

**ESRC TRANSPORT STUDIES UNIT
UNIVERSITY COLLEGE LONDON**

TSU ANNUAL REPORT 2001

1. SUMMARY

TSU is now half way through its second (and final) term of funding as the smallest of the designated ESRC research centres, with the culmination of a number of research strands in sight, and substantial progress of some organisational changes, agreed during the mid-term review, as part of the 'exit strategy'. The key element of that was to be eventual full convergence of TSU with the larger Centre for Transport Studies at UCL. During Professor Goodwin's term of office as head of CTS (at the same time as Director of TSU, which continues), which was completed at the end of September 2001, some administrative and management changes were initiated to this end, and are being further extended now with Professor Andrew Evans as Head of CTS. Thus while for financial control and formal reporting TSU does retain its separate identity, the boundary between research areas and activities is no longer so well defined. This blurring of boundaries will become even more pronounced as the process of convergence is developed.

As a result, some changes have been made to the structure of this report, with inclusion of work and publications both by the staff whose salaries are directly paid, in full or part, by the ESRC grant, and also (though in much less detail) by colleagues for whose research the ESRC makes no direct contribution, but which represents the wider, and increasingly unified, research institute of which TSU is a part.

During this transitional period, quantitative indicators are given both under old definitions, for ease of comparability, and the eventual new definitions in which it will not be useful to distinguish TSU and CTS.

Taking TSU as narrowly defined on the old basis, the year saw the production of 43 (last year also 43) written reports of substance, not counting short articles and similar items, of which 14 (last year 11) were in the categories books and monographs, book chapters and peer-reviewed journals, and 14 (15) were conference presentations which had been specially invited, keynote addresses, or published in the proceedings. This is slightly higher than the average for earlier years, and considerably higher, on a per capita basis, than the average output of the main University transport groups. The Review Panel considered that this rate of output is broadly appropriate. Last year, it was commented that rather more than usual were still 'in the press', partly reflecting random movements in the pace of writing, and partly the longer waiting periods which resulting from the pressures of the research assessment exercise. Allowing for this and for the change in dates, it seems that the rate of output is broadly constant. Addition of the relevant other CTS publications approximately doubles the rate of output.

Members of TSU, and their CTS colleagues, maintained an active presence in committees, conferences and networks, both within the UK and overseas.

The other main development during the year concerned the broad financial position of UCL as a whole, and its implications for transport studies. Under great financial pressure, UCL has decided it needs to make cuts which are likely to include academic staff posts of which the share of Engineering Sciences (the faculty in which TSU is located) will be about 15 jobs, representing about 10 of the staff. There have been obvious concerns about the significance of this, and it is very encouraging to report

that four areas have been identifying for exception from the general pressures for reduction, with a protected position and the intention of growth. These four areas are Transport, Communications, Environment, and Health. It is not yet clear how the timing and specific decisions will be managed to give expression to this potential.

During the year it was decided that TSU would be subject to an audit by the ESRC's internal auditor, requiring a considerable preparation. The audit was carried out, and at the time of writing we are awaiting the report and the ESRC's response to it: the preliminary feedback was that the accounting, filing and administration of transactions were satisfactory, but that improvements to the UCL management information systems would be desirable, and the 'exit fund' account, agreed in the mid term review as part of the eventual exit strategy, should be reconsidered and if possible increased.

2. INTRODUCTION

The Transport Studies Unit was awarded the status of a designated research centre of the ESRC from October 1994 to September 2004, subject to a mid-term review of the first five years' performance. The research programme commenced at the University of Oxford, and transferred to University College London in January 1996. TSU itself is one of the smallest of the ESRC's designated research centres, but now forms a part of one of the largest University groups specialising in transport, the Centre of Transport Studies at UCL. It is the only ESRC centre located in an engineering department, and its disciplinary background - primarily economics, econometrics, geography, psychology and politics - also reflects the engineering and scientific tradition in transport studies.

Members of the Unit in 2001 were as follows:

Tagreed Aziz B.Eng (Civil Engineering with Architecture) MSc (Civil Engineering with Transport) graduate student

Sally Cairns B.A. (Geography), D.Phil., (Geography)

Joyce Dargay (Deputy Director) B.Sc. (Mathematics), M.A., Ph.D. (Economics)

Phil Goodwin (Director) B.Sc. (Economics), M.A., Ph.D. (Transport), FCIT, FIHT

Mark Hanly B. Eng. (Chemical Engineering), M.Sc. (Economics)

Richard McCulloch B.Eng. (Civil Engineering) graduate student

Graham Parkhurst B.A. (Psychology and Philosophy), M.Sc. (Human Biology), D.Phil (Geography)

Liselot Hertel (Administrator) (replacing **Patricia Smith** who left in July 2000, but rejoined on a temporary basis in 2001-2). As a result of convergence CTS/TSU administration is now organised on functional lines, so that administrative support for TSU has been carried out by both, and by **Richard Sharp** who is the head of administration for Civil and Environmental Engineering.

3 OBJECTIVES AND RESTATEMENT

(This section is not materially different from last year's report, but is included here so that the report is complete).

The intellectual objectives as originally specified in the research proposal to the ESRC in 1992 focused on two central themes: traffic growth, and dynamic methodologies. It was argued that these interact: emerging new policies stem from the tension between current trends in demand and expected constraints on provision of infrastructure, and their assessment requires the development of new analytical tools, largely dynamic in character, which enable these processes to be analysed.

During the mid-term review, two generic themes were identified for further work: (a) the process of behavioural change, and (b) the tools for appraisal. (A third topic, the dynamics of policy, was discussed: it was agreed not to make this a main theme in its own right, but to include some work within the other themes). Within the process of behavioural change, four sub-themes were envisaged, namely: (i) factors moderating change at individual and household level; (ii) interactions between individuals and institutional initiatives; (iii) comparisons of responses in urban and rural areas; (iv) European and transnational issues. Within tools of appraisal, sub-themes identified were: (i) forecasting procedures; (ii) evaluation methodology; and (iii) procedures for monitoring.

These themes are in sympathy with, and make use of, the themes of traffic growth and dynamic methodology that informed the first programme, but are organised on a somewhat different conceptual basis. Having been discussed in great detail as part of the mid-term review, it was not considered useful to have further substantial reconsideration during the year, and only minor evolution of emphasis arose during the natural course of development of the research.

4. MAIN OUTCOMES OF THE YEAR

During this transitional period, quantitative indicators are given in both the old format, for ease of comparability, and the eventual new format in which it will not be useful to distinguish TSU and CTS. Table 1 below summarises the main research outputs.

Table 1: Main Research Output Indicators, 2000

Indicator	TSU only, old basis	CTS, other relevant work	Total TSU+CTS new basis
A1 Books and monographs	1	1	2
A2 Book chapters	4	4	8
A3 Refereed journal articles	9	5	14
A4 Non-refereed journals and short articles	9	5	14
A5 Project reports and working papers	6	3	9
B6 Conference papers published in proceedings	14	6	20
Total	49	41	90

Notes: TSU and CTS have adopted slightly different conventions on classification, and in some cases on attribution of dates. As a result the comparability of the statistics is not exact, and the figures should be treated as broad indicators rather than precise measures. TSU figures are not exactly comparable with the previous year because of change of reporting dates. A5 and B6 publications are, whenever possible, later published as A1, 2 or 3 articles.

Thus taking TSU as narrowly defined on the old basis, the year saw the production of 43 (the same as the previous year) written reports of substance, not counting short articles and similar items, of which 14 (last year 11) were in the categories books and monographs, book chapters and peer-reviewed journals, and 14 (15) were conference presentations which had been specially invited or published in the proceedings or both, keynote addresses and the like. This is slightly higher than the average for earlier years, which was at that time considerably higher, on a per capita basis, than the average output of the main University transport groups. The Review Panel considered that this rate of output is broadly appropriate. Last year, it was commented that rather more than usual were still ‘in the press’, partly reflecting random

movements in the pace of writing, and perhaps partly the longer waiting periods which may result from increased general academic research activity in a year preceding a research assessment exercise. Allowing for this, and for the change in dates, it seems that the rate of output is broadly constant. Addition of the relevant other CTS publications approximately doubles the rate of output.

Only including TSU as narrowly defined, the highlights of each member's activities during the year are as follows.

Tagreed Aziz spent a period working in Cairo with the assistance of the transport institute in Cairo University, and carried out a pilot survey of schoolchildren focussing on their travel to school in the context of road safety. She took a number of courses in computing and analytical methods.

Sally Cairns successfully completed her Research Fellowship in Japan from the Japanese Science and Technology Corporation, and has continued her collaborative work with the Traffic Safety Section of the Japanese National Research Institute of Police Science. She also began research on a project about company travel plans for the DTLR, working closely with Transport 2000 and Adrian Davis Associates. She continues to investigate the effects of reducing road space for cars, together with Phil Goodwin, and in new collaboration with Steve Atkins, Visiting Professor at Southampton. She has also maintained her involvement in research on home shopping, including making invited contributions to the European ROSETTA project, and workshops convened by the University of Westminster and University of Stuttgart. She has continued as a columnist for Town and Country Planning magazine.

Joyce Dargay continues her work with the development of methodologies for dynamic transport modelling and the analysis of the determinants of travel behaviour. During the year she has been involved in two projects for the DTLR: a literature review on price elasticities; and the development of an aggregate transport-forecasting model for the UK. International collaboration is an important feature of her work and close contacts have been maintained particularly with Jean-Loup Madre and others at INRETS and various French universities on British-French comparisons of car ownership and use and public transport demand; and with Dermot Gately at New York University on developing methods for forecasting car ownership and use in on a global level. During the year, she was an invited speaker at an INRETS symposium "Longitudinal data: collection and analysis issues" and gave invited seminars on her work on the pseudo-panel analysis of car ownership and use at the University of Leeds and Kyoto University in Japan and on her work on bus fare elasticities at the Transport Economists Group. She also gave a presentation at the Institute for Public Policy Research's launching of the book, "Any more fares? delivering better bus services", in which she and Phil Goodwin contributed a chapter on the effects of bus fares. Her work has been presented at the World Conference on Transport Research in Seoul, Korea and at the UTSG Conference in Oxford. She also serves as a member of the Methodological Innovations Committee of the Association of European Transport of the PTRC and chaired a session at the 2001 European Transport Conference. She acts as referee for a number of transport and energy journals and served on a selection committee for the best contribution to *The Energy Journal*.

Phil Goodwin continued as a non-executive director of Dover Harbour Board, and gave advice to DTLR, CfIT, CPRE and a number of related organisations, Scottish Executive, Greater London Assembly, Transport for London, and other local authority and private organisations about development and monitoring of transport policy; public/private town centre transport partnerships, road pricing in London, fares and transport taxes, and multi-modal studies. Among other visits and conferences, he made presentations in Vancouver, Edinburgh, and Brussels, the ESRC annual conference in London, and the opening lecture at a Cabinet Office ‘blue skies’ discussion on the future of transport, which was followed by a number of briefings and discussions on transport matters with DTLR, Treasury and other interested agencies. He was specialist advisor to the House of Commons Select Committee on transport.

Mark Hanly continued his work on the analysis of the demand for air travel and a historical review of attitudes to travel, set up a major new database on road transport demand elasticities, carried out a meta-analysis and a number of specific investigations using it, and assisted in work aimed at a national aggregate transport forecasting model. He and Graham Parkhurst took on the role of seminar organisers for the Centre for Transport Studies.

Richard McCulloch’s PhD thesis was examined, and the examiners recommended that certain amendments and further work should be carried out, currently under discussion.

