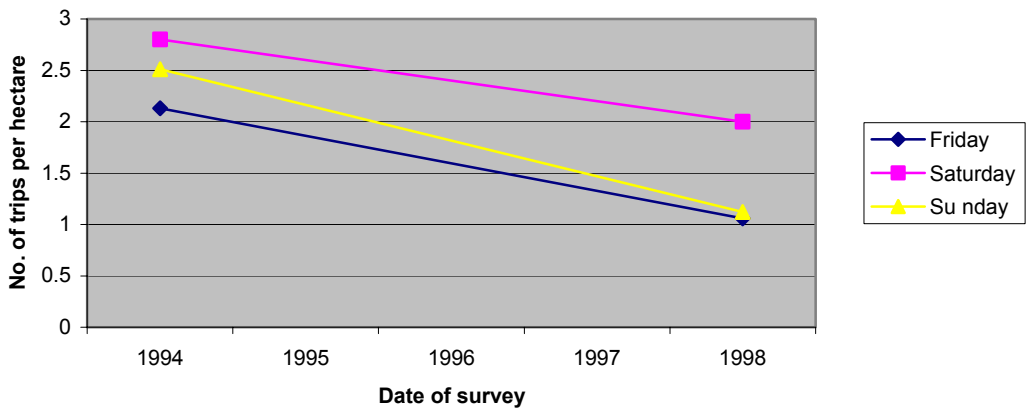


Figure 49: Trip rate analysis for Marina, Hythe, Hants

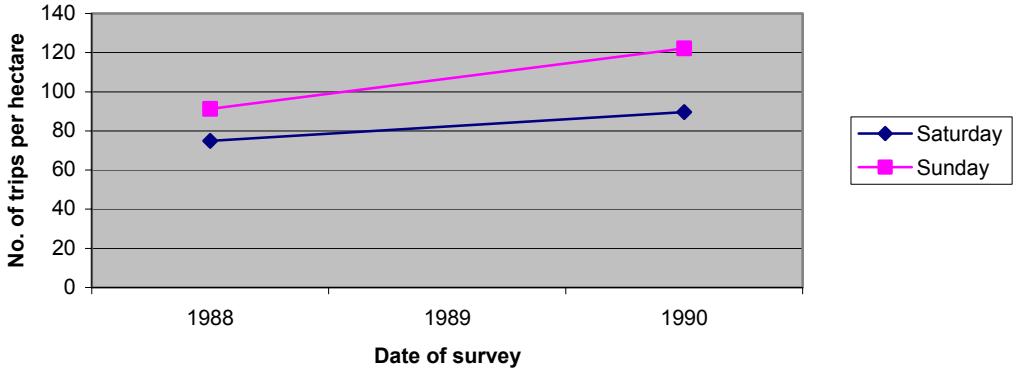


Figure 50: Trip rate analysis for Marina, Gillingham, Kent

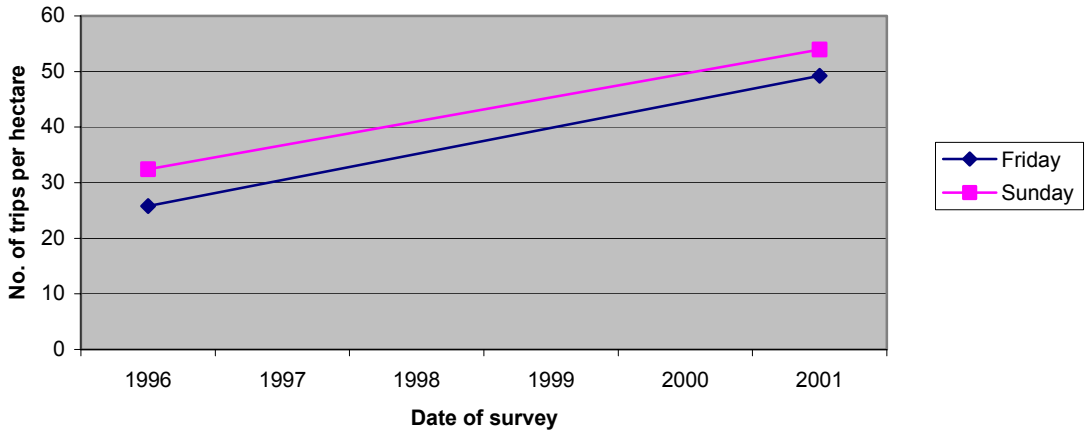
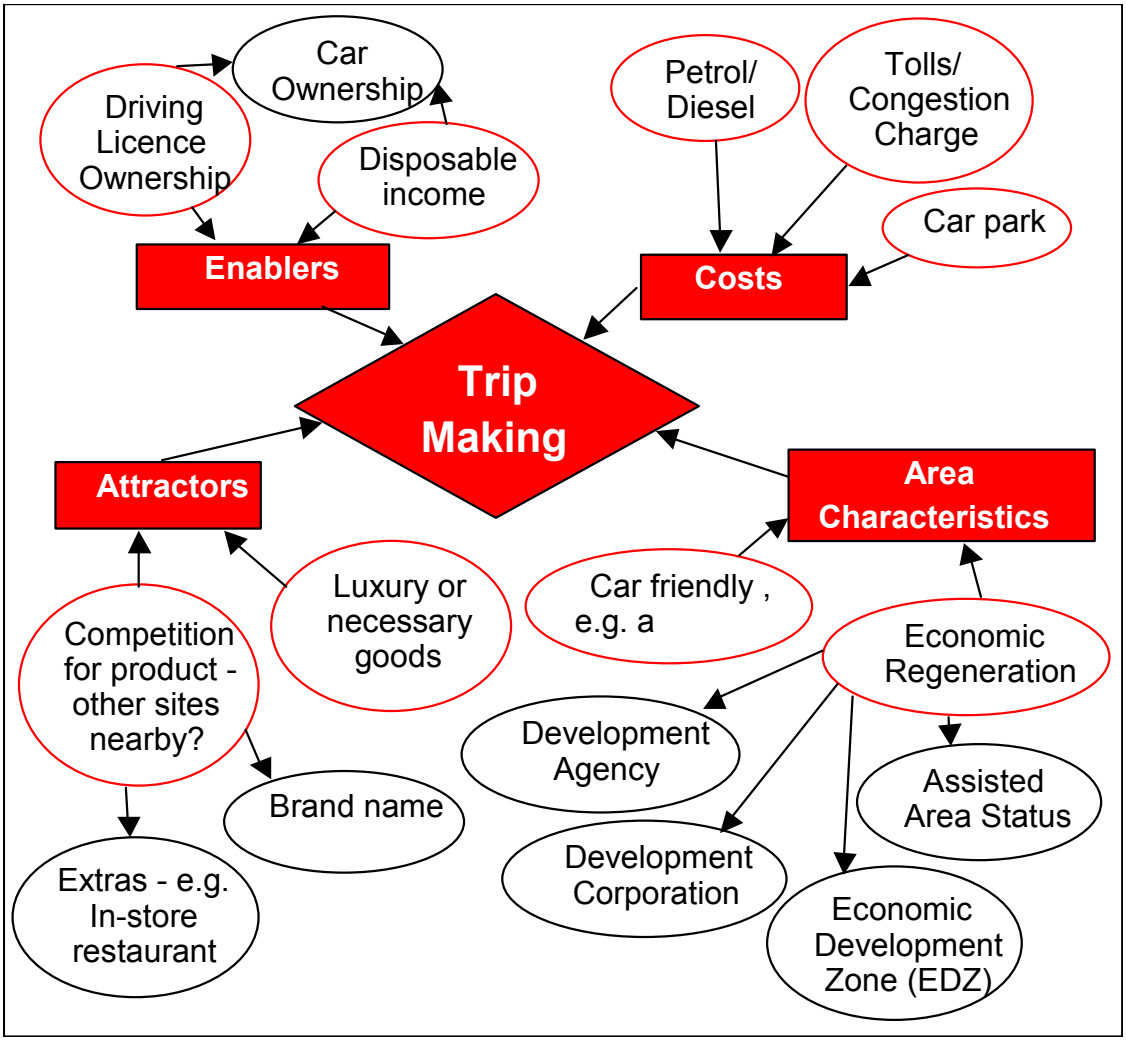


Figure 51: Other factors not identified in TRICS that may explain variations in Trip Rates



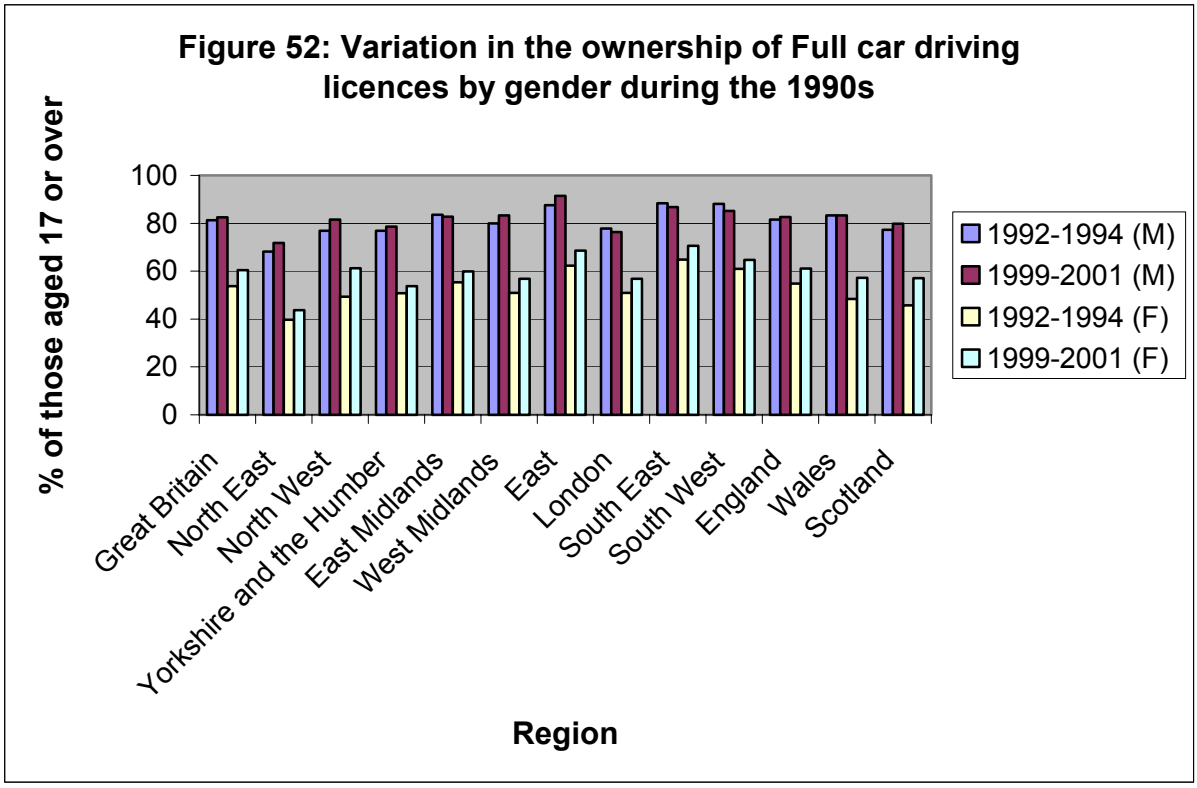


Figure 52: Variation in the ownership of Full car driving licences by gender during the 1990s
% of those aged 17 or over
100
80
60
40
20
0
Great Britain
North East
North West
Yorkshire and the Humber
East Midlands
West Midlands
East
London
South East
South West
England
Wales
Scotland
1992-1994 (M)
1999-2001 (M)
1992-1994 (F)
1999-2001 (F)
Region

Source: Ref 5.

Figure 53: Trend in UK New Car Sales [Ref 6].

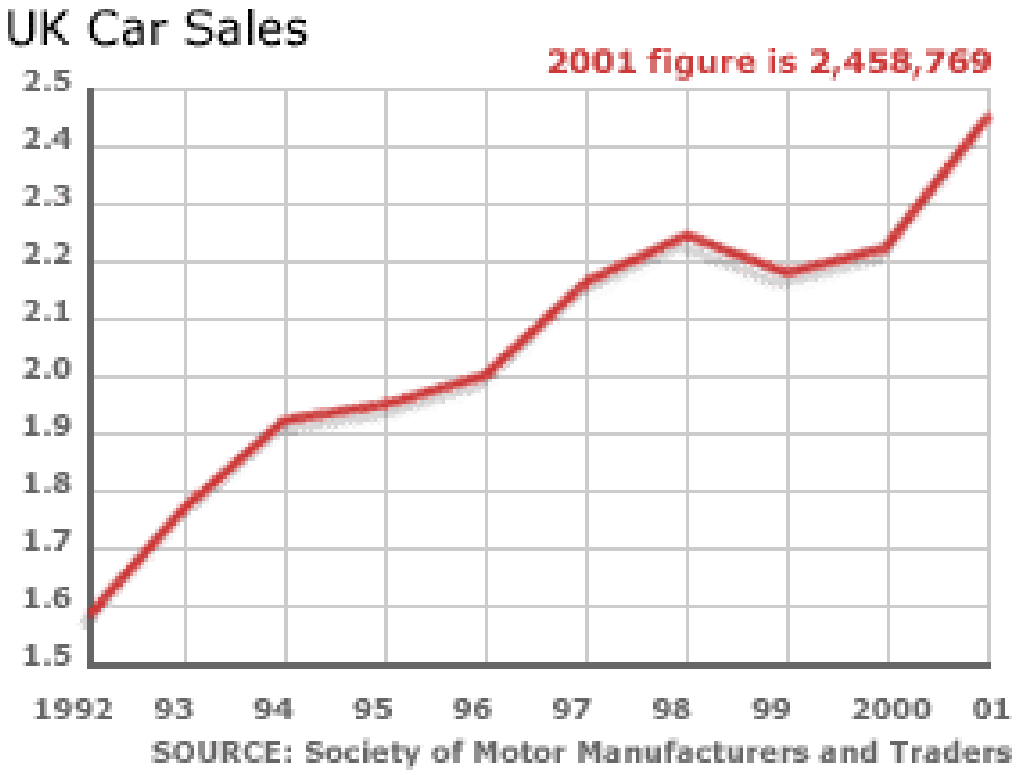


Figure 54: Applications received and decided and speed of decision, England 1989/90 to 2001/02.

