Final Report for Publication

Project STIMULUS

Contract No. RO-97-SC 2161

Project
Co-ordinator: **Interactions Ltd (INTR)** **(IRL)**

Partners:

Gestionnaires Sans Frontieres (GSF) **(RO)**
FIT Consulting Srl (FIT) **(IT)**
Solutions Research A.S. (SOLU) **(NO)**
Transport and Travel Research Ltd (TTR) **(GB)**

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Partnership

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b) Associated Contractors

Associate Contractor	**Organisation**	**Attached to Contractor**		
1. Ms Marian Wilson	**Dublin Transportation Office**	**INTR**	**DTO**	**IE**
2. Professor Finn Tschudi	**University of Oslo / Tschudi System Sales**	**SOLU**	**TSS**	**NOR**
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c) Main Sub-Contractors

Sub-Contractor	**Organisation**	**Attached to Contractor**		
1.	**Bristol City Council**	**TTR**	**BCC**	**GB**

Executive Summary

Background

The STIMULUS project was designed against a background of growing realisation that conventional ways of thinking about and categorising road users might not reflect the reality of market segmentation. For instance is a car driver psychologically different from a public transport user? Are their communications needs and styles the same or different? Do campaigns directed towards behaviour change fail because differences between user types are not recognised, or more likely are supposed differences manufactured for the convenience of advertisers? The project was designed to answer these questions and also sought to detect naturally occurring attitudinal clusters in society.

A secondary objective was the development of research methods and software for analysis that could be extended for use in other and future road transport projects and even other areas of research.

The project has been successful in all areas, new market segments have been detected, attitudinal profiles defined and an analytical software tool developed. Some transport companies have taken delivery of the software and database and have commencing training and familiarisation.

Standardised data acquisition

A hallmark of the STIMULUS project is the rigorous standardisation of research procedures across all sites. These standards were applied in each of the research areas:

?? Survey of city and environmental variables
?? Demographic variables
?? Lifestyle descriptors
?? Attitudes towards transport modes
?? Issues of importance
?? Attitudes towards Management measures
?? Relevance of management measures
?? Attitudes towards Stereotypes of people and issues of importance
?? Information needs and Media usage

Standardisation of approach was agreed by the partners in consortium meetings as was content and structure of questionnaires. These planning sessions were particularly important in highlighting and demonstrating different approaches to research and participation in research in different cultures. The differences in perceptions about proposed content of the research also helped to demonstrate cultural differences and promote designs to overcome them.

In order to make valid comparisons between sites standard methodologies were developed for acquisition of environmental, qualitative and quantitative data. Hence the same research was carried out to the same standard in each test site.

Survey of city and environmental variables

The sites chosen for the STIMULUS project were selected to reflect different city size, climate and topography and varying national or local urban transport and planning policies. The study includes two regional capitals with conurbation populations of over one million (Liverpool, UK and Turin, Italy), three national capital cities varying in size from less than one to over two million (Oslo, Norway; Dublin, Irish Republic; Bucharest, Romania), and a relatively geographically independent regional capital which is home to half a million inhabitants (Bristol, UK). Surveys were conducted to enable the social, political and physical environments of these sites to be compared.

A standard questionnaire form was sent by the partners to the most appropriate official(s) at their city.

Demographic variables & Lifestyle descriptors

Demographic variables and lifestyle descriptors were gleaned from three sources:

Partners' experience in other transport projects
Partners' experience in non-transport studies
The specifications in the Technical Annex.

Identification of criteria for questionnaire attitudinal scales

Items and topics for inclusion in the questionnaire were initially informed by the returns from the policy-maker and Partners' experiences. Additional input was also provided by transport operators and interested authorities in participating cities.

In order to turn these items and topics into meaningful questions for members of the public a qualitative research approach was specified. The conceptual and methodological framework of Personal Construct Psychology (PCP) was used for all qualitative and quantitative attitudinal data gathering. The key features of PCP that led to this choice were:

?? Non-directive and non-contaminating research methods
?? Seamless interface between qualitative data and quantitative assessment
?? Overarching philosophy, theory and integrated diagnostic tools.

Qualitative interviews with road transport users were carried out at all sites. The data gathered from these interviews were collated into a database using an Excel spreadsheet. The items on

this spreadsheet could be used in other questionnaires and projects.

Questionnaire design

Questionnaire design was carried out by the members of the consortium working together in workshop formats in Bucharest, Oslo and Dublin. With only a small number of site-specific variations a standard format was developed allowing comparisons to be drawn between sites.

Questionnaires were administered in 'hall test' environments using quotas to ensure a cross section of the population (in Dublin, Belfast, Bristol, Merseyside, Turin and Bucharest. In Oslo the questionnaires were completed by respondents at home – a larger sample being gathered to ensure a cross section of the public.

Sample sizes were as follows:

Location	Sample size	Proportion of overall sample
Dublin	233	12.8
Belfast	188	10.3
Bristol	250	13.7
Merseyside	231	12.7
Oslo	446	24.4
Turin	238	13
Bucharest	240	13.1
Total	1826	

Software development

A number of software options were reviewed. The key requirements were:

?? Open and capable of being upgraded/extended
?? Resilient to missing / dirty data
?? Data format compatible with standard Microsoft programs
?? Output compatible with standard Microsoft programs
?? Ability to handle qualitative and quantitative variables in very large 2 dimensional matrices
?? Usual range of conventional statistics and cross-tabulations
?? Ability to categorise data using naturally occurring patterns.

The following programs were evaluated formally and informally; SPSS, SPSS Chaid, Sphinx, Surveycraft, ESPRI and SPAD-N. Although all are good programs, none of them met all the above requirements.

Two core program groups 'GPR' written by John Porter and MULTIGRID by Finn Tschudi were evaluated and as a result of the findings further developed into an integrated STIMULUS package that meets all requirements.

User Manual

A comprehensive User Manual describing all aspects of the research process and software use has been produced.

Types of analysis

The STIMULUS computer package segments data in four ways:

?? Demographics and Lifestyle
?? Attitudes towards 'elements' such as modes of transport, 'management measures' and 'transport users'.
?? Importance or relevance of issues, measures, media and personal qualities
?? Psychographic segmentation of attitudinal data sets; modes, management measures and people.

Results of analyses

The acceptance and rejection of road transport policies at the European level and at each site was assessed. The needs, concerns and attitudes of conventional market segments were defined. These segments, such as car users and public transport users, are traditionally regarded as different target audiences with differing preferences and requiring different communication and marketing campaigns. The results of the survey showed, however, that very few differences exist between these groups.

The software was used to segment the sample according to psychological make-up rather than pre-determined demographic, behavioural or attitudinal variables. This method of segmentation involving the generation of natural groupings of people revealed more differences between the segments than conventional segmentation. These naturally occurring groups within the population have different psychological structures from each other, hence their outlook on the world is different thus requiring different methods of communication.

The management measures most likely to be acceptable to respondents throughout the participating cities is the use of speed cameras, bus lanes and restrictions on freight delivery times. The least popular measure is parking pricing. Congestion and air pollution seem to be recognised as the most obvious problems related to transport. In general, the results showed that the car remains the most attractive mode although the train is a clear second option. Car users seem to be much more in favour of their mode over bus transport than public transport users. Evidence suggests that bus transport needs to offer more of the service attributes (speed, comfort, ease of use, freedom, flexibility) required by customers in order to become more attractive and influence a modal shift.

The results also show that while on some occasions people in all cities can be treated as if they were similar in their thinking this is not always so. Differences (often unexpected) can

occur and have important implications for the planning process.

Applications of the STIMULUS system

The data set associated with this project was derived broadly within the traffic and transport arena. The research methodology and software on the other hand are suitable for use in any area where there is a service or product interface with users. This can even extend to internal relationship within organisations. Stimulus-type methodologies have been used extensively in Public Transport in Dublin to define service quality and develop brands. In the same city a completely new brand and style of Banking Service has been developed and launched using the same methodology. New market segments have been identified, their needs determined and appropriate brand image and communications devised.

'Products' offered by the STIMULUS Consortium and other dissemination activities

?? Training in research methods, analyses and interpretation
?? Software analytical package
?? File preparation
?? Consultancy in research design and interpretation
?? Research project design, execution and management
?? Conferences and presentations.

Future development

The members of the Consortium have committed themselves to working together to improve the product, gain greater user acceptance and expand the user base. Specific areas of activity will include:

?? Development of graphical interface for software
?? Increase the speed of the software
?? Development of more intelligent analytical routines requiring less human intervention
?? Direct production of clear graphical output
?? Syndication of projects with groups of clients
?? Expansion to other product and service arenas.

Objectives of the Project

1.1. To classify particular types of road transport users, representing special market segments according to conventional demographics and user type specifications in the various countries. (Conventional classifications)

For example: Pedestrians, Cyclists, Elderly, Disabled, Bus users, Car users; Residents of a certain area; Social Class, Age

1.2. To identify the interests, attitudes/motivators and behaviours of these groups towards communication of transport information and transport management measures, the implications of mobility restriction and attitudes / understanding of environmental and external costs.

Measures to include:

Road pricing and other demand management
Variable message signs (VMS) and other media for journey routing, parking etc.
Pollution and congestion
Public transport - delivery mechanisms for information

1.3. To identify new categories of user according to underlying psychological processes and cross tabulate these with known demographic and user types.

1.4. To identify the interests, attitudes/motivators and behaviours of these newly defined cross-category groups towards traffic and traffic management measures, the implications of mobility restriction and attitudes / understanding of environmental and external costs.

(Measures as described above.)

1.5. To enable information systems, polices and strategies to be assessed for their level of acceptance or rejection by different user groups according to both methods of classification.

1.6. To enable information systems, polices and strategies to be assessed for the reasons for their acceptance or rejection by different user groups according to those groups' perceptions of the social and environmental 'cost' of transport (pollution, infrastructure, etc.).

1.7. To assess the attributes of information delivery systems according to conventional and revealed market segments:

Better travel (convenience, quality of life etc.)
Safer travel
Travel planning
Transparency and user-friendliness of systems.

1.8. To make the results relevant and accessible to decision makers at all levels (e.g. European, National, local). (See also dissemination.) It is anticipated that in time this could contribute towards:

Co-ordination of research efforts and promotion of research
Achievement of greater value from standard approaches
Development of more efficient and effective information systems
Better planning of infrastructure
Easier implementation / exploitation of Road Transport Development Projects.

Means used to achieve the Objectives

Objective 1.1

> *To classify particular types of users, representing special market segments according to conventional demographics and user type specifications in the various countries.*

The main task of workpackage 2 was to identify and classify the conventional demographics and user types used in transport research. Previous research projects were investigated and all of the variables used were collated. These variables are listed below in the same format as they appear in the software codebook.

Objective 1.2, 1.3, 1.4

> *To identify the interests, attitudes/motivators and behaviours of these groups towards communication of transport information and transport management measures, the implications of mobility restriction and attitudes / understanding of environmental and external costs.*
>
> *To identify new categories of user according to underlying psychological processes and cross tabulate these with known demographic and user types.*
>
> *To identify the interests, attitudes/motivators and behaviours of these newly defined cross-category groups towards traffic and traffic management measures, the implications of mobility restriction and attitudes / understanding of environmental and external costs.*

These objectives required a number of research stages:

- ?? Definition of topic areas, e.g. modes of transport, issues of importance.
- ?? Definition of elements within topic areas, e.g. bus, train, car.
- ?? Qualitative research – interviews with users to determine specific attitudinal scales or constructs, e.g. fast-slow, flexible-rigid.
- ?? Questionnaire design
- ?? Large scale quantitative research to measure actual perceptions and psychological priorities.

Analyses of the data revealed the attitudes and behaviours of the groups as defined by conventional classifications, e.g., location, car users or public transport users.

Further analyses uncovered the underlying psychological processes of the respondents and allowed them to be grouped according to new classifications. The attitudes and behaviours of these new groups were then determined.

Objective 1.5

> *To enable information systems, polices and strategies to be assessed for their level of*

acceptance or rejection by different user groups according to both methods of classification.

Analyses of the data revealed the acceptance or rejection of different policies/strategies for the whole sample, for each site, according to conventional classifications and according to the new user groups identified. Likewise the program allows any communications medium to be tested for usefulness / acceptability against any desired segment. Communications style and content can be synthesised from analyses of the issues of concern, policy acceptance and relevance and personal characteristics sections of the data base.

Objective 1.6

To enable information systems, polices and strategies to be assessed for the reasons for their acceptance or rejection by different user groups according to those groups' perceptions of the social and environmental 'cost' of transport (pollution, infrastructure, etc.).

The reasons for acceptance or rejection were identified by segmenting the sample on the attitudinal basis of acceptance or rejection. Psychographic segmentation also proved valuable in defining reasons for acceptance / rejection and revealed dimensions that were not previously anticipated or identifiable in any other way. Attitudes towards certain social and environmental issues, e.g. pollution, were investigated and correlated with acceptance of strategies / management measures.

Objective 1.7

To assess the attributes of information delivery systems according to conventional and revealed market segments:

User needs for travel information were incorporated into the questionnaire and assessed during the quantitative survey. These data can be analysed using the conventional analyses part of the program.

Objective 1.8

To make the results relevant and accessible to decision makers at all levels (e.g. European, National, local). (See also dissemination.) It is anticipated that in time this could contribute towards:

Co-ordination of research efforts and promotion of research
Achievement of greater value from standard approaches
Development of more efficient and effective information systems
Better planning of infrastructure
Easier implementation / exploitation of Road Transport Development Projects.

Achievement of these objectives is in progress via. the following processes:

(See the dissemination plan for full details.)

- ?? Brochure(s) (In draft form)
- ?? Conferences and presentations **held** –
  POLIS (Bucharest 1998), International academic group (University of Stuttgart August 1999), Launch conference (Rome September 1999) Market research seminar (Bucharest, September 1999) Transport operators local authorities and road authorities (Oslo November 1999), User training (London, November 1999), Romanian Transport Forum (Bucharest, November 1999)
  Planned -
  Conferences for Potential users (Dublin and Belfast December 1999)
  (UK early 2,000)
  Transport conference (Trondheim January 2000)
  European Personal Construct Conference (Malta April 2000)
- ?? Transport operator syndicates – being formed in Ireland and Italy
- ?? Transport operator using software and data base (Dublin)
- ?? Proposal for a full investigation of the data base and report on the Norwegian results submitted to the Norwegian Roads Authority.

Scientific and Technical Description of the Project

Overview

The specific deliverable components and *products for future use* are:

?? Review of city transport environments
Questionnaires and framework for general use
?? Qualitative database of items in the language of users
Database of items for future use
Standard interview methodology
Standard recording instruments
?? Repertory grid questionnaire
Framework for future questionnaire design
?? Quantitative data base for ongoing investigations
?? Computer programs for
a) market segmentation according to
Demographic descriptors, lifestyle and behaviour
Attitudes
Importance and relevance of issues
Naturally occurring psychographic segments
b) General descriptive statistics analyses
?? Results for all participating cities and the whole sample
Information for planners

Site comparisons

Background statistical and descriptive information was collected using two short questionnaires. The purpose of these surveys was to ascertain key demographic, social and economic trends specific to each site as well as more detailed information on the transport problems and policy objectives being pursued in each case. The questions contained both pure factual and descriptive information regarding transport provision and demand in each city, and more subjective questions regarding the nature of transport problems, political acceptance of various policies and constraints on their implementation. These were completed by city transport professionals representing the views of the politicians and decision makers in each case study site. The latest city-wide transport plans were also referred to in this phase of the project. The questionnaires consisted of:

1. City Variables : demographic and socio-economic information; the existing transport environment; problems and issues in each site; the degree of support for various policy initiatives
2. Constraints : a short survey requesting political representatives to indicate the degree to which a list of factors contributed to the adoption or non adoption of a list of policies
3. Acceptance - a short survey requesting political representatives to indicate the degree to

which each policy area was believed to be politically acceptable in the city.

The characteristics and policy directions are summarised below along with an account of the similarities and differences between each project site. To a varying degree, each site represents the focus of commercial, industrial and cultural functions within its wider regional or national context. In each case, the regional or national industrial significance of each site has caused it to be particularly sensitive to economic fluctuations and this is reflected in the current urban land use and transport planning contexts.

Both Liverpool and Turin exhibit similar characteristics of marked economic restructuring away from heavy industry towards more high tech service industries. In both cases this process has resulted in high levels of unemployment and diminishing and ageing populations. As a result, physical urban planning policy in each of the two cities is heavily focused around urban regeneration objectives as well as environmental improvement in order to regain some competitive advantage. This policy climate has resulted in transport policy in these cities being more conservative in terms of the willingness to explicitly restrict car use than may be the case in the other case study sites. However, this in itself has not necessarily precluded significant progress towards improving the public transport networks in the sites, particularly in the case of Liverpool.

Bristol and Oslo on the other hand are both enjoying buoyant economies, although Bristol still experiences relatively high unemployment levels. Whilst both sites also reflect national trends of declining industrial capacity, both have been more successful in diversifying their respective economies. This appears to have resulted in policies more inclined towards stricter designation of new development to specified city locations. Such policies are aimed at containing the cities physical growth and beginning to attempt to minimise the need to travel within the cities. In addition, these more 'wealthy' cities may tap into the private economy in each city in order to make infrastructure improvements whether in the form of commuted payments in Bristol or the possible financing of a new arterial road in Oslo.

Bucharest is suffering the most from the effects of economic restructuring due to its transition from a communist to market oriented economy. The effects of the restructuring are exacerbated by less potential for public or private financial backing of any infrastructure improvements than any of the other case study sites. This is leading to a comparatively ad hoc set of policies which concentrate on public transport whilst attempting to introduce basic traffic management measures. Social factors as well as the inability to find investment for capital expenditure on road investment justify the emphasis on public transport improvement.

Bucharest stands apart from the other case study sites due to its particular economic and cultural circumstances. Particularly relevant is the fierce release of latent demand for car ownership and use combined with increasingly dispersed patterns of settlement and movement. These trends are taking place within a planning context which has so far this decade been absent of any strategic planning framework. However, Bucharest shares with the other case study sites its desire to improve the environmental quality of the city and utilises many of the same policy tools to achieve this end.