Graham Parkhurst worked on the analysis of the wider transport policy implications of cleaner and more efficient road vehicle technologies, and on disseminating the findings. A chapter will appear in 2002 in a book considering the related issue of the fuel price protests of 2000. The research also proved timely given the launch by government departments of a joint consultation exercise *powering future vehicles*. Dissemination of previous work on transport interchange, particularly bus park-and-ride schemes, has continued, including the acceptance of an article by the *Journal of Transport Geography* (forthcoming in 2002) and a presentation at the annual TRICS practitioner conference. At the end of the year he was asked to take an advisory role for a project considering the appraisal of parking at railway stations for the Strategic Rail Authority. The ‘EMITS’ project appraising the Oxford Transport Strategy also entered its final year during 2001, with the final major surveys being undertaken in November. A new research direction was the consideration of the social and political implications of growth in demand for air travel. A small informal research network has been established with academics from five other UK universities and a joint application has been made for funding, not successful in its original form but the work will proceed in a different way.

5. PROGRESS TOWARDS THE CENTRE'S OBJECTIVES AND ESRC CORPORATE PLAN OBJECTIVES

As reported also last year, there has not been a major reconsideration of the role and activities of TSU within the ESRC overall plans, and the main progress is measured by the outputs of the research activities themselves, as discussed in Section 7 below.

In summary, TSU's work continues to combine an active and sometimes high profile engagement in the large and small problems of public policy at a time of great change in the transport sector, together with fundamental contributions to the theory and practice of transport modelling and forecasting. We feel that this corresponds well with the general ESRC strategic approach.

The main management issues during the year, material to interaction between TSU, CTS, and the rest of UCL, are reported in the next section.

6. MAIN ISSUES AND PROBLEMS IDENTIFIED DURING THE YEAR AND ACTION TAKEN

CONVERGENCE OF TSU WITHIN CTS

Following discussion with colleagues, the Panel, ESRC and Advisory Board, it was agreed that the appropriate 'Exit Strategy' after 2004 would be for full integration of TSU into the Centre for Transport Studies, and that towards this end there should be progressive convergence of management styles, administrative procedures and, where opportunities arise, research interests, subject to the need for transparent management and accounting responsibilities to ESRC.

This process has continued. One important administrative change has been that the former division of responsibility (one administrator for TSU, another separate one for CTS, each carrying out a number of equivalent tasks for the two structures) has been replaced by a division on functional lines, so that one of the administrators carries out financial matters, the other manages events, etc. This will be reconsidered in the light of experience as necessary. Also, there has been closer attention to the areas of specific overlap, differences, and synergy of interest between TSU and other CTS themes. Other CTS work which is closest in interest to TSU priorities includes work on public transport and car use by Roger Mackett, work on accessible transport systems by Nick Tyler, work on traffic and safety by Richard Allsop and Heather Ward, and work on railway safety and transport economics by Andrew Evans, and work on road traffic modelling by Ben Heydecker, each with their support staff and graduate students. Altogether, this represents a large part of the total research activity of CTS, and it is expected that there should be no difficulty whatsoever in eventual complete convergence as far as research interests are concerned. Already, the interested outsider would have no certain way of distinguishing 'TSU' and 'non-TSU' research within the centre by its theme, for around 90% of the activities: there is a spread of approaches and themes with somewhat distinct centres of gravity, but hardly any sharp dividing lines.

THE FINANCIAL CONTEXT

The other main development during the year concerned the broad financial position of UCL as a whole, and its implications for transport studies. For 2001-2 the College aimed to save £10m but only succeeded in saving £7m. The target for 2002-3 is to save £11.2m. It is expected that the next stage of such savings will involve reductions, mostly voluntary, in academic staff posts of which the share of Engineering Sciences (the faculty in which TSU is located) will be about 15 jobs, representing about 10 of the staff. There have been obvious concerns about the significance of this, and it is very encouraging to report that four areas have been identifying for exception from the general pressures for reduction, with a protected position and the intention of growth. These four areas are Transport, Communications, Environment, and Health. Since the Centre for Transport Studies is not only the leading location of transport activities within UCL, but also has subsidiary interests in aspects of the other three themes as well, there is the possibility of great potential even within a difficult overall financial position. It is not yet clear how the timing and specific decisions will be managed to give expression to this potential.

AUDIT

During the year it was decided that TSU would be subject to an audit by the ESRC's internal auditor, requiring a considerable preparation. The audit was carried out, and at the time of writing we are awaiting the report and the ESRC's response to it. The preliminary feedback to us was that the accounting, filing, control systems and administration of transactions were satisfactory, but that improvements to the UCL management information systems would be desirable, and the 'exit fund' account, agreed in the mid term review as part of the eventual exit strategy, should be reconsidered and if possible increased.

RESEARCH SUMMARIES

(A) TSU (OLD DEFINITION) ONLY

Young adults, and their attitudes to travel and travel costs

ESRC and Japan International Science and Technology Exchange Centre, Sally Cairns and Kazuko Okamura

There is now a consensus in many countries that it is socially desirable to persuade people to consider travel options other than the car. This research analyses and compares education programmes about the issue for younger people in the UK and Japan. A set of education resources was developed for teaching 16-17 year olds about the costs of different transport options. This was trialed in a Japanese high school, and evaluated to analyse the effects on attitudes to travel.

The hypothesis was that teaching students about the practical costs of travel would alter their travel preferences in a socially desirable direction. Specifically, it was hypothesised that education about costs could reduce the attractiveness of car ownership and use, whilst increasing the attractiveness of alternative modes of travel, safer driving and smaller, more environmentally friendly, cars.

The education trial involved two groups, with approximately 40 Japanese high school students in each. The educational intervention consisted of three phases, all of which were led by the classroom teacher. The three phases were: a) an introductory transport cost quiz; b) a maths calculation exercise; and c) an evaluation questionnaire. Students in the experimental group completed all three phases, whilst the control group only completed the evaluation questionnaire.

The results of the work were promising. On the basis of the two short interventions, the analysis suggested that the attractiveness of car ownership and use can be reduced, and students may be encouraged to drive more safely and to consider buying more environmentally friendly vehicles (assuming that such vehicles are cheaper). Given the small sample size, and the over-representation of girls in the control group, it was particularly surprising to have achieved statistically significant differences between the two groups.

In the future, the aim of this project is to undertake further trials, both in the UK and Japan to establish whether the results from the first phase of the work are replicated with a larger group.

The impacts of reallocating road space

ESRC. Sally Cairns, Steve Atkins and Phil Goodwin

Previous work funded by London Transport and the DETR looked at the traffic impacts of reducing highway capacity for cars. Reducing road space for general traffic, and reallocating it to pedestrians or cyclists or buses or trams or other high occupancy vehicles, could significantly increase the attractiveness of these modes, and facilitate more efficient use of the road network. Yet proposals for such changes

are usually controversial. One recurrent issue is whether the displaced traffic will simply divert to neighbouring streets, clogging them up and leading to worse congestion and pollution. The original study included an examination of over 60 case studies from 11 countries. The findings suggested that such problems are, in reality, rarely as bad as predicted, and that, with careful planning and appropriate implementation, reallocating road-space to more sustainable modes of transport could result in a variety of complementary benefits.

This work has continued, including a survey of the opinions of over 150 transport professionals world-wide, and the collation of information on 12 new case-studies (including controversial and innovative UK examples such as the M4 bus lane, the Oxford Transport Strategy and the Leeds High Occupancy Vehicle Lane).

Overall, all follow-up work has broadly confirmed the findings of the original study. When pedestrianisation schemes or wider pavements or cycle lanes or bus (and other priority vehicle) lanes or road closures are introduced, pre-scheme predictions of what will happen are usually excessively pessimistic. In practice, it is rare that schemes result in a significant deterioration of traffic conditions. Traffic levels can reduce by significant amounts, with the average being that perhaps 11% of the traffic on the treated road or area cannot be found in the area afterwards. However, all schemes are different, and each will need to be considered according to its own circumstances. The corollary is that it is not appropriate to automatically assume that traffic levels will remain fixed. The public is likely to react in a range of ways to changing conditions, and, if there are no easy alternative options, there are a variety of responses that people may make which, taken together, can result in the measurable loss of traffic from a network.

In addition to the original findings, the follow-up work has highlighted some further issues. First impressions of schemes count, such that it is very important to get the details of scheme implementation correct, and to manage public and media perceptions. Monitoring of key issues is critical and facts need to be available fast, so that debate is informed. Pre-warnings of initial problems may result in pre-emptive behavioural changes, which can help to avoid difficulties. Controversial schemes can be introduced in (easily reversible) stages; it is important to ensure that the benefits of schemes are obvious; and any 'side-effects' need to be managed. The quality of resulting streetscape may be critical to its acceptability, and budgets should aim to provide the often expensive re-landscaping that may be required. Many transport professionals highlight that traffic reduction should usually be an explicit aim of policy, although the objectives of schemes are usually far broader than altering vehicle flows. It is important that scheme monitoring includes counts of people as well as vehicles, to balance debate about issues of social equity or how attractive an area has become.

Finally, the findings reinforce the overall conclusion of the original study – namely, that well-designed and well-implemented schemes to reallocate road space away from general traffic, can help to improve conditions for pedestrians, cyclists or public transport users, without significantly increasing congestion or other related problems. Moreover, schemes can help in achieving a wide variety of benefits including accident reductions, air quality improvements, reduced neighbourhood severance, increased business investment, more attractive living and working surroundings and

improved retail vitality. The feasibility of scaling up the successes of local schemes into more comprehensive initiatives is currently unclear. However, this is a critical issue for future exploration, given the potential opportunities that such schemes offer to achieve traffic reduction, urban regeneration, more efficient use of economic resources and other national policy objectives.

Travel plans

DTLR, Sally Cairns with Transport 2000, Adrian Davis Associates, and Addison & Associates

A study of individual company travel plans was undertaken for the Department for Transport, Local Government and the Regions, in collaboration with Transport 2000 and Adrian Davis Associates. This aimed to identify and examine approximately 20 organisations that, in some way, exemplify best practice in encouraging staff to commute to work more sustainably.

At these organisations, introducing a travel plan had often been prompted by growing parking and congestion problems, or planning restrictions related to new development. However, when asked about the benefits of the travel plan, it was rare for organizations only to talk about alleviation of such problems or fulfillment of planning requirements. Instead, a wide range of benefits were mentioned, including improving travel options for staff, attracting new employees, reducing commuting stress, retaining staff and positive PR.

In terms of effectiveness, current provisional results suggest that, on average, the organizations had reduced the number of cars arriving at the workplace by 18%, such that there were at least 14 less cars arriving per 100 staff. Several travel co-ordinators commented that some staff had given up a second car as a result of the travel plan. Meanwhile, on average, the organisations had nearly doubled the proportion of staff arriving by bus, train, cycling and walking. The highest levels recorded were 23% of staff commuting on foot, 21% cycling and 53% using public transport. There had also been considerable success with encouraging car sharing. In terms of getting staff involved, the most successful organisation had encouraged 47% of its staff to register, and over 30% of staff to actively share at least one day per week. In terms of regular sharing, the best performing organisation had persuaded 26% of staff to car-share on a daily basis.

The case studies demonstrated that it is possible to achieve changes in how people get to work regardless of the starting point, and that there is no 'natural maximum' level of use of the sustainable modes. The key is the overall strategy adopted by the organisation. To achieve substantial change, it is usually necessary to introduce parking management, as well as providing incentives to use alternative modes.

In addition to examining direct measures introduced to encourage change, other factors were assessed. It was shown that organisations situated in town centres, with lower paid staff, with a high proportion of staff living locally, with good walking and cycling access, or with cheap public transport fares, were more likely to have low levels of car use. However, none of these factors were critical, and 'natural

advantages' could be wasted, and 'natural disadvantages' could be overcome, depending on the parking strategy and incentives offered.

Organisations varied in how much they spent on travel planning. Current provisional analysis suggests that the median average annual running cost was £47 p.a. per employee, which is notably cheaper than the £300-£500 often quoted as the annual cost of running a parking space. Six organisations had considerably reduced their costs by recycling car park revenues. Travel plan work usually involves close partnership working with others, and such partnership work had also often helped to considerably reduce the costs to the organisation itself.

Meanwhile, current best practice still has scope for improvement, implying that the future potential for modal shift from travel planning is likely to be even higher than the achievements of the best practice examples analysed here.

These findings are feeding into good practice guidance, due to be produced by the DTLR later this year. Meanwhile, current results are provisional only, and may be subject to revision.