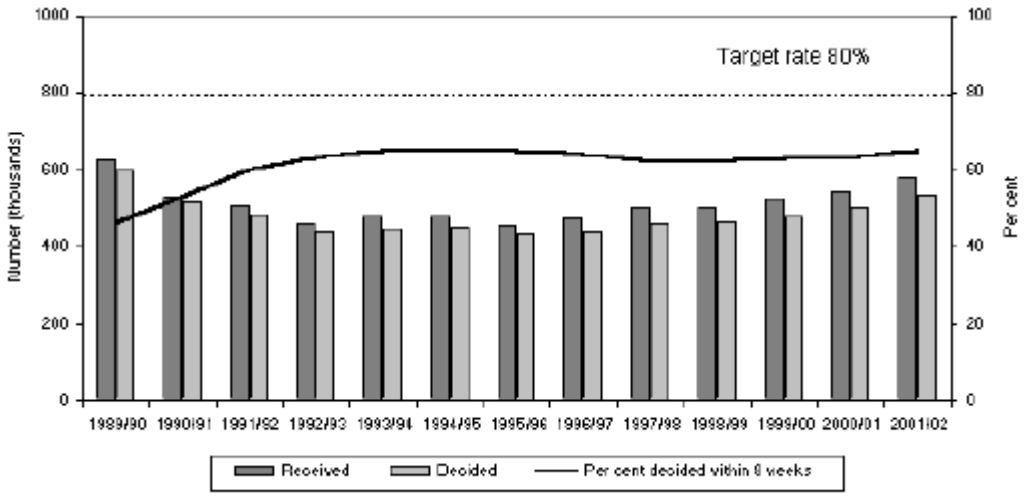


Figure 55: **Percentage change in applications received between 2000/01 & 2001/02 by Government Office Region.**

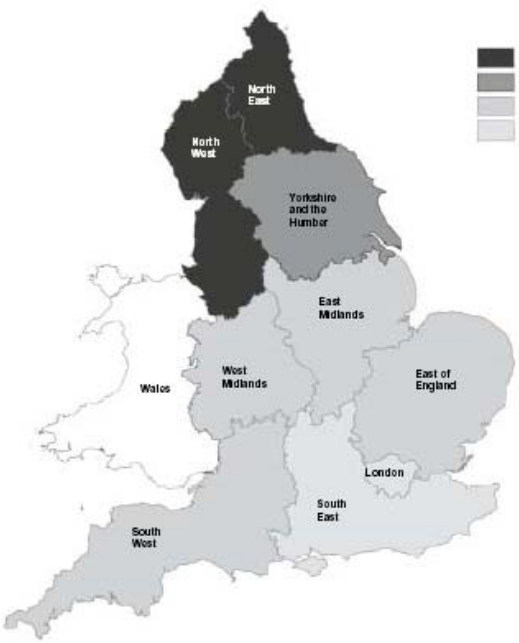


Figure 56: **Percentage change in applications decided between 2000/01 & 2001/02 by Government Office Region.**

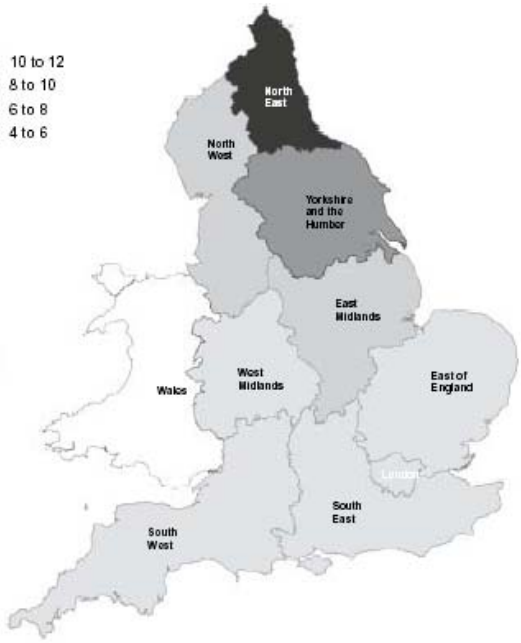


Figure 57: Planning decisions by type of development.

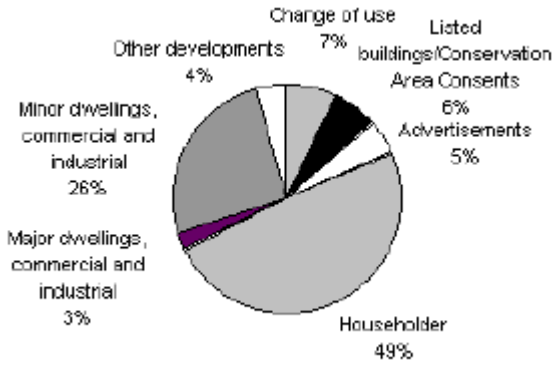
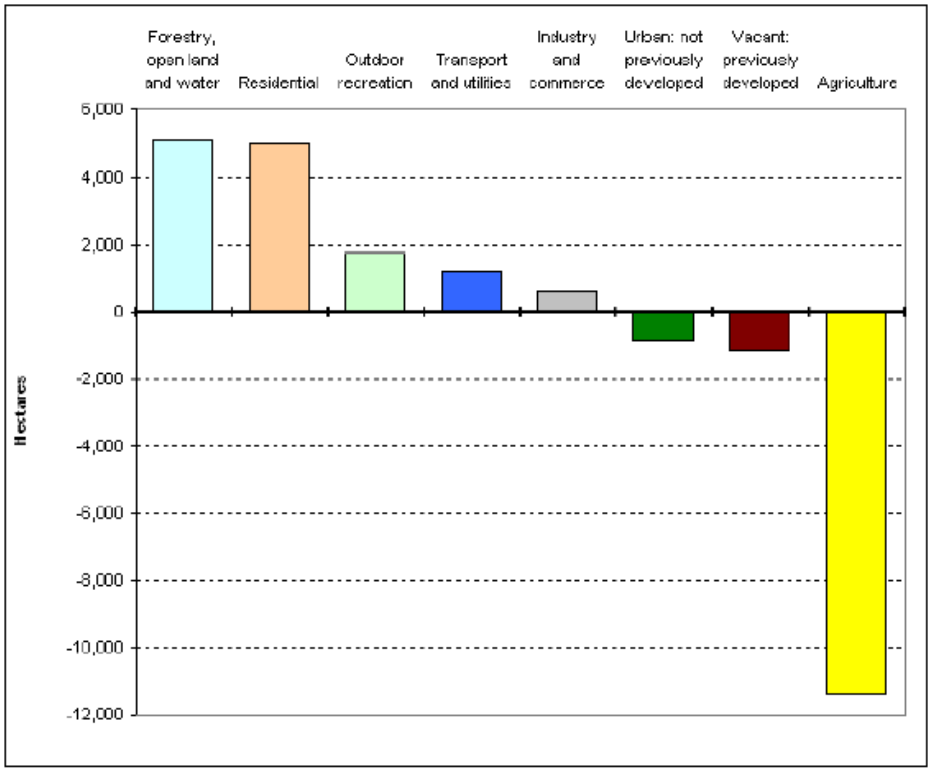


Figure 58: Net annual average change in all land use groups, 1996-1998.



Urban: not previously-developed = previously undeveloped land within an urban boundary.

Figure 59: Gross annual average land use change between and within developed land and undeveloped uses, 1996-1998.

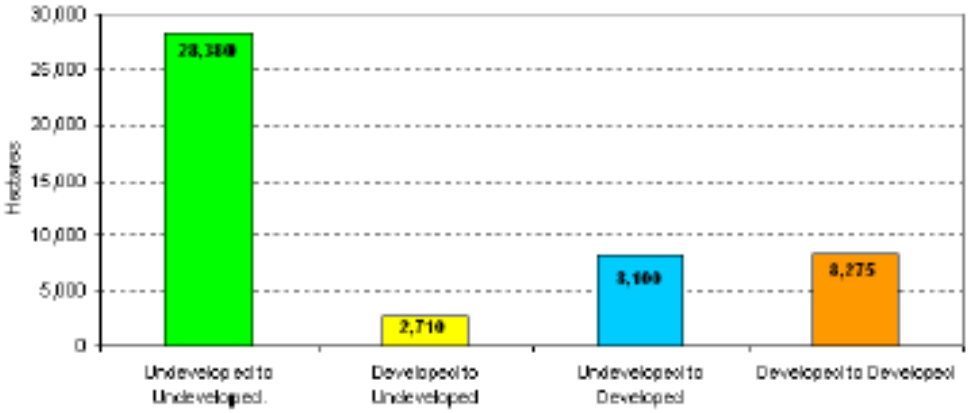


Figure 60: Previous use of land changing to developed use 1996-1999.

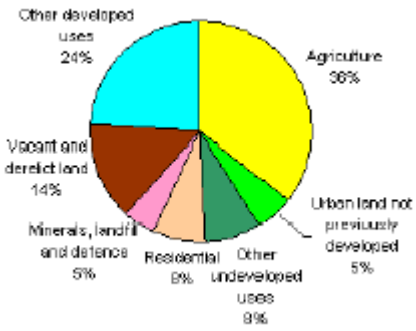


Figure 61: New use of land changing to developed use 1996-1999.

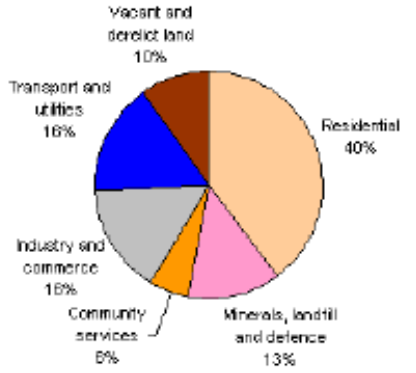


Figure 62: Percentage of land that was previously-developed by new developed use, 1996-1999 average.

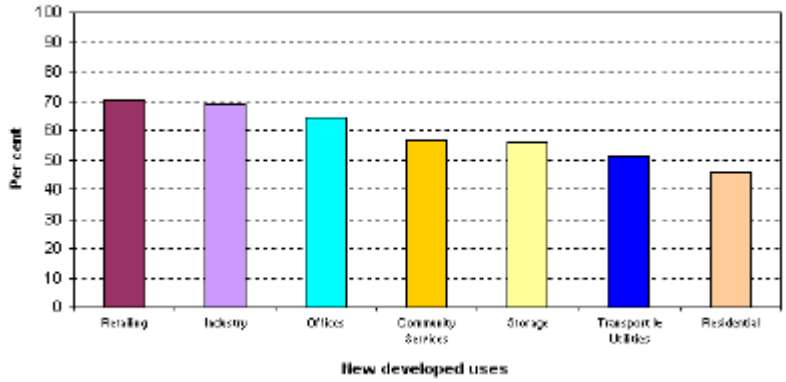
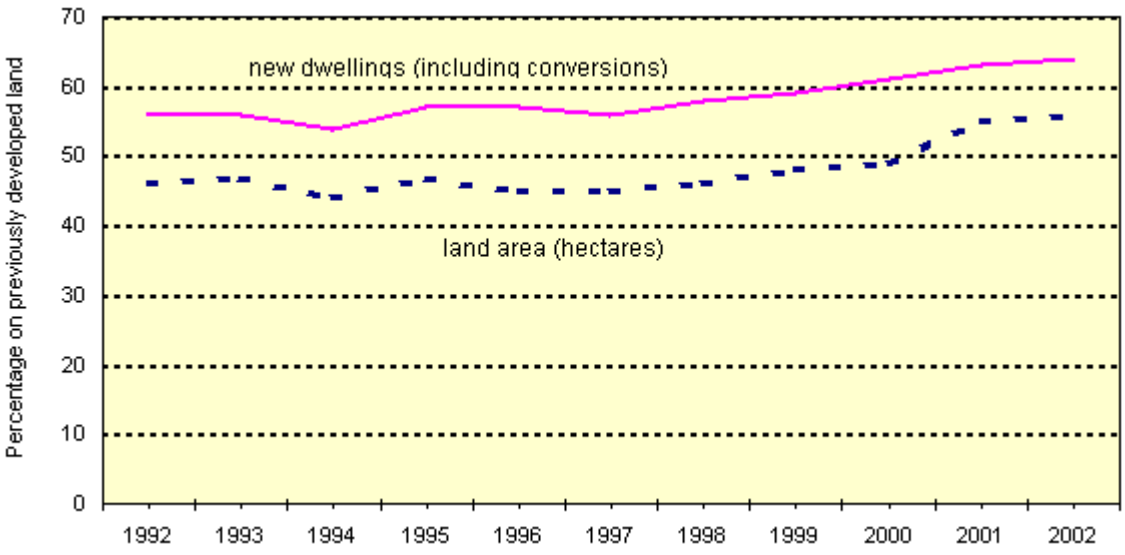
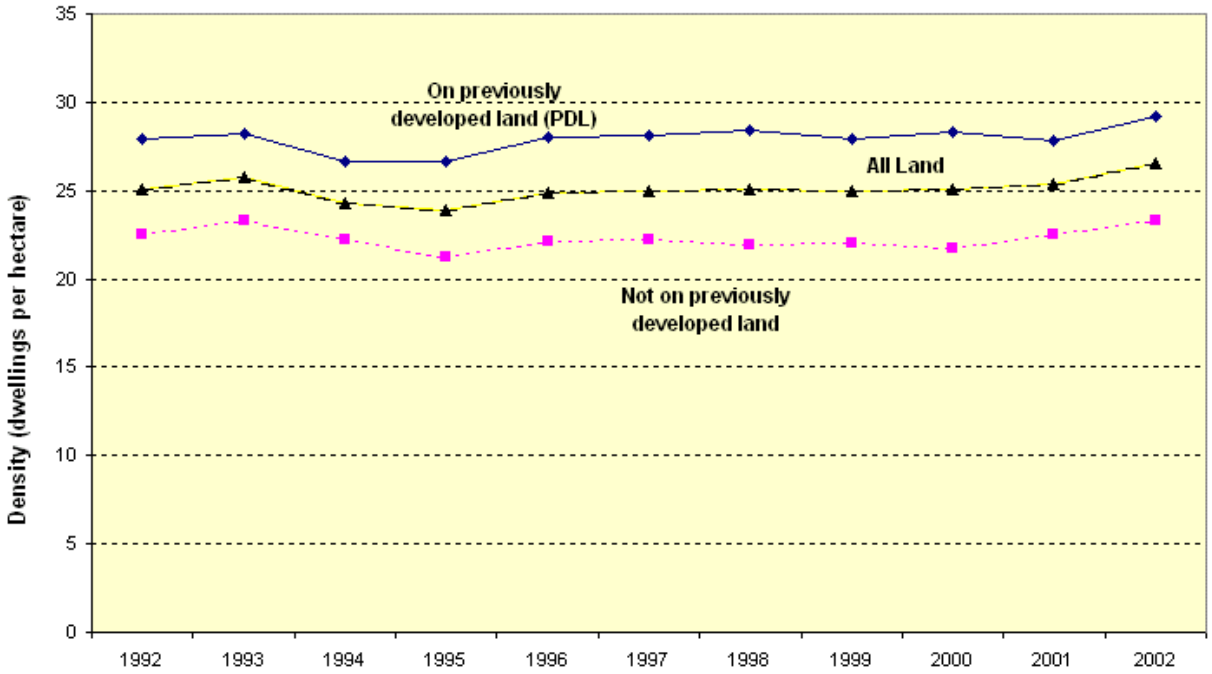