Existing Transport Environment

The two British sites operate an almost exclusively bus orientated public transport network. In these two cities, these operations are also almost entirely privately operated. The Dublin transport network is also mainly bus based, but operated in this case by the State. Whilst bus use is central to each of the case study city's public transport networks, each of the three continental cities operate tram services in addition. Bucharest and Oslo supplement these systems further with metro operations, Bucharest even further with trolley buses. Park and Ride (P&R) is well established in the two British cities and has been extensively planned for Dublin. However, none of the other sites appear to have so far developed P&R as a significant part of its wider transport strategy. In addition, the three historical port cities, Bristol, Liverpool and Oslo have limited ferry capacity. No case study city has a significant network of suburban railway lines, with Oslo being the possible exception to this. Dublin and Bristol must be noted for their plans to develop a light rail network. All of these passenger transport services involve a mix of public and private operations as can be seen in the following table:

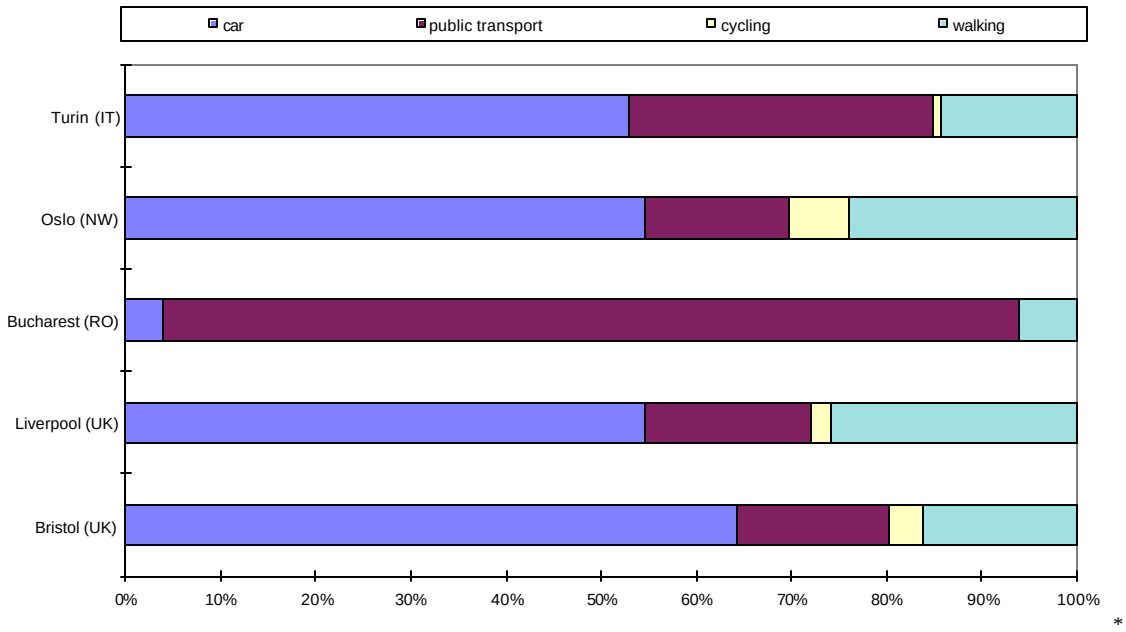
Transport Provision	Liverpool (UK)	Bristol (UK)	Bucharest (RO)	Oslo (NO)	Turin (IT)	Dublin (IRL)
bus	Private	Private	City	City / Private	City / Private	State
train	Private	Private	State	State	City	State
tram	—	—	City	City	City	---
metro	—	—	State	City	—	---
trolley bus	—	—	City	---	—	---
ferry	—	Private	—	City	—	---
private hire cars	Private	—	Private	Private	—	Private
taxi	City	Private	Private	Private	Private	Private

Each site lies at key nodes in their respective regional road and rail network and therefore have to deal with substantial volumes of through traffic. Each urban area is largely structured around a radial network with opportunity to move between the radials limited in almost all cases, Turin being the slight exception. So far, none of the sites contain roads operated privately although Oslo does charge at the point of use for use of a ring of toll booths surrounding the city centre so that vehicles may not pass into the city area without paying. In this case, this road pricing restraint policy is supplemented by extensive pedestrianisation of the centre streets.

Travel Demand and Patterns

The proportion of journeys made by car is relatively similar in all sites with the notable and perhaps obvious exception of Bucharest. Despite huge increases in car ownership in Bucharest since 1990 and an ageing public transport infrastructure, the culture of public transport use prevails. The two UK sites present another interesting comparison. Although the proportion of trips by car differs by less than 10% between the two sites, these two locations represent two ends of the spectrum as far as car ownership and use is concerned in the UK: Bristol exhibits some of the highest rates of car use in the country whilst Liverpool's population is relatively dependent on passenger transport.

In addition, despite its car culture, Turin residents use public transport more often than their other western European counterparts in this study. Cycling in this city, however, is very low although not as low as Bucharest where it is almost non existent. Liverpool and Oslo display the highest rates of pedestrian movements. All these patterns are best illustrated in the graph below which compares the modal split in each site.



** Bristol - work journeys only
Liverpool - all journeys in the Merseyside area
Bucharest - work journeys only
Oslo - all journeys in the city region
Turin - not known

In the case of Dublin, figures were only available for motorised modes. The situation in this city is as follows:

Private Car	69.5%
Bus	22.0%
Rail	8.5%

Policy Influences in each site

There are some variations in the degree to which national and local governments and other stakeholders in the transport process have an influence on policy making in the sites.

The following table reveals that national government is considered to be very influential in all the cities although Turin appears to have the weakest national and greatest local government input into policy making and Oslo the opposite of this. Transport operators have the greatest power in Bucharest and apparently more in UK cities than on the continent. All types of lobby groups are relatively powerful in Turin but rather weak in all the others apart from perhaps Dublin, Bristol and Oslo where environmental and economic groups have some hold over

policy making. The European Union has greatest involvement in Dublin and the UK cities.

Influence over policy making in the sites

	Liverpool	Bristol	Bucharest	Oslo	Turin	Dublin
National Government	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝ ✝
Local Government	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝
Bus Companies	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝
Railway Companies	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝	✝ ✝	✝ ✝ ✝
Tram Companies	N/A	N/A	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝	N/A
Police	✝	✝ ✝	✝ ✝ ✝	✝ ✝	✝ ✝	✝ ✝ ✝
Social Lobby Groups	✝ ✝	✝ ✝	✝ ✝	✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝
Economic Lobby Groups	✝ ✝	✝ ✝ ✝	✝	✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝
Environmental Lobby Groups	✝	✝ ✝ ✝	✝ ✝	✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝
European Union	✝ ✝ ✝	✝ ✝ ✝	✝ ✝	✝ ✝ ✝	✝ ✝	✝ ✝ ✝ ✝

✝ ✝ ✝ ✝ ✝ total influence
✝ ✝ ✝ ✝ a lot of influence
✝ ✝ ✝ some influence
✝ ✝ a little influence
✝ none at all

Transport Problems, Issues and Policy Objectives

Although the sites reflect different size, geography and national or state policies, the overall diagnosis of the transport situation is similar in most cases - additional numbers of cars cannot be accommodated in city streets without major physical restructuring or a deterioration in the urban environment. However, the extent to which car restraint policies are pursued and the degree to which environmental or economic issues have influenced policy formation, varies from site to site. However, it is noticeable that the 'problem' is by no means framed exclusively in terms of congestion. Instead, environmental concerns are beginning to feature strongly. The environment features both in terms of air quality and noise pollution and in terms of a desire to maintain and enhance the attractiveness of city centre as a point of cultural and economic life and for competitive reasons. Improving traffic safety is also a priority. The degree to which these issues are regarded by the transport professionals as problematic can be seen in the following table:

Transport Problems in each city

	Bristol (UK)	Liverpool (UK)	Bucharest (RO)	Oslo (NOR)	Turin (IT)	Dublin (IR)
Peak-time congestion	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝
Lack of parking	✝ ✝	✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝
Traffic noise pollution	✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝

Road safety	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝
Air pollution	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝
Lack of integration of PT Network	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝
Carrying capacity of Public Transport	✝ ✝	✝	✝ ✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝
Carrying capacity of roads	✝ ✝ ✝ ✝	✝	✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝
Reliability of Public Transport	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝ ✝
Cost of Public Transport	✝ ✝ ✝ ✝	✝ ✝ ✝ ✝	✝ ✝	✝ ✝ ✝ ✝	✝ ✝ ✝	✝ ✝ ✝

✝ ✝ ✝ ✝ ✝	major problem
✝ ✝ ✝ ✝	problem
✝ ✝ ✝	neutral
✝ ✝	slight problem
✝	not a problem

Consistent with the above indication that car use is less of a problem in Liverpool, congestion and the carrying capacity of roads is cited as slightly less of a problem here. More generally, however growing public and political concerns about traffic related problems, particularly in relation to air quality and the environment, are combined in all cities with a shortage of funds for transport to result in pressures for change. As a result, each site is undergoing a policy reassessment. Oslo is currently waiting for approval of a new city wide transport plan. Bucharest, however, has been operating in a virtual planning vacuum since 1990 but expects to see approval of a General Urban Plan and a Transport Master Plan by the end of 1999.

Despite the different levels of progress with transport plans, a number of common policies are evident between sites. The major transport policy elements are reviewed under the following general headings:

Public Transport

Existing / planned public transport measures in each city

	Bristol (UK)	Liverpool (UK)	Bucharest (RO)	Oslo (NOR)	Turin (IT)	Dublin (IR)
bus lanes / priority bus routes	✝	✝	✝	✝	✝	✝
Park and Ride	✝	✝	✝	✝	✍?	✍?
tax concessions for PT users	✝	✝	✝	✝	✝	✍?
tax concessions for PT providers	✝	✝	✝	✝	✝	✝
integrated public transport ticketing	✝	✝	✍?	✝	✝	✍?

✝ = exists ✍? = under consideration ✝ = not for consideration

Public transport provision is generally viewed as the cornerstone of urban transport policies in each of the case study cities.

- ?? public transport priority - in all cases the ease of access of public transport facilities is being improved and given a high priority in investment spending. This includes bus lanes, segregated tram routes and roads and priority signalling. All cities have some reserved lanes for their bus or tram systems but so far these have not resulted in taking away substantial capacity from the car.
- ?? expanding the network - overall the density of the transport networks are remaining fairly constant in each location although service qualities are improving. However, in Bucharest there is a conscious policy to maintain density of the network, particularly of buses. Other notable exceptions include the planned development in Bristol and Dublin of a light rail system, and new suburban railway stations planned for Liverpool and Bristol as well as a new rail line linking Oslo with its new airport.
- ?? integrated ticketing – Dublin and Bucharest are so far the only cities without integrated tariffs and ticketing. However, in both cases this has been given a high priority for development, in Bucharest's case in conjunction with the development of a region wide transport authority. Liverpool and Turin have already set up organisations to provide integrated passenger transport throughout the city region
- ?? efficiency improvements although particularly prevalent in the Bucharest context, there is a marked move in all cities towards greater efficiency of public transport operations. Efficiency improvements appear to go hand in hand with the purchasing of upgraded vehicles and supporting infrastructure - most notable is Bristol where environmentally friendly fuelled vehicles are also being introduced.
- ?? Park and Ride - there seems to be some divergence in the priority given to this policy. Again the UK cities are similar to each other in their emphasis on this although Bristol's P&R system has been established far longer than Liverpool's. Dublin is planning 9 facilities as a central part of its city wide transport plan. Bucharest seems to have ruled out the development of any P&R and Turin has no capacity so far. P&R, therefore, does not consistently feature as a key element in an overall transport strategy in all of the cities.
- ?? travel concessions - the following table reveals which sectors of the population are entitled to free or discounted travel in each city:

Travel Concessions

	Students	Disabled	OAPs	Public Transport Employees
Liverpool	some	free	free	free
Bristol	none	some	some	free
Bucharest	free	free	free	free
Oslo	none	some	some	some
Turin	some	some	free	free
Dublin	some	free	free	Free

Roads and Traffic Management

Existing / planned road and traffic management measures in each site

	Bristol (UK)	Liverpool (UK)	Bucharest (RO)	Oslo (NOR)	Turin (IT)	Dublin (IR)
one-way systems	†	†	†	†	†	†

traffic calming	†	†	✍?	✍?	†	†
traffic free residential zones	†	✍?	†	†	✍?	✍?
Real Time Information						
parking information systems (VMS)	†	†	✍?	†	†	†
VMS advanced warning of congestion	†	†	†	†	†	✍?
in-vehicle route guidance	†	†	†	✍?	†	†

† = exists ✍? = under consideration † = not for consideration

?? new road building - the sites most positive about new road construction are Dublin and Oslo. Dublin has plans to significantly improve its surrounding trunk road network and in Oslo a new arterial route is being considered for development albeit with private financial contribution and possible associated road pricing. The possibility of this latter proposal being accepted, however, is far from certain as it is only certain interest groups, namely suburban politicians and planners in some local planning areas and private industry, that are pushing for the road. Liverpool advocates 'selective' improvements in road infrastructure in accordance with its emphasis on economic regeneration and Turin also encourages road building where it is linked with public transport policies such as bus lanes. There is no sign of significant road construction in Bucharest despite sharp increases in car use, although this may be more the result of financial constraints than any explicit policy to suppress road capacity. Therefore, the city with the strongest stance against road building is Bristol where no new major radial road construction is planned. However, improvements to its main orbital roads are still seen as necessary.

?? traffic calming - with the exception of Turin and Oslo, traffic calming measures are well established in the other western European cities, particularly in residential areas. Traffic calming is under consideration in Bucharest and Oslo.

?? route guidance systems a number of cities are experimenting with the use of technology to improve transport system performance. All except Bucharest use systems designed to improve traffic flow by using Variable Message Signs (VMS) in order to optimise the use of the urban transport network. This route guidance is supplemented by parking guidance in these three sites as well as in Dublin. However, Oslo is the only site considering introducing in-vehicle route guidance.

Parking

Existing / planned parking measures	Bristol (UK)	Liverpool (UK)	Bucharest (RO)	Oslo (NW)	Turin (IT)	|Dublin (IR)
variable parking pricing	†	†	✍?	✍?	✍?	✍?
on street parking restriction	†	†	†	†	†	†
off street parking restriction	†	†	†	†	†	✍?
controlled parking zones	†	✍?	†	†	†	†

† = exists ✍? = under consideration † = not for consideration

?? city centre parking - in most sites parking policy appear to be viewed as a key element of urban transport policy, most using it as the best available politically acceptable means of restricting car use in the city centre. As a result, most sites have now stabilised their provision of public parking in the city centre. However, Liverpool and Bristol have felt it

necessary to increase capacity for short term shopping and visitor parking, reflecting the competition experienced in each city form out of town retail developments. Oslo is using price as the main restrain mechanism. Bucharest, however, is taking a tough stance on central parking and is targeting illegal roadside parking in order to improve the environment of the area, whilst at the same time refusing to increasing off road city centre parking capacity. Dublin is introducing environmental parking 'cells' within its centre. As part of the effort to generate / regulate the city some aspects of off-peak car use are encouraged by cheap parking.

?? residential parking - Bucharest is increasing capacity in residential areas. This contrasts to the UK cities where residential parking schemes are being slowly introduced although are not yet a major policy tool

?? private non residential parking restraints are not yet in effect in any of the sites

Walking and Cycling

Existing / planned walking / cycling strategies in each site

	Bristol (UK)	Liverpool (UK)	Bucharest (RO)	Oslo (NW)	Turin (IT)	Dublin (IR)
cycle ways	✝	✝	✍?	✝	✍?	✍?
pedestrianisation	✝	✝	✍?	✝	✝	✝

✝ = exists ✍? = under consideration ✝ = not for consideration

?? walking - there is a growing awareness in most sites of the importance of walking, but actual policies to achieve this are unclear. They appear to rely on reducing obstacles in the pedestrian environment and raising awareness of environmentally friendly modes of transport. Once again, Bristol is particularly proactive with the latter type of initiatives. Oslo is introducing pedestrianised streets to some of its suburban centres

?? cycling – cycle networks are so far only established in the two British sites and Oslo. However, where they do not currently exist they are under consideration.

Land Use Planning

Bucharest admits to experiencing little co-ordination of land use and transport policies, Turin, Dublin and Liverpool exhibit 'some' co-ordination whilst Oslo and Bristol are beginning to integrate them in a relatively comprehensive way. In its policy documents, Bristol is the only of the case study sites that makes any significant reference to the need to reduce necessary journeys. New developments in both Bristol and Liverpool are to be cited where they can best be served by existing public transport infrastructure. In Bucharest, despite the current lack of a general urban plan, their are plans to develop public transport interchanges. However, trends towards dispersal of land use activity are problematic for the city. In Oslo, city containment has been a long standing and relatively successful urban policy.

The acceptance of Transport Policies by Politicians

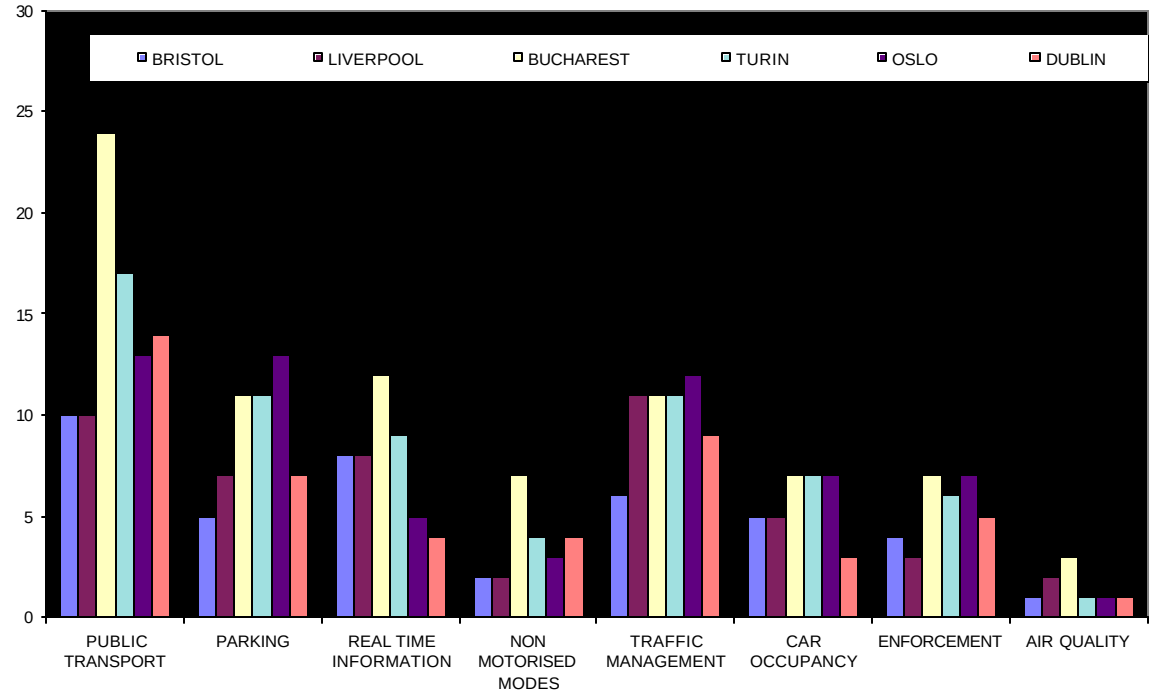
Representatives of political decision makers in each city were asked to complete a table indicating the degree to which each policy was accepted. The results of this survey are shown in the following table.