The traffic impacts of home deliveries

ESRC. Sally Cairns

Home delivery of shopping has taken off dramatically in recent years, though with some concerns about its environmental effects, depending on the balance between reduced car travel and increased delivery traffic. This research highlights that an important split is emerging between schemes offering home delivery of food compared with non-food goods – and that the general increase in light goods traffic should not be taken as indicative of problems caused by all forms of home shopping.

In particular, it synthesises modelling work undertaken by the author, and other researchers in the UK and Finland, together with the few empirical studies that exist, which suggest that home shopping *for food and other groceries* should be cautiously welcomed on transport grounds.

Meanwhile, there are various factors involved in the organisation of all home delivery schemes which will help to maximise the benefits, and minimise their environmental costs. These include:

- effective strategies to minimise returns
- prices that encourage more efficient ordering
- increasing use of storage lockers on houses, and intermediate drop-off points for light goods, which customers can then collect at their own convenience
- better use of different vehicle types, including more use of vans that run on alternative fuels, improved control of vehicle emissions, quieter vehicles, more use of trains, bikes and walking couriers, and ensuring that existing vehicles are well-maintained and well-driven.
- greater exploitation of information technology to optimise the use of vehicles, more efficient load consolidation via companies becoming more involved with customer ordering procedures, more co-operative working arrangements, etc..

In research terms, the priority is for monitoring of actual customer behaviour and supply chains, to find out what the real impacts of real schemes are.

Transport Pricing

Phil Goodwin and Joyce Dargay
Funding ESRC

This study considers the issue of transport pricing, using dynamically specified, policy-sensitive assessment tools in the context of institutional arrangements for seeking to use fuel prices, road pricing, and hypothecated revenue to support public transport service levels and prices. A major conclusion is that a dynamic approach to assessment of some key policy options gives different insights than the conventional equilibrium methods.

For example, it has always been accepted that fares increases have the danger of losing customers, but the technical assumptions about how many customers are lost for this reason have led to a widespread assumption that for commercial objectives fares increases still make sense. The empirical evidence – based on dynamic modelling – casts doubt on this assumption, by showing that, in the longer run, fares increases are likely to lead to much larger demand losses than thought, and in some markets are likely to be self-defeating. Conversely, in the long run fare reductions will cost less than currently assumed, and in some markets will be income-generating. The issue thus becomes how to finance the short run in order to achieve the long run build up. Market confidence does not (yet) allow this to be funded in the market itself.

The results are politically very interesting, indicating the possibility of using road-pricing funds essentially as a *temporary* measure to start the revival of public transport which – at some appropriate stage – then becomes increasingly responsible for its own further expansion. This would significantly change the longer-term perspective against which immediate policies are judged.

Air travel demand

Joyce M. Dargay and Mark Hanly
Funding: ESRC

The objectives of this project are to analyse the demand for air travel to and from the UK during the past decade and to investigate the factors determining its development. The factors considered are income, airfares, foreign trade, exchange rates and domestic price levels. Pooled time-series cross-section data are used to estimate dynamic econometric models for air travel by British residents to 20 OECD countries and for residents of these 20 countries to the UK. In each case, the leisure and business markets are treated separately.

The results obtained thus far indicate that international air travel by UK residents for leisure purposes is relatively price sensitive (-0.6 in the long run), suggesting that a large part of the increase in air travel over the past decade can be explained by declining airfares. Business travel by UK residents, however, appears to be insensitive to fare changes and is driven mainly by other factors, particularly foreign trade. For non-UK residents, the fare elasticity appears to be the same for leisure and business travel, with an elasticity of around -0.3 in the long run. In all cases, income (or trade) is a prime determinant of air travel, although relative price levels and exchange rates also play an important role. In addition, there we find that there are substantial lagged effects - the short-run elasticities are much smaller than the long-run elasticities.

Papers based on the results of this project have been presented at the 9th World Conference on Transport Research, Seoul Korea and the 34th Annual Conference of the Universities' Transport Study Group in Edinburgh.

Fuel Prices

ESRC, Phil Goodwin

The fuel price protests of 2000 represented an upheaval serious enough to constrain policy discussion, due, in part, to underestimating the 'sensitivity' of fuel price as a political issue. Analytically, we have a forecasting problem, affecting the way in which the transport policy and projects are evaluated, which may be due, in part, to underestimating the 'sensitivity' of demand to fuel price. The connection is, at best, complex. But both seem to indicate that policy discourse in the transport field has tended to play down the role of price, and we have two entirely different signals that it may be a serious mistake to do so.

Transport Strategy in the UK

ESRC, CPRE, DETR, CfIT, Rees Jeffreys Road Fund . Phil Goodwin

UK transport policy continues to evolve. Research has involved a general monitoring and interpretation of policy developments, and attention to the significance for the 10 Year Plan of pricing, rail developments, the measure of 'congestion' used, EC policy, monitoring strategies, and DETR and CfIT modelling and forecasting exercises.

Income and Price Elasticities in the Demand for Road Transport

Mark Hanly, Joyce Dargay and Phil Goodwin

Funding: DTLR

A literature review has been carried out of income and price elasticities, updating and extending earlier reviews. Special attention has been given to evidence on those elasticities (or relationships governing their evolution over time) which have a material effect on the reliability of forecasts and policy tests.

Road Transport: a global perspective

Joyce Dargay

Collaboration: Dermot Gately, New York University

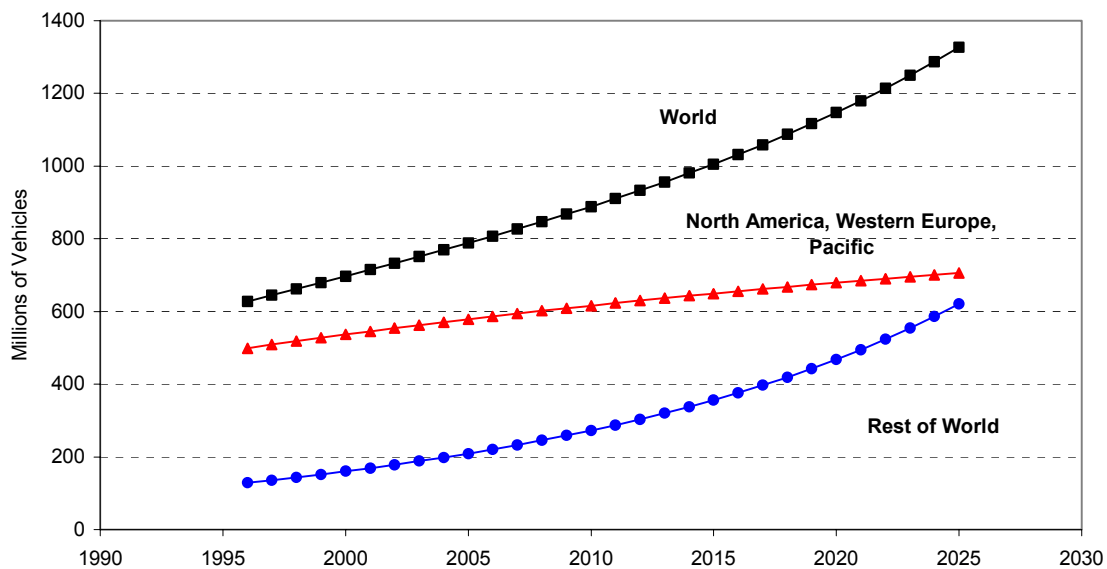
Funding: ESRC

The aim of this project is to provide a basis for projecting road transport and its environmental consequences on a global level. The projections are based on a vehicle-forecasting model which employs an S-shaped function - the Gompertz function - to empirically estimate the relationship between the vehicle stock and income, or GDP. Pooled time-series and cross-section data are employed to empirically estimate the saturation level and income elasticities for different countries. By employing a dynamic model specification, which takes into account lags in adjustment of the vehicle stock to income changes, the influence of income on the vehicle stock in different time perspectives is examined. In order to allow for differences in saturation related to demographic factors, vehicle saturation is related to population density. The issue of symmetry of response to rising and falling income is examined.

The study includes 82 countries, so that for the year 1996, 85% of the world population and 93% of the total vehicle stock is represented. The comprehensiveness of the data set and particularly the inclusion of a large number of developing countries provide a high degree of variation in both income and the vehicle stock. This allows relatively precise estimates of the relationship between income and the number of vehicles at various stages of economic development.

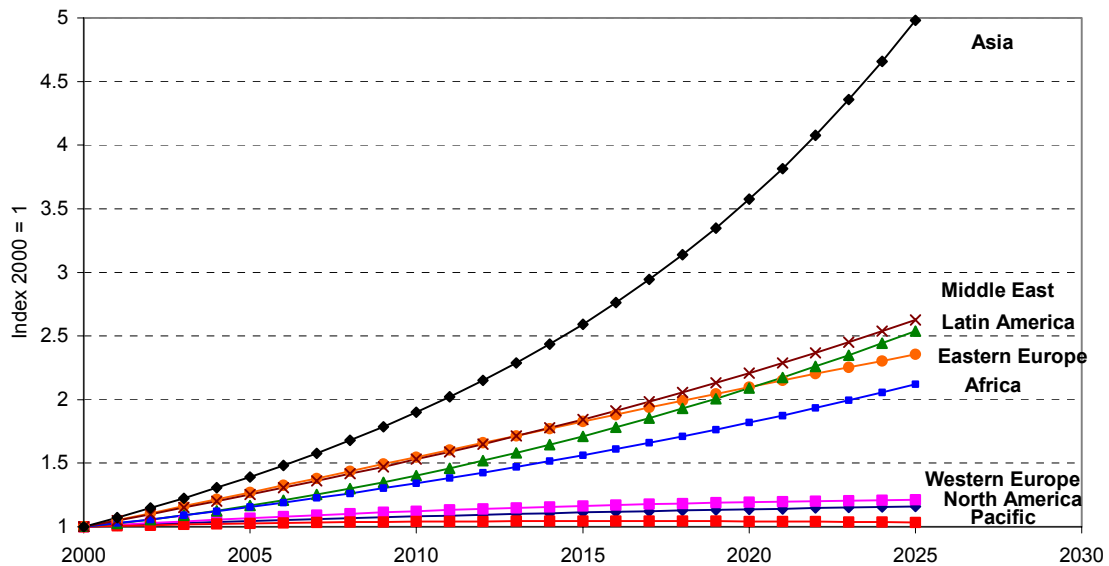
The estimates are used, in conjunction with forecasts of income and population growth, to make projections of future growth in the vehicle stock over the next 25 years. The projections for the world, and developed and developing countries separately are shown in Figure 1.

Figure 1: Projections of vehicles, 2000 to 2025.



The implications of the forecast growth for traffic, traffic density and CO₂ emissions are investigated. Using assumptions of a relatively small improvement in vehicle emissions, the projected increase CO₂ emissions is shown in Figure 2.

Figure 2. Projected growth in road-traffic related CO₂ emissions to 2025.



The results of this study have been presented at the 9th World Conference on Transport Research (WCTR) conference in Seoul Korea, and a paper has been accepted for publication in *Municipal Engineer*.

Pseudo-panel analysis of dynamic transport demand relationships

Joyce Dargay
Funding: ESRC

Our work with the development and application of the pseudo-panel methodology to investigate the dynamics of car ownership and use has continued during the past year. The work has largely focused on two issues: the differences in factors determining car ownership in rural and urban areas, and the investigation of car use. Both analyses are based on cohort data constructed from the Family Expenditure Surveys in the UK.

The major conclusion is that elasticities differ substantially for different household groups. The elasticity of car ownership with respect to car purchase costs is twice as high in urban areas as it is in rural areas. Fuel costs, on the other hand, have no significant effect in rural areas, but do have a small influence on car ownership in urban areas. The relative insensitivity of car ownership to costs for rural households is an important consideration in the formation of transport policy, and especially for the distributional aspects of such policies. The results suggest that general increases in the costs of car transport would pose a considerable economic burden for rural households, and that other area-specific measures may be more suitable, particularly from an equity point of view.