Figure 63: New dwellings and residential land from previously-developed land: 1992-2002.



Note: The estimates for 2001 and particularly for 2002 are subject to revision as further land use changes in those years are detected by Ordnance Survey retrospectively. Figures become more robust as further years of data are recorded.

Figure 64: Density of dwellings built: 1992-2002.



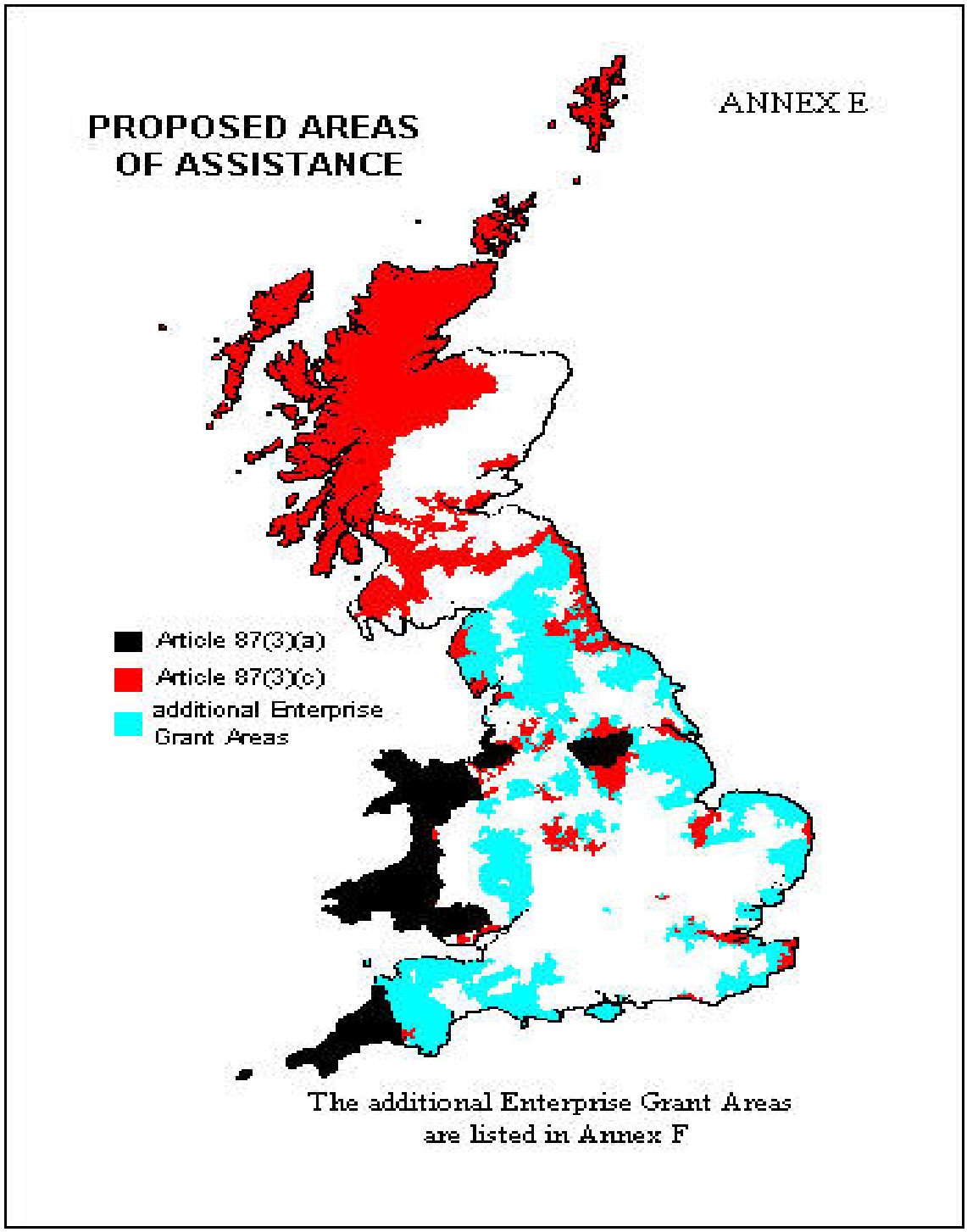
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
On PDL	28	28	27	27	28	28	28	28	28	28	29
Not on PDL	22	23	22	21	22	22	22	22	22	22	23
All Land	**25**	**26**	**24**	**24**	**25**	**25**	**25**	**25**	**25**	**25**	**27**

1. 1999 estimates subject to some uncertainty due to incomplete data.
2. 2002 figures are provisional.
3. Figures for more recent years are subject to subsequent revision as changes continually being detected. "All Land" figures less likely to be revised.

Figure 65: Location of National Parks in the UK as of mid 2003 [Ref 14]

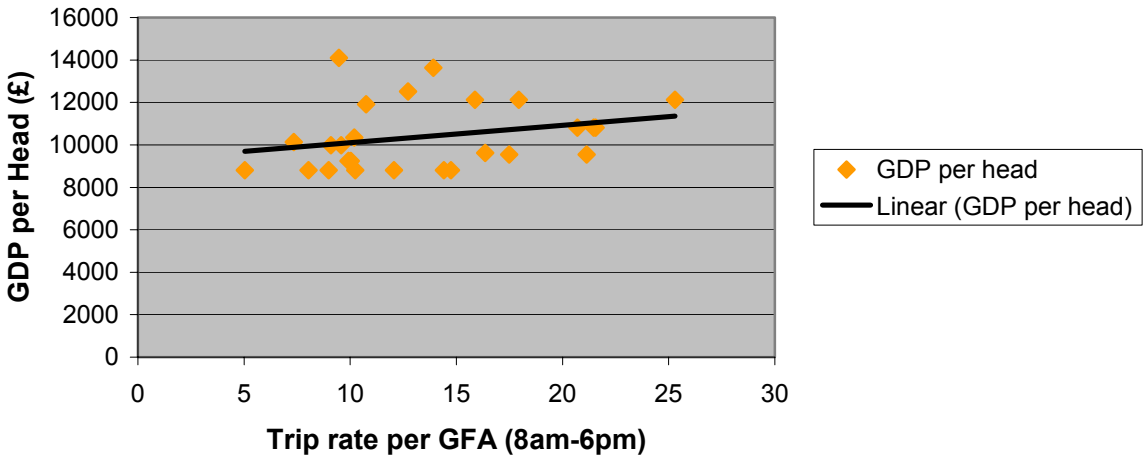
Note: The Association of National Park Authorities have not yet updated this map to include the 'Cairngorms'.

Figure 66: Proposed Areas of Assistance [Ref 16]



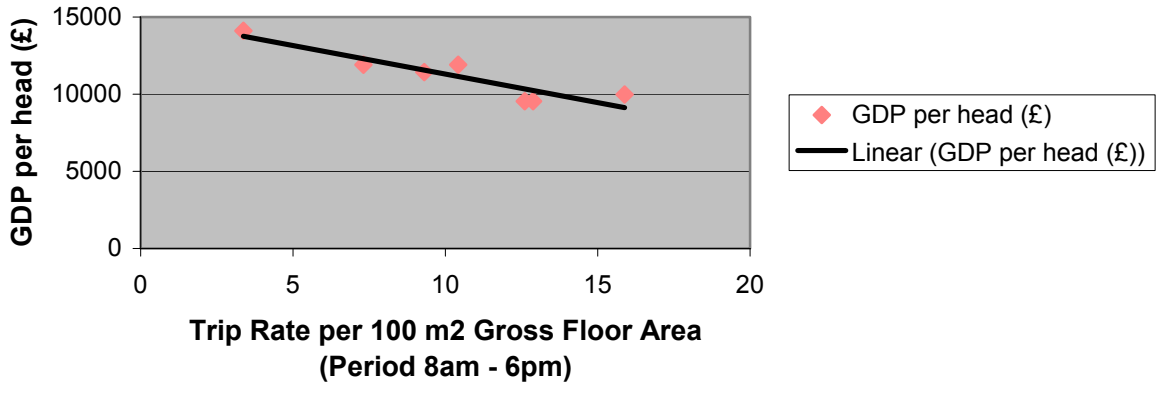
Note: For Definition of what the different designations mean see para 6.7.6.

Figure 67: Offices - Correlation between trip rates and GDP per head (period 1989-1999)



Correlation Coefficient	Sample Size	5% 1 tail Threshold	Decision
-0.3251	26	± 0.3297	Accept H0 – no correlation

Figure 68: Business Parks - Correlation between GDP per head and Trip Rate (period 1995-1997)



Correlation Coefficient	Sample Size	0.5% 1 tail Threshold	Decision
-0.9143	26	± 0.8745	Accept H1 – inverse correlation

APPENDIX A

Research Brief.

IMD Consultants Ltd

TRICS RESEARCH - BACK VALIDATION

Background

1. The TRICS database accumulates information from third parties about sites and their trip generation and before information is accepted it goes through a range of validation procedures, which have been made increasingly rigorous over the years. This has allowed misleading or possibly erroneous information to be queried.

2. The validation procedures often use the database itself to check on ranges and rates and to verify if there are any unusual or special circumstances. The older the data, or the sparser the data, the more difficult it was at date of entry to make a full validation.

3. Now with more data on TRICS it is possible by using statistical or logic checks to Back Validate sites under 8 years old and to identify any unusual or misleading information.

4. The current research on trip rate variation and on hospital travel has already raised some useful points and can provide a starting point. However, it would be appropriate to investigate this whole topic in a separate manner.

Task

5. To extend the current validation procedures by:
   (a) identifying information in v5.2 which appears misleading or erroneous
   (b) checking on the data above for accuracy by viewing the source material, checking with the data supplier, contacting the site (in that order).
   (c) draw up any amendments to v5.2 data
   (d) identifying any factors that strongly influence trip making and are not currently properly included
   (e) drawing up enhanced back validation procedures
   (f) testing these procedures on sites over 8 years old
   (g) reporting on the robustness of the database
   (h) producing a short technical report, plus discussion of findings at the next TRICS MGM

Requirements

6. The researcher undertaking the task should have extensive experience of using TRICS, statistical and analytical techniques and the practical application of TRICS to transport assessment.

7. The current research (para. 4) and the current validation procedures should be appraised in order to save any duplication of effort.

8. A time period of 2 to 3 months is envisaged with a budget of £10k excluding VAT. This resource would include for following up information queries.

APPENDIX B

Technical Note – Identification of Key Land Uses.

TRICS

Data Validation Research

Technical Note – Identification of Key Land Uses.

0002096 27/06/03

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Tel 01622 666269 Fax 01622 677784

C1 Introduction

C1.1 There are 16 land uses in the TRICS database with 93 sub categories.

C1.2 TRICS version 5.2 has been used to give an overview of data availability (see Table C1). The research project will be based on data contained in the forthcoming version 2003(b). This will have more sites on it and the effect of the cut off will not be an issue as the research centres on historic data.