		DEGREE OF ACCEPTABILITY BY POLITICIANS HIGHLY ACCEPTABLE → TOTALLY UNACCEPTABLE				
1	Tolls / other road pricing		? ? BRISTOL	? ? OSLO ? ? L'POOL	? ? TURIN ? ? DUBLIN	? ? B'REST
	Bus lanes / priority bus routes	? ? BRISTOL ? ? L'POOL	? ? B'REST ? ? OSLO ? ? TURIN ? ? DUBLIN			
	Park and Ride	? ? OSLO ? ? DUBLIN ? ? L'POOL	? ? BRISTOL ? ? TURIN		? ? B'REST	
	Tax concessions for PT users	? ? BRISTOL ? ? L'POOL		? ? OSLO ? ? DUBLIN	? ? TURIN	? ? B'REST
	Tax concessions for PT providers			? ? BRISTOL ? ? OSLO ? ? DUBLIN ? ? L'POOL	? ? TURIN	? ? B'REST
	Integrated public transport ticketing	? ? BRISTOL ? ? OSLO ? ? TURIN ? ? DUBLIN ? ? L'POOL		? ? B'REST		
2	Variable parking pricing	? ? BRISTOL ? ? DUBLIN	? ? TURIN	? ? B'REST ? ? L'POOL	? ? OSLO	
	On-street parking restriction	? ? BRISTOL ? ? L'POOL	? ? B'REST ? ? OSLO ? ? DUBLIN	? ? TURIN		
	Off-street parking restriction	? ? BRISTOL	? ? L'POOL	? ? TURIN ? ? DUBLIN	? ? B'REST ? ? OSLO	
	Controlled parking zones	? ? DUBLIN ? ? L'POOL	? ? BRISTOL ? ? B'REST	? ? OSLO ? ? TURIN		
3	Real Time Information	? ? BRISTOL ? ? OSLO ? ? DUBLIN ? ? L'POOL	? ? TURIN	? ? B'REST		
	Parking information systems (VMS)	? ? OSLO ? ? DUBLIN	? ? BRISTOL ? ? TURIN ? ? L'POOL	? ? B'REST		
	VMS congestion warning	? ? OSLO ? ? DUBLIN	? ? BRISTOL ? ? L'POOL	? ? B'REST ? ? TURIN		
	In-vehicle route guidance	? ? DUBLIN	? ? TURIN	? ? BRISTOL ? ? B'REST ? ? OSLO ? ? L'POOL		
4	Cycle ways	? ? BRISTOL ? ? L'POOL	? ? OSLO ? ? TURIN ? ? DUBLIN		? ? B'REST	
	Pedestrianisation	? ? BRISTOL ? ? OSLO ? ? L'POOL	? ? TURIN ? ? DUBLIN	? ? B'REST		
5	Restriction of freight delivery times		? ? BRISTOL	? ? B'REST ? ? TURIN ? ? DUBLIN	? ? OSLO ? ? L'POOL	
	One-way systems	? ? DUBLIN	? ? BRISTOL ? ? B'REST ? ? OSLO ? ? TURIN ? ? L'POOL			

	Traffic calming	? ? BRISTOL	? ? B'REST ? ? OSLO ? ? DUBLIN ? ? L'POOL	? ? TURIN		
	Traffic free residential zones		? ? BRISTOL	? ? TURIN ? ? DUBLIN ? ? L'POOL	? ? B'REST ? ? OSLO	
6	HOV lanes		? ? DUBLIN	? ? BRISTOL ? ? OSLO ? ? TURIN ? ? L'POOL	? ? B'REST	
	Car sharing / car pooling	? ? DUBLIN	? ? BRISTOL ? ? L'POOL	? ? B'REST	? ? OSLO ? ? TURIN	
7	Speed cameras	? ? BRISTOL ? ? DUBLIN ? ? L'POOL	? ? OSLO ? ? TURIN	? ? B'REST		
	Wheel clamping	? ? L'POOL	? ? BRISTOL ? ? B'REST ? ? TURIN ? ? DUBLIN	? ? OSLO		
	Parking fines	? ? BRISTOL ? ? L'POOL	? ? B'REST ? ? OSLO ? ? TURIN ? ? DUBLIN			
8	Air quality policies	? ? BRISTOL ? ? OSLO ? ? TURIN ? ? DUBLIN	? ? L'POOL	? ? B'REST		

These results were then 'scored' to give overall impressions of the acceptability of different policy areas. The following graph summarises these results by adding up the scores for each policy area. The lower the score, the more the policy is accepted by politicians in each city.

Scored acceptance levels of policy areas in each city



1. Public Transport

Bucharest and Turin politicia ns appear to exercise the greatest caution with respect to public transport policies, both regarding fiscal constraints as highly unacceptable. Bus priority measures enjoy a high level of acceptability in all cities, as does integrated ticketing, P&R – although with the exception of Bucharest once again. Road pricing is only regarded as acceptable by Bristol, even though the only city in which it currently exists is Oslo.

2. Parking

Bristol once again exhibits the greatest degree of acceptance in this policy area, followed by Turin and Dublin. Oslo finds parking policies the most sensitive to implement.

3. Real Time Information

All the case study cities regard the introduction of real time information systems as relatively acceptable. Dublin and Oslo politicians regard this set of policies as particularly politically friendly.

4. Non-motorised modes

Bucharest has by far the greatest difficulty with cycling and walking policies which are comparatively well accepted in all other cities, particularly Bristol and Oslo.

5. Traffic Management

Once again Bristol is the most open to traffic restraint policies, particularly traffic calming, car free residential zones and the restriction of freight deliveries. Oslo is the most cautious in this policy area.

6. Car occupancy

Dublin politicians appear to regard car sharing policies as insulated from political sensitivity compared to Oslo, Turin and Bucharest who are cautious of such policies. Dublin is also the most open to the idea of HOV lanes.

7. Enforcement
All cities regard these policies as acceptable although Bucharest and Oslo are fairly resistant to speed cameras and wheel clamping.

The Constraints on Policy Making

In addition to political acceptability of each policy area, political representatives were asked to indicate the degree to which a series of factors hindered or aided the prospect of an implementation of each policy. For example, the issue of timescale could exercise a negative impact on implementation in the case of road tolling, but be a positive influence on the decision to introduce on street parking restrictions. The results for each city are shown in the tables to follow. Oslo, however, had difficulties finding a suitable candidate to complete this particular table.

Summary of Policies and Constraints

The following table highlights the policies for which the cities are most renowned and the particular constraints placed on policy making:

Policies and Constraints in each site

	POLICIES	CONSTRAINTS
? Liverpool	? ? urban regeneration ? ? bus priority systems ? ? vehicle fleet modernisation ? ? new railway stations ? ? selective investment in the road network ? ? environmental improvements and traffic calming ? ? comprehensive cycle network ? ? increasing central short stay parking capacity	? ? economic policy a priority over environmental policy ? ? relative lack of investment capital / weak economic climate ? ? ageing / diminishing population ? ? lack of control over public transport operators
? Bristol	? ? bus priority systems ? ? Park and Ride ? ? commuted payments ? ? vehicle fleet modernisation ? ? new railway station ? ? no new road building ? ? integrated transport and land use policy - reducing the need to travel ? ? awareness campaigns and information provision ? ? residents parking schemes ? ? possible road pricing ? ? variable message signing	? ? high car dependency ? ? national transport context restricting possible introduction of road pricing ? ? lack of control over public transport operators ? ? inadequate legislative powers for the introduction of road pricing even though there is some political acceptance

?? Bucharest	?? urban regeneration ?? high transport subsidy and concessions ?? regulation of public transport ?? new regional transport authority ?? public transport priority systems ?? infrastructure modernisation ?? parking enforcement ?? increased residents parking ?? development at transport nodes	?? lack of investment capital ?? no general urban plan or transport master plan ?? rapidly increasing car ownership ?? insufficient public transport priority measures ?? ageing infrastructure ?? development on the periphery ?? inefficient transport operators
?? Oslo	?? road pricing ?? financial contribution to road building from local businesses ?? air pollution policies ?? urban containment	?? lack of integration of public transport ?? awaiting approval of transport plan ?? climate
?? Turin	?? urban regeneration ?? variable message signing	?? car culture ?? lack of sufficient legislation
?? Dublin	?? quality bus corridors ?? Rapid Light Transit ?? environmental parking cells ?? improvements to surrounding trunk roads	?? lack of investment capital ?? inadequate transport planning structures ?? rapidly increasing car ownership ?? concentration on economic development

Common variables

?? all the case study sites recognise it is not feasible to cater for unrestrained increases in car use

?? all sites have primarily bus based public transport systems, the greatest diversity provided in Bucharest

?? bus lanes and priority systems are encouraged in each location

?? environmental issues are given as much weight as congestion itself in policy making in each site

?? parking policy is the main car restraint policy in use - nowhere is the car being aggressively constrained - even in Oslo where road pricing is in use, road building is not entirely ruled out

?? the take up of variable message signing is increasing in all sites; no site has yet opted for in vehicle route guidance

?? the adequate legislative structures are not in place to support such policies as road pricing, fiscal subsidy, enforcement

?? environmental lobby groups appear to have a positive influence in the implementation of many public transport policies, although this lobby group appears absent from policy making in Turin

Regional Differences

?? very low car ownership and use in Bucharest, relatively low in Liverpool, high in Bristol

?? high levels of public transport subsidy and concessionary fares in Bucharest

?? degree of public transport integration is poor in all sites but poorest in Bucharest

?? integrated ticketing is available in the two U.K sites, Turin and Oslo but not in Bucharest and Dublin

?? extent of integration with land use planning varies - very low in Bucharest, at its strongest

in Bristol and Oslo

?? road safety varies as a concern / priority - slight in Oslo, major in Liverpool

?? policy on road building varies from general moratorium in Bristol, selective improvements in Turin and Liverpool and new construction in Oslo

?? Bristol appears to be the only site placing emphasis on awareness campaigns and information provision

?? walking and cycling encouraged everywhere but extent of definite polices differs from comprehensive cycle networks (UK sites) to ad hoc improvements

?? environmental lobby appears weak in the Italian site but has varying degrees of influence in all the other cities

Identification of User Groups

Conventional market research uses traditional social and demographic variables to segment the market. The partners drew on their various experiences in research, the results of the city environment survey and items specified in the technical annex, to identify as large a range as possible of these traditional variables. In total, 121 such variables were identified (a further 32 variables were used for specific topics in Dublin and Belfast only) and incorporated into the main survey questionnaire. These covered, among others, age, gender, occupation, education, type of residence, household composition, use of private or public transport, purpose and frequency of travel, use of travel information. These were then used in the quantitative data collection phase to segment the respondents in a conventional manner and then to compare the conventional segmentation with the STIMULUS approach to segmentation.

A list of questionnaire variables and coding convention is available from the consortium members on request.

Specification of sample groups

Sample groups were then specified for the qualitative and quantitative surveys.

Sample group for qualitative data collection

A total of 74 in-depth interviews were carried out. Sample sizes for this aspect of research are quite small since it is only the 'language' used by respondents that is being sought for inclusion in the questionnaire. There are no issues of statistical reliability.

Road transport users were interviewed in all sites as follows.

Market	*Site*	*Period*	*No of interviews*
England	Bristol/Liverpool	June 10-11	17
Ireland	Dublin	June 12-13	14
Italy	Turin	w/c June 15	6
Norway	Oslo	June 10-12	17
Romania	Bucharest	w/c June 15	20

Respondents were recruited to ensure representation of age (15-29, 30-44, 45-64, 65+) and gender groups as well as usage of cars, bicycles and the most common means of public transport in each location. In this context, it should be remembered that the main function of qualitative research in this project was to aid development of a precise and sensitive questionnaire (or repertory grid) for the quantitative study. In other words, it was neither a realistic nor a relevant objective in qualitative research to aim for a representative sample in a statistical sense.

Qualitative data were elicited according to the instructions contained in the Qualitative Manual (Deliverable 3).

Sample group for quantitative data collection

A quota sampling strategy for the quantitative study was arrived at as follows - to ensure adequate representation of the most important groups of transport users in each market. Each group was split evenly by gender.

Age	Regular users of Public Transport	Non regular travellers	Regular users of cars
Under 20	20	20	20
21-40	20	20	20
41-60	20	20	20
60+	20	20	20
Age bands can be changed as necessary to suit local requirements			

This gave a target of 240 respondents for each city. In Oslo, a random population sample was used so a target of 500 respondents was specified. In all, 1826 fully completed valid questionnaires were returned.

Specification of Approaches, Methods and Techniques

The choice of approaches was addressed at three levels:

1. The philosophical approach to research

2. The methods used for data collection

3. The techniques used to analyse the data

A synthesis of approaches was developed selecting methods and techniques that operated under one research philosophy. This approach defines data collection methods and analytical techniques used within the STIMULUS framework.

Review of research approaches

Different approaches to market segmentation were reviewed and it was found that the approach of STIMULUS forms a bridge between two conventional approaches.

Traditionally in market research, social characteristics have been used as variables for market segmentation that relies on correlations with patterns of behaviour. These variables are easy to record with high precision. During the last few decades it has become clearer that the explanatory power of socio-demographics to predict behaviours and design communications is decreasing in many fields. This calls for new variables to explain human behaviour and to understand the motives behind the behaviour (Dalen, 1989).

Marketing techniques adopted in the sector of consumer goods can be summarised into two typologies: the traditional and most common one consisting of the so-called ex-ante segmentation and the Direct Marketing typology which is still in an experimental phase.

The technique of traditional ex-ante segmentation is purely statistical and is based solely on valid statistic sampling, because it is possible to assign a weight to the segments according to reference population. In the worst case, it is based on the beliefs and biases of the Marketing Director who will invent evidence to support his or her preferred view. As a logic for extensive sampling techniques, this methodology has very expensive costs, and the efficacy of the results is statistically significant only at an aggregate level. Its global benefits have never been scientifically measured and there are no articles and/or publications to verify the aspect of cost/benefits of these campaigns and of citizens' awareness.

Furthermore, transport market liberalisation has led transport companies to start making direct contact with both potential and existing clients. The attention in this sector reached its maximum in the pilot initiative of Direct Marketing promoted by UITP ("Switching to Public Transport") in which European transport companies took part. This initiative has been applied to specific situations, for example in areas characterised by high offer of public transport and low level of demand (or use). The Turin experiment, conducted with maximum cost-saving in mind, involved retired ATM personnel visiting the selected sample family among non-users of public transport and to demonstrate the types of public transport network available to meet the needs of family members.

Despite this approach, the direct (phone contacts, home-appointments, visit of the entrusted person and eventual further phone call) and the indirect costs (supply of a free season ticket for a fixed period) remain very high when calculating on a unitary basis. The benefits of Direct Marketing technique have been measured in a pilot study promoted by UITP which found an increase of ATM clients of 8% of the contacted sample, three months after the visit. STIMULUS could be seen as a middle way of creating a market segmentation technique through a methodology likely to be considered as a bridge between two extreme approaches in use until now (collective and individual). A synthesis of these approaches is shown on the following table.

	Publicity survey ATM/CAMPARIE	STIMULUS	Direct Marketing UITP
Segments	Ex-ante	Ex-post	Resident in the same area
Objectives	To analyse survey results independently from the impact of the phenomenon on the population	To analyse respondents answers by clustering the individuals based on behaviour/attitudes toward the considered phenomenon	To contact singularly some people living in a restricted area (low demand/high offer) providing personalised solutions
Method	Ex-ante conventional segmentation	Identification of ad hoc segments (after survey)	Validation of the new strategy on a limited target situated in a restricted zone
Use	In cases of yet aggregated and/or Known data	Both in explorative and final phase (impact validation)	In cases of high offer and low demand

Costs	Globally high	Moderate costs	High per unit
Benefits	Not scientifically tested owing to the intervention complexity	Homogeneous segments with respect to specific message	Increase of 8% on the considered sample (three months after the survey)

Traditional market segmentation techniques, especially in transport are to date based on ex-ante strategies, according to conventional demographic variables and modality (sex, age, etc.). After a series of evaluations of some strategies, which sometimes have not been successful, (in some case the effects revealed to be opposite to the expectation), it emerges that it is not always possible to launch a product or a service by describing ex-ante the target of destination, the lifestyle and eventual individual motivations. This way of operating could aggregate in the same group a number of persons characterised by different attitudes and needs, causing a waste of resources or sending messages which are not sufficiently accurately targeted to reach any member of the supposed target audience. To obviate this problem, the solution consists of ex-post segmentation following the identification of interests, attitudes/motivations and group behaviours about information, management and service distribution. The STIMULUS technique consists of the identification of ex-post segments (with no ex-ante classification).

Specification of research approach

The philosophy chosen for the STIMULUS study is based on Personal Construct Psychology (PCP). It has a methodology especially suitable to the STIMULUS concept in that it allows the interests, attitudes, motivations, values and psychological variables of individuals and groups to be accessed through its unique data collection techniques.

Personal Construct Psychology also helps the researcher to understand the nature of change, resistance to change and how to overcome such resistance. This is particularly useful in the transport market where the public is often required to or forced to change its travelling behaviour by the policies, management schemes and communications of governments, policy makers and transport providers.

The framework and basic methodology of Personal Construct Theory was developed by George Kelly (1955). As a clinical psychologist, Kelly felt that science was standing in the way of understanding his clients. He encountered some problems, which are common to researchers today and developed Personal Construct Theory (PCT) to overcome these which are described below:

?? The role of the expert. Kelly objected to scientists in white coats experimenting with and studying human beings as if they were another species. He believed we are all scientists trying to make sense of the world; we conduct our own experiments and test hypotheses.

?? Observer bias. This can pose a serious obstacle to understanding someone else's point of view. The elicitation techniques of personal construct psychology enables the

researcher to interview someone in detail and elicit information with as little observer bias as possible.

Kelly formulated PCT from the premise of 'man the scientist' who develops hypotheses, tests and modifies or discards them, developing a network of constructs or values along the way. This framework of personal constructs is what we use to construe events, situations and people (which Kelly called 'elements') and to make predictions about the future. Our constructs are so called because they have been built up or 'constructed' from experience, and also because we use them to 'construe' or interpret the world. We anticipate events using our construct systems and determine our behaviour accordingly. If our behaviour is invalidated our experiment has failed and so we experiment with new behaviour. The fundamental postulate of personal construct theory states that our psychological processes are influenced by the ways in which we anticipate events.

Stewart and Stewart (1981) have simplified personal construct theory as follows;

- Perceptions influence expectations and expectations influence perceptions
- This happens through our construct system
- Construct systems are unique to the individual and develop through life

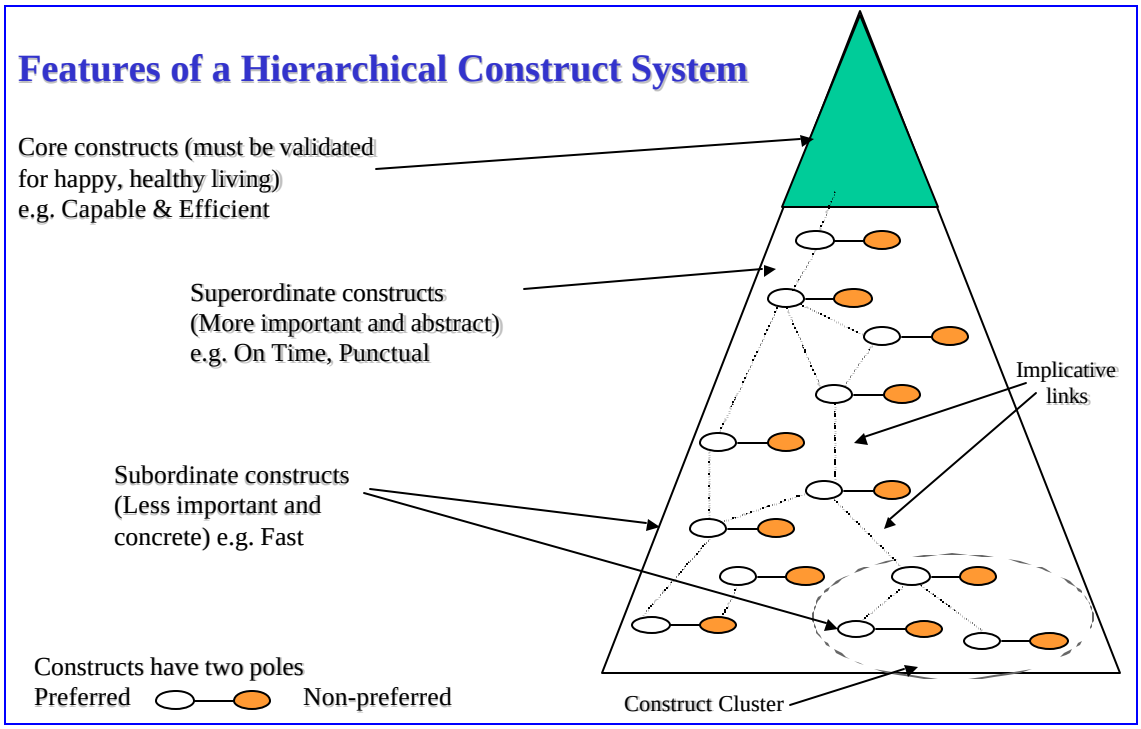
Kelly then developed the commonality corollary of the theory to describe the implications of similarities among people's construct systems. This corollary states that people who have similar construct systems construe their experiences in a similar way. It is a measure of the extent to which they are like each other and the extent to which the are likely to understand each other.