In addition, the analysis strongly confirms the notion that adjustment to changes in prices and income takes time. The elasticities are around 40% higher in the long run than they are in the short run, and full adjustment takes about 4 years. We also show that, in the case of cohort data, a static model can be used to estimate the long-run elasticities. However, the dynamic formulation is preferable in that it distinguishes

between the impacts of income and prices in different time horizons and allows estimation of the speed of adjustment. This is clearly of importance in forecasting car ownership or assessing the implications of price-related transport policy, where we are interested in car ownership and the response to transport measures at specific points in time rather than at an undefined equilibrium.

Our work on car use has thus far not attempted to distinguish between households in different areas. For the average UK household, we find that car use, in terms of total kilometres travelled, is more sensitive than car ownership to changes in income, purchase costs and fuel costs. In addition, there is an indication that the response to income changes is asymmetric: car use increases more when income rises than it falls when income declines.

A paper on this work has been published in *Transportation Research* during the year and another is awaiting publication. An earlier study on car ownership in France was published in an INRETS publication. Invited seminars were given at the University of Leeds and Kyoto University in Japan.

Car ownership: panel data analysis

Mark Hanly and Joyce Dargay

Funding: ESRC

The advantages of panel data for behavioural analysis of travel decisions are numerous: they provide information on behavioural change at a sufficient level of detail to unravel true causality, there is no loss of information due to aggregation and they allow the analysis of changes in individual behaviour over time rather than of differences between individuals at a given point in time. Transport panel surveys are rarely available, particularly for a sufficiently long time period to examine such changes more than cursorily. For the UK, none exists for other than limited regions. However, the ongoing British Household Panel Survey (BHPS), begun in 1991, does provide some information related to transport – specifically, household car ownership – as well as information on the economic and socio-demographic characteristics of the households surveyed. The aim of this project has been to exploit the BHPS data to analyse car ownership and the factors determining car ownership decisions on an individual household level.

During the current year, our earlier studies were extended in a number of ways. Firstly, along with state dependence, the question of asymmetric response to rising and falling income is investigated. Secondly, the effect of access to company cars is examined. Finally, the data set is extended 1999 to include the most recent data. Dynamic discrete choice models are employed which relate car ownership to income, socio-demographic factors such as household composition and residential location, generational variables and the household's access to company cars. Car ownership in the previous period is included as a state variable and the question of asymmetric response to rising and falling income is examined.

The results indicate that state dependence (i.e. previous car ownership level) is the most important determinant of current car ownership. This is explained by the

longevity of the vehicle stock as well as by habit persistence. There is also strong evidence that the effects of rising income on car ownership are greater than the effects of falling income. The existence of hysteresis is an indication of the difficulty of reducing car dependence in favour of other transport modes. In addition, the year of birth of the household head has a positive effect on car ownership – car ownership has become increasing greater for younger households. This supports the generation effect noted elsewhere.

An invited seminar on this work was given at INRETS in France.

Development of an Aggregate Transport Forecasting Model

Joyce Dargay, Phil Goodwin and Mark Hanly
Funding: DTLR.

The aim of the project, being carried out for the DTLR is to construct a method of making forecasts at a very aggregate (typically nationwide) level, and without the separate attention to many different road types, area types and other conditions which characterise the Department's current National Travel Model (NTM). The forecasts include various components of transport demand, and are intended to inform policy assessment at the strategic level, so that the ability to analyse the sensitivity of demand to policy instruments is a key attribute. An important aspect of the model is that it will be dynamically specified so that it will allow explicit consideration of the time scale over which demand responses evolve.

The proposed model will forecast passenger kilometres, vehicle kilometres, fuel consumption and CO₂ emissions, for car, bus and rail travel. These forecasts would enable tests to be carried out of the effects of changes in assumptions, such as income growth, or different policies affecting transport prices and service levels for each mode.

Demand responses are modelled on economic principles, and distinguish between short-and long-run effects, connected by an explicit time scale of approach towards equilibrium. Responses include both the direct effects on use of each mode, and also substitution among them, as determined by a matrix of direct elasticities and cross elasticities, which are explicitly specified in the model (though provision will be made to substitute user-specified values). It is envisaged that price and service effects will be estimated by distinct elasticities, rather than by combining them into a generalised cost for which historical data is lacking. Car costs include the costs of both ownership and use, and allow for endogenous changes in fuel efficiency. The model includes some simplified aggregate demand-supply feedback effects, notably the effects of increasing supply on demand, but does not treat supply itself as endogenous.

The project is still at an early stage and continues into 2002.

The Demand for Public Transport

Joyce Dargay and Mark Hanly.

Collaboration: Prof. G. Bresson (Paris II), J.L. Madre (INRETS) and A. Pirotte (University Lyon II)

Funding: ESRC

Our work on public transport demand follows on from the project on bus fare elasticities carried out for the DTLR and completed in 2000. During the year a paper was prepared summarising the modelling of bus patronage using national annual data. The estimations use dynamic econometric models relating per capita bus patronage to real per capita income, real bus fares and service level. The results indicate that patronage is relatively fare-sensitive, with an elasticity for all Great Britain of -0.4 in the short-run and -0.9 in the long-run. The evidence suggests that the long-run values are at least twice the short-run elasticities and that the total response takes about 7 years. The cross elasticity between bus patronage and motoring costs appears to be negligible in the short run and about 0.3 to 0.4 in the long run.

Another element of the project is a comparison of the public transport markets in England and France. For England, the panel of 46 counties is used, and for France, the panel of 62 urban areas. Of prime concern is the impact of fares, service supply and income on the demand for public transport. Estimates were obtained using a common set of variables, a similar time period and a common methodology based on dynamic econometric models and panel techniques, so that both short- and long-run elasticities are estimated. The heterogeneity amongst areas is accounted for using a random-coefficients approach, and Bayesian shrinkage estimators. The results show that there is a considerable variation in the elasticities among areas, and that it is important to allow for this heterogeneity. This approach is clearly a considerable improvement over traditionally used methodologies.

Invited seminars on this work have been given at the University of Leeds and at the Transport Economists Group.

Attitudes towards travel and traffic

Mark Hanly

Funding: ESRC

Over 10 years ago, with funding from the Rees Jeffreys Road Fund, TSU conducted a nation-wide survey of car drivers' attitudes to driving and traffic. Over the past decade transport issues have become more to the forefront given the increasing concern with environmental issues, the escalating congestion and the new transport policies advocated by the current government. This project aims to determine the extent to which these changes are reflected in peoples' attitudes towards cars, traffic and transport provision. The most appropriate way to do this would be through a follow-up survey of car drivers' attitudes - a repeat of the earlier TSU survey. Given the costs involved in such an exercise, it may be beneficial to extend the original survey to include additional questions, which may shed light on changing attitudes.

Before embarking on this survey, a review of published transport attitude surveys, carried out both prior and subsequent to the TSU survey, is being undertaken in order to determine if any trends in attitudes are apparent. This should provide some valuable insights into attitudes towards transport and aid in the design of a follow-up survey.

EMITS: Environmental Monitoring of Integrated Transport Strategies

Funding: ESRC and EC LIFE programme. Graham Parkhurst and Phil Goodwin, with 4 collaborating institutions.

EMITS monitoring of the Oxford Transport Strategy (OTS), begun in 1996, entered its final year in 2001. The OTS, adopted in 1993, resulted in an increase in pedestrianisation from June 1999. New regulations were required in respect of through traffic, on-street parking, public transport routes, and freight deliveries. Public transport was made more attractive in order to maintain the accessibility of the central area.

The project team is multidisciplinary; the other partners are the two Oxford local authorities (City and County Councils), Imperial College (National Heart & Lung Institute), and Oxford University (School of Geography). Monitoring covers traffic flows, air quality, the effects of air pollution on both human health and the fabric of historic buildings, and local economic vitality. Previous studies have examined causal links between these data streams, but not all together in the same urban context.

As the study enters its final six months, the key findings are now ‘firming’ up:

- EMITS data show that traffic entering the central area reduced by 17% (9400 motor vehicles per day) between 1998-2000, suggesting many through-trips have been re-routed. Use of the off-street public car parks did also decline, by 19% (760 cars per day), but has been compensated for by greater bus use, up by 8%, equivalent to 2000 extra passenger trips per day. Bus is hence now the most important mode for accessing the centre. Within the city centre, greater pedestrian circulation has been recorded.
- Significant traffic redistribution has not emerged; in the case of one alternative route the decision was taken to remove traffic calming introduced as a precaution.
- Most air pollution indicators show reductions following implementation, although there has been some redistribution of nitrogen oxide emissions due to changes in bus routes. Importantly, statistically significant reductions in asthma symptoms have been identified amongst some groups of schoolchildren and emergency cardiovascular admissions to hospitals were found to be 12% lower. Work is ongoing to establish whether this latter relationship is a correlation or causal. Similarly, analysis of the effects of air pollution changes on building stone erosion rates is ongoing.
- The effect of the OTS on the economy has been controversial: some retailers have maintained support whilst others have cited the OTS as an important reason for trading difficulties. Determining the influence of the OTS is complex, due to the natural turnover of businesses, the disruption of unrelated streetworks, the expansion of Internet trading, the patterns and cycles of retail-sector investment in the wider region, and problems in the tourist industry. However, concerns that the

OTS was causing a reduction in trade have eased during 2001. Whilst the occupancy of particular premises has changed, prime retail rents are in line with comparator cities. Significant investment is occurring in the sector, suggesting that economic prosperity will grow.

TSU analyses in the final phases of the research will include an appraisal of the role of air quality politics within UK urban transport policy, taking Oxford as a case study, and an analysis of the importance of relative travel costs in driving a mode-shift away from car use to public transport use and park and ride. An overall commentary on the significance of other partners' work to wider transport policy will be provided.

A journal article is also in preparation by Graham Parkhurst (in collaboration with Dr Geoffrey Dudley of Oxford University) on the historical importance of an advocacy coalition promoting 'bus interests' in the city as a prime mover in local policy. The OTS and EMITS are to be included in the *Improvement and Development Agency's* web-based 'knowledge' database of local authority best practice in 2002. A one-day dissemination event is also planned for the summer of 2002.

Park and Ride

ESRC. Graham Parkhurst with Jeremy Richardson (Scott Wilson and Imperial College)

The number of short-range bus park and ride (P&R) schemes in the UK grew considerably during the 1990s and further increase is expected in the current decade. Over the same period, concerns about both the local and strategic environmental consequences also grew. Previous research by Graham Parkhurst had concluded that the effects of many P&R schemes contradict several transport, social inclusion, land use, and environmental policy aims, but that they would be more likely to contribute to these objectives if sited further from host cities and if the 'ride' is integrated with established public transport, rather than run in parallel.

Many of the outstanding concerns regarding P&R schemes reflect the fact that their effects are wider in both time and space than the scope of existing statutory planning assessments, and particularly where an individual site is part of a multiple-site programme. Collaboration with Jeremy Richardson in 2001 considered whether Strategic Environmental Assessment (SEA) might offer a suitable means of examining specific schemes with respect to their wide-ranging consequences.

The approach was demonstrated by applying SEA-type procedures to two notional variants of car-bus interchange. It was concluded that would be more able to evaluate the wider environmental, social and economic sustainability of P&R proposals. The likely practical implications of such an approach are that

- a) alternatives to P&R would be preferred more often by local authorities, and
- b) where P&R continues to be promoted, the interchanges are likely to be provided closer to users' origins, in order to maximise car traffic interception.

The findings have been disseminated:

- at a practitioner conference,
- through working papers available on the internet, and
- in a forthcoming journal article.