C1.3 The purpose of this note is to discuss which of the land use categories should be studied as part of the data validation research.

C2 General considerations

C2.1 Points to consider

- Sample size
- Usefulness of land use for future use
- Age of existing data

C2.2 It will be unlikely that statistically significant conclusions will be able to be made due to the size and nature of the data. Although many land uses are covered often the number of site is less than 50. Also many of the surveys are based on just one day providing a snapshot of travel patterns.

C2.3 Having selected which land uses to include the next step will be to research national trends and try to establish whether these are reflected in TRICS. If they are consistent then this should be stated so that historic data can be viewed in the context of current trip rates. Where differences occur or data appears to be more erratic then the individual TRICS sites need to be considered. Local factors need to be considered, for example the proximity of the nearest similar site, the location of the site, out of town versus town centre and so on.

C2.4 Some sites have been subject to resurvey. These do not appear to be obvious other than looking at individual site details. Where information is available for the same site over a range of years then these will be investigated on an individual basis to establish any specific trends.

C3. Land use selection

C3.1 **Food superstores** are covered by the largest number of sites and survey days – this will provide research of the greatest statistical significance. 202 food superstore sites have been surveyed over 586 days. Sites date from the 1980s to present.

C3.2 **Retail park excluding food** – comprising DIY superstores, motorists DIY, other superstores. This sub land use has the second largest number of survey days (204) at 62 sites.

C3.3 **Retail park including food** – includes major food retailing as at least one unit. Trips are recorded at entrance/exit of the site and therefore include generation to the site a whole. There are 31 sites in the database covering 66 survey days (mainly including week day and weekend).

C3.4 The residential land use will become increasingly important for planned future developments. Although suggested for this research it should be noted that JMP are carrying out some research to see whether housing integrated with schools, shops and employment reduces the need to travel as advised by Government policy.

C3.5 **Houses privately owned** is covered by 208 survey days but only across 82 sites. The earliest sites were surveyed in the late 1980's. Could relate to car ownership levels. Would have expected to have gone up. New housing developments have much lower parking standards applied therefore this ought to mean fewer car based trips in the future. I

C3.6 **Mixed private housing** (housing developments where at least 75% of the housing is privately owned and there is no 75% predominance of a particular housing type) is covered by 69 sites with 188 survey days. Range from the late 1980s to 2002. Includes some repeat surveys. This land use will also become more significant as a proportion of new housing stock will be affordable/social housing.

C3.7 Future increase in housing will also have an impact on the development of flats. Flats are covered by two sub categories in TRICS; **flats privately owned** and **flats for rent**. However few of the sites are older than the 8 year cut off.

C3.8 **Sheltered accommodation** for elderly people (not nursing homes) could be another important sub land use for the future use of TRICS due to the aging population. There are 45 survey days (including ATC information) over 17 sites. Surveys date from the early 1990s to present including some resurveys.

C3.9 There are 94 **office** sites covered by 127 survey days in the database. Earliest surveys were carried out in the mid 1980s. Could be significant for comparisons in the future to compare with work place charging sites. Also travel plans could have an impact.

C3.10 **Private golf courses** the development of these has probably reached their peak. There are 25 sites in the data base with 18 of these older than the 8 year cut off date. Worth investigating whether trip rates from historical data still apply.

C3.11 Under the Education land use **secondary schools** have been covered by the most surveys (35), dating from the early 1990s to present. 19 **Primary schools** have also been surveyed. This a topical land use with national trends indicating an increase in car based trips. Need to check whether this is reflected in the TRICS database.

C3.12 The Leisure land use covers cinemas, bowling alleys, sports and leisure centres, bingo halls, art galleries/museums, country parks and so on. Trip rates for different sub land uses could be compared to allow for larger selections to be made.

C3.13 **Sports centres,** that is leisure centres without private membership, covers 38 sites with some resurveys included. Surveys have taken place since the late 1980s.

C3.14 There are 10 **multiplex cinema** sites included on the database. They cover a range of over 10 years. Initial thoughts on cinema trips indicate that other non quantifiable factors affect trip patterns over a range of years. For example ticket sales were up in 2002 with the release of popular films but previous to that numbers had been falling. Could see if this is reflected in the TRICS data.

C3.15 Only 5 sites are included for **bingo halls** but it is thought that these are gaining in popularity and therefore if historical data can be applied this will be useful information for users. Sites surveyed between 1995 and 1999.

C3.16 **DIY superstores with and without garden centres** are listed under two separate sub land use categories with 30 and 35 sites included respectively. Some of the sites may have been historically surveyed without a garden centre but more recently include a garden centre. Check to see whether TRICS data represents national trends in the popularity of DIY.

C3.17 **Business parks** have been included in the TRICS database since the late 1980s. There are 30 sites included covered by 29 manual counts and 50 automatic traffic counts. There has been a continued growth in business parks.

C3.18 The **health** land use will not be considered, as that is currently the subject of a separate research topic.

Table C1: Data in version 5.2 sorted by number of sites

	No of sites	No. of survey days
FOOD SUPERSTORE	202	586
INDUSTRIAL ESTATE	100	184
OFFICE	94	127
HOUSES PRIVATELY OWNED	82	208
MIXED PRIVATE HOUSING	69	188
RETAIL PARK - EXCLUDING FOOD	62	204
MISCELLANEOUS	51	82
HOTELS	50	127
SPORTS CENTRES	38	99
PETROL FILLING STATIONS	37	75
DIY SUPERSTORE - WITHOUT GARDEN CENTRE	35	106
GARDEN CENTRE	31	69
RETAIL PARK - INCLUDING FOOD	31	66
DIY SUPERSTORE - WITH GARDEN CENTRE	30	92
BUSINESS PARK	30	79
TOURIST ATTRACTIONS	29	97
OTHER INDIVIDUAL NON-FOOD SUPERSTORE	29	63
WAREHOUSING (PRIMARILY DISTRIBUTION)	29	41
GENERAL HOSPITAL - WITH CASUALTY	27	76
PRIVATE 18 HOLE COURSES	25	78
HOLIDAY ACCOMMODATION	22	48
DISCOUNT FOOD STORES	22	43
SECONDARY	21	35
COLLEGE/UNIVERSITY	19	25
PRIMARY	19	19
SHELTERED ACCOMMODATION	18	52
HOUSEHOLD WASTE	17	83
SHOPPING CENTRE - LOCAL SHOPS	17	22
SWIMMING POOLS	16	21
MARINAS	15	52
MIXED PRIVATE/NON-PRIVATE HOUSING	15	43
PUB/RESTAURANT	15	35
PFS - WITH RETAIL	15	28
PRIVATE HOSPITAL	15	22
FLATS FOR RENT	15	15
INDUSTRIAL UNITS	14	19
WAREHOUSING (PRIMARILY STORAGE)	14	14
RECYCLING CENTRES	13	40
CASH & CARRY - WHOLESALE & CLUBS	13	33
CAR SHOW ROOMS	13	28
RESTAURANTS	13	27
MIXED USE	13	26
FAST FOOD - DRIVE THROUGH	13	20
COUNTRY PARKS	12	53
HOUSES FOR RENT	12	30
ROAD-SIDE FOOD (eg. Little Chef)	12	27
SPORTS CLUBS	12	22

	No of sites	No. of survey days
NURSERY	12	19
NURSING HOMES	12	19
ART GALLERIES/MUSEUMS/EXHIBITIONS	12	17
GP SURGERIES	12	16
BOWLING ALLEYS	11	20
FLATS PRIVATELY OWNED	11	18
MIXED NON-PRIVATE HOUSING	11	14
MULTIPLEX CINEMAS	10	30
MOTORWAY SERVICE AREAS (res./PFS/motel)	10	21
PRIVATE > 18 HOLE COURSES	10	18
GENERAL HOSPITAL - WITHOUT CASUALTY	10	17
CLINICS	10	16
PUB/RES + HOTEL	9	22
STUDENT ACCOMODATION	8	22
TENNIS CLUBS	8	14
FARM DIVERSIFICATION	7	49
MOTORIST DIY	7	17
MIXED SHOPPING MALLS	7	17
FACTORY OUTLET CENTRES	7	15
ICE RINK	7	12
PARCEL DISTRIBUTION CENTRES	7	8
LANDFILL	7	8
PRIVATE 9 HOLE COURSES	6	29
VEHICLE PARTS & REPAIR CENTRES	6	16
MUNICIPAL 18 HOLE COURSES	6	10
SPECIAL (eg. Neurological)	6	6
SKIING	5	20
DRIVING RANGE	5	13
BINGO HALLS	5	11
LEISURE PARK	5	9
CAR BOOT SALES	5	6
WATERSPORTS CENTRES	4	12
BUILDER'S MERCHANTS	4	5
RESIDENTIAL SCHOOL	4	4
FOOTBALL (5-a-side)	3	9
MIXED LEISURE COMPLEX	3	4
INSTITUTIONAL HOSTELS	3	3
TAKE-AWAY SHOPS (eg. fish bars etc)	3	3
HOSPICE	2	4
EQUESTRIAN CENTRES	2	3
MUNICIPAL 9 HOLE COURSES	1	3
MUNICIPAL > 18 HOLE COURSES	1	2
CARAVAN PARKS (NON-HOLIDAY)	1	1
COMMUNITY EDUCATION	1	1
NURSES HOMES	0	0
"PAR 3" COURSES	0	0

APPENDIX C

TRICS – Analysis of Repeat Surveys in Kent.

Kent County Council

TRICS – Analysis of repeat surveys in Kent

0002096 6/1/2003

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Figures

1. Introduction

1.1 As part of Kent's programme of data collection for input to the TRICS database some sites have been included in a rolling programme whereby they are resurveyed after several years. This data can be used to provide a snap shot of monitoring trip rates associated with various types of landuse.

2. Data used

2.1 This analysis includes the following sites:

Land use	Sub land use	TRICS ref	Description	Day	Date
Residential	Sheltered Accom.	KC 03 F 01	Maidstone Sheltered Accom.	Thur	21/10/93
Residential	Sheltered Accom.	KC 03 F 02	Maidstone Sheltered Accom.	Thur	14/06/01
Residential	Institutional Hostel	KC 03 E 01	Probation Hostel, Maidstone	Wed	25/11/98
Residential	Institutional Hostel	KC 03 E 02	Probation Hostel, Maidstone	Thur	15/11/01
Health	General Hospital with casualty	KC 05 A 01	Maidstone Hospital	Sat	18/11/95
				Sun	19/11/95
Health	General Hospital with casualty	KC 05 A 03	Maidstone Hospital	Sat	30/10/99
				Sun	31/10/99
Retail	Food Superstore	KC 01 A 01	Tesco, Maidstone	Fri	02/10/87
				Sat	03/10/87
Retail	Food Superstore	KC 01 A 17	Tesco, Maidstone	Fri	05/11/99
				Sat	06/11/99
Retail	Food Superstore	KC 01 A 02	Tesco, Whitstable	Sat	03/10/87
Retail	Food Superstore	KC 01 A 12	Tesco, Whitstable	Sat	26/11/94
Retail	DIY Superstore, without garden centre	KC 01 E 02	B&Q Maidstone	Fri	02/10/87
				Sat	03/10/87
Retail	DIY Superstore, without garden centre	KC 01 E 03	B&Q Maidstone	Fri	14/10/94
				Sat	15/10/94
Leisure	Sports centre	KC 07 C 01	Maidstone Leisure Centre	Wed	04/11/92
Leisure	Sports centre	KC 07 C 04	Maidstone Leisure Centre	Fri	20/10/00
				Sat	21/10/00
				Sun	22/10/00
Leisure	Ice Rink	KC 07 F 01	Gillingham Ice Bowl	Fri	15/10/93
				Sun	17/10/93
Leisure	Ice Rink	KC 07 F 02	Gillingham Ice Bowl	Sun	19/08/01
				Thur	23/08/01
				Fri	19/10/01
				Sun	21/10/01
Marina	Marina	KC 08 A 01	Gillingham marina	Fri	11/10/96
				Sat	12/10/96
				Sun	13/10/96
Marina	Marina	KC 08 A 02	Gillingham marina	Fri	10/08/01
				Sun	12/08/01
				Fri	12/10/01
				Sun	14/10/01

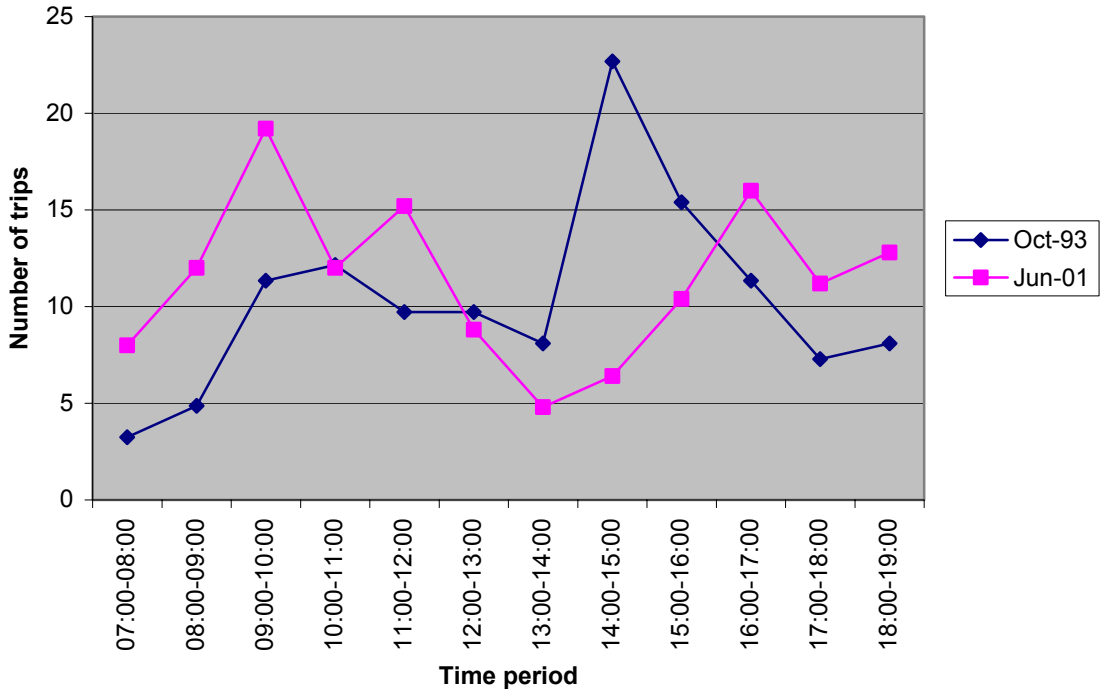
2.2 The Tesco store in Maidstone was the only site to change in size by the time of the resurvey. In this case the retail floor area (RFA) increased from 3669sqm in 1987 to 5555sqm in 1999 although the gross floor area (GFA) was consistent.