Schein (1985) studied a number of work groups across industries. He came to the conclusion that cultural groups (segments in our terms) may not be defined by who the people are, where they work, their age or skill level for instance, but rather by they way they think and solve problems:

> "I will mean by "culture": *a pattern of basic assumptions - invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration - that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems."*

Kelly believed that our constructs (assumptions) are arranged in a pattern. We systematise our constructs by arranging them in hierarchies. This helps us to avoid making contradictory predictions. Constructs may be seen as organised into a hierarchy with subordinate constructs at the bottom, linking with superordinate constructs above which link in turn with core beliefs about the self. People differ, however, in the way they organise their construction of events.

Dalton and Dunnet (1992) compare the construct system to scaffolding. Constructs are linked together in ordinal relationships, like the spars of the scaffolding. Porter (in Dalton and Dunnet, 1992) likens the structure to a pyramid with a large base of subordinate constructs 'supporting' fewer superordinate constructs and a very few core constructs.



The relationships between constructs work up and down as well as laterally so a single highly abstract construct at the top may be related to many more concrete constructs at the bottom, with various levels in between. The core constructs are those which a person uses to maintain his or her identity and existence. They are comprehensive and central to the individual's view of self and his/her social roles. Kelly developed his personal construct theory to inquire into this pattern of constructs or cognitive processes.

Specification of data collection techniques

Qualitative data collection techniques

Qualitative interviews were conducted at each site using the eliciting techniques of personal construct theory.

The construct is the basic unit of one's construct system. It is a form of differentiation between elements and is bi-polar. These poles are contrasts which make sense to the individual. The job of the researcher is to elicit these bi-polar constructs in a non-directive way. To elicit constructs the researcher asks the interviewee to differentiate between the elements chosen (e.g., road pricing, park & ride, bus lanes). The interviewee construes the elements and states the difference between them; (e.g., facilitation). This is called triadic eliciting; dyadic can be done using just two elements at a time.

The interviewer then probes for the contrast pole (e.g., restricting) and the outcome is a construct which the individual uses to discriminate between elements:

facilitating - restricting

The interviewer then chooses another or the same set of elements and elicits another construct:

environmentally friendly - environmentally unfriendly

The constructs elicited in this way may be located anywhere in the individual's system. Further elicitation techniques known as laddering and pyramiding allow the individual to explore his/her construct system, drawing out more superordinate or subordinate constructs. The process of laddering explores the more superordinate constructs which are less easy to express. The interviewer first establishes the preferred pole of the construct for the individual e.g., facilitating and then asks why that pole is preferred or why it is more important. The answer is the emergent pole of another (more superordinate) construct, e.g., *gives more options*. The opposite pole of this is then elicited: - *lack of choice*

This may in turn be laddered to more superordinate constructs until core constructs are reached, e.g., *freedom to achieve - lack of achievement*

Pyramiding is the opposite of laddering. It is used to discover the subordinate (less important) aspects of the structure, the more concrete constructs. The individual is asked to define exactly what he/she means by the constructs already elicited. For example, facilitating may mean *enabling me to do something, making it possible by putting structures in place*.

For further information about the eliciting process and qualitative data recording the reader is referred to the operating manual as well as other standard texts on PCP.

Problems to be researched were identified by Workpackage 2 and user interviews as follows:

Core Problems	*Specific to some sites*
Congestion	Underuse of Public Transport outside peak hours
Parking Problems	Lack of integration of Public Transport Network
Noise Pollution	Lack of stratified work/school start and finish times
Air Pollution	Free-pass holders travelling during peak hours
Speeding	Lack of modern road infrastructure (medieval layout)
	Use of spiked tyres

Fransella, Jones and Watson (1988) describe how personal constructs come to be shared by groups of people and Porter and Tschudi (1994) demonstrate how Personal Construct methodology can be used across representative samples of the population as a whole to analyse similarities and differences of psychological structures.

Quantitative data collection techniques

Large scale quantitative surveys were conducted using questionnaires designed using the data collected during the qualitative interviews. These questionnaires were repertory grids based on the techniques of personal construct theory.

As a scientist, Kelly wanted to make predictions about his clients in a rigorous way; to measure their clinical problems before therapy, use these measurements during therapy and measure again after therapy. What you cannot measure you cannot control. Therefore he developed the Repertory Grid as a tool for looking at how an individual uses a set of constructs in relation to one another and in relation to a given set of elements.

The Repertory Grid is a matrix containing the ELEMENTS of a study together with the repertoire (hence repertory) of personal CONSTRUCTS.

The grid was used by Kelly to enable one to describe psychological relationships within and between elements and constructs in mathematical terms, in other words to produce a numerical representation of a person's psychological structure. Using repertory grids we are able to determine not only what people think, but why and how they go about thinking. The computer analysis of a rating grid gives a picture of a person's psychological processes captured at a moment in time.

Instead of regarding each construct as a pair of words, Kelly proposed the notion of psychological space between the poles of the construct. He found that people could easily position elements within that space. In the following example, X is Park & Ride and Y is Road Pricing.

Facilitating		X	Y		Restricting

Fransella and Bannister (1977) compare this format with the semantic differential devised by Osgood (1957) warning that the underlying theory and assumptions are different. In keeping with the belief that we are all scientists conducting our own experiments, repertory grid technique seeks to understand the dimensions which the individual uses to make sense of his/her world. The individual is not an object, but a theoriser, an experimenter and a constructor of meanings just as the researcher is. The grid is more like a conversation than a psychological test; an attempt to enable the subject to present his/her own construing of the elements in such a way that they can be understood. This can be done by getting the individual to rate each element on each bi-polar construct resulting in a matrix of elements by constructs as follows:

Scores 1	Element A	Element B	Element C	Element D	Scores 7
Facilitating	2	5	6	1	Restricting
Environmentally friendly	5	3	1	2	Environmentally unfriendly
Gives more options	3	1	5	5	Lack of choice
Puts structures in place	5	4	3	2	No structures

As described above, the constructs elicited during the qualitative interviews were categorised into groups of similar meaning and one construct selected to reflect the overall meaning of that construct group. These were then chosen for inclusion in the repertory grid and used to apply to the range of elements. Respondents were then asked to rate each element on each

construct in the grid. The questionnaire consisted of different sections relating to different topics and is summarised in the table below.

M1 PERCEPTION OF TRANSPORT MODES	
I2 TRANSPORT ISSUES/PROBLEMS RELATIVE IMPORTANCE OF	**P3** TRANSPORT POLICIES/MGT SCHEMES - PERCEPTION OF
P4 Congestion, P5 Pollution, P6 Road safety SUITABILITY OF POLICIES FOR PROBLEMS	
S5 PERCEPTIONS OF SELF AND STEREOTYPICAL TRANSPORT USERS	
I6 IMPORTANCE OF PERSONAL CHARACTERISTICS	
M7 MEDIA PREFERENCES (FOR TRANSPORT INFORMATION)	
SOCIO-DEMOGRAPHICS	
HOUSEHOLD DETAILS	PERSONAL DETAILS

The questionnaire also measured the relative importance of each construct relating to the 'self' and to transport problems. This identifies the constructs most resistant to change and those most likely to be threatened when people are asked to change their behaviour. Segmentation is also possible by choosing members of the sample who recorded an item as being one of the most important, one of the least important, or neither important nor unimportant.

Statistical analyses of these repertory grids were then conducted to identify the interests, attitudes, behaviours etc of the conventional user groups.

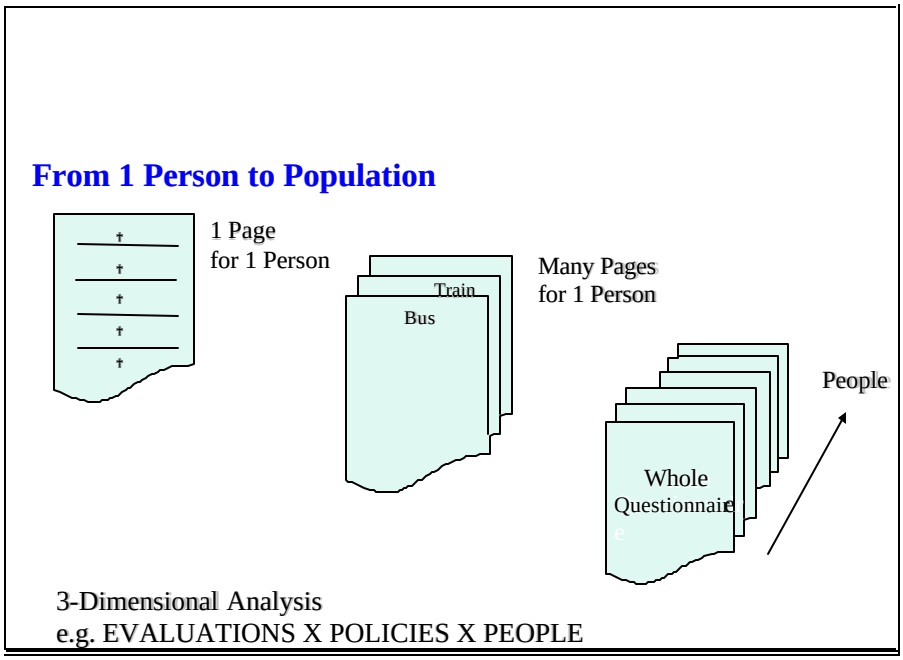
Further analyses were conducted to uncover the underlying psychological processes of the respondents and allowed them to be grouped according to new classifications. The STIMULUS package works out the mathematical relationships between the constructs and between the constructs and the elements. This reveals how the individual construes the elements and how he/she uses the constructs in relation to each other. Comparing people's grids shows the existence of commonly held constructs, similar construct systems and whether elements are construed in the same way by members of the group. The attitudes and behaviours of these new groups were then determined.

Specification of analytical techniques

A number of different software packages were reviewed, describing the respective philosophy of each package, giving an insight into the potential of each. It was originally decided to make a benchmark comparison between two selected software packages for clustering (one well known and in the market at large - SPAD-N; the other a new one to be calibrated and fine-tuned within the STIMULUS project - MULTIGRID). 35 questionnaires were completed during the pilot data collection in Merseyside, U.K. These were prepared for software elaboration but analysis was achieved by MULTIGRID only because of difficulties associated with the operation of SPAD-N on this type of data. Multigrid was then further developed and

integrated with Interactions' own (GPR written by John Porter) software to become the STIMULUS software package, used to run conventional analyses as well as psychographic segmentation.

Unique to the STIMULUS research process is the ability to progress from the level of the individual to whole groups of people.



Rationale for the STIMULUS software package and analytical approach

Psychographic segmentation

The challenge set by the segmentation task in this project was to find a method of identifying centroids of attitudes from an apparent continuum of attitudinal data. Having reviewed other approaches we decided to use Principal Components Analysis.

In this approach the total content of the attitudinal scales (within a given data set) is used to generate natural associations between the people in the sample.

The psychographic segmentation software used in STIMULUS is a development of MULTIGRID. For a full explanation of the functioning of MULTIGRID please see the User Manual (Deliverable 3). The following is simplified account of the rationale.

MULTIGRID can employ a number of analytical approaches:

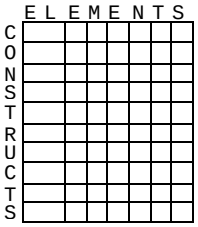
Principal Components Clustering
Focus Hierarchical Clustering

Cliff rotational configuration correlations

In the STIMULUS version an enhanced form of Principal Components Analysis is used. In this type of analysis there is no dependent variable (as in SPSS Chaid). Instead the data themselves define the criteria on which segmentation takes place:

1. Data are prepared in the form of a matrix in which ELEMENTS (for example, self, ideal self, car users, etc.) are assessed or rated on a numeric scale of 1-5 by the respondents according to a set of attitudinal scales or CONSTRUCTS, (e.g. trustworthy, wealthy, hard working, off-hand, not caring about the environment).

Matrix format:



2. A set of matrix data are collected for each topic area for each respondent in the sample.

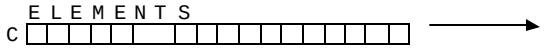
3. There are a number of possibilities for analysis:

Using raw data as in SPAD-N
Construct configurations (correlations)
Element configurations

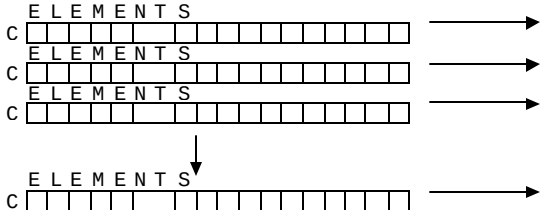
In this example the analysis was performed using simple strung out raw data as shown below.

4. The process is as follows:

Each person's two dimensional 'grid' matrix is strung out so that the person's data is represented as a single vector, e.g.



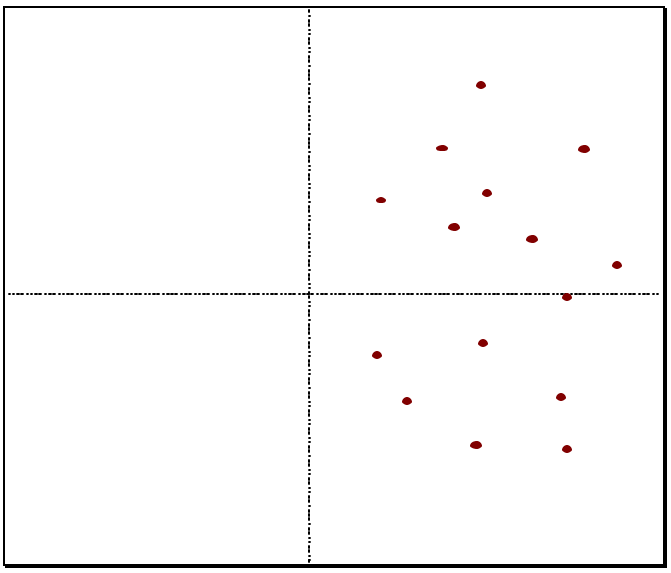
5. Finally the strung out matrices for all people in the sample are assembled into one 'super matrix' and the whole data set subjected to analysis. i.e.



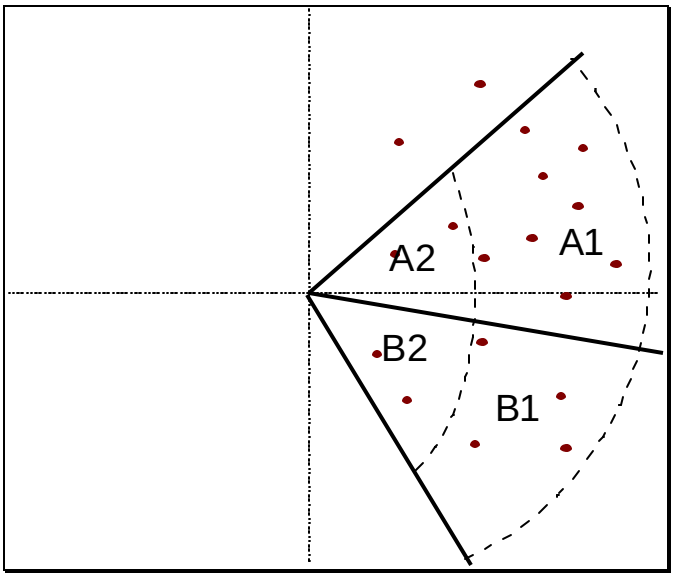
6. Segmentation is derived from the way in which the people are plotted spatially in element-construct space. The software allows for the creation of specified sets of segments of equal size, or of segments of pre-determined configuration and unequal size. A further analysis is then made of within and between segment variance in order to determine the statistical validity (within and between segment variance or homogeneity) or otherwise of the new segments.

How the Segments are Identified

Imagine that the data have been amalgamated and the persons (cases) in the study analysed as construing vectors. (Note that the STIMULUS approach is not to seek out clusters – but rather to identify attitudinal centroids.) Their positions in a principal components analysis may appear as follows:



The positions which they occupy are governed by the totality of the construing within and between cases. If we now overlay on this plot a series of arcs and segments it is possible to allocate, by virtue of their position, the various cases.



In the example above we have assumed two sectors and two arcs.

In MULTIGRID the following parameters can be varied to suit the data and research objectives:

- ?? Number of sectors
- ?? Number of arcs
- ?? Equal numbers of cases per sector (i.e. vary the sector angle so as to encompass equal numbers of cases
- ?? Equal sector size (i.e. fixed angle) allowing the number of cases per sector to vary

The process for the amalgamation of the data is also described fully in the User Manual.

New 'natural' groupings of respondents are identified. In addition to the attitudinal profile of these new natural segments their demographic composition is also determined and the key descriptive data that differentiate them from other segments are automatically identified and relevant statistics computed.

Further development of the program may be possible to maximise the within arc/sector variance and minimise the corresponding between them. Further discussion is required on the nature of cases occupying the inner arcs. Experience has shown that these cases comprise a great deal of random noise. However, one should not lose sight of the possibility of a three (or more) dimensional solution.

Importance Measurement

Resistance to change may be better understood when taking into account the relative

importance of the constructs on which change is required. (See also construct hierarchy (Porter in Dunnett and Dalton above.) Hinkle (1965) developed the Resistance-to-Change grid to test the hypothesis that superordinate constructs would be more resistant to change than subordinate ones. Respondents are presented with every possible pair of constructs used in the repertory grid (see above) and asked to consider a situation in which they would have to move from their preferred pole to the unpreferred pole on one of the constructs in the pair, e.g.:

1. able to achieve - lack of achievement
2. environmentally friendly - environmentally unfriendly

The respondent may choose number 2 as the one on which he/she would be prepared to change, i.e., to give up *environmental friendliness* and be *able to achieve* rather than give up the ability to achieve and remain environmentally friendly.

This process is repeated comparing all possible pairs of constructs. The more a construct resists change the more superordinate it is likely to be. Using STIMULUS, people's resistances to change may be diagnosed in a way which indicates the nature of the personal / psychological anxiety or threat.

This procedure whilst very stable and informative to the individual (especially in therapy) is cumbersome and tedious to use in a market research environment.

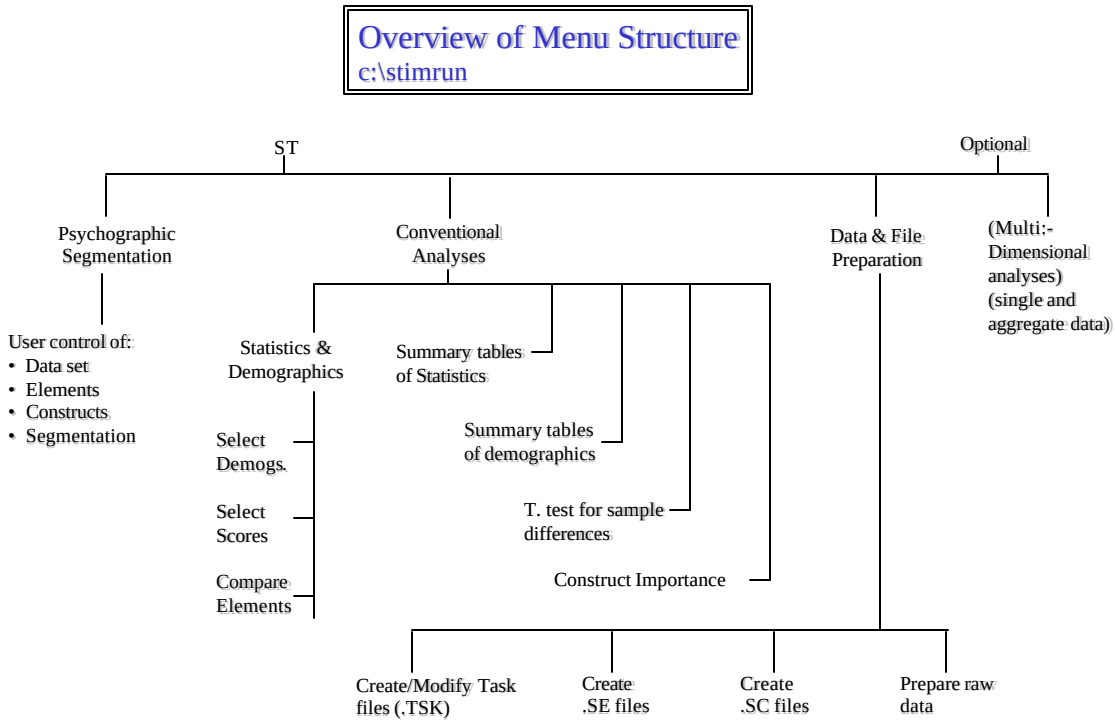
Interactions has developed an importance questionnaire in which respondents are asked to choose the 'n' most important and 'n' least important constructs to them personally. T-tests and correlation analyses between this method and Hinkle's resistance to change grid show that this method is reliable when dealing with large sample sizes of 200 or more cases. (Sub-samples as small as 20 will yield results but should be used with caution.)