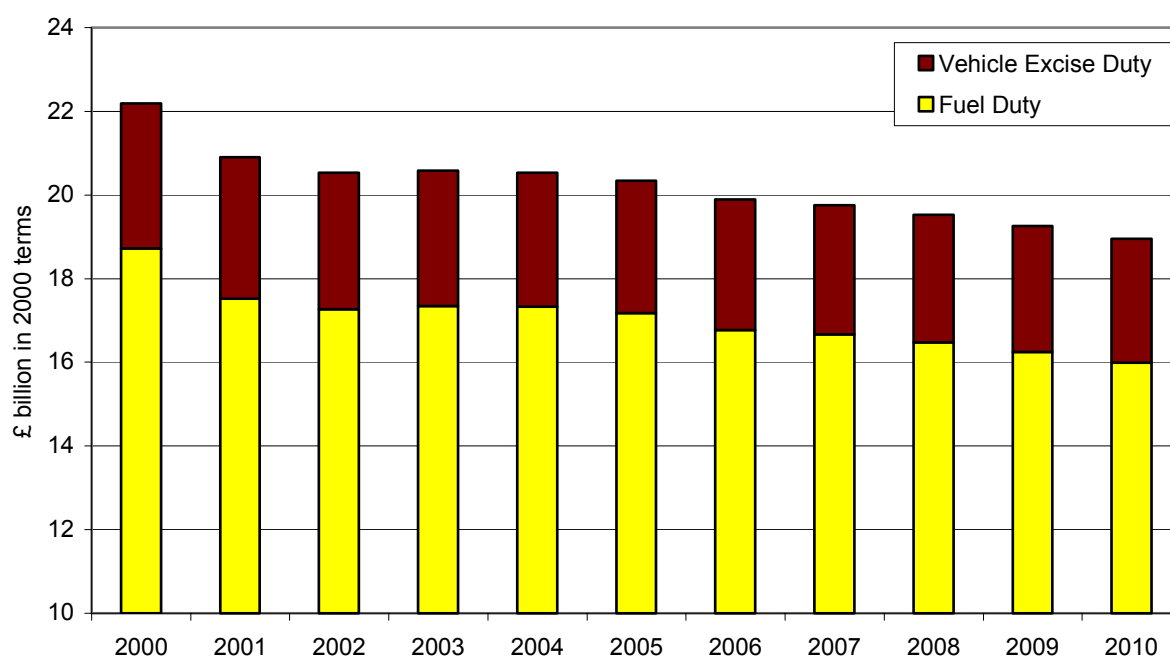
Policy Implications of New Road Transport Technologies

ESRC. Graham Parkhurst

A combination of car ownership growth, traffic growth, and motoring taxation policies has, for a number of years, resulted in rising taxation revenues from car use for governments of industrialised states, including that of the UK. In recent years, though, policy measures have been adopted to increase vehicle efficiency along with tax incentive schemes to increase the use of low-pollution fuels.

In the context of government policies to restrain traffic growth, a trend for greater road transport efficiency has the potential to result in a decline in revenue from motoring taxes at current duty rates. Data analysis published in 2001 by Graham Parkhurst shows that, if the government's *Ten-year Plan for Transport* is moderately successful, the magnitude of reduction in taxation revenue from private and commercial use of cars by 2010 could be £1.25 billion per annum; sufficient in the trend-context to demand a compensatory policy response from government.

Projected Fuel Duty and Vehicle Excise Duty revenues from car use 2000-10 given 17% traffic growth and inflation-linked increases from the 2003-4 budget



Government has a range of options for replacing the lost revenue. However, policy analysis suggests that the most obvious response - simply increasing duty rates - may not be the most attractive one. Instead, it is concluded that the course of action which best serves government fiscal interests is to adopt relatively firm traffic restraint policies by introducing road tolls. These could be hypothecated for transport purposes in the limited sense that they would replace some or all Treasury expenditure. There are two reasons for favouring tolls, probably at least in the first instance to be applied to the motorway network:-

- A 'loser' group of citizens that drives relatively few miles per year but will be unable to afford the new, more efficient, money-saving technologies in the short-term would be subject to most of the extra taxation burden if fuel duty rates are simply increased to maintain revenue. Tolls would be a more equitable, effective, and politically inclusive option, which would raise the lost revenue according to distance driven.
- In the absence of road tolls, the twin trends of higher incomes and lower per kilometre fuel costs will encourage higher traffic growth. Tolls could restrain road congestion whilst raising funds for the Treasury.

Considerable effort on disseminating these findings has been invested in 2001, including:

- a detailed report including technical appendices (pp60) available on the internet;
- a book chapter forthcoming in 2002;
- an article in the practitioner journal *Parking News*;
- a conference presentation at the *Universities' Transport Studies Group* annual conference in January 2002; and
- a submission to the government consultation on the strategy for technological change in the road vehicle sector initiated in December 2001.

The Governance of Airport Expansion

ESRC Graham Parkhurst with Geoffrey Dudley (Oxford), David Howarth (Essex), Steven Griggs (Staffordshire) and Guy Baeten (Strathclyde)

The political salience of airport development has increased in correspondence with the rapid expansion of air travel since 1945. In the past decade, however, the pressures on airport capacity have grown exponentially, especially in countries and regions of the European Union. This includes Britain, and particularly the Southeast of England, where Heathrow has for some time operated at the limits of capacity. Despite this momentum within the sector, the capacity of governments to meet these demands has been called into question by community opposition to airport development and the spread of environmental critiques. These challenges to the 'predict and provide' policy paradigm that has underpinned airport development hitherto place great strains on the local, regional, national, and supranational systems of governance.

In 2001 a scoping study was undertaken with a view to establishing a major project to consider the changing dynamics of airport development. It was found that there is a scarcity of longitudinal empirical studies that describe, characterise and explain the policy networks governing airport expansion. Moreover, it is argued that this lack of detailed academic research into the political dynamics of airport governance exacerbates the difficulties of policy-makers seeking to accommodate the complex interplay of the multiple stakeholders, ideas and interests involved. An overall reassessment of the role of air travel may facilitate the introduction of new ideas and the reconstruction of interests and networks. Major infrastructure investment decisions must continue to be made, but in a climate of problematic policy learning, where the political dynamics of airport expansion may be increasingly interpreted as

‘ambiguous’ and the issue as a whole is undergoing significant reinterpretation by key actors.

As the year unfolded, the timeliness of the topic was underlined. The terrorist attacks of September served to highlight and increase the uncertainties about air traffic demand. Together with the subsequent November announcement of planning permission for the fifth terminal at Heathrow also brought issues of airport location and scale, and air transport policy in general, centre stage, creating a time-window in which policy is unusually prone to change.

Research funds are now being sought to investigate the dynamics of airport development in Britain; together with matched case studies from four other EU countries. In the meantime, a discussion article is proposed for 2002.

Some factors influencing the development of the motorway network in the UK

Research for thesis: Richard McCulloch

The evolution of the network may be viewed as a system of interacting feedback processes, giving a context in which the existing network is maintained and managed under the limits of growth so that it may function adequately with changing demands on its use. Possible qualitative and quantitative influences on the development of the network are identified, including the need for connections between urban centres, concerns over the environment, the increasing resources required to sustain the existing roads and to construct new ones and increasing dependence on the car.

Children’s’ travel patterns and their effect on their safety

Research for thesis: Tagreed Aziz.

Supported by Rees Jeffreys Road Fund

The study involves a comparison between London and Cairo, concerning travel patterns and their effect on road safety as modified by all the other cultural and economic differences between these places. Literature reviews have been carried out on UK, Egyptian and international literature, and a pilot survey has been carried out in Cairo.

8(B) SHORT SUMMARIES OF RELATED CTS PROJECTS

Motorcycling and Congestion

Halcrow Group for DTLR; Sandy Robertson

This study provided an initial estimate of the effects of a transfer of different proportions of trips from cars to two wheel motor vehicles (TWMVs) in terms of congestion and network performance, together with the consequential effects on pollution and noise. The work undertaken at CTS focused on behavioural issues. Behaviours of TWMV's in congested conditions were categorised and quantified.

Reducing children's car use: the health and potential car dependency impacts

EPSRC. R.L. Mackett, L. Lucas, J. Paskins, J. Turbin with 6 collaborating institutions.

Surveys of over 500 children aged 7-10 have been carried out in co-operation with Hertfordshire County Council and Mouchel in ten schools in Hertfordshire. There are three strands to the surveys: the children's travel and activity patterns, their parents' behaviour and attitudes to the car, and the children's health in terms of height, weight and body fat. From these data, it will be possible to explore the relationships between the quantity of car use and the children's activity patterns and health, and their parents' behaviour and attitudes to the car.

Transport legislation in economic communities: the context of the European Union and Mercosul

Research for thesis: J.R. Marar

The framework to assess the implementability of regulatory activity in international contexts has been refined. This research has now been submitted as a PhD thesis and is awaiting examination.

Review of Transport for Mentally-ill People in Rural Kent

Nick Tyler

The integration of the travel mentors project into other schemes for employment and rehabilitation of mentally-ill people is progressing. Terms and constraints have been determined so that a project can be defined to test the idea in a practical application. A project consortium is being developed to include service users so that the project will be relevant and helpful as well as acting as a reference for others working with mentally-ill people.

Small Vehicles in Historic Houses

National Trust. Nick Tyler

This year we have started to investigate the effects of wheelchairs on carpets. The structure of the carpets is being analysed to determine possible causes for the problem of wrinkling under pressure from the wheels. A wheelchair has been equipped with video cameras to observe the dynamics of the problem and thus to enable us to test the effects of different surface structures – from the basic floor and its supports through underlays and carpets to overlays designed to protect carpets from the passage of feet.

Dynamic Travel Information to Mobilise People with Learning Difficulties (DIMPLE)

Hackney Community Transport. Marcela Wainstein, Nick Tyler

DIMPLE is a feasibility study to investigate the technical feasibility of a video map device. The video map has been produced with the help of a small number of people with learning difficulties, carers and travel trainers. The usefulness of using visual stimuli to act as a guide when on a journey has been established, and the ability of a GPS system to locate the equipment has been tested. We have tested a number of different ways of presenting the information and different types of information and instructions. The result is useful for both pre-trip travel training and during a journey. We are now investigating the technical issues surrounding making the equipment small enough, secure and simple to use (for people experiencing difficulties with keys and buttons for example).

Interactions between Pedestrians and Delivery Systems in Historic Town Centres

Research for thesis: Elvezia Cepolina

This project developed a microscopic simulation model to help the analysis of pedestrian movements in various types of spaces. We conducted experiments with a number of pedestrians interacting with various sizes of obstacle (stationary and moving) in a laboratory context and on-street. The model suggests that there is a buffer zone surrounding the “solid” element of each pedestrian and that this buffer changes in shape and intensity according to various characteristics of the pedestrian. In this way we can model people with characteristics such as vision or hearing problems as well as the more obvious physical difficulties. The work has been presented as a doctoral thesis in the University of Genoa.

Access to Justice in Planning Decisions

Nick Tyler

This project is examining how adequately the planning system ensures that planning decisions are just and fair, in the context of the Human Rights Act 1998. One problem of interest is the extent to which the apparent public involvement in planning is outweighed because of the timing and nature of the consultation. For example, the development plan-led process could favour developers because they are more aware than the general of the importance to subsequent planning decisions of abstract concepts such as the development of planning parameters.

Transport Research Uncovered Using Multimedia for Public Education and Training (TRUMPET)

EPSRC Public Awareness of Science Programme, Chris Cook, Nick Tyler

The project is working with children in a number of special schools in Southend to devise a way for them to understand their local bus service. Although we have explored the possibilities of video-based information, the main output of this research is a board game in which the children learn significant features about the bus service, including how to make sure that they board the correct one, have regard to their personal security and how to know where to get off the bus. The board game has been tested with the children and a generalised version is now being produced, both in hard copy and (eventually) for dissemination via the web.

Development of a bid-rent network equilibrium model

Research for thesis: Su-Eun Chang

The objectives of this research are to investigate the factors which determine people's behaviour in urban area in terms of location and transport choices, and to represent them in a systematic modelling framework of land-use transport interactions. The basic assumption underlying the modelling process is that people seek to optimise two goals simultaneously. Namely, people are assumed to choose the location which has the highest attractiveness while having the lowest possible transport cost. A random bid-rent function has been developed to represent the location attractiveness. This is being applied to formulate the main sub-models. Its extension to multiple user classes and quasi-urban dynamics will be investigated.