3. Analysis of results

3.1 Residential/Sheltered Accommodation

3.1.1 Maidstone Sheltered Accommodation has been surveyed in October 1993 and June 2001, on both occasions counts were carried out on a Thursday. The two way daily trip rates recorded more vehicle trips in 2001 (1.70 per household) than 1993 (1.52 per household). The distribution of the trips is shown in figure 1.

Figure 1 Distribution of two way trips - Maidstone Sheltered Accommodation

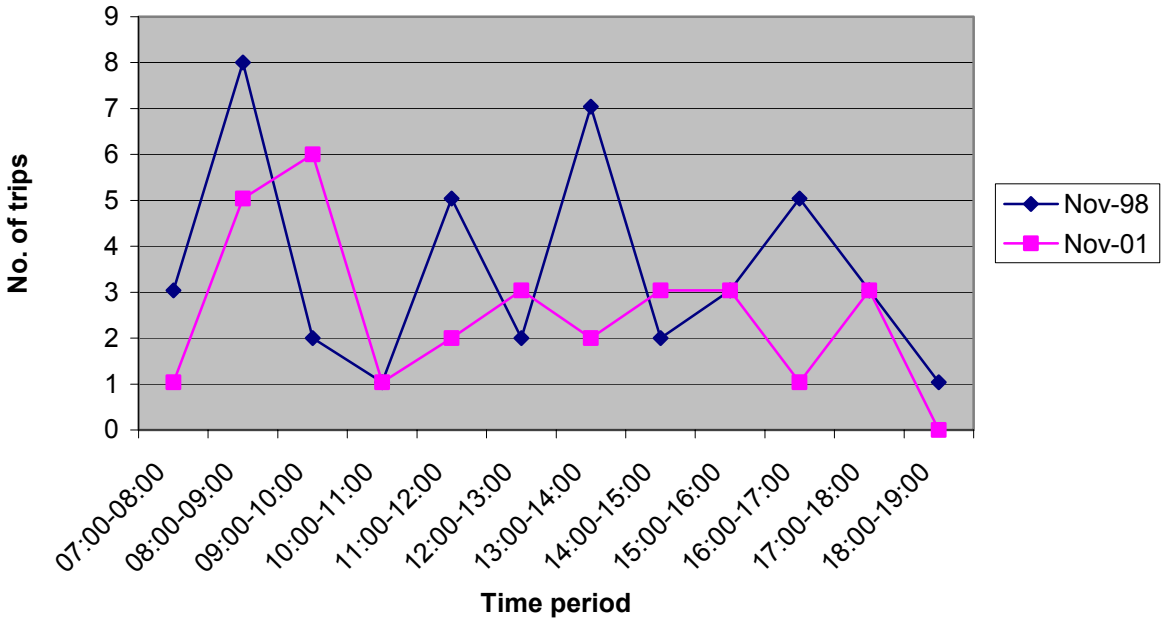


3.1.2 The distribution of trips throughout the day shows quite different patterns for each of the surveys.

3.2 Residential / Institutional Hostel

3.2.1 A probation hostel in Maidstone was surveyed in November 1998 (on a Wednesday) and November 2001 (on a Thursday). The trip rate has been analysed by parking space, there being 8 spaces at the site. The daily two way trip rate is very different for 1998 (5.25 per space) compared to 2001 (3.75 per space). The distribution across the day, as shown in figure 2 also reveals no pattern in the results.

Figure 2 Distribution of two way trips – Probation Hostel, Maidstone



3.3 Health / General Hospital

3.3.1 Maidstone Hospital has been surveyed in 1995 and October 1999. Surveys that were carried out on a Saturday and Sunday have been compared.

3.3.2 Figures 3 and 4 both show similar distributions of the number of trips across the day in both years. The number of trips has also stayed consistent between the years with around 15 trips per 100sqm on both Saturday and Sunday in 1995 and 1999.

Figure 3 Distribution of two way trips – Maidstone Hospital (Saturday)

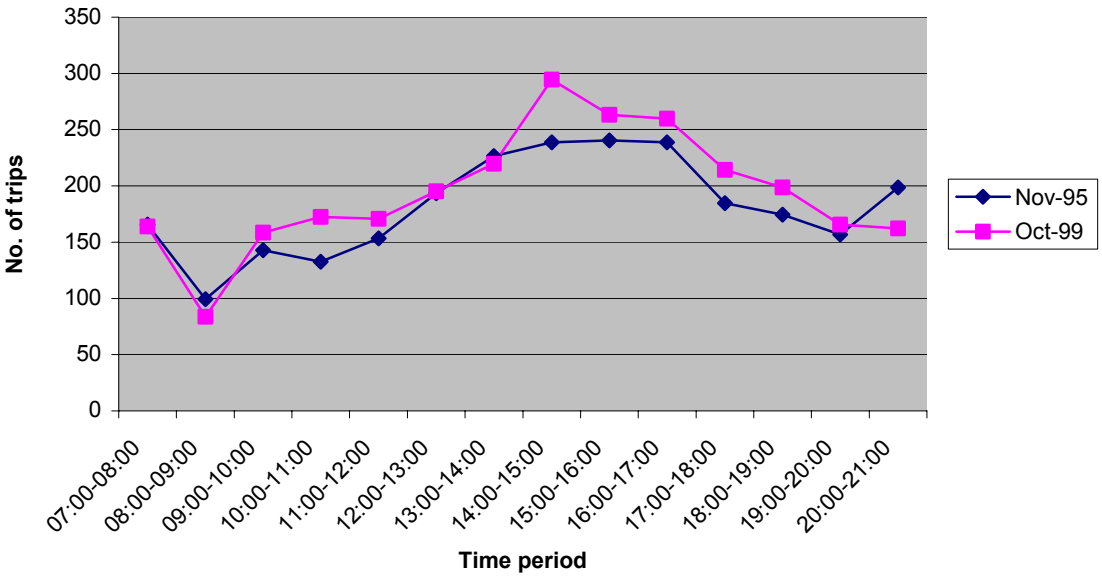
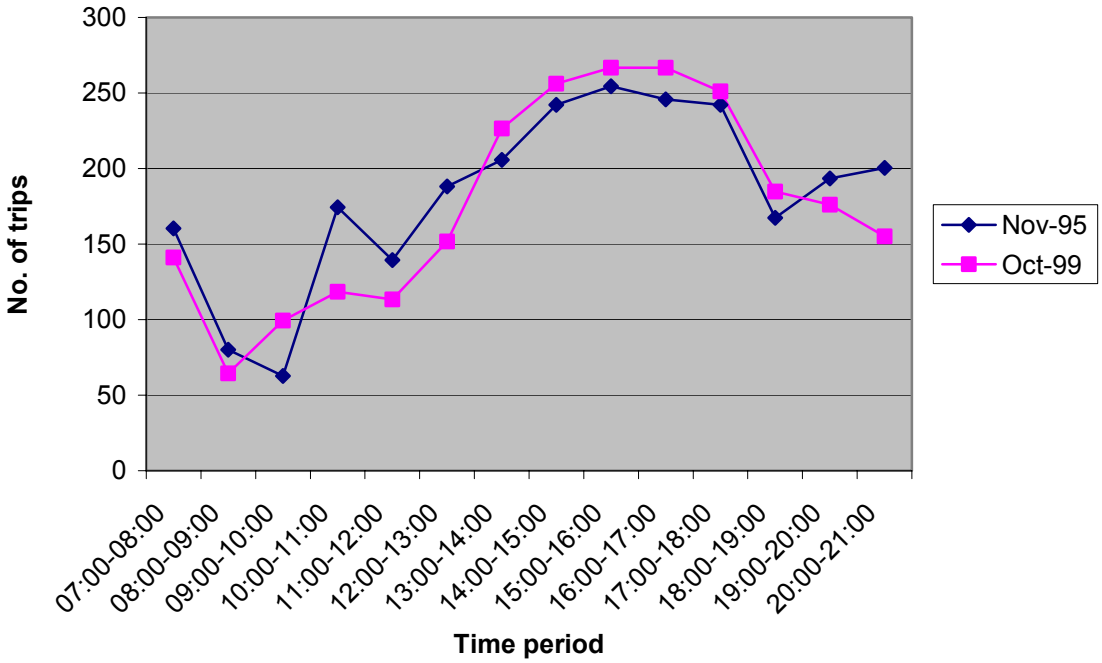


Figure 4 Distribution of two way trips – Maidstone Hospital (Sunday)



3.4 Retail / Food Superstore

3.4.1 Surveys were carried out at Tescos in Maidstone in October 1987 and November 1999 on a Friday and a Saturday. Changes have occurred in opening times with Tesco open 24 hours by 1999 and closing at 22:00hrs on a Saturday. However when calculating the two way trips to cover the same survey period as the count undertaken in 1987 (08:00-22:00hrs Friday and 08:00–21:00hrs Saturday) the number of trips in 1999 is much greater than 1987.

- Total number of two way trips Oct 1987 Friday – 7096
- Total number of two way trips Nov 1999 Friday – 9860
- Total number of two way trips Oct 1987 Saturday – 7948
- Total number of two way trips Nov 1999 Saturday – 10605

3.4.2 The retail floor area (RFA) of the site has increased since the survey in 1987 by space being taken from the storage area. The increase in store opening times has also led to an increase in the number of employees that would also contribute to the trip generation figures.

3.4.3 Figures 5 and 6 show the distribution of trips across the day. The Friday trips broadly show the same patterns of movement with the peak number of trips occurring between 17:00-20:00hrs. The movements on Saturday are also similar with the peak being around midday. However the rise in the number of trips between 16:00-17:00hrs recorded in the 1987 count was not evident in 1999.

Figure 5 Distribution of two way trips – Tesco, Maidstone (Friday)