Rogers and Bruen (1998) have evaluated this technique in The European Journal of Operational Research.

This procedure is used to measure importance of criteria, the extent to which issues are relevant in a particular location, the suitability of a particular policy or management measure for dealing with problems and communications needs and preferences.

The STIMULUS Software Menu

The diagram below shows the structure of the STIMULUS software menu.



The menu offers 4 options.

1. Psychographic segmentation
2. Conventional analyses
3. Multi-Dimensional analyses
4. Data and file preparation

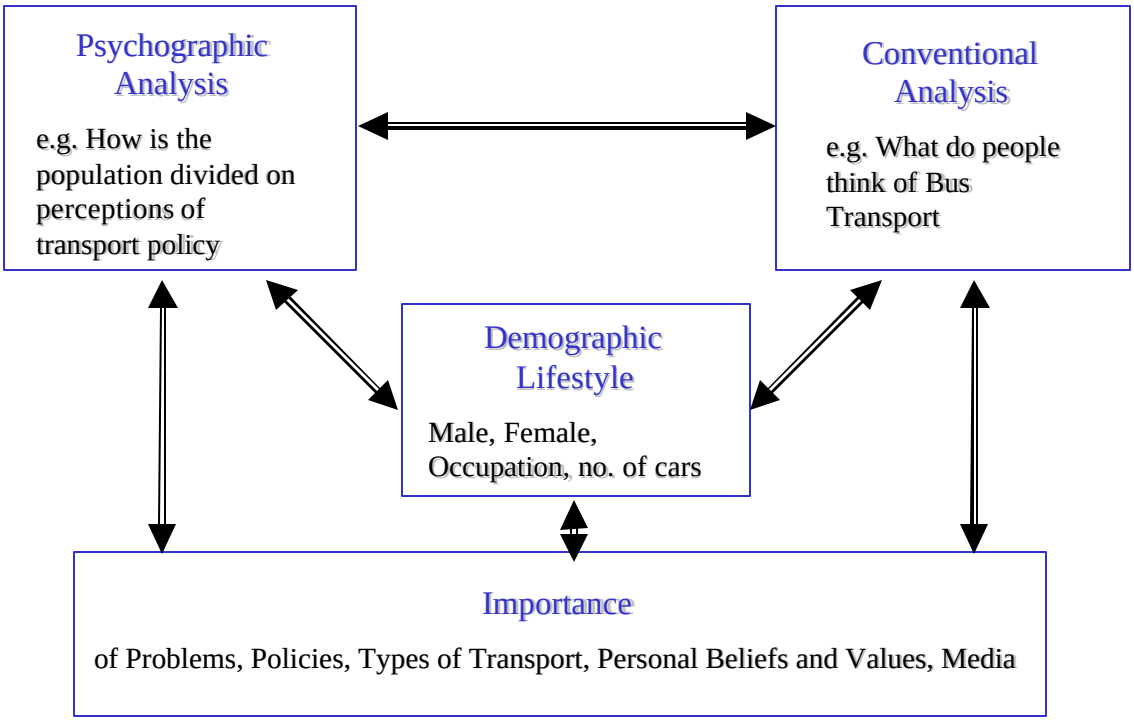
This report deals with the first two types of analyses for the current STIMULUS database, Data and file preparation.

Multi-Dimensional analyses (Flexigrid - also written by Finn Tschudi) is available from Interactions Ltd. for an additional fee of 400 Euro.

Operating System

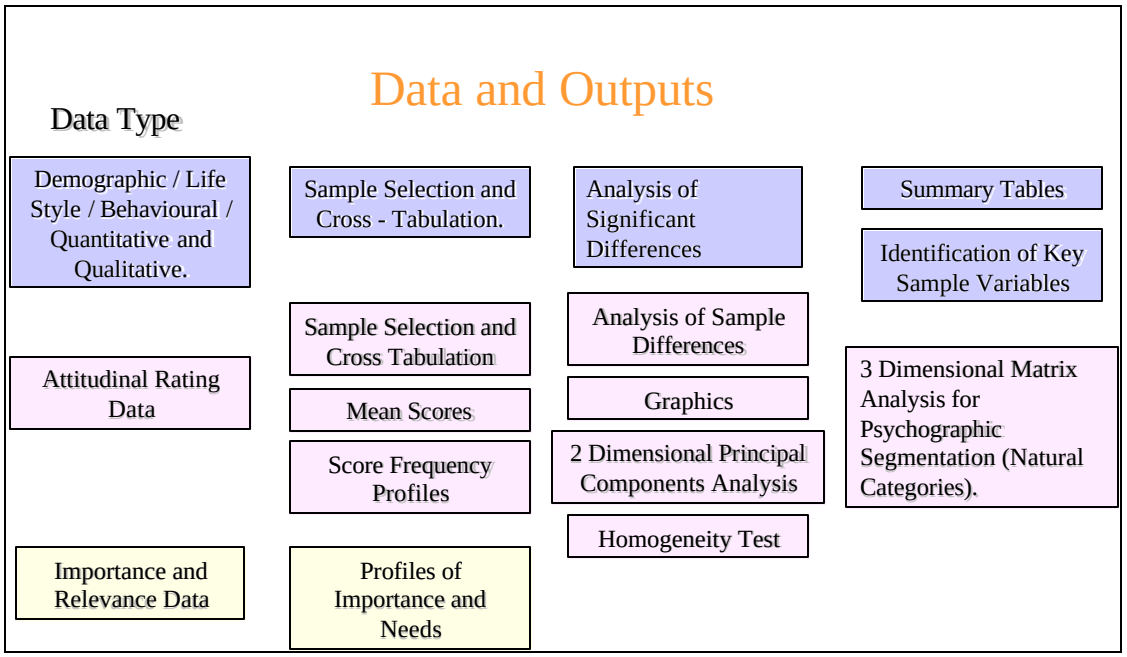
STIMULUS software runs in a DOS window under Windows 95 (or later) (32 bit environment).

The program suite comprises 4 main modules:

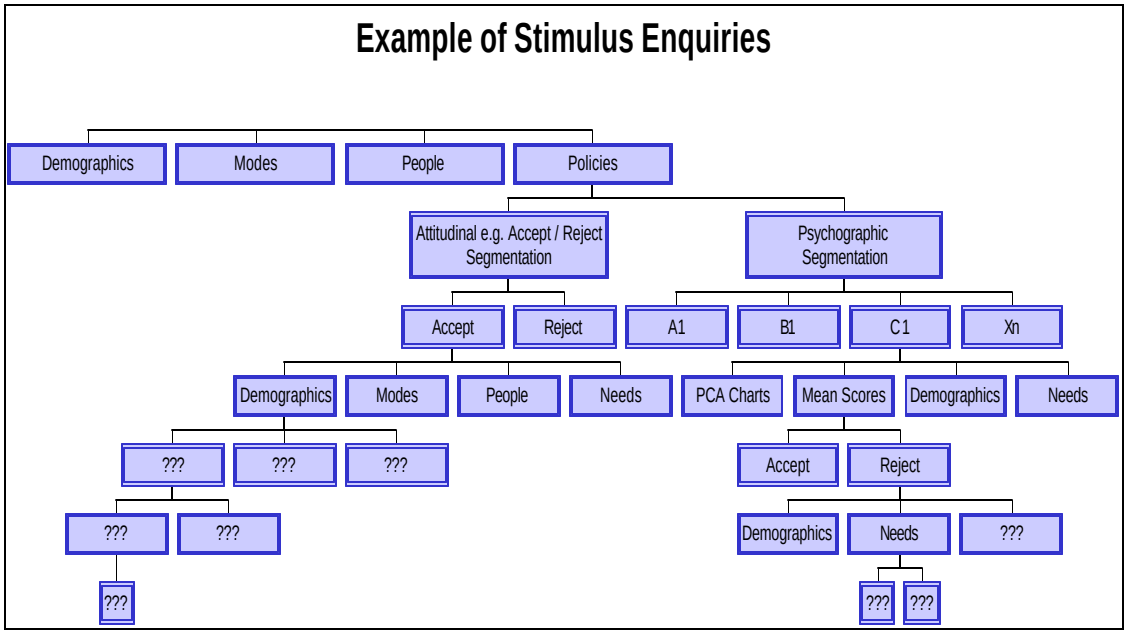


Analysis of a data set can start in any of the four modules, use only that module, or continue in any or all of the other modules in any order the user wishes.

The types of data and outputs are shown below.



Using this data structure and software, enquiries can take an hierarchical format through either the conventional 'dichotomous' sample division tree or the psychometric tree. The Demographic tree retains sample homogeneity from the point of view of demographics - but soon degrades the sample size to a low value coupled with attitudinal heterogeneity. The psychographic route makes demographic interpretation more difficult, but retains greater attitudinal homoge neity and larger sample size.



Many single aspects of this methodological approach have been tested with success in other fields of market research than transport. Specific aspects of it have been used successfully in

Ireland also within the transport industry; STIMULUS is the most extensive and consistent use of methods based on and developed from Kelly's thinking, both:

?? as a market research and segmentation project
?? across a multitude of geographical markets

The project has thus facilitated the further development for larger scale market research applications of already existing software[1] that combines sophisticated market research thinking with deep insight into Kelly's theories.

As a result, for *national and local transport officials* in any single market in which it is implemented, STIMULUS more so than other market research and segmentation approaches, may provide to those that desire to take advantage of its potential:

?? an improved understanding of how transport users think about each transport problem and transport policy
?? more effective communication programs, introducing and achieving a higher degree of user acceptance for those policies
?? transport policy decisions based on a more realistic understanding of likely transport user reactions in terms of attitudes and behaviour.

In the longer term, to *international transport policy and planning bodies*, STIMULUS should - if employed in a wider number of cities and their surrounding suburban areas - provide a broader understanding on how different city characteristics, such as:

?? make-up of transport infrastructure
?? location
?? cultural and demographic traits of its transport users

influence suitability of different transport policy strategies.

To national or local transport operators, it should provide:

?? improved understanding of how their customers think about their own and competitive modes of transport
?? more effective use of resources in terms of:
    ?? transport facility maintenance and improvements
    ?? marketing and communication programs vis a vis transport user segments
    ?? staff training

in order to obtain:

?? increased public transport usage
?? improved image and customer satisfaction
?? a benchmark for the comparison of their position with their customers relative to those of

[1] In particular Multigrid, developed by Professor of Psychology Finn Tschudi, formerly of University of Oslo

other transport operators of the same mode in other cities

The most cost-efficient use of STIMULUS would be as a syndicated study for transport officials and operators:

?? at a local level
?? at national level (thus including the major larger city areas of that nation)
?? at a regional level across national boarders, or even
?? at a European level

Results

Interpretation of Graphs

The following pages contain a number of different types of graphs. The most common are rating and importance graphs.

a) Rating graphs

The questionnaire scales used in this study were based on a 4 point scale. Any number of points could have been used, 5 and 7 point scales are common in northern countries of Europe whereas in the more southern and eastern countries respondents are more familiar with 4 point scales. Since the adoption of a 4 point scale had no adverse implications and was also acceptable to northern respondents it was adopted throughout the rating scales.

Within the theoretical framework of Personal Construct Theory the criteria or constructs of a questionnaire are presumed to be bi-polar (regardless as to how they are actually presented). The midpoint between 2 poles is thus a position of 'no opinion'. Hence the 4 point scale has been converted to a scale from –1.5 to +1.5 and a mid point of zero. In the rating graphs that follow a score to the left of or below the axis is therefore a negative or unfavourable opinion (rating). Conversely positive or favourable scores are plotted above or to the right of the axis (depending on graph format).

b) Importance or relevance analyses and plots

Where the importance or relevance of a criterion or issue is being assessed the scale is from zero to one hundred percent. A score of 100% shows that all respondents in a sample group assessed that item as being one of the n most important. A score of zero means that everybody thought that it was one of the least important.

Demonstration Approach

With so many scales and variables and choice of possible analyses, the lack of a definitive enquiry question presents a problem, since any one of the thousands of possible routes

through the data can produce hundreds of pages of output. In order therefore to provide a comparative demonstration, and assess attitudinal profiles across the sites within a manageable document size we have chosen to use section 3 of the questionnaire, 'Management schemes and Policies' as our starting point. The objective of the test was to gain an understanding of the acceptance or rejection of these traffic and transport schemes. The various tables and graphs in this section of the report will help demonstrate some of the analytical capabilities of the software. Further details of these will be contained in the Operating Manual.

Four analytical approaches were adopted:

1. Segmentation according to behaviour (car driver or public transport user)
2. Segmentation according to attitudes (acceptance or rejection of policies)
3. Segmentation according to importance or relevance (this accesses the structure of peoples' construing processes
4. Non-directed psychographic segmentation to test for the existence of naturally occurring categories of people

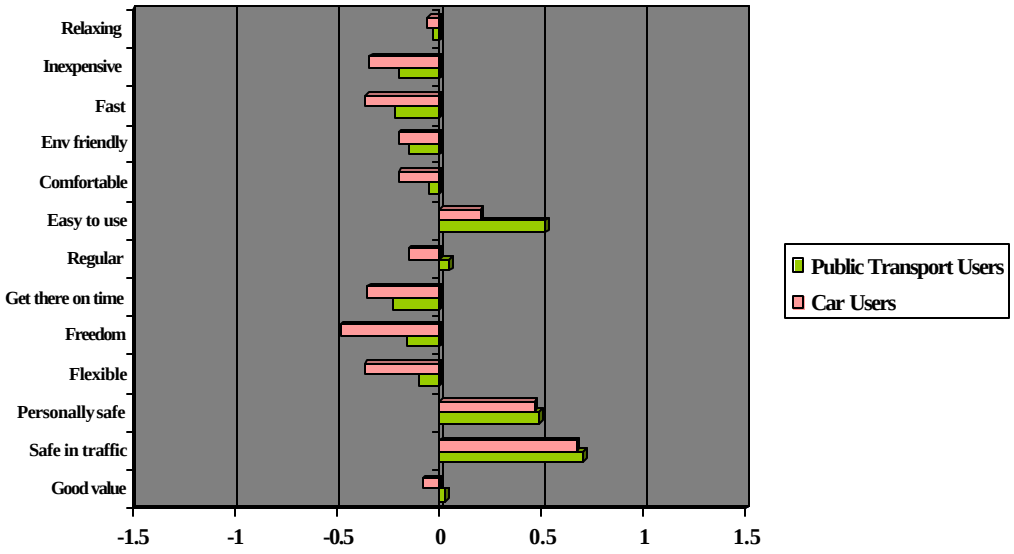
Behavioural segmentation

Car Drivers vs. Public Transport Users

In order to polarise the viewpoints as much as possible the sub-samples were selected using a positive response to questions 115 and 118:

> When do you use a car (weekdays?) (Q. 115) (codebook var. 105) - car users
> When do you use Public Transport (weekdays?) (Q. 118) (codebook var 108)

Perceptions of Bus Transport by Car and Public Transport Users



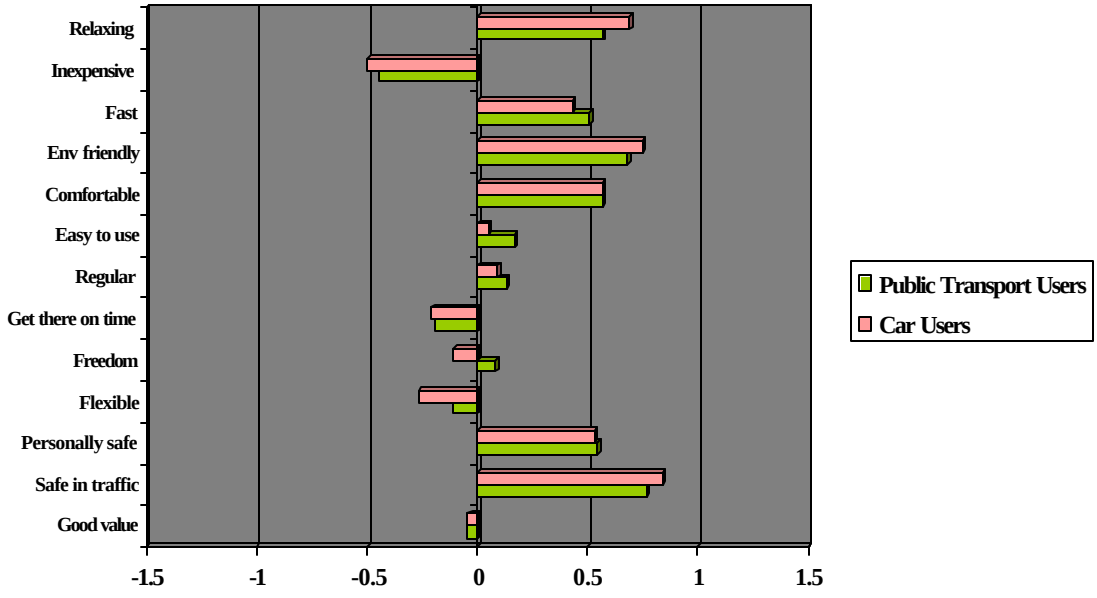
The following table shows the statistical significance at the 5% level (unpaired t test) of the differences in scores between the two samples. In other tables that appear in this report the same test has been applied. (Sample groups - car = car user, PTU = Public transport user)

Construct	Statistical sig.
Relaxing	NS
Inexpensive	p <= 0.05
Fast	p <= 0.05
Env. Friendly	NS
Comfortable	p <= 0.05
Easy to use	p <= 0.05
Regular departures	p <= 0.05
To dest. on time	p <= 0.05
Sense of freedom	p <= 0.05
Flexible	p <= 0.05
Personally safe	NS
Safe in traffic	NS
Good value	p <= 0.05

Although most of the differences between the sample groups are *statistically* significant they are still small and show general agreement between groups as to their perceptions of the transport mode.

Ease of use, flexibility and giving a sense of freedom are important criteria and it is on these that car users perceive the bus in a much less favourable light than public transport users.