Distributed adaptive control for traffic signal systems

Jeanan Sha'Aban, Benjamin Heydecker and Richard Allsop with Andy Tomlinson and Larry Bull (University of the West of England)

This project is investigating the use in traffic management and signal control of evolutionary algorithms. These are based on a Learning Classifier System (LCS), which develops effective rules to deal with complex sequences of decisions and is applied here to a traffic signal control system. At present the LCS is being integrated into the latest version of the SIGSIM microscopic simulation model that will implement responsive traffic signal control. SIGSIM provides simulated detector data and measures of performance. The LCS uses these measures to develop and evaluate signal control strategies. Initial investigations have used the mean rate of delay at each junction as a measure of performance.

Lateral track prediction for stacking aircraft

National Air Traffic Services. JD Addison and BG Heydecker

This work pursued the analysis of the lateral track of aircraft that are stacking immediately before their approach to landing. Two methods of analysis – the Fourier transform and a discrete state classifier called the support vector machine were applied to detect the transition from stacking flight to the final approach to landing. The principle was established that either of these methods could be used in real time for the automatic detection of transition in flight behaviour.

Dynamic traffic assignment

JD Addison, S Han, BG Heydecker and RE Allsop

Choices such as departure time and route affect the operation of the road network. Analyses of route choice in steady-state are well established, but counterpart analysis for time-varying route choice during peak periods remain the subject of active investigation. We have developed a novel dynamic version in continuous-time of Beckmann's transformation of the static route choice model into a convex mathematical programme. This novel transformation identifies a quantity that will be minimised at each instant during a peak period by dynamic equilibrium assignments. We have solved the resulting formulation for peak periods in a small example networks.

Dynamic traffic assignment models with departure time choice

Research for thesis: J-S Mun

Existing traffic performance models have been evaluated according to requirements for their use in dynamic traffic assignment. A novel traffic performance model that

satisfies all the established requirements has been proposed. Two dynamic traffic assignment models for general networks, incorporating the proposed traffic performance model, were developed: a fixed demand dynamic user equilibrium assignment model, and one in which variations in demand are modelled with departure time choice. The performance and features of these models have been tested through networks with multiple OD pairs.

Optimisation of traffic-responsive signal control at isolated junction

Research for thesis: W-Y. Ahn

Traffic-responsive signal control at isolated junctions is a well-established idea but still has some important features to be investigated. These include the motion of vehicles responding to current traffic signal displays, and its consequences for interpretation of vehicle detections. Using information from a vehicle detector, delays incurred by traffic due to control decisions are estimated for a lookahead period (detection and prediction period). A Kinematic car-following model is adopted to study the motion of the vehicles from the detector to the stop-line and hence its resulting delays can be estimated directly according to the combination of driver and vehicle characteristic variables. Control decisions are based on the value of the objective function and the whole optimisation process is repeated according to the rolling horizon method. The performance of this model will be tested using the SIGSIM microscopic traffic simulation model.

Blocking-back at traffic signals

Research for thesis: Ioanna Spiropoulou.

For signal-controlled junctions in urban road networks, queues can become so long that they block traffic at upstream junctions. This phenomenon is being studied to identify circumstances in which it is likely to occur, its likely duration, and ways in which its onset can be delayed or prevented. Several traffic models with distinct characteristics are being investigated. The way they manipulate traffic and their characteristics have been reviewed and assessed. These models have been coded in an appropriate computer language and are being compared in detail using a range of scenarios. The next steps are to compare results from simulations to investigate how well the models operate, and to use them to investigate the effects of blocking back on network performance.

Influence of geometry on performance of signal-controlled road junctions

Research for thesis: Dimitris Sermpis

A method has been established to estimate the rate of delay due to the presence of the signals in the various traffic streams at signal controlled road junctions from the micro-simulation model SIGSIM, which uses the Gipps car following model. For the needs of this study, several experimental scenarios were used consisting of two types of junctions (T-junction and crossroads) with either 1 or 2 lane approaches and with different geometrical characteristics (in terms of lane width, turning radii and gradient) under two different signal control strategies (fixed-time and traffic responsive signal control). The simulations have been made for three levels of arrival rate (heavy, medium and light). The rates of delay due to the presence of the signals have been statistically analysed using GLIM to investigate the influence of the geometry on delay under different signal control strategies in each experimental scenario.

Fusion of data from visual and low-spatial-resolution thermal cameras for surveillance

Research for thesis; Gwynfor Jones with John Gilby (SIRA)

New technology in the field of infrared imaging is being used to create a surveillance system with a reduced false alarm rate. The system consists of a standard CCTV camera and a low-resolution thermal camera. Work is well advanced and comprises the development of algorithms for the calibration of the cameras - which allows registration of images between the two cameras - and the fusion of the information presented from the two images using Markov Random Fields.

Jones et al (2001)

Modelling interactions between bus operations and traffic flow

Research for thesis: Paulo Silva

This project was successfully concluded in 2001. A simulation model capable of representing some crucial types of interaction between buses and other vehicles was built taking the software SIGSIM as its basis. The model, called BusSIGSIM, was validated by a newly adapted methodology whose quantitative microscopic procedure employs error analysis using time series. With some improvements to make it more friendly, BusSIGSIM could now be used in practical applications, such as predicting impacts on traffic that could be caused by accessible bus stops like those designed under the EXCALIBUR project.

Modelling Bus Stop Interactions

Research for thesis: Rodrigo Fernandez

As reported last year, this project has developed the simulation model PASSION which enables bus stops to be analysed in terms of both passenger and bus movements. The project has been submitted as a PhD thesis and is awaiting examination.

Assessment of image processing techniques as a means of improving personal security in public transport (PerSec)

EPSRC. Maria-Alicia Vicencio-Silva, Richard Allsop and Nick Tyler, with Sergio Velastin (Kingston University).

Patterns of behaviour for a number of threatening situations to passengers have been identified through workshops and interviews. Taking technical constraints into consideration, a subset of them have been simulated and filmed on video. Newly developed algorithms have been tested to detect automatically these threatening situations with promising results.

Pro-active integrated systems for security management by technological, institutional and communication assistance (PRISMATICA)

CEC, DG-TREN. Maria-Alicia Vicencio-Silva, Richard Allsop and Nick Tyler with Sergio Velastin (Kingston University), Pierre Lagrange (RATP Paris) and 12 other partners.

The state of the art and user's needs in personal security in public transport environments have been determined. In particular, studies on the perception of risks

by key stakeholders have been carried out. Currently, innovative tools and processes are being identified. Some of these will be verified and evaluated to assess their impact on personal security and their scope for improving social inclusion.

The Demand for Public Transport – A Practical Guide

EPSRC. R.L. Mackett, E. Shane with 9 partners.

UCL's contribution to the new version of the collaborative report 'The Demand for Public Transport' has concentrated on the collection of data from the studies in the UK carried out using aggregate data on the effects of fares, quality of service and income and car ownership on the demand for local public transport services. The data on fares is being integrated with disaggregated UK data and evidence from overseas at UCL while other partners in the project are concentrating on other elements of the synthesis.

URBAN RAIL SYSTEMS: A PLANNING FRAMEWORK TO INCREASE THEIR SUCCESS

R.L. Mackett with E. Babalik (Middle Eastern University, Ankara).

The main element of this work has been the synthesis of information about the impact of light rail systems into the KonSULT Knowledge base on Sustainable Land Use and Transport being developed at the Institute for Transport Studies, University of Leeds. This has involved the identification of the potential impacts of light rail schemes both in theoretical terms and using evidence from systems such as Manchester Metrolink and Sheffield Supertram.

The potential impact of new urban public transport on people's travel behaviour

Research for thesis: Aoife Ahern

The modal choices of potential users of two new light rail systems, Luas in Dublin and Tramlink in Croydon, have been examined, using the Theory of Planned Behaviour. Before-and-after interviews have been carried out with potential users of Tramlink. Questionnaires were also distributed to potential users of Luas 2 years before its expected opening. The work concludes that the theory is an appropriate tool for understanding and explaining modal choices, particularly those modal choices that relate to new urban public transport systems.

Modelling the provision of transport with planned or market-determined public transport services

Richard Allsop

Implications of the difference between planned and market-determined public transport services for the modelling of the transport system and its use have been examined. In the former case, the task for government seeking to optimise performance of the transport system has a standard bi-level form, but in the latter case, the lower-level problem in the bi-level formulation is to determine mutually consistent solutions to a pair of optimisation problems. The relevance of the mutually consistent solution in this context contrasts with its sometimes misleading role in the context of optimisation of urban traffic signal control.

Accessibility Research Reaching Outward (ARROW)

EPSRC, Ian Brown, Martha Caiaffa, Chris Cook Paulo Silva, Nick Tyler, Phil Goodwin

This project is funded as an EPSRC Platform Grant in recognition of the Accessibility Research Group's international status in the field. The project supports all other projects being undertaken by the group and in addition is progressing research into cognition and the development of accessible information systems. The project gives long term support and stability to the group. The framework of projects being undertaken by the Accessibility Research Group can be seen at <http://www.ucl.ac.uk/~ucet48b/>

EXCALIBUR

Transport for London, East London Bus & Coach Company, George Lines Merchants Ltd. Martha Caiaffa, Chris Cook, Nick Tyler

EXCALIBUR is now monitoring and evaluating the impacts of the accessible bus stops constructed in East London. Early outcomes are that driver training is extremely important to obtain good performance at the stops but still rather undervalued by the bus operators. Work will commence this year with disabled people in the area once the drivers are accustomed to using the EXCALIBUR stops properly.

Promoting Accessible Transport in Hackney (PATH)

Hackney Community Transport. Nick Tyler

The Hackney Plusbus, set up in 1998 to test the effects of a fully accessible bus operating in a micro network, continues to thrive. Two more routes have now been added to the network, one of which having been adopted as a public bus route by Transport for London. The study continues to assess the ways in which people use the bus service in its own right and as a link to mainstream public transport.

Evaluation of Direct and Cross-sector Impacts of Accessible Public Transport in Rural Areas (ELIXIR)

Countryside Agency. Ian Brown, Nick Tyler

This year the Community Company set up at the beginning of the project has begun to manage the bus service. We have also been acquiring approval from the local Ethics Committee for the study of individual people and their use of transport in relation to their health and social services needs. An intensive travel diary survey is just starting, following approval by the Ethics Committee.

Public Participation Processes in Transport (PUPPIT)

Martha Caiaffa and Nick Tyler with Brighton & Hove Council.

We set up an experiment in public participation for the planning and design process to try to resolve the problem identified in last year's review of accessible bus stops in Brighton and Hove. The experiment took as an example a pair of bus stops and invited the public in the local area to become involved in the detailed design of the bus stops. This was successful in that it raised awareness of the problems of accessible bus stops and what was needed in terms of design and showed that initial public scepticism could be changed into interest and support for the project. Work is now in hand to take the results from this experiment and make them more practical for the continuing bus stop reconstruction project in Brighton and Hove.

A Framework for a User-oriented Transport Booking System

Research for thesis: Patricia Idaewor.

This project is remodelled from the initial study carried out last year into the use of paratransit systems by elderly and disabled people. The objective is to improve the

quality of life via improved transport services for mobility-impaired people by developing a framework with which community transport brokers can assess and incorporate in transport mode/vehicle selection processes, the travel preferences of their users in addition to the traditional criteria of cost and time constraints. The framework would be centred on a user-database system and an attached computer program, which would be designed to compute a user satisfaction index based on a stated preference experiment and analysis, for every possible choice available to the broker to make in response to a travel request from a user. This, it is expected, would enhance the suitability of the selected transport for the given user.

Urban safety and speed management

DTLR. Heather Ward

Heather Ward continued to assist the DTLR's Road Safety Division in developing a strategic research programme for speed management to take forward commitments published in *Tomorrow's Roads, safer for everyone*. Within this programme, assistance is being given to draft a report for the ECMT on Safety on Rural Roads in Europe: Strategies for improvement.