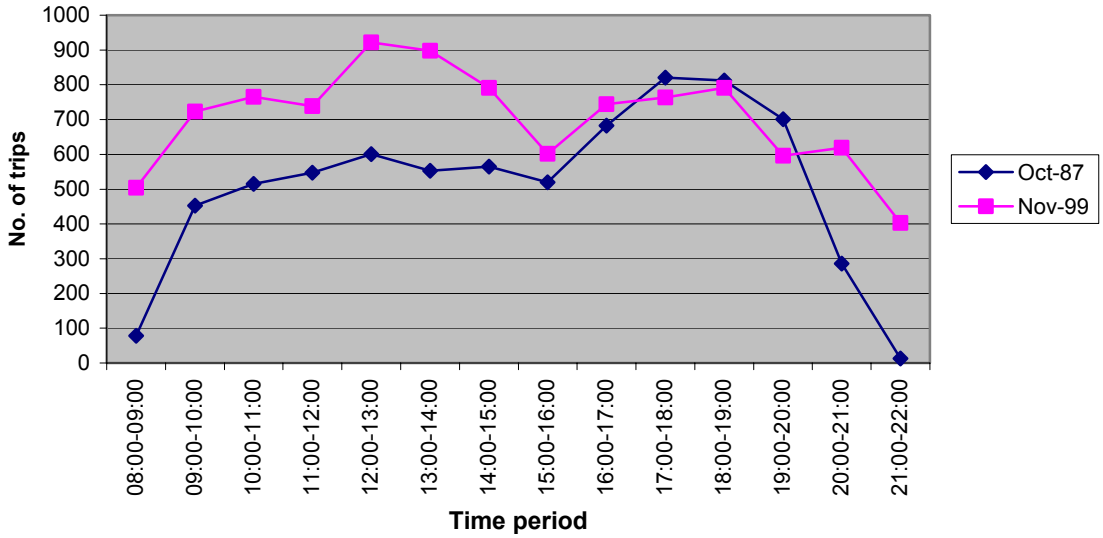
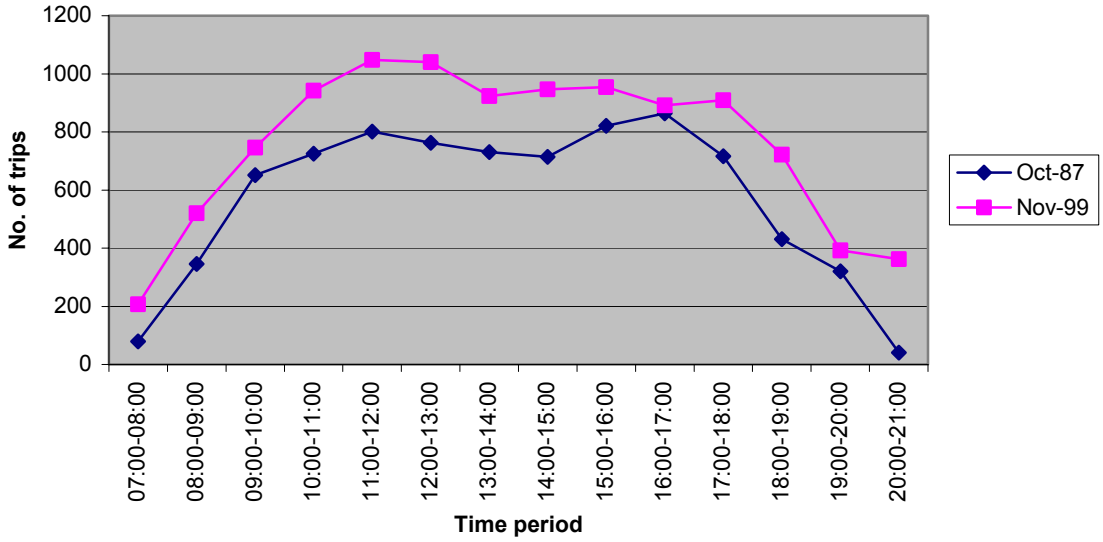
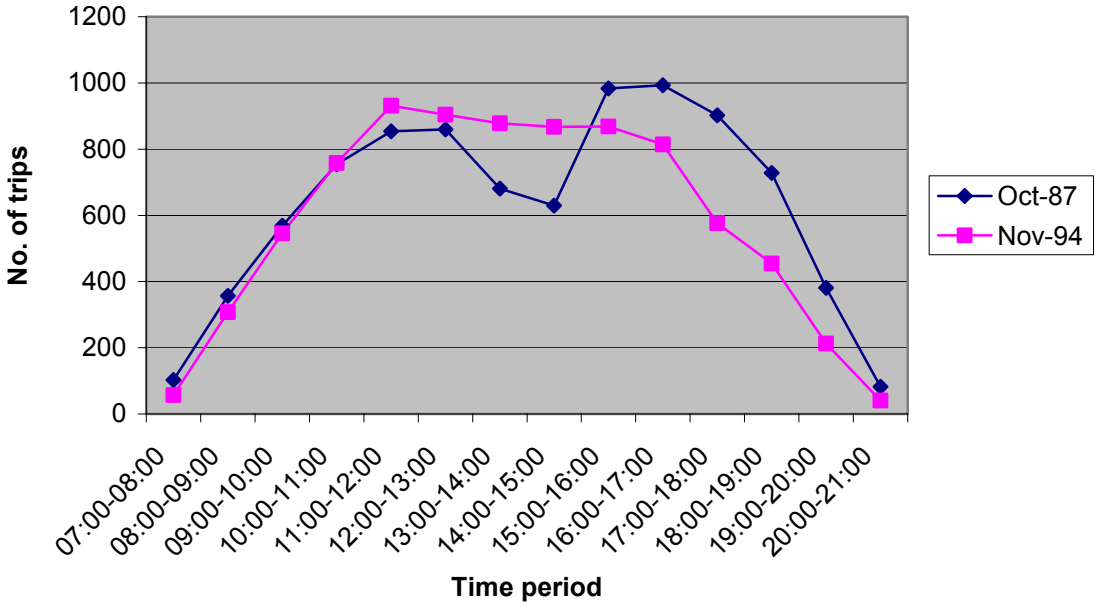


Figure 6 Distribution of two way trips – Tesco, Maidstone (Saturday)



3.4.4 Counts carried out at Tesco Whitstable reveal a drop in the number of trips between 1987 and 1994 from 8874 to 8215 between 07:00-21:00hrs. Figure 7 shows more defined peaks in traffic movements in 1987.

Figure 7 Distribution of two way trips – Tesco, Whitstable (Saturday)



3.5 Retail / DIY superstore without garden centre

3.5.1 Counts undertaken at B&Q Maidstone in October 1987 and 1994 show conflicting patterns. The number of trips on a Friday was less in 1994 than 1987; 1086 and 1441 respectively. However the number of trips on a Saturday increased from 1646 in 1987 to 2179 in 1994. The pattern of trips across the day is fairly similar for both years on the Friday however there is less of a pattern in movements on the Saturday as shown on figures 8 and 9.

Figure 8 Distribution of two way trips – B&Q Maidstone (Friday)

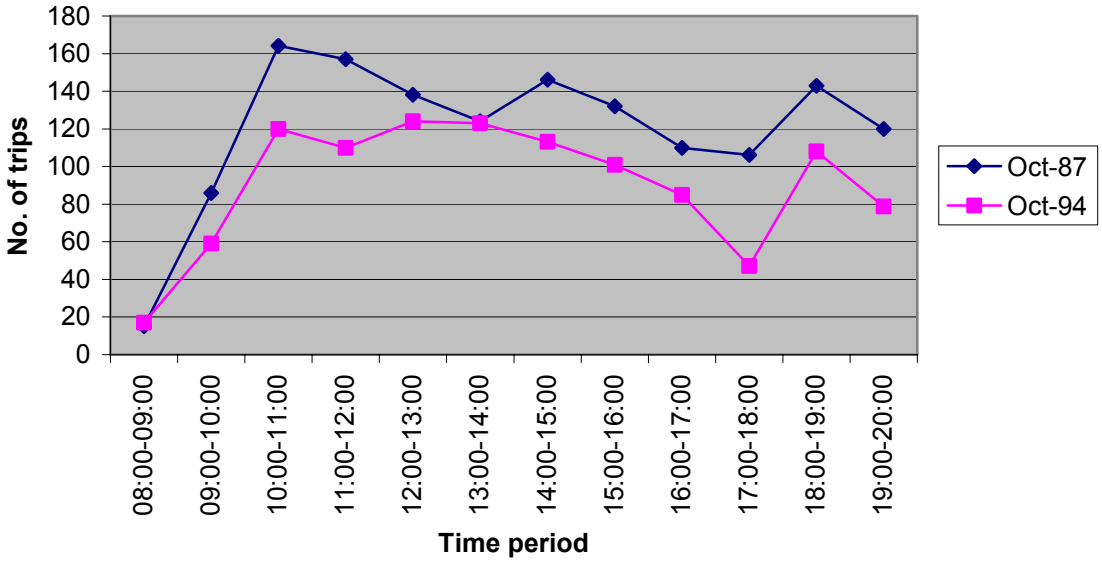
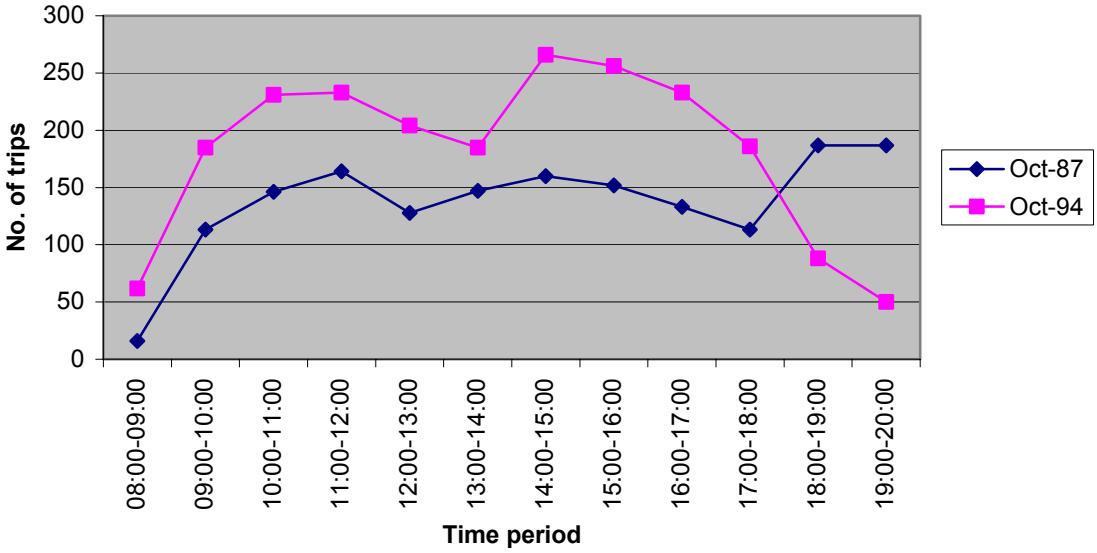


Figure 9 Distribution of two way trips – B&Q Maidstone (Saturday)

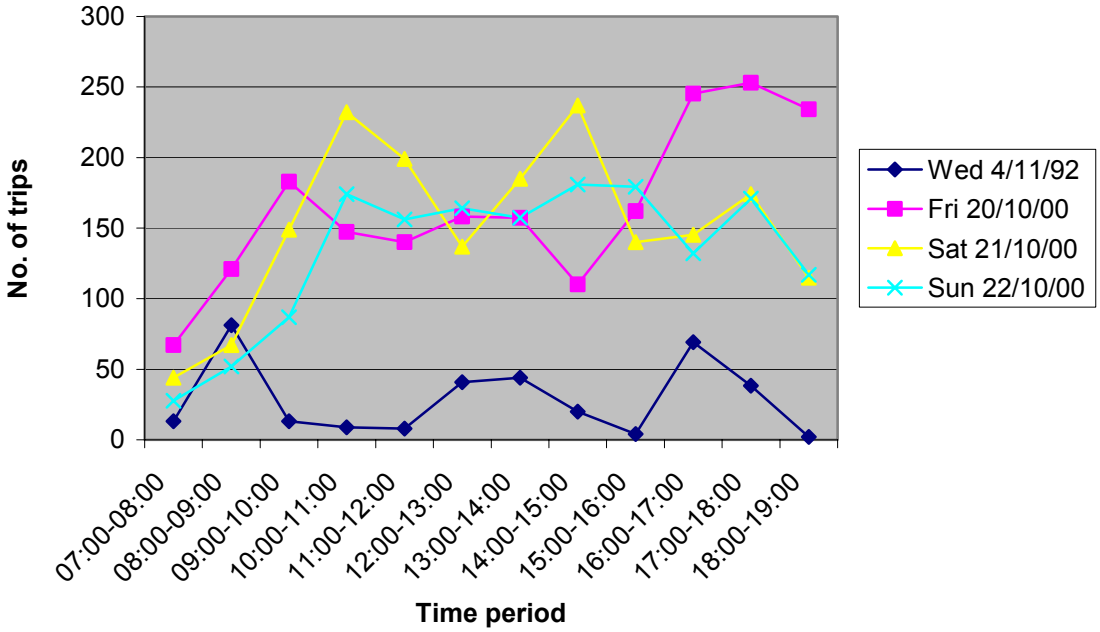


3.6 Leisure / sports centres

3.6.1 Several surveys have been carried out at Maidstone Leisure Centre although direct comparison is difficult across the years as the day of the week differs.

3.6.2 The number of trips is much lower in 1992 compared to the counts undertaken in 2000. However this is likely to be more to do with the day of the week than any real growth in traffic. Figure 10 shows the distribution of trips based on each of the surveys.

Figure 10 Distribution of two way trips – Maidstone Leisure Centre

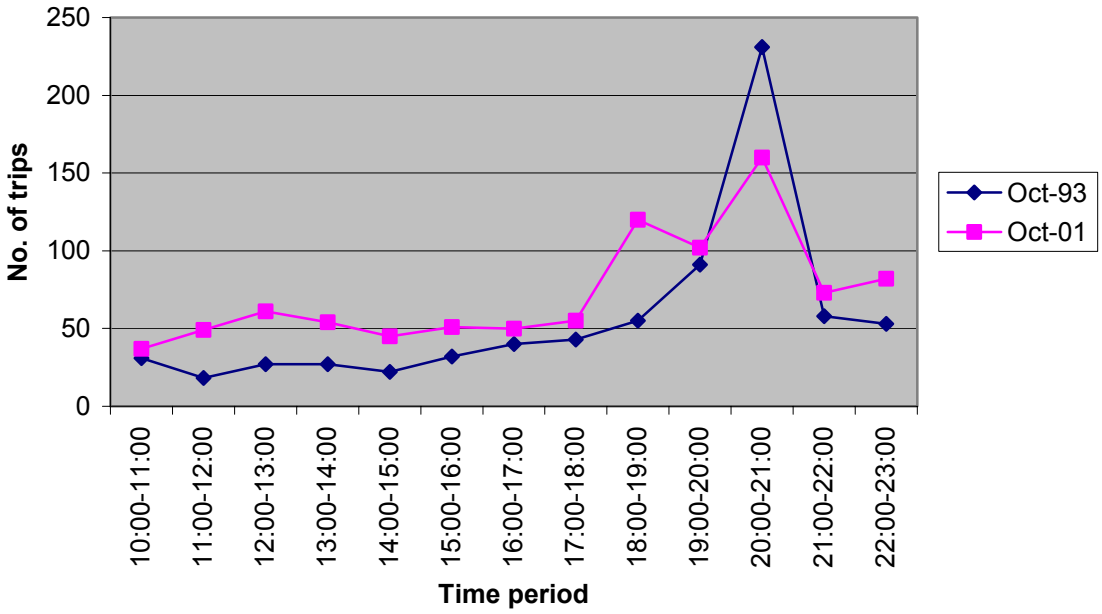


3.7 Leisure / Ice rink

3.7.1 Surveys have been undertaken at the ice rink in Gillingham in October 1993 and October 2001 on a Friday and a Sunday. In 2001 a count was also undertaken in August to assess the effect of seasonality (Sunday only).