Perceptions of Train Transportation by Car and Public Transport Users

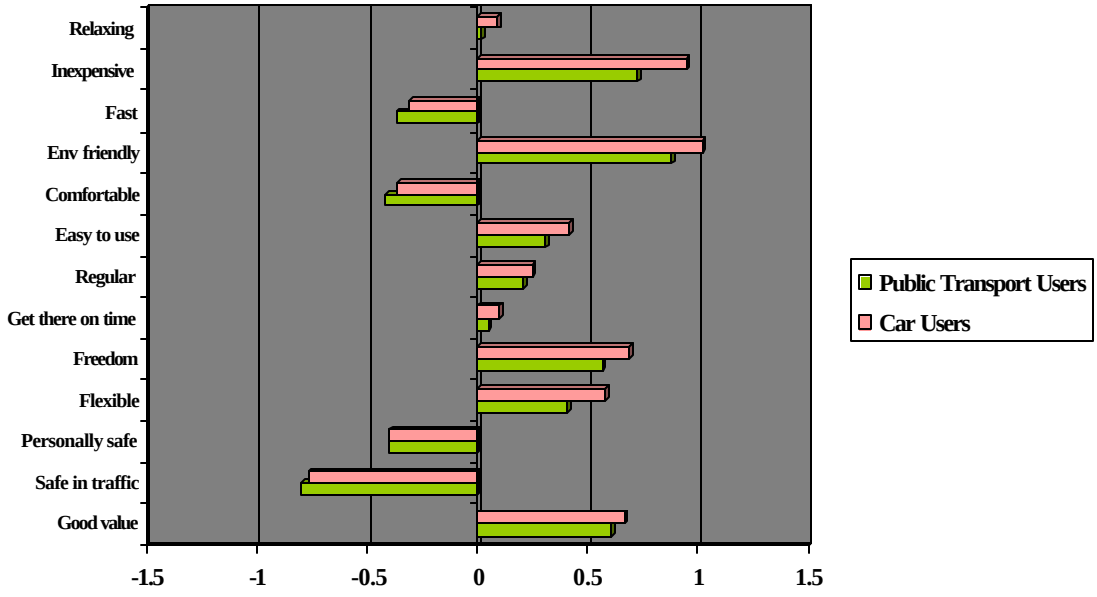


Differences between groups are even smaller with fewer significant differences.

Element 2 **TRAIN**

Construct	car	ptu	Statistical Sig.
Relaxing	0.69	0.57	p <= 0.05
Inexpensive	-0.49	-0.43	NS
Fast	0.44	0.52	NS
Env. friendly	0.76	0.69	NS
Comfortable	0.58	0.58	NS
Easy to use	0.05	0.17	p <= 0.05
Regular departures	0.1	0.14	NS
To dest. on time	-0.2	-0.18	NS
Sense of freedom	-0.11	0	p <= 0.05
Flexible	-0.27	-0.11	p <= 0.05
Personally safe	0.54	0.55	NS
Safe in traffic	0.85	0.78	NS
Good value	-0.03	-0.03	NS

Perceptions of Cycling by Car and Public Transport Users



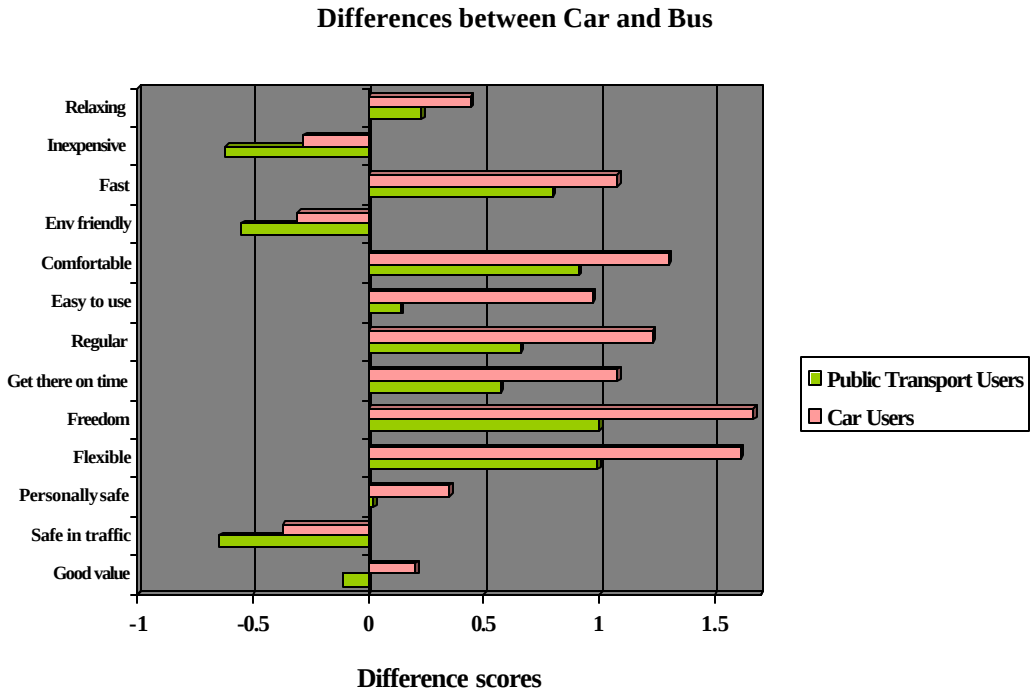
There are few differences of any magnitude. Apart from being environmentally friendly, cycling is uncomfortable and not safe. The table of differences has been omitted in this case.

Perceptions of the Car by Car and Public Transport Users

Because the car is so universally popular a slightly more detailed analysis has been made of how it and the bus are perceived by the two sample groups. The following table shows perceptions by the two sample groups as mean scores. The sample groups differ significantly on all criteria in their perceptions of the car; car users are much more positive. The question that remains is 'Is the car better than the bus even for those who use Public Transport?'

Construct	car	Ptu		Bus by PTU	**Car advantage / dis over bus by PTU**	Bus by CAR	**Car advantage / dis over bus by CAR**
Relaxing	0.39	0.21	p <= 0.05	-0.02	**0.23**	-0.05	**0.44**
Inexpensive	-0.62	-0.81	p <= 0.05	-0.19	**-0.62**	-0.34	**-0.28**
Fast	0.72	0.58	p <= 0.05	-0.22	**0.8**	-0.36	**1.08**
Env. friendly	-0.5	-0.69	p <= 0.05	-0.14	**-0.55**	-0.19	**-0.31**
Comfortable	1.1	0.86	p <= 0.05	-0.05	**0.91**	-0.2	**1.3**
Easy to use	1.17	0.66	p <= 0.05	0.52	**0.14**	0.2	**0.97**
Regular departures	1.08	0.71	p <= 0.05	0.05	**0.66**	-0.15	**1.23**
To dest. on time	0.73	0.34	p <= 0.05	-0.23	**0.57**	-0.35	**1.08**
Sense of freedom	1.19	0.84	p <= 0.05	-0.16	**1**	-0.48	**1.67**
Flexible	1.24	0.89	p <= 0.05	-0.1	**0.99**	-0.37	**1.61**
Personally safe	0.83	0.52	p <= 0.05	0.5	**0.02**	0.48	**0.35**
Safe in traffic	0.31	0.07	p <= 0.05	0.72	**-0.65**	0.68	**-0.37**
Good value	0.12	-0.08	p <= 0.05	0.03	**-0.11**	-0.08	**0.2**

Car users see many advantages in their mode of transport. Both groups are more generally in favour of the car over bus and agree to some extent about the environmental and cost disadvantages of the car - however the car users are much more in overall favour of their mode over bus transport than the PT users. Their resistance to modal shift is understandable. The challenge is for the bus to adopt some of the key service attributes exhibited by the car. (Speed, comfort, ease of use, freedom, flexibility).



The graph above shows very clearly the leading position of the car. In recent initiatives in Dublin involving the introduction of Quality Bus Corridors the key attributes of 'speed, frequency and ease of use' have featured highly in the communications to the public. In a survey conducted in September 1999, one week after introduction of a Quality Bus Corridor, the number of new customers amounted to 27% of passengers and of these 60% previously used a car for the same journey. Dublin Bus has used a STIMULUS type construct–based approach to brand design and marketing for many years.

Summary

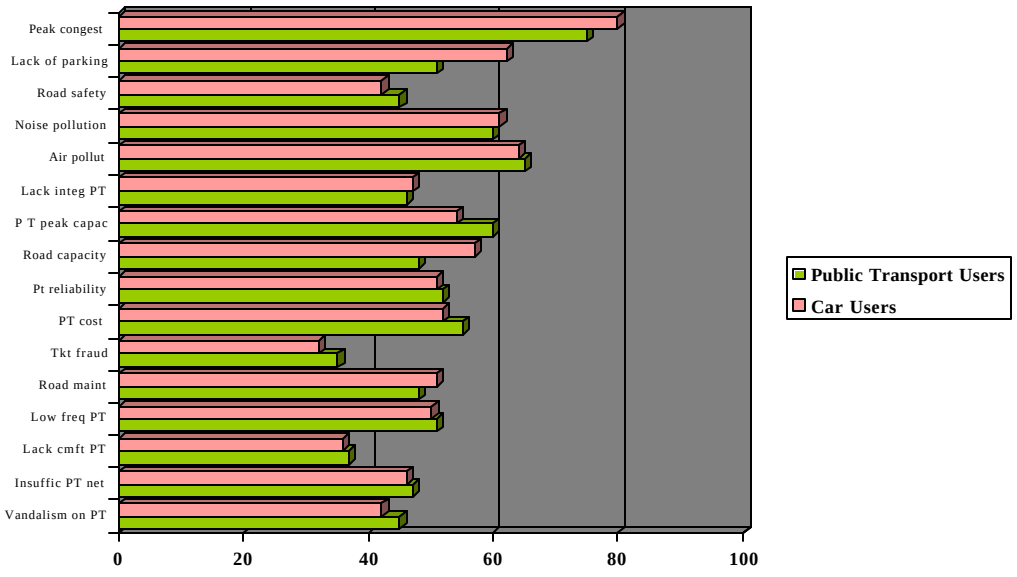
The car remains more attractive overall than other modes, although the train is a clear second option. In order to become more acceptable, bus transport must take on more of the service attributes required by customers and equally important communicate its ability to deliver them.

Transport and Traffic problems - Issues of concern

The following table and graph show the relative importance or weight given to each of the issues by the two sample groups. As can be seen they are similar in their outlook. Only the criteria marked * seem to be different in weighting. The overall correlation between results is high at 0.92 thus indicating that there is probably little or no significant difference between car and PT users in their outlook.

	Public Transport Users	Car Users	
Peak congest	75	80	
Lack of parking	51	62	*
Road safety	45	42	
Noise pollution	60	61	
Air pollut	65	64	
Lack integ PT	46	47	*
P T peak capac	60	54	*
Road capacity	48	57	
Pt reliability	52	51	
PT cost	55	52	
Tkt fraud	35	32	
Road maint	48	51	
Low freq PT	51	50	
Lack cmft PT	37	36	
Insuffic PT net	47	46	
Vandalism on PT	45	42	
Correlation	**.92**		

Issues of Concern by Car and Public Transport Users



Management Schemes and Policies

Differences of perceptions of management schemes have been calculated between the two groups. The statistically significant differences are shown below. Apart from a general trend for car users to be less in favour, the differences are small. The high number of statistically

significant differences arises because of the large sample size. Nevertheless we see a consistent trend of resistance to control from car users. Not surprisingly there is little resistance to restriction of goods deliveries by members of the general population.

Element 1 BUS LANES

Construct	car03	ptu03	Diff score	
Helpful	0.46	0.7	-0.23	p <= 0.05
Env friendly	0.26	0.34	-0.08	NS
Safety	0.39	0.57	-0.18	p <= 0.05
Economical	-0.15	0.11	-0.26	p <= 0.05
Time saving	0.55	0.72	-0.17	p <= 0.05
Equal treatment	-0.09	0.18	-0.26	p <= 0.05
Regulating orderly	0.38	0.63	-0.25	p <= 0.05
Financial incentive	-0.16	0.03	-0.18	p <= 0.05
Lessens stress	0.19	0.42	-0.23	p <= 0.05
Clear	0.43	0.57	-0.13	p <= 0.05
Helps reduce cong.	0.36	0.56	-0.2	p <= 0.05
Makes ppl change	0.05	0.28	-0.22	p <= 0.05
Favours PT	0.87	0.9	-0.03	NS
This is acceptable	0.58	0.84	-0.25	p <= 0.05

Element 2 RESTRICTION OF GOODS DEL.

Construct	car03	ptu03	Diff score	
Helpful	0.02	0.19	-0.16	p <= 0.05
Env friendly	0.04	0.12	-0.07	NS
Safety	0.21	0.35	-0.13	p <= 0.05
Economical	0.06	0.06	0.01	NS
Time saving	0.17	0.28	-0.1	NS
Equal treatment	-0.3	-0.2	-0.1	NS
Regulating orderly	0.25	0.37	-0.11	p <= 0.05
Financial incentive	-0.36	-0.26	-0.09	NS
Lessens stress	0.13	0.15	-0.01	NS
Clear	0.09	0.17	-0.07	NS
Helps reduce cong.	0.39	0.46	-0.06	NS
Makes ppl change	-0.03	0.08	-0.1	NS
Favours PT	-0.1	0	0.18	p <= 0.05
This is acceptable	0.23	0.38	-0.15	p <= 0.05

Element 3 INCREASED PARKING PRICING

Construct	car03	ptu03	Diff score	
Helpful	-0.71	-0.39	-0.32	p <= 0.05
Env friendly	-0.18	0	-0.18	p <= 0.05
Safety	-0.44	-0.16	-0.28	p <= 0.05
Economical	-0.47	-0.25	-0.21	p <= 0.05
Time saving	-0.55	-0.31	-0.23	p <= 0.05
Equal treatment	-0.48	-0.33	-0.15	p <= 0.05
Regulating orderly	-0.35	-0.05	-0.29	p <= 0.05
Financial incentive	-0.93	-0.69	-0.23	p <= 0.05
Lessens stress	-0.81	-0.53	-0.27	p <= 0.05
Clear	-0.34	-0.12	-0.21	p <= 0.05
Helps reduce cong.	-0.18	0.06	-0.24	p <= 0.05
Makes ppl change	-0.19	-0.01	-0.18	p <= 0.05
Favours PT	0.38	0.35	0.03	NS
This is acceptable	-0.45	0	-0.45	p <= 0.05

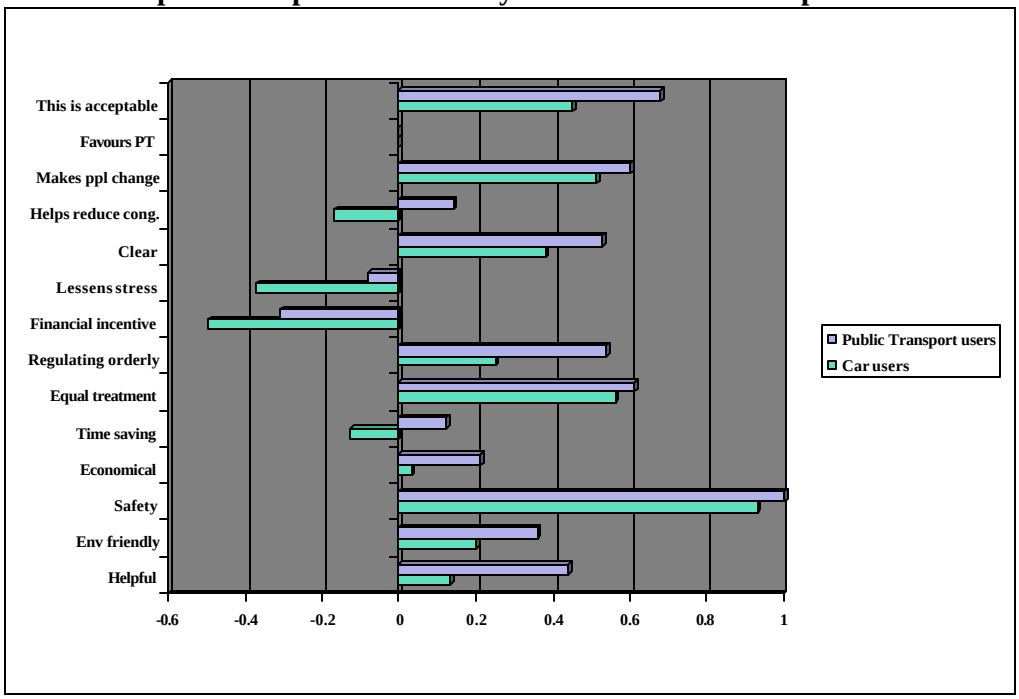
Element 4 CAR FREE ZONES

Construct	car03	ptu03	Diff score	
Helpful	-0.4	-0.02	-0.37	p <= 0.05
Env friendly	0.57	0.68	-0.11	p <= 0.05
Safety	0.52	0.59	-0.06	NS
Economical	-0.12	0.03	-0.14	p <= 0.05
Time saving	-0.57	-0.29	-0.28	p <= 0.05
Equal treatment	-0.48	-0.36	-0.12	p <= 0.05
Regulating orderly	-0.15	0.06	-0.21	p <= 0.05
Financial incentive	-0.68	-0.42	-0.25	p <= 0.05
Lessens stress	-0.54	-0.17	-0.37	p <= 0.05
Clear	-0.13	0.06	-0.18	p <= 0.05
Helps reduce cong.	-0.07	0.13	-0.19	p <= 0.05
Makes ppl change	0	0.17	-0.16	p <= 0.05
Favours PT	0.28	0.36	-0.07	NS
This is acceptable	-0.04	0.28	-0.31	p <= 0.05

Element 5 SPEED CAMERAS

Construct	car03	Ptu03	Diff score	Statistical Sig.	Construct	car03	Ptu03	Diff score	Statistical Sig.
Helpful	0.13	0.44	-0.3	p <= 0.05	Financial incentive	-0.5	-0.31	-0.19	p <= 0.05
Env friendly	0.2	0.36	-0.15	p <= 0.05	Lessens stress	-0.37	-0.08	-0.28	p <= 0.05
Safety	0.93	1	-0.07	NS	Clear	0.38	0.53	-0.15	p <= 0.05
Economical	0.03	0.21	-0.18	p <= 0.05	Helps reduce cong.	-0.17	0.14	-0.31	p <= 0.05
Time saving	-0.13	0.12	-0.24	p <= 0.05	Makes ppl change	0.51	0.6	-0.09	NS
Equal treatment	0.56	0.61	-0.04	NS	Favours PT	0	0	0.12	p<=.05
Regulating orderly	0.25	0.54	-0.29	p <= 0.05	This is acceptable	0.45	0.68	-0.23	p <= 0.05

Perceptions of Speed Cameras by Car and Public Transport Users

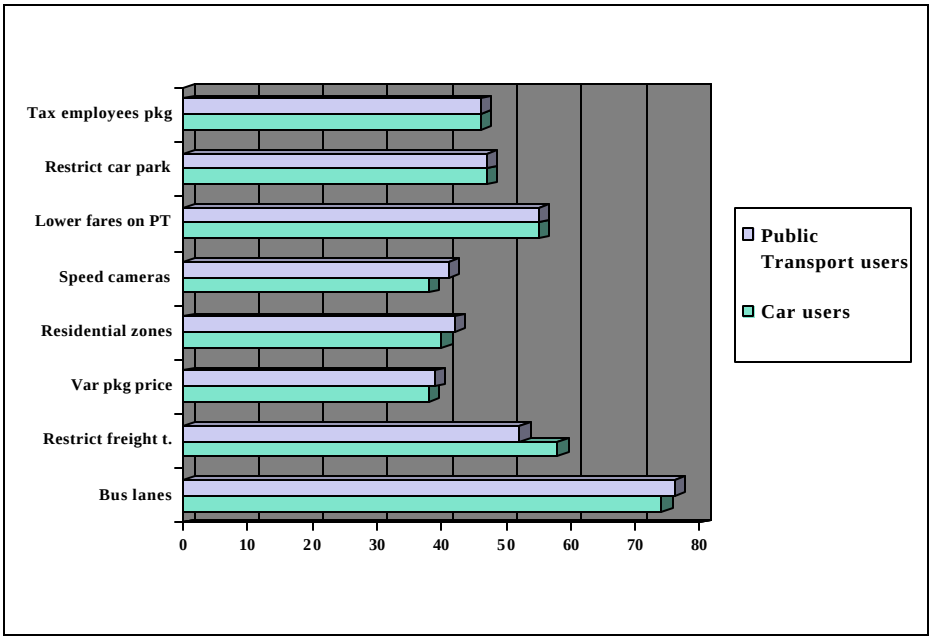


Suitability of management measures (also referred to as Policies)

The following table and graphs show the suitability weighting given to each management measure for dealing with problems of Congestion, Pollution and Road Safety. Only the five measures common to all sites have been analysed in this section of the report. The samples are as before, car users and public transport users. The figures can be viewed as 'perceptions of suitability or perhaps more correctly as suitability weightings.