Gloucester Safer City Project

TRL for DTLR. Heather Ward, Sandy Robertson

Work being undertaken at UCL as part of the Gloucester Safer City project has now been completed. The main task at UCL was the matching of road traffic casualties reported by the hospital and by the police in Gloucester. Five years were matched which allowed estimates to be made of changes in the reporting rates over this period. Increases in reporting rates have been detected but casualty data from a control town, which were similarly matched, showed no corresponding increase.

Junction Improvements for Vulnerable Road Users (JIFVRU)

Oscar Faber for DETR: Sandy Robertson, C. Just (Technical University of Dresden).

Data on speed distributions and conflicts have been analysed from before and after studies of a range of schemes implemented by Local Authorities to improve safety for vulnerable road users. Analysis and interpretation of the data are now complete and a report is in preparation.

Estimating the reporting rates of road traffic accidents in London.

TRL for TfL. Heather Ward and Sandy Robertson

An initial investigation and feasibility study of casualty reporting rates is being undertaken. Matching road traffic casualties reported by hospitals and by the police in London will be undertaken for a small sample of London hospitals. The resulting estimation of the level reporting of accidents in London will provide a base-line against which the effect on casualty numbers of initiatives, such as publicity campaigns, can be properly assessed, given that the level of reporting might be influenced and change over time.

Assistance to the Department of Health's Accidental Injury Task Force

Department of Health, Heather Ward

The Accidental Injury Task Force was set up in November 2000 to advise the Chief Medical Officer on the way forward to reduce the numbers of accidental injuries in

England. Assistance to the Department of Health has involved drafting the report to the CMO on behalf of the Task Force and position papers to aid the debate.

Assistance to the Department of Health's Accidental Injury Task Force Working Group on Methods of Monitoring Injury

Department of Health, Heather Ward

Assistance has been given to the Chair of the Measuring and Monitoring Injury working group set up by the Accidental Injury Task Force. This has involved drafting the report to the Accidental Injury Task Force on behalf of the working group.

Road safety policy and targets

Richard Allsop

Continuing advice on the monitoring and reporting of progress towards the road safety targets for 2010 has been provided through the Statistics Subgroup of the Road Safety Advisory Panel. The feasibility and likely cost-effectiveness of doubling over a period of 3 years the workforce available in local authorities and their service providers for developing, progressing and monitoring programmes of local safety engineering schemes have been demonstrated. Implications for road safety work in Britain of developments in policy and practice in other Member States of the EU and in the EU itself have been assessed. Advice has been given to the Land Transport Safety Authority in New Zealand about road engineering aspects of their proposed road safety strategy to 2010.

A framework to assess the usability of pedestrian crossing places.

EPSRC. Sandy Robertson and Richard Allsop

Informal crossing places have a part to play along with Zebra and signal-controlled crossings in encouraging walking, and their effectiveness needs to be assessed appropriately. Preparations have been made to investigate what factors make a crossing place easy to use both for pedestrians and for other road users. The outcomes will be used to develop a PC-based framework to assess the usability of crossing places, through a comparison of zebra crossings with one type of informal crossing place. The project will produce recommendations for choosing between existing types of crossing place, and the framework will provide a tool to assess new and innovative designs of crossing places taking into account the needs of the wide range of users.

Unified statistical modelling of road accident occurrence.

J Wu and BG Heydecker

Relationships have been established between traffic and design variables of road sites, to provide qualified estimates of their likely future accident frequencies. This extends the established use of log-linear models for mean accident frequencies to include an explicit estimate of their accuracy, used to estimate appropriate weights for modelled and observed accident frequencies within a Bayes statistical analysis. A data-set of priority-controlled road junctions from two US states has identified sites for detailed investigation, and their likely future accident frequency in the absence of treatment.

A methodology for systematic diagnosis of accidents in urban areas in Portugal

Research for thesis, Silvia Costa.

This study aims to improve urban road safety in Portugal. The main output from this research project is expected to be a tool for local authorities to use which

systematically diagnoses the problem of accidents in urban areas and supports the appropriate implementation of road safety engineering measures. An initial methodology has been developed against the background of the current Portuguese urban road safety situation and of the existing methods and techniques of urban road safety in Britain and other countries. The applicability of the methodology being developed is examined in a practical way in the case of the City of Almada.

Fatal train accidents on Britain's main line railways

A.W. Evans.

Work has continued on the statistical analysis of fatal train accidents on the British main line railway network since 1967. Early in 2001, Railway Safety published their railway Safety Risk Model, in which they estimate the fatality risk from collisions and derailments to be more than twice as great as Evans' estimates based on the analysis of past accidents. Therefore a focus this year has been to try and account for this difference, and review the properties of the statistical approach. Nevertheless, at present the reasons for the difference in the estimates remain unresolved. An update of the previous results takes the analysis to the end of 2000.

Speed and rolling stock of trains in fatal accidents

A W Evans

This project explored the relationship between impact speed, type of rolling stock, and the number of fatalities in fatal train accidents on the national railway network between 1967 and 2000. The project concluded with the publication this year by the Health and Safety Executive of the contract research report.

Major train accidents in European Union countries

A W Evans

This project was a statistical analysis of the data on train accidents with 20 or more fatalities in the 15 European Union countries in the period 1967-2000. There were 24 such accidents, causing 1,080 fatalities; of these, 3 were in Great Britain, with 115 fatalities. The proportions of accidents and fatalities that occurred in Britain are similar to the proportion of passenger-km in Britain. The average number of fatalities in the major European accidents is similar to that in Britain. There has been a substantial long-term fall in the accident frequency. Thus the European conclusions generally reinforce conclusions based on British data alone.

Obstruction of the railway by road vehicles

A. W. Evans

Andrew Evans was a member of a Health and Safety Executive work group set up after the accident at Great Heck in February 2001 to investigate the risks from road vehicles obstructing railways. As part of the work for that group, data have been extracted and analysed on all fatal collisions between trains and road vehicles between 1967 and 2000/01, both at level crossings and elsewhere.

9. COMMENTARY ON PERFORMANCE INDICATORS

Performance continues to be broadly at the same level and balance as previously. In this year's report we include projects and publications by other members of the Centre for Transport Studies, not being funded by ESRC, with which we are increasingly closely connected. These are shown separately for ease of comparability with previous years.

10. LOOKING FORWARD

We have not felt it necessary to make any substantial amendment to the detailed plans for the next two years approved last year following the mid-term review.

11. SUMMARY OF ANY ACTION REQUESTED FROM THE BOARD OR ESRC MORE WIDELY

None requested.

APPENDIX 1; REPORTS AND PUBLICATIONS

(a) TSU (old definition)

ATKINS S & CAIRNS S (2001g) *Traffic Impact of Highway Capacity Reductions: an update of case study evidence and related research*. TSU working paper: 2001/25

CAIRNS S & OKAMURA K (2001a) *The effects of educating students about transport prices* Presentation to the Japanese National Research Institute of Police Science, Kashiwa, 26/1/2001.

CAIRNS S & OKAMURA K (2001b) *Costs and choices: the effects of educating students about transport prices*. TSU working paper 2001/10

CAIRNS, S (2001c) *Knowing if the Price is Right Town and Country Planning 70 (1)*, pp10-11

CAIRNS, S (2001d) *Why walking and urban green spaces are good for each other Town & Country Planning 70 (4)*, pp 102-103

CAIRNS, S (2001e) *Attracting tourists without cars Town & Country Planning 70 (10)*, pp 262-284

CAIRNS S, ATKINS, S and GOODWIN, PB (2001f) *Disappearing Traffic: the story so far*. TSU working paper 2001/26, due for publication in *Municipal Engineer*, March 2002, special issue 'Sustainable Transport Policy'.

CAIRNS S, DAVIS A, NEWSON C and SWIDERSKA C (2001h) *Travel Plan Best Practice: an examination of individual case studies plus companion volume Individual Travel Plan Case Studies*. Reports to the DTLR – two drafts of each, and final versions.

CAIRNS S (2001i) *The traffic impacts of home delivery services for groceries: empirical findings*. Presentation at conference "Electronic commerce (B2C) and its consequences for urban development and transportation", Stuttgart, 23/11/01.

CAIRNS, S (2002a) *Cutting traffic: Possibilities and opportunities Town & Country Planning 71 (2)* pp38-39

CAIRNS, S & Okamura K (2002b) *The effects of educating young adults about transport prices*. 22/2/2002, UCL CTS seminar, London.

CAIRNS, S (2002c) *Effective travel plans: experience from case studies*. Transport 2000 'Travel-to-work Toolkit' training day, 12/2/2002, Nottingham.

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- DARGAY, J & M HANLY (2001a), The demand for air travel in Great Britain, In *Procs of the 9th World Conference on Transport Research*. Seoul, Korea. July.
- DARGAY, J & M HANLY (2001b), The Determinants of the Demand for International Air Travel to and from the UK, 34th Annual Universities' Transport Study Group Conference, Edinburgh, 3-5 January, 2002.
- DARGAY, J & M HANLY (2001c), Modelling car ownership using the British household panel survey, paper presented the Symposium on Longitudinal data: collection and analysis issues, INRETS, France, 14 November 2001.
- DARGAY, J & M HANLY (2001d), Bus patronage in Great Britain: An Econometric Analysis, ESRC Transport Studies Unit, July.
- DARGAY, J, P GOODWIN & M HANLY (2001), Development of an Aggregated Transport Forecasting Model (ATFM), STAGE 1 - INTERIM REPORT, December.
- GOODWIN P B (2001a) Running to Stand Still?: An analysis of the 10 Year Plan for Transport, Council for the Protection of Rural England, London
- GOODWIN P B (2001b) The Nine-Year Plan for Transport: What Next? *Proc. Inst. Civ. Eng Transport 147*, pp239-244
- GOODWIN P B (2001c) El Libro Blanco de 1998 y sus problemas, in 'La Política Británica de Transporte' Ministerio de Fomento, Madrid (in Spanish in the press) Monzon (ed): La política británica de transportes, Jornadas sobre Políticas Nacionales de Transporte en la Unión Europea, Ministerio de Fomento, Madrid, Spain. ISBN 844980518X

- GOODWIN P B (2001d) A Third Way? *Railway Strategies*, Autumn, pp38-39
- GOODWIN P B (2001e) Urban Sprawl: Workshop Conclusions, ECMT, Paris
- GOODWIN P B (2001f) Traffic Reduction, chapter 3 in *Handbook of Transport Systems and Traffic Control*, ed KJ Button & D A Hensher, ISBN 0080435955, pp 21-32, Pergamon, Oxford
- GOODWIN P B (2001g) Achieving a sustainable transport system: presentation to Cabinet Office Performance Innovation Unit Seminar, November, <http://www.cabinet-office.gov.uk/innovation/2001/futures/0achieving.ppt>
- GOODWIN P B (2001h) What are the Arguments Really About? Commentary on the EC Transport White Paper. Proc. *Imprint Seminar*, Brussels, 21-22 November.
- GOODWIN P B (2002a) The limitations of transport policy: a comment, *Transport Reviews* (in the press)
- GOODWIN P B (2002b) The benefits of congestion pricing in London: overestimate or underestimate? *Transport for London*
- GOODWIN P B (2002c) Are fuel prices important? In: Lyons, G & K. Chatterjee (Eds) *Transport Lessons from the Fuel Tax Protests of 2000*. Ashgate, Aldershot.
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- GOODWIN P B & NOLAND R B (2001) Building New Roads Really Does Create Extra Traffic: a Response to Prakash et al. ULCTS Working Paper
- HANLY M, DARGAY J & GOODWIN P (2002) A Review of Income and Price Elasticities in the Demand for Road Traffic, Department of Transport, Local Government and the Regions
- PARKHURST, G (2001a), *Dedicated Bus-based Park and Ride Services and the Demand for Public Transport*. (TSU Ref 2001/5)
- PARKHURST, G (2001b), *Can Car-bus Interchange Policies Make a Contribution to Sustainability?* 13th TRICS Conference, London, November 2001. (TSU Ref 2001/23)
- PARKHURST, G (2001c), New Road Vehicle Technologies and Motoring Taxation: the Top of the Escalator? (TSU Ref 2001/2)
- PARKHURST, G (2001d), New sources of motoring taxation in an era of greater efficiency and traffic restraint. *Parking News*, September, 68-72.
- PARKHURST, G (2001e), *Road Transport Taxation in a Context of More Efficient Vehicles*. Paper presented to 34th Universities' Transport Studies Group Conference, Civic Centre Edinburgh, January 2002 (ESRC TSU report 2001/24)

PARKHURST, G (2002) The top of the escalator? In: Lyons, G & K. Chatterjee (Eds) *Transport Lessons from the Fuel Tax Protests of 2000*. Ashgate, Aldershot.