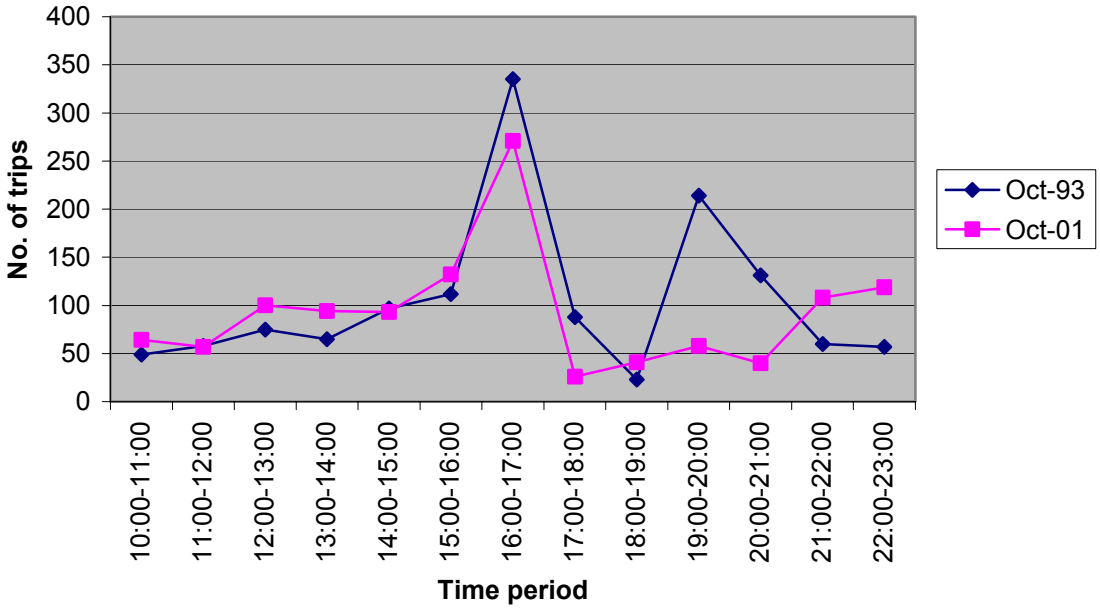
3.7.2 The number of trips generated on a Friday in October 1993 and October 2001 is similar; 728 and 857 respectively. Figure 11 shows that the distribution of trips across the day follows broadly the same pattern.

Figure 11 Distribution of two way trips – Ice Bowl, Gillingham (Friday)



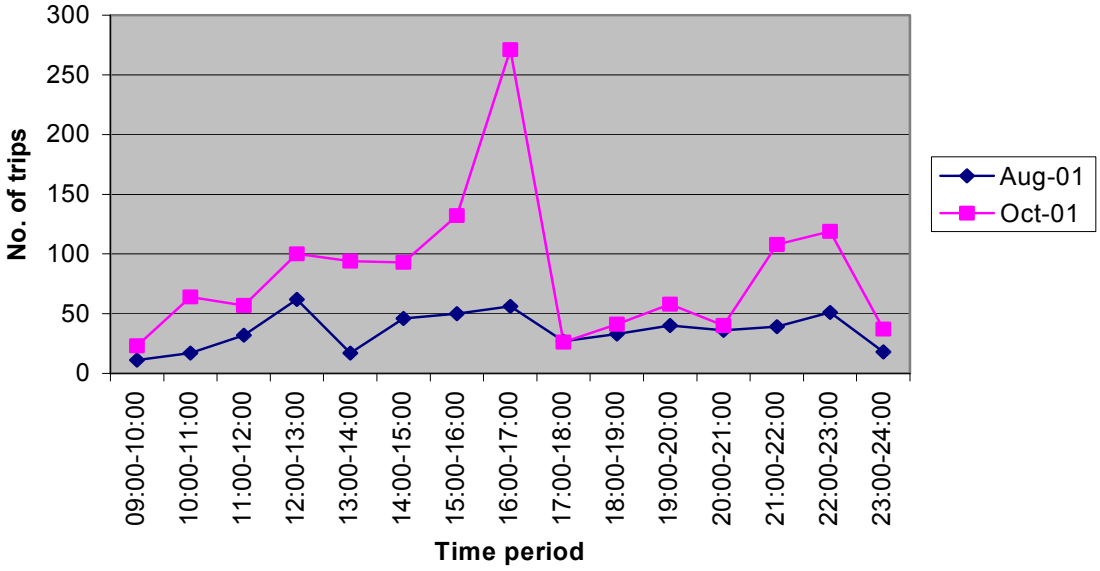
3.7.3 The counts for Sunday in October also recorded similar number of trips; 1993; 1364 trips, 2001; 1203 trips. Again the patterns across the day are similar as shown in figure 12 although there were two distinct peaks in 1993 and only one in 2001.

Figure 12 Distribution of two way trips – Ice Bowl, Gillingham (Sunday)



3.7.4 The number of trips generated on a Sunday in August compared to October 2001 were very different. The number of vehicle trips in August was less than half those in October; 506 trips compared to 1203. This could be because ice skating is not as popular in the summer, even during the school holidays, or it could also be due to a greater proportion of trips to the site being taken by non vehicular modes. Figure 13 demonstrates the differences recorded in the vehicle counts.

Figure 13 Distribution of two way trips – Ice Bowl, Gillingham (Aug/Oct)



3.8 Marina

3.8.1 The marina in Gillingham was surveyed in October 1996 and 2001 on a Friday and a Sunday. On both the Friday and the Sunday the trip generation was higher in 2001 than 1996. The pattern of traffic movement across the day more closely matched on the Sunday than the Friday when comparing 1996 and 2001, see figures 14 and 15.

Figure 14 Distribution of two way trips –Gillingham Marina (Friday)

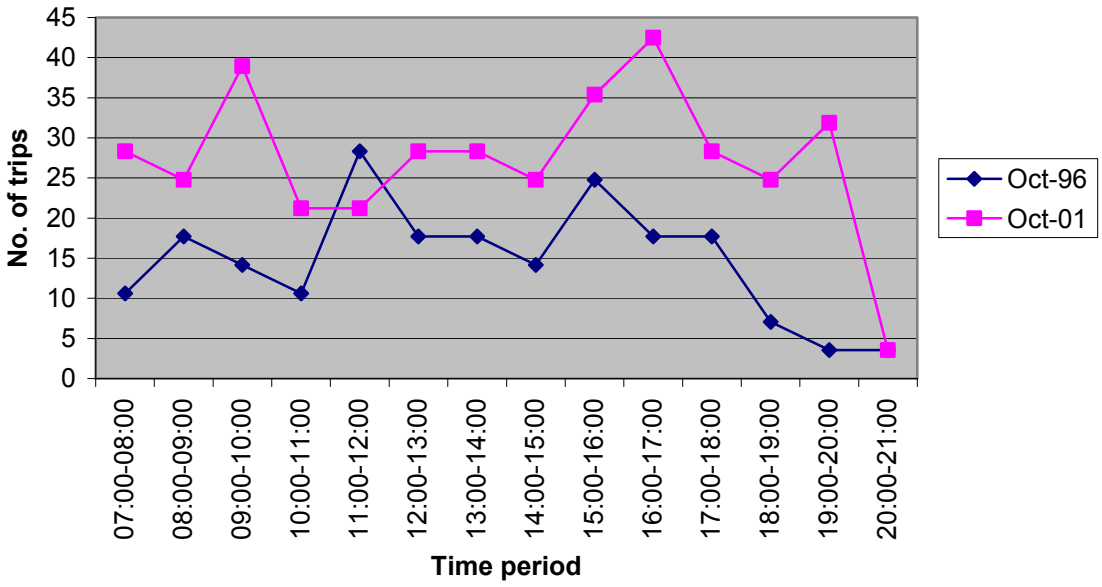
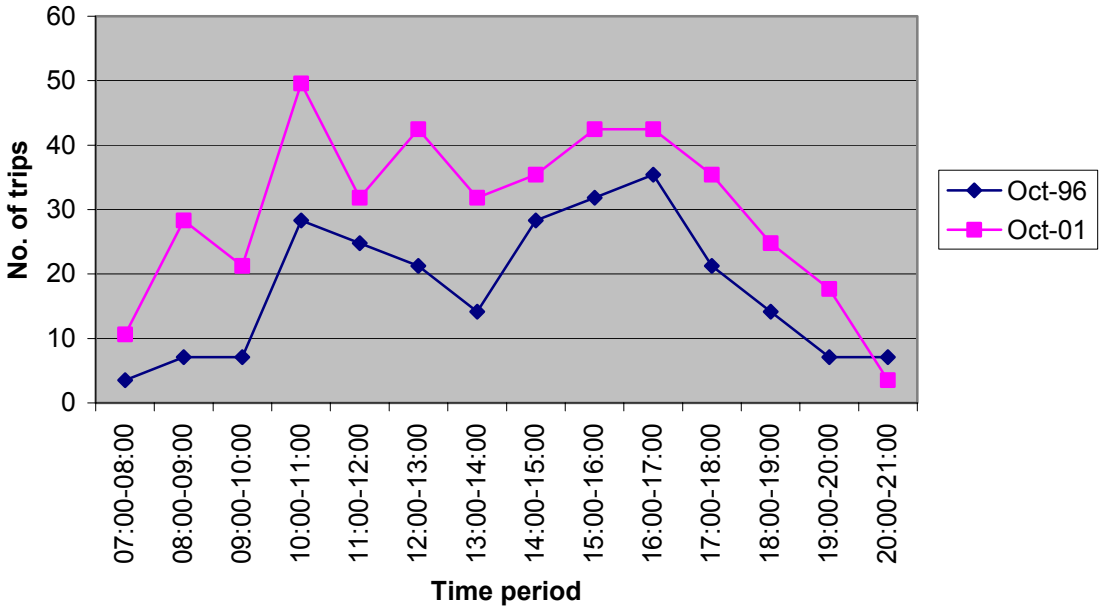


Figure 15 Distribution of two way trips –Gillingham Marina (Sunday)



3.8.2 In order to provide a seasonal comparison the marina was also surveyed in August 2001, again on a Friday and a Sunday. There were more vehicular movements in the October on Friday and Sunday. The pattern of trips across the day was broadly similar on the Sunday but no real pattern emerged for the Friday, as shown in figures 16 and 17.

Figure 16 Distribution of two way trips –Gillingham Marina (Friday Aug/Oct)

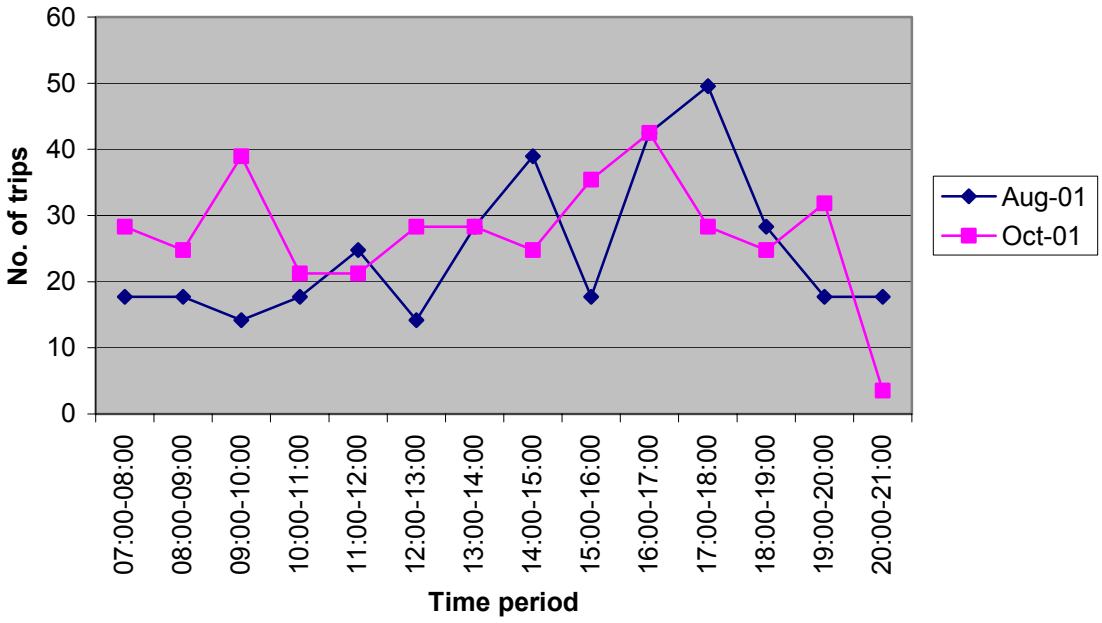
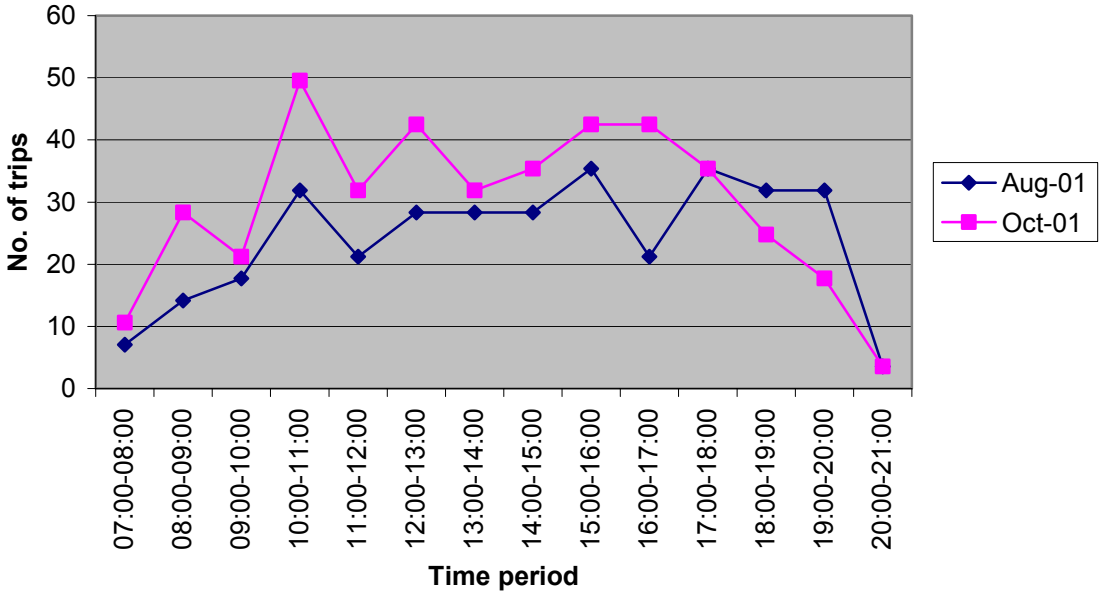


Figure 17 Distribution of two way trips –Gillingham Marina (Sunday Aug/Oct)



4. Conclusion

4.1 Based on the repeat surveys undertaken in Kent it has been established that any pattern in traffic growth varies between land use and in some cases by site. The day of the week the survey was carried out also affects the trends of traffic growth/reduction.