	CONGESTION		POLLUTION		ROAD SAFETY	
	Car users	Ptu	Car users	Ptu	Car users	Ptu
Bus lanes	74	76	61	63	64	66
Restrict freight t.	58	52	53	52	43	41
Var pkg price	38	39	34 *	39	24 *	30
Residential zones	40	42	59	59	56	57
Speed cameras	38	41	33	36	75	74
Lower fares on PT	55	55	55	54	50	51
Restrict car park	47	47	50	50	46	46
Tax employees pkg	46	46	47	47	45	44

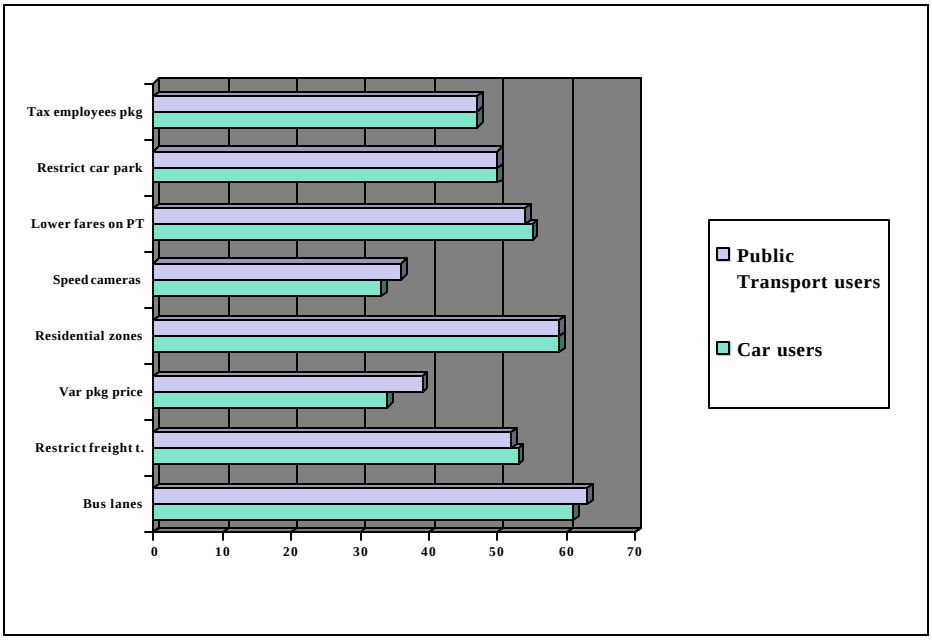
Perceptions of suitability of 'Measures' for dealing with Congestion by Car and Public Transport Users



There are only minor differences between the sample groups. Bus Lanes together with lower fares on P.T. seem to be most relevant.

Car drivers recognise the relevance of bus lanes for dealing with congestion in the same way as public transport users.

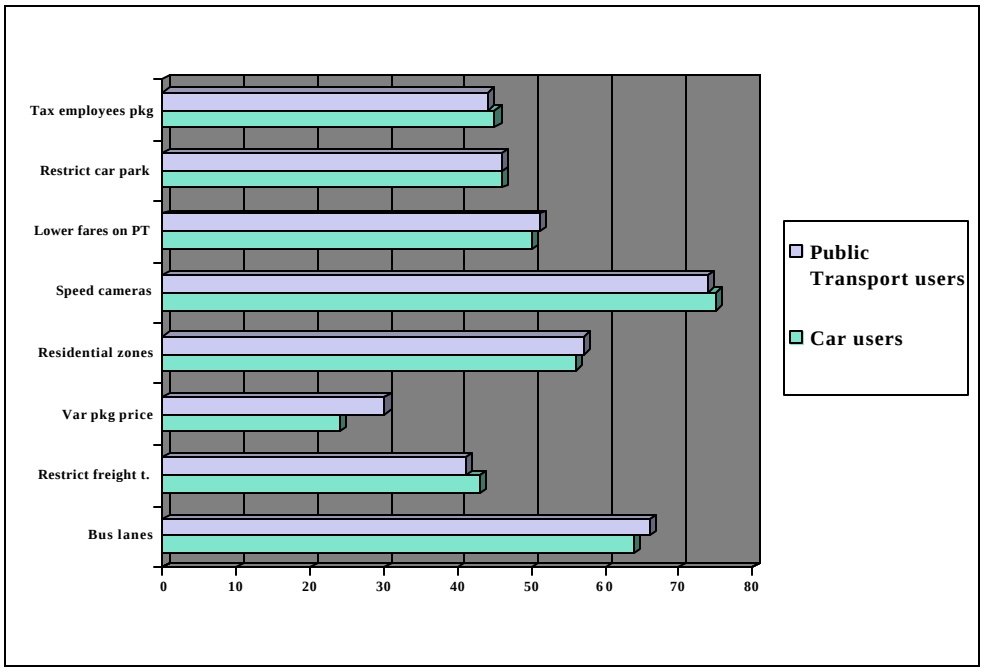
Perceptions of suitability of 'Measures' for dealing with Pollution by Car and Public Transport Users



Restriction of Freight delivery times and car free residential zones play an increasingly important role together with Bus Lanes in reduction of pollution.

There are only two slight differences between the groups in relation to the use of parking pricing as a mechanism for dealing with Pollution and Road safety.

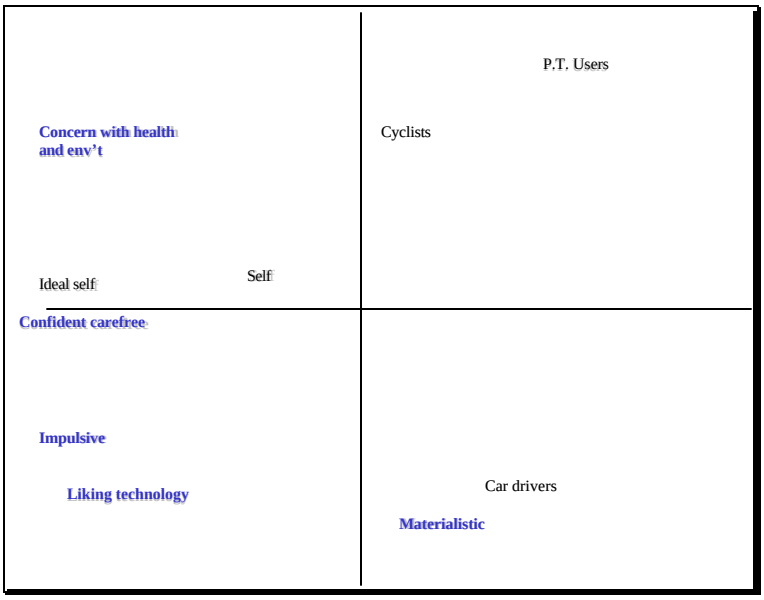
Perceptions of suitability of 'Measures' for dealing with Road Safety by Car and Public Transport Users



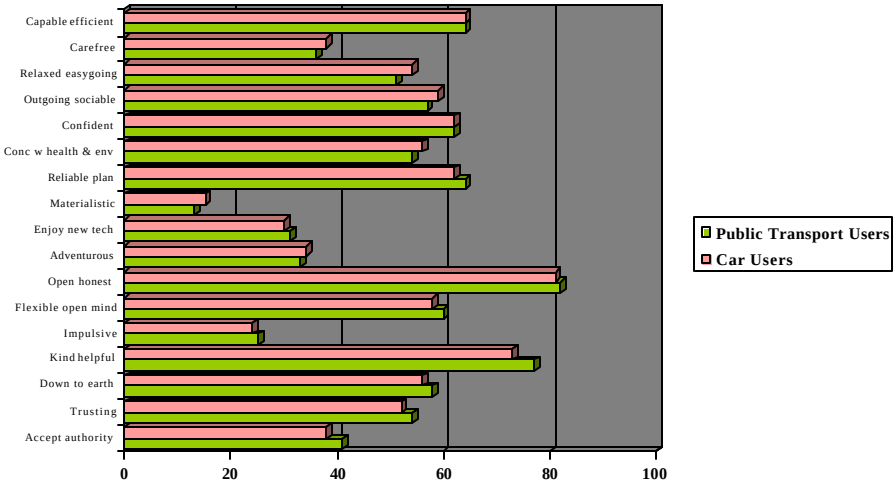
Speed cameras are perceived to be most effective in dealing with issues of road safety.

Perceptions of Self and Others

Principal components analyses (shown simplified below) do not reveal any significant differences between the orientations of car users and P.T users. Both groups see P.T. users as opposite to their desired selves, and see motorists as materialistic. Motorists are slightly more prepared to see themselves as materialistic than P.T Users. A clinical psychology interpretation of these findings demonstrates clearly an underlying resistance of people to move from private to public transport.



Importance of Personal Characteristics by Car and Public Transport Users



Analyses of the importance weighting of personal characteristics shows the following:

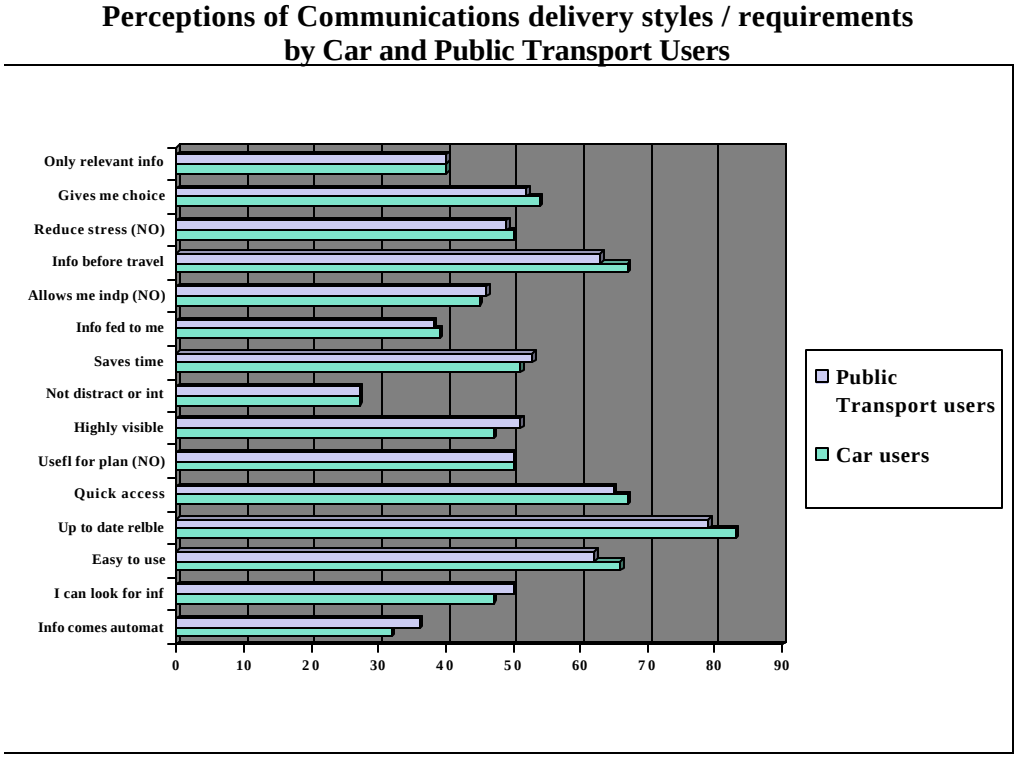
	Car users	P.T. Users		Car users	P.T. Users
Capable efficient	64	64	Adventurous	33	34
Carefree	36	38	Open honest	82	81
Relaxed easygoing	51	54	Flexible open mind	60	58
Outgoing sociable	57	59	Impulsive	25	24
Confident	62	62	Kind helpful	77	73
Conc w health & env	54	56	Down to earth	58	56
Reliable plan	64	62	Trusting	54	52
Materialistic	13	15	Accept authority	41	38
Enjoy new tech	31	30		**Correlation**	**0.99**

The correlation of 0.99 between the results demonstrates that there is no difference between the aspirations of the two samples.

Communications delivery styles / requirements of Car and Public Transport users

	Car users	P.T. Users
Info comes automat	32	36
I can look for inf	47	50
Easy to use	66	62
Up to date relble	83	79
Quick access	67	65
Usefl for plan (NO)	50	50
Highly visible	47	51
Not distract or int	27	27
Saves time	51	53
Info fed to me	39	38
Allows me indp (NO)	45	46
Info before travel	67	63
Reduce stress (NO)	50	49
Gives me choice	54	52
Only relevant info	40	40
Correlation		**0.99**

There are no differences between the sample groups and the correlation between their results is 0.99.



Summary

These results show quite clearly that other than through a behavioural artefact there is no market segmental difference between car and public transport users. Each is as likely to accept or reject a policy as the other and the data gives no insight into how they might be better communicated with. This finding is important since a number of campaigns seem to be targeted at motorist or bus users as if they are different market segments. In this as well as other studies we can find no evidence to support a significantly different orientation between car and P.T. users.

Attitudinal Segmentation Rejecters vs. Acceptors

A second example of the use of the STIMULUS software is to select cases based on some attitudinal response. As before we have chosen the transport policies or measures area of the data.

Conventional analyses were conducted to select those who accepted or rejected each policy. (Question 14 of questionnaire section 3.) It was found that there was a large group of acceptors who accepted the Measures generally, while rejecters feel into two smaller groups - those who rejected bus lanes and freight restrictions on the one hand and those who rejected car-free zones and increased parking pricing on the other hand. (Those who rejected speed cameras did not form a distinct group but rather overlapped with the other 2 groups of rejecters.)

The demographic variables and travel patterns of these 3 groups (1 group of acceptors and 2 groups of rejecters) were compared and it was found that the acceptors were those who used public transport while the two groups of rejecters were car users.

However, those who rejected bus lanes and freight restrictions appeared to be those who needed to use their cars (as opposed to having a choice). Those who rejected increased parking pricing and car-free zones seem to use a car because they want to, not because they have to.

The former group of rejecters travel more for business purposes and more of them have company cars. They reject the kind of Measures (freight restrictions and bus lanes) that would make it difficult for them to do business. The latter group reject the kind of Measures that penalise car-users.

Further analyses were conducted to determine how they perceive the different modes of transport, how these people see themselves in comparison with other road users and how they want to be. The following bullet points and table summarise the main differences between the groups.

?? Acceptors - Use Public Transport
?? Rejecters 1 - Have to use car

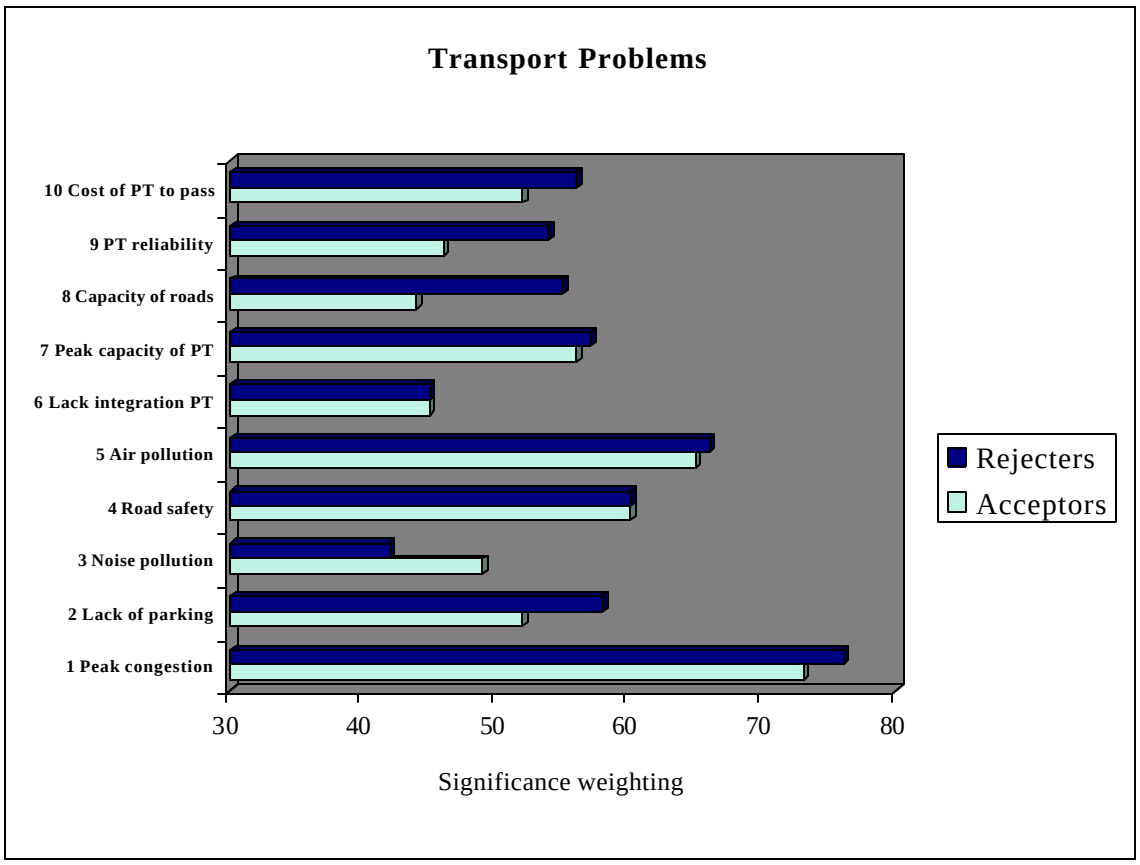
?? Rejecters 2 - Want to use car

Summary of Acceptors/Rejecters of Policies

Acceptors of all 5 policies	**Rejecters of Parking Pricing and Car-free Zones - 2**	**Rejecters of Bus Lanes and Freight Restrictions - 1**
Fewer owner occupied - more apartments More urban More females More mobility impaired in household	 Fewer OAPs More mobility impaired	 More males Have more children
More students	More full-time working	More self-employed
	More professional, clerical	More home-makers, manual, supervisors
		Lower standard of education
	More mobile phone/PC users	
More public transport users	More car ownership	More company cars, parking space at work
More travel to allotment/garden	More commuting; more escort to school	More travel in course of business
		Less satisfied with journey time
	Park in driveway, have gardens	
Feel police should influence policy more than they do	* Feel Social Lobby should influence policy more than they do	
Rely more on TV for travel information	Rely on VMS more	
	Believe they have a right to park in city centre	Believe they have a right to park in city centre
Believe they have a right to late night public transport	* Believe they have a right to late night public transport	
Believe they have a right to pedestrian areas, cycle lanes, fewer cars on the road	* P.T. seen as less expensive, less reliable, less flexible than car.	P.T. seen as more expensive, slower, less reliable, less flexible and worse value than car.
More Bucharest respondents	More Oslo respondents	More Oslo respondents
See selves as concerned with the environment; accepting of authority	See selves as more materialistic * Want to be less materialistic	See selves as more carefree; enjoy technology.
	P.T. users seen as less confident, * less materialistic, more flexible, more honest	P.T. users seen as less confident, less materialistic, less adventurous and less impulsive.
Want to be relaxed	* Car drivers seen as more materialistic, more impulsive, less kind, less trusting, less reliable	Car drivers are seen as less honest and less trusting.
Do not want to be impulsive		Less likely to want to be adventurous

It can be seen clearly from the table above (see items marked *) that rejecters 2 would be more easily persuaded to use P.T. than rejecters 1. Their desire to be less materialistic coupled with a more social orientation and view of P.T. as less expensive could make them susceptible to modal shift.