PARKHURST, G & J RICHARDSON (2002) Modal integration of bus and car in UK local transport policy: the case for Strategic Environmental Assessment. *Journal of Transport Geography* **10** (forthcoming).

APPENDIX 2
RELATED REPORTS AND PUBLICATIONS
(B) BY OTHER MEMBERS OF CTS

AHERN, A. (2001a) The complexity of modal choice, 9th World Conference on Transport Research, Seoul, Korea, July 2001.

AHERN, A. (2001b) Modal choices and new public transport, *Traffic Engineering and Control*, 42 (4), 108-114.

AHERN, A. (2001c) The potential impacts of new urban public transport, THINK UP (Framework V) workshop, Vienna, April 2001.

AHN, W-Y. (2002) "An application of a Kinematic car-following model to traffic-responsive signal control", UTSG 34th Annual Conference, Edinburgh, Vol.2, pp 64.1-64.13.

ALLSOP, R E (2001a) Brytyjska strategia poprawy bezpieczeństwa ruchu drogowego oraz cele na rok 2010 (British road safety strategy and targets for 2010). *Transport Miejski* 9, 2-8

ALLSOP, R E (2001b) Modelling the provision of transport with planned or market-determined public transport services. *Journal of Advanced Transportation* 35(2) 97-104.

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ALLSOP, R E (2001d) Rządowy program bezpieczeństwa ruchu w Wielkiej Brytanii na lata 2000-2010 (Government programme for road safety in Great Britain for 2000-2010). In *Research and Technical Papers: Proceedings No. 42*. Cracow: Association for Transportation Engineers in Cracow, 17-28.

ATKINS S & CAIRNS S (2001g) *Traffic Impact of Highway Capacity Reductions: an update of case study evidence and related research*. TSU working paper: 2001/25

BROWN I.E.W., N.A. TYLER (2001) Users' Responses to the Implementation of an Innovative Accessible Bus Service in a Remote Rural Area. Ninth International Conference on Mobility and Transport for Elderly and Disabled People, Warsaw, July.

CAIAFFA M.M., N.A. TYLER (2001) Evaluation of Changes to Bus Stop Design to Benefit Elderly and Disabled People. Ninth International Conference on Mobility and Transport for Elderly and Disabled People, Warsaw, July.

CAIAFFA M., N.A. TYLER (2001) Provisión de información en el ambiente de paraderos para omnibuses totalmente accesibles. II Simposio Internacional sobre Facilidades de Transporte y Tránsito para Personas Discapacitadas, La Habana, September.

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- COSTA, S. (2002) Urban road safety strategy: the Portuguese City of Almada. 34th Annual Conference UTSG, Napier University, Edinburgh, January 2002.
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- HEYDECKER, BG and WU, J (2001) Identification of road sites for accident remedial work by Bayesian statistical methods: an example of uncertain inference. *Advances in Engineering Software*, **32**(10-11), 859-69.
- HEYDECKER, BG (2001) Objective functions for dynamic traffic assignment. *Proceedings of the 6th Conference of the Hong Kong Society for Transportation Studies: Transportation Planning and Management in the 21st Century*, Hong Kong, 1 December 2001 (eds H-p Lo and A Zhang) City University of Hong Kong, 40-9, ISBN 962-442-198-6.
- JONES, G. D, M A HODGETTS, R E ALLSOP, N SUMPTER & M-A VICENCIO-SILVA (2001). A Novel Approach for Surveillance using Visual and Thermal Images. *Proc. DERA/IEE Workshop on Intelligent Sensor Processing, Birmingham, February 2001*.
- MACKETT, R. L. (2001a) Are we making our children car dependent? Lecture given at Trinity College Dublin, Ireland, 17 May 2001, available on the World Wide Web at <http://www.ucl.ac.uk/transport-studies/chcaruse.htm>.
- MACKETT, R. L. (2001b) The effects of increasing car use by children, Proceedings of the TRICS 2001 conference, held at The Britannia International Hotel, London, November 2001.
- MACKETT, R. L. (2001c) Reducing car use for short trips, 9th World Conference on Transport Research, Seoul, South Korea, July 2001.

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- MACKETT, R. L. (2001e) Measures to influence public transport use: light rail systems, contribution to the KonSULT Knowledgebase on Sustainable Land Use and Transport, Institute for Transport Studies, University of Leeds, accessible through the world wide web at http://www.env.leeds.ac.uk/its/public/level0/10_hom.htm.
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- TYLER N.A. (2001) Política británica de transportes: transporte público y accesibilidad, in Monzon (ed): *La política británica de transportes, Jornadas sobre Políticas Nacionales de Transporte en la Unión Europea*, Ministerio de Fomento, Madrid, Spain. ISBN 844980518X

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TYLER N.A., J.C. DEXTRE (2001) Accesibilidad para todos en el contexto peruano. II Simposio Internacional sobre Facilidades de Transporte y Tránsito para Personas Discapacitadas, La Habana, September.

VICENCIO-SILVA, M-A, R E ALLSOP & N A TYLER (2001) Empirical studies of the perception of key stakeholders. In PRISMATICA Deliverable 4: Report on requirements for project tools and processes. Brussels: CEC DG-TREN; 57-83

VICENCIO-SILVA, M-A (2001) Interview Outline. Annex 3 of PRISMATICA Deliverable 4: Report on requirements for project tools and processes. Brussels: CEC DG-TREN.

APPENDIX 3. OTHER INDICATORS

TSU (old definition) only

(A1-A5 and B6 listed in reports and publications above)

A6. Data sets:

Preparation of detailed qualitative/quantitative data base on UK travel plans (intended for web publication subject to Ministerial approval)

Data base on price and income elasticities for road traffic with support of DTLR

A7. Software: 0

A8. Audio-visual:

The TSU website <http://www.ucl.ac.uk/transport-studies/tsuhome.htm> was updated. A few full texts of suitable papers have been lodged on the site, and the number of visits continues to be greater than the readership which would be expected for many published papers in specialist journals.

INDICATOR GROUP B: EXTERNAL INTERRELATIONSHIPS

B1. Membership of Committees:

UK

Dover Harbour Board

EPSRC Built Environment College

Association of Metropolitan Authorities Academic Advisors Panel

PTRC, Methodological Innovations Committee

non-UK

Advisory activities for several governments, but on ad hoc basis rather than standing committees.

Editorial Boards

Journal of Transport Economics and Policy

Transportation

Transport Policy (founding editor)

Energy journal award panel

B2. Membership of networks:

Chartered Institute of Transport (now Institute of Logistics and Transportation)

Institution of Highways and Transportation

Universities' Transport Studies Group
International Association of Energy Economists
International Association of Travel Behaviour Research
World Conference on Transportation Research Society
EMITS (Consortium monitoring the effects of the implementation of the Oxford Transport Strategy)
Transport Visions network of young professionals
Transport Planning Society
Transport Economists Group
Sustainable cities aviation network (SCAN-UK)

B3. Overseas visitors:

Approximately 20 short-term visitors. (nb This does not include CTS visitors, much greater in number)

B5. Substantial advice and consultancy:

UK

DTLR: Road traffic elasticities literature review
DTLR: Aggregate transport forecasting model
Research methodology for road pricing
DTLR: Travel Plans good practice
University of Westminster: traffic impacts of home delivery (also with University of Stuttgart)

Non-UK

EU Rosetta Project
European Conference of Ministers of Transport
European Commission, transport and environment directorates
Australian transport agencies

B7. Media coverage: newspapers and journals

Once a week or so (more when there is a current transport news story) reporters telephone for advice, which may then appear in the form of a sentence or two in almost any of the serious newspapers. The transport trade and news press, especially *Local Transport Today*, probably has a mention or two about TSU in about half its issues. TCPA magazine column.

B8. Media coverage: Radio and TV (incomplete)

Some interviews on radio (4 and 5) and television, including a feature programme for New Zealand television.

B9. Seminars, Conferences and Workshops:

a) Organised by TSU:

Mark Hanly and Graham Parkhurst now responsible for organising the CTS seminar programme (ie both TSU and other CTS activities), with regular programme of meetings on transport theory and practice. Included Cairns and Okamura *The effects of educating young adults about transport prices. 22/2/2002,*

Organising a series of meetings with members from the Policy Studies Institute, Camden Council, London Cycling Campaign, Travellight consultancy and the Cycle Audit and Design Unit, in relation to cycling research.

Co-organisers (with Southampton University) seminar on *Transport Lessons from the Fuel Tax Protests of 2000*

Assisted organisation of events for SCAN-UK network mentioned above

b) Contributions to events organised by others:

14 papers to Seminars and conferences (listed above).

Cairns:

Presentation to the Japanese National Research Institute of Police Science, Kashiwa, 26/1/2001.

Presentation at conference “Electronic commerce (B2C) and its consequences for urban development and transportation”, Stuttgart, 23/11/01.

Transport 2000 ‘Travel-to-work Toolkit’ training day, 12/2/2002, Nottingham.

DTLR seminar, 11/4/2002, London.

Dargay:

9th World Conference on Transport Research. Seoul, Korea.

Seminars on Pseudo-panel analysis of car ownership and use at the University of Leeds and Kyoto University in Japan

IPPR seminar on Bus fares

Dargay and Hanly:

9th World Conference on Transport Research. Seoul, Korea. July.

34th Annual Universities’ Transport Study Group Conference, Edinburgh, 3-5 January, 2002.

Symposium on Longitudinal data: collection and analysis issues, INRETS, France, 14 November 2001.

Transport Economist Group on bus fare elasticities

Goodwin:

Annual Transport Planning Society Lecture, June

Cabinet Office Performance Innovation Unit, (the ‘Birt Seminar’) November,

Imprint Seminar, Brussels, November.
ESRC Conference on evidence-based policy
Other guest lectures for various organisations in UK, Netherlands, Australia, New Zealand, Spain, Belgium, France.

Parkhurst:

13th TRICS Conference, London, November 2001. (TSU Ref 2001/23)
34th Universities' Transport Studies Group Conference, Civic Centre Edinburgh, January 2002 (ESRC TSU report 2001/24)

B10. International Collaborative Research Projects participated in by Centre:

International transport and energy modelling, with Dermot Gately (New York University, USA)

Analysis of longitudinal data for transport, with Jean-Loup Madre (INRETS, France)

Public transport demand in France and the UK, with Jean-Loup Madre (INRETS), Georges Bresson (University of Paris II), M. Boulahbal (VIA-GTI), and A. Pirotte (University Lyon II)

Travel patterns and urban form: comparisons of UK and USA, with Genevieve Giuliano (University of Southern California)

Pseudo-panel methodology, with Rob Eisinga (University of Nijmegen, NL)

'Imprint' project, led by University of Leeds for EC

Young adults' perceptions of transport costs, with Kazuko Okamura and other members of the Traffic Safety Section, National Research Institute of Police Science, Japan.

INDICATOR GROUP D: STAFF RESOURCES

D5. Staff development:

Aziz: courses on SPSS and statistical methods

Cairns: Participation in 3 day training course on Access97, in connection with 'Travel Plans' research.

Hanly: extension to IT skills.

Hanly, Parkhurst: responsibility for seminar organisation in CTS

Parkhurst: extension to IT skills with responsibility for TSU website.