4.2 There has been growth in the recorded trip generation at the following sites;

- Maidstone Sheltered Accommodation October 93 – June 01
- Tesco, Maidstone (Saturday) October 1987 – November 1999
- B&Q Maidstone (Saturday) October 1987 – October 1994
- Gillingham Ice Bowl (Friday) October 1993 – October 2001
- Gillingham Marina (Friday and Sunday) October 1996 – October 2001

4.3 A reduction in trip generation occurred at these sites;

- Probation Hostel, Maidstone October 1993 – June 2001
- Tesco, Whitstable October 1987 – November 1994
- B&Q Maidstone (Friday) October 1987 – October 1994

4.4 At the following sites the number of trips in each year remained fairly consistent;

- Maidstone Hospital (Saturday and Sunday) November 1995 – October 1999
- Gillingham Ice Bowl (Sunday) October 1993 – October 2001

4.5 There were some sites with conflicting trip generation trends depending on the day adopted most notably Friday at B&Q saw a reduction whereas Saturday experienced an increase in trips.

4.6 The pattern of trip generation across the day has also been assessed to establish whether any trends have emerged when comparing one year with the other.

4.7 Similar patterns in daily trip movements were found at;

- Maidstone Hospital (Saturday and Sunday)
- Tesco, Maidstone (Friday and Saturday)
- Tesco, Whitstable
- B&Q Maidstone (Friday)
- Gilllingham Ice Bowl (Friday and Sunday)
- Gillingham Marina (Sunday)

4.8 Different patterns in trip movements across the day were evident at;

- Maidstone Sheltered Accommodation
- Probation Hostel, Maidstone
- B&Q Maidstone (Saturday)
- Gillingham Marina (Friday)

4.9 In this analysis an attempt has been made to establish the effect of seasonality at two sites; the Ice Bowl and Gillingham Marina. However it is difficult to draw meaningful conclusions as only a few days were included and the difference in trip generation focuses only on vehicle movements and does not take into account the effect of season on modal split.

4.10 Some potentially interesting trends have emerged through undertaking repeat surveys at the same sites however as the data has been collected on just one or two days firm conclusions cannot be drawn.

APPENDIX D

Kent Development Control Forum – Workshop Summary.

TRICS – WORKSHOP.

Introduction:
This note provides a summary of the workshop findings.

Approach.
The Workshop was convened to enable attendees to contribute to and influence the current research on 'Back Validation' and future system development.
5 small working groups were identified with a cross section of 5 representatives in each. Each group was presented with the same questions and asked to discuss them and record all elements promoted on the A3 sheets provided. The questions were based around the topic:
'Changes in land use and associated operational factors that would have influenced trip making over the last decade and may do so in the future.'

A 'spokesperson' from each group provided summary feedback to the forum on a selected question.

A summary of key answers and related points for each of the questions posed is provided here.

1. HOW HAS CENTRAL GOVERNMENT POLICY INFLUENCED YOUR DEVELOPMENT CONTROL PRACTICE AND THE FORM OF PLANNING SUBMISSION OVER THE LAST DECADE?

Residential:
PPG3 Housing density up/parking standards and highway space down (reduced level of provision).
Move to housing associations, provision of social and affordable housing.
Affordable housing – increase in %.
Disinclination to use courtyard parking/commercial needs dictates allocated parking – hence visitor parking overspills onto highway.
1.5 spaces being adopted by Inspectorate.
Greenfield v Brownfield – different transport needs.

Economic:
Focus on Brownfield sites for redevelopment.
Out of town shopping.
Telecommunication provision.
De-regulation of public transport – no control over services.
Rail policy – targeting increased rail usage.
Funding from Europe – Inter-reg regeneration schemes.
Assisted Area Status –started things going for regeneration and but some pressure on to compromise standards e.g not to adhere to PPG13 to put intensive uses on existing transport corridors.

Procedural:
More discussion with developers and more time spent on design issues.
Little change in developer submission except increase in density.
Parking decriminalistion.
White Papers/LTP's – change to funding focus with reduced expenditure allocated to new highway infrastructure (roads) and more to package measures (traffic management).

Design:
'People and places', DB32 and associated publications has affected layouts.
Homezones Reducing speeds, encouraging people places and movement.
Architects layouts made to work by engineers.
Increased safety and security – introduction of safety audit.
Building Control (Parts M & K).

Environmental:
PPG13
Reducing the need to travel.
Travel Plans – enforcement problems;
onus on the developer to find solutions.
Reduced parking subject to public transport levels.
Reduction in car parking provision – political issues at the local level.
Mixed use development.
Less reliance on car borne trips;
Building on the flood plain – Environment Agency.
Greater sustainability requirements - TIA to TA, bicycle and walk provision/connections, public transport provision, travel plans, materials used, maintenance issues, live/work units.
Disparity between urban and rural locations.
Developer contributions to Public Transport.
PPG6
Sequential approach to town centre development.
Less out of town development to reduce the need to travel.

2. WHAT LOCAL POLICY ELEMENTS HAVE INFLUENCED YOUR DEVELOPMENT CONTROL PRACTICE AND THE FORM OF PLANNING SUBMISSION OVER THE LAST DECADE?

Structure, Local and Local Transport Plans still key framework documents for policy.

Policy itself can generate conflict when development is planned and to be encouraged (policy makers v decision takers).

Policy still challenged at planning application stage.

Regeneration and sustainability needs.

Kent design/DB32	design of estate roads; greater innovation with layouts; developers failing to achieve ped/cycle priority through sites.

Layouts for industrial and residential development.

Problems with emergency access.

Parking standards/level of parking provision	minima v maxima (now adopted); more flexibility needed; local variations need formalising; difficult to persuade Inspectorate on adoption of local variations; necessary to manage commercial development.

Identification of walking, cycling and bus strategies.

Commuted payments/contributions – transport infrastructure not a political priority e.g. compared with education/schools.

Affordable housing need – parking squeezed for this element to facilitate increased parking at main residential provision.

Sustainable Urban Drainage System (SUDS) – developers seeking them as a solution but not liked by planners.

3. WHAT CHANGES IN THE TYPE/FORM OF LAND USE/DEVELOPMENT PROPOSAL HAVE YOU SPECIFICALLY NOTED OVER THE LAST DECADE?

01 - Retail.
Extension of shopping hours - 24 hour opening at Superstores;
- Sunday opening.
Growth in edge of town retail superstores.
In store provision of minor services e.g. pharmacy, opticians, post offices.

02 - Employment.
Reduction in office space provision (influenced by call centres, hot desking and home working).
Smaller office units being sought.
Greater provision of live/work units.
Live/work units being converted back to residential.

03 - Residential.
Garage conversions on new developments.
Courtyard parking spaces.
Increase in smaller housing units.
Greater provision of Live/work units;
Affordable housing (up to 50% in rural areas);
Sheltered housing.
Live/work units being converted back to residential.

04 - Education.
Extensions to existing school buildings.
Day care centres/nurseries for pre-school children.
Diversification of school sites – use as sports centres, art centres and libraries.

05 - Health.
Nursing Home extensions.
Consolidated practice at new medical centres.
Reduction in doctor surgeries.

06 - Hotel, Food and Drink.
Increase in numbers of 'chain' hotels and travel inns (motels).
Introduction of drive through fast food outlets (A3's).
Increase in town centre restaurants/cafes (link to increased residential provision).
Conversion of hotels to residential accommodation (flats).

07 - Leisure.
More caravan sites.
Trout farms and Koi Carp centres.
Greater provision of private complexes e.g. David Lloyd centres.

08 – Marinas.
Growth in associated residential development.

09 - Golf.
Proliferation of golf courses in the early 1990's.

13 – Petrol Filling Stations.
Provision in association with superstores
Closures of independent (garage) outlets in rural areas.
Growth in food retail – collaboration with major stores.

16 - Mixed use.
Intensification of proposals.
Residential and business combination increasing.

Miscellaneous.
Introduction of communication facilities – masts and relay stations.

Rural Diversification.
Reuse of agricultural buildings as:

- Holiday homes;
- light industrial premises (B1/B8);
- offices;
- storage/distribution – freight haulage;
- Barn conversions to residential use;
- Play barns (children indoor play areas);
- Riding schools and stables.

Policy.
Small infill residential sites.
Reuse of Brownfield Sites.
Economic regeneration focus on larger site areas e.g. Kent Thameside & Ashford.
Extension of operating hours has seen changes in peak demands and increased service vehicle activity.
Redevelopment of town centres.
Changes in defence policy – reuse of barracks, airfields and dockyards often for mixed residential/employment development.

Town Centre Redevelopment.
Return of supermarkets e.g. Tesco Metro.
More restaurants/eateries.
Increase in financial institutions (A2/A3/B1 rather than A1).
Housing (especially flats) as part of mixed development.
Loss of heavy industry.

Brownfield Sites.
Small infill residential sites;
Industrial to residential.
Industrial premises converted to storage and distribution (warehousing).
Land forming to make site viable.

4. HOW HAS THE SWITCH TO TRANSPORT ASSESSMENT (TA) AFFECTED THE TYPE OF DEVELOPMENT BEING PROMOTED?

[one group suggested delete 'type of' from the question]

Developers are starting to consider effective people access more than traffic impact on the highway network.

Greater promotion of non-car facilities - pedestrian and cycle links, bus lanes/routes – and associated information provision e.g. real time notification systems.

Travel Plans make developers consider what they are doing and how to manage it – although targets are not often monitored.

More emphasis placed on existing public transport services (be it often presented inaccurately) and its development/extension.

Location/accessibility has a higher profile.

TA tries to prove that the development is justified (i.e. written to provide support rather than to inform/guide a development process).

TA's used to justify reduced parking ratios and traffic impact e.g. junction operation.

More focused on urban areas.

Increased density due to less reliance on the car/greater anticipated public transport usage.

Promotion of use of different modes of transport and delivery made difficult by current travel habits.

Supporting planning policies need to catch-up (change to Structure/Local Plan documents ongoing).

Obtaining contributions to public transport easier.

Not applicable to the vast number of small applications.

5. WHAT PRIVATE SECTOR CONSIDERATIONS/TRENDS HAVE INFLUENCED THE FORM OF LAND USE/DEVELOPMENT SCHEME BEING PROMOTED?

Finance/national economics.

Land supply.

Focus on re-developing Brownfield Sites.

Access to public transport.

Decline in agriculture/farming conversion to B1/B8;
poor supporting infrastructure;
difficult to reject on traffic grounds – use large vehicles + peaks of harvesting.

Decline in heavy manufacturing industry e.g. East Kent coalfields, Chatham Dockyard, Ashford as a railway centre.

Decline in Ports.

Decline in office development – switch to B2 (industrial) and B8 (storage and warehouse).

Influence of retail trends on rural/suburban life – closure of shops, public houses etc. and conversion to residential.

Residential developers on greenfield sites are happy to accept PPG3 parking provision to avoid call-in.

Higher density residential development with more flats and affordable housing.

Housing Associations being able to develop sites not previously considered viable for residential development.

Utilities – difficulty of servicing sites.

E-communication.

Leisure habits and growth in theme pubs – particularly in large commercial town centre properties.

Funding of recreational centres.

Heritage and Countryside developing as an industry rather than service.

6. WHAT PLANNING/LAND USE RELATED ISSUES WILL REQUIRE FUTURE ACTION?

Intensification at existing retail park sites.

Installation of a mezzanine level.

Height of buildings.

Brownfield sites.

Call centre growth.

Affordable housing coupled with increased density issues.

Eco homes.

Change of use for non-food retail e.g. furniture store to a Matalan/T.K. Maxx.

Change of use in food retail - depends on the operator e.g. Tesco v Lidl.

Continuing rural diversification and impact on highway network.

Accessibility planning.

Modal shift to public transport.

Parking levels – what monitoring is taking place, are reduced levels working.

Section 278/Travel Plan monitoring and enforcement.

Sustainability: Air quality;
Water supply (more reservoirs, flooding controls, recycling);
Infrastructure (land allocation for roads, schools etc).

Traffic impact monitoring and actions to resolve excess generation.

Private Finance Initiatives (PFI).