Concern with Transport Problems



In this further analysis of those who generally tend to be rejecters we can see that they are more concerned by lack of P.T. reliability, lack of parking space and road capacity and less concerned by noise pollution than acceptors. These findings could indicate opportunities for educational communication in the market place. They also indicate that these people are less personally aware of the need to change behaviour in order to protect the urban environment.

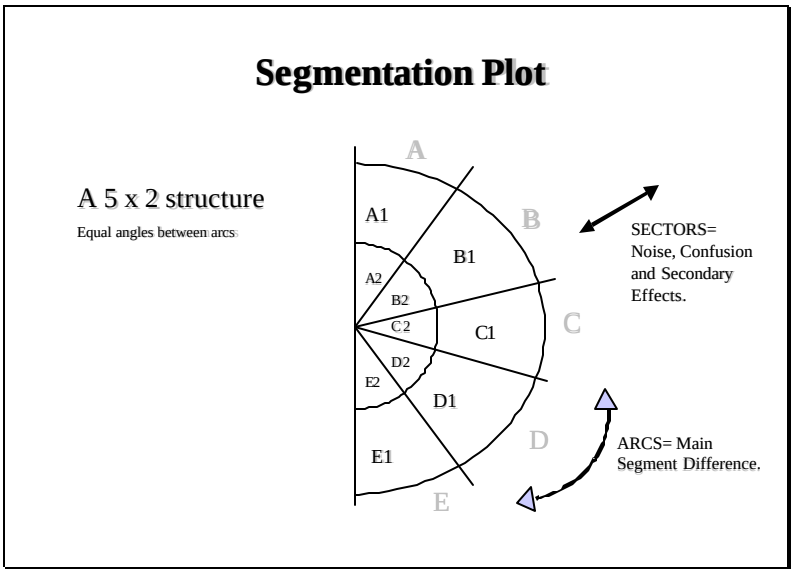
In this section we have shown that segmentation may be carried out using attitudinal scales. There is some evidence from the findings that this attitudinal segmentation may be of greater value in predicting behaviour and designing communications than other more conventional approaches.

Psychographic segmentation

Analyses using the Policies and Schemes data set

As before, analysis was carried out on the policy acceptance area of the questionnaire (section 3). This process could be repeated for sections 1 and 5 as well as for each site.

Psychographic segmentation was based on a 5 x 2 structure:



Individuals whose questionnaires are plotted towards the outer margins are those who hold the strongest and most consistent views. Those positioned in the region of A1 and E1 sectors also hold stronger and more extreme views. These people could be the sort of people who lead pressure groups and command greater 'air time' than their proportion in the population would appear to warrant.

Those positioned in the outer regions of B1, C1, and D1 could be regarded as the opinion-formers. By varying the number of arcs and segments the STIMULUS software provides an opportunity for further investigation of these topics.

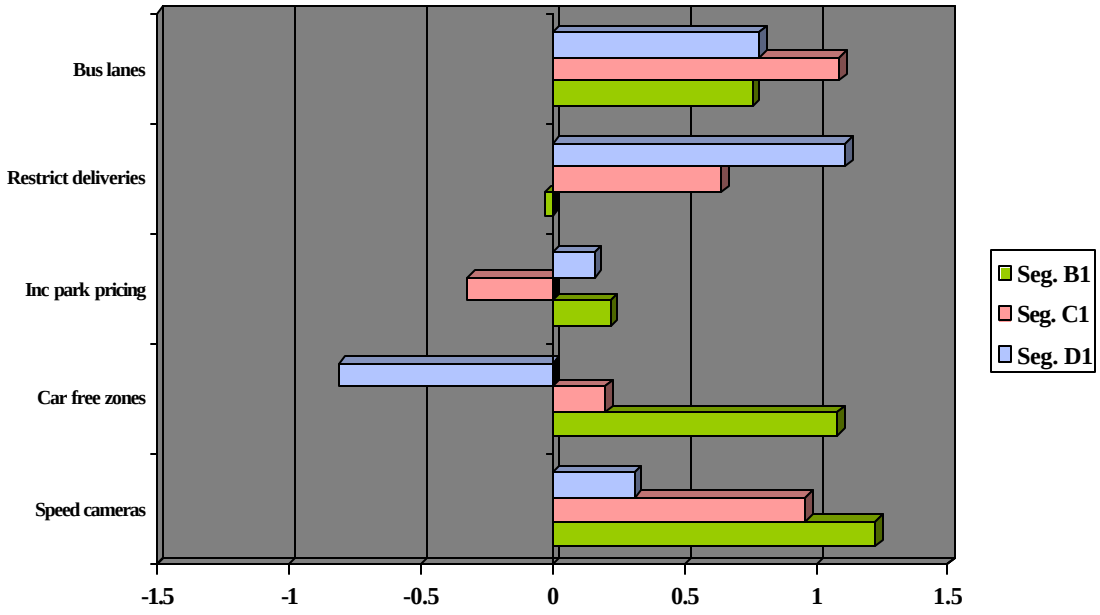
In this report we have concentrated only on the outer arcs. Research into specific topics often requires consideration of the inner arcs as they reveal information of a different quality and content.

It should also be noted that the analyses in this section are for the sample as a whole. Individual sites and further analyses of revealed segments would also reveal wider differences and more easily identifiable segmentation.

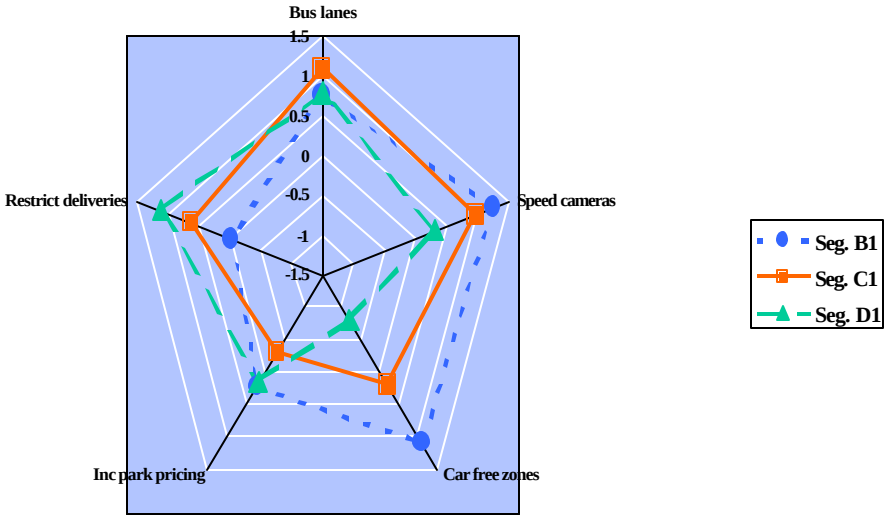
The acceptance or otherwise of the policies by members of these naturally occurring segments is shown below.

Acceptance and Rejection

Sample sizes in the A1 and F1 segments were only 5 and 6 respectively. They have therefore been omitted from the graph below.



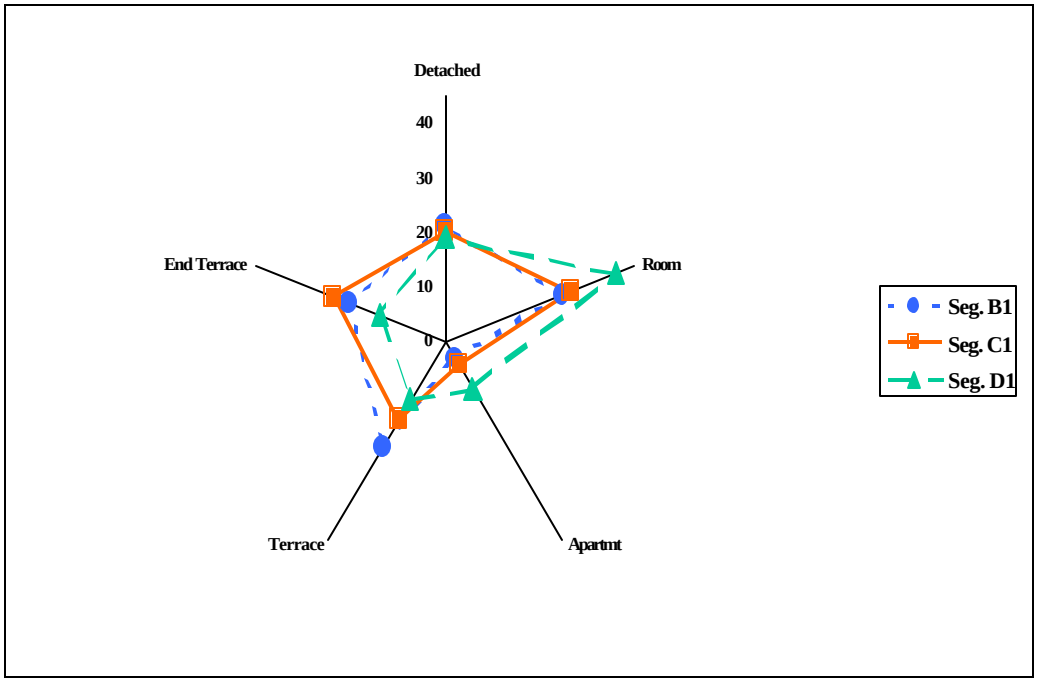
These different segments are not clearly defined by demographic differences but rather by the sum total of the way the members of the segments view the policies in the light of their total existence.



The differing degrees of acceptance between the segments can now be seen more clearly.

Examples of some of the demographic differences are shown overleaf.

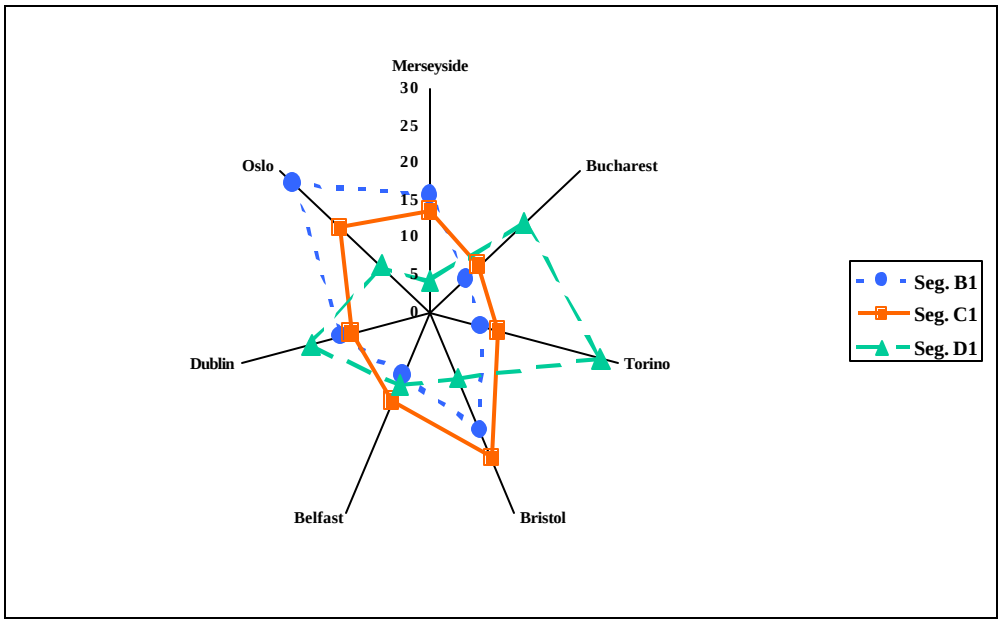
Location



In this radar plot it can be seen that the sample proportions for each country are not the same within the segments. Interestingly Bucharest and Turin have similar profiles, as do Dublin and Belfast, and Oslo and Bristol. The cultural and urban environments of these 'paired' cities bear more than a passing similarity.

Type of Residence

Type of residence also varies across the segments - perhaps reflecting economic prosperity as well as different housing preferences from country to country.



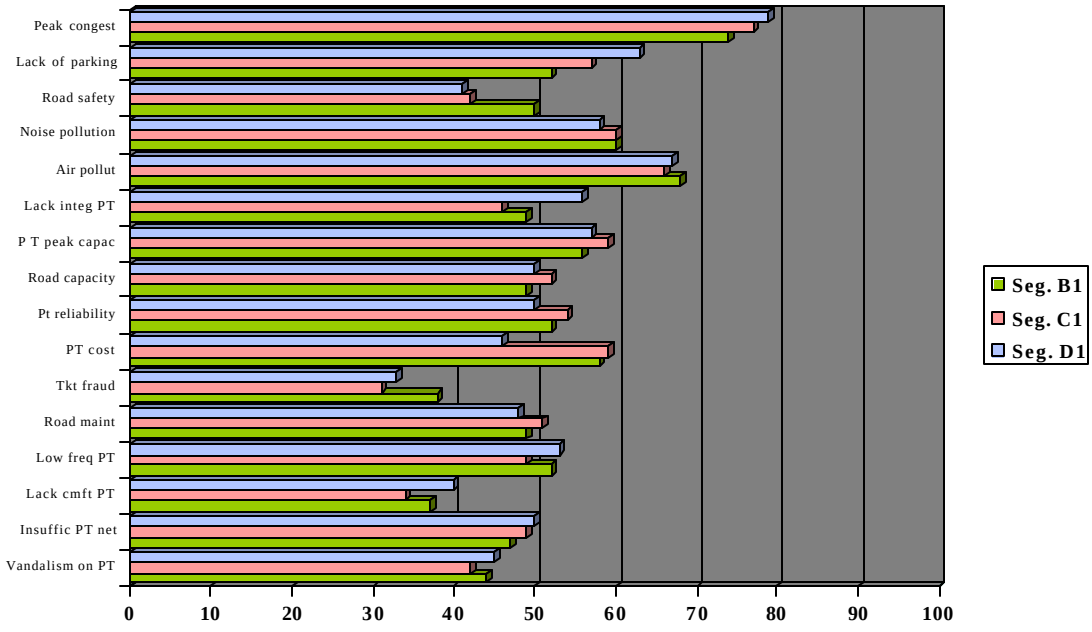
The following table summarises some further features of the demographic characteristics of the main segments.

Seg. B1	Seg. C1	Seg. D1
More mobility impaired		
Lower level of car ownership		
		High level of 'room' and apartment occupiers
Avge. age 35	Avge. age 30	Avge age 40+
		More self-employed
63% female	60% female	50% female
	Majority single	Majority married
41% own a car	55% own a car	69% own a car
		Few cyclists
P.T. users (weekday and weekends)		Use a car on weekdays and weekends
Think police should have more influence over policy	Think police should have more influence over policy	
Make greater use of travel / transport information from a variety of sources		
		Believe in a right to adequate roads and city centre parking
Believe there should be fewer cars on the road		
More Oslo		More Turin

There appears to be a 'wealth' gradient from B1 (low) to D1 (high). B1 appear to be city dwelling people who use public transport – perhaps we could call them 'Urban Workers' Segment C1, also young and mainly female are perhaps more 'dynamic'. Segment D1 is older, more male richer and more assertive of their rights. Hence we have a new way of looking at person types on a gradient from young Urban Worker to older 'Established'.

Issues of Concern

	Seg. B1	Seg. C1	Seg. D1
Peak congestion	74	77	79
Lack of parking	52	57	63
Noise pollution	50	42	41
Road safety	60	60	58
Air pollution	68	66	67
Lack integration PT	49	46	56
Peak capacity of PT	56	59	57
Capacity of roads	49	52	50
PT reliability	52	54	50
Cost of PT to pass	58	59	46
Ticket fraud on PT	38	31	33
Poor maint stds	49	51	48
Low frequency PT	52	49	53
Lack comfort PT	37	34	40
Insufficient PT net	47	49	50
Vandalism on PT	44	42	45



There are no major differences - segment B1 is marginally more concerned about noise pollution and ticket fraud. As might have been expected from the results of the previous section the D1 segment is less concerned about matters that do not impinge on them directly.

Importance of Personal Characteristics

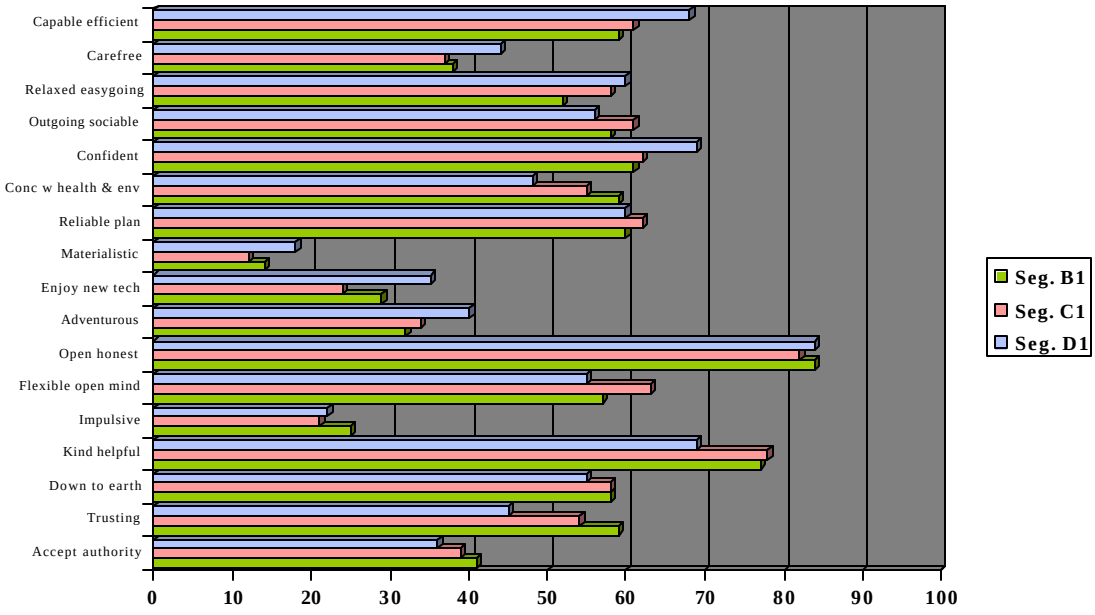
	Seg. B1	Seg. C1	Seg. D1
Capable efficient	59	61	68
Carefree	38	37	44
Relaxed easygoing	52	58	60
Outgoing sociable	58	61	56
Confident	61	62	69
Conc w health & env	59	55	48
Reliable plan	60	62	60
Materialistic	14	12	18
Enjoy new tech	29	24	35
Adventurous	32	34	40
Open honest	84	82	84
Flexible open mind	57	63	55
Impulsive	25	21	22
Kind helpful	77	78	69
Down to earth	58	58	55
Trusting	59	54	45
Accept authority	41	39	36

Segment B1 is 'softer' in its outlook (highlighted in red shading), As expected from a younger more female audience. Segment D1 (richer, more experienced and established people) is 'harder' (blue shading). They want more for themselves; and to be capable, efficient, carefree, confident, adventurous and liking new technology.

These characteristic profiles are graphed below.

There are also significant differences between the segments in how people see themselves and how they would like to be.

Compared with segment B1, segment D1 is less carefree and relaxed and wants to be more so, they are less concerned about the environment and are more technology oriented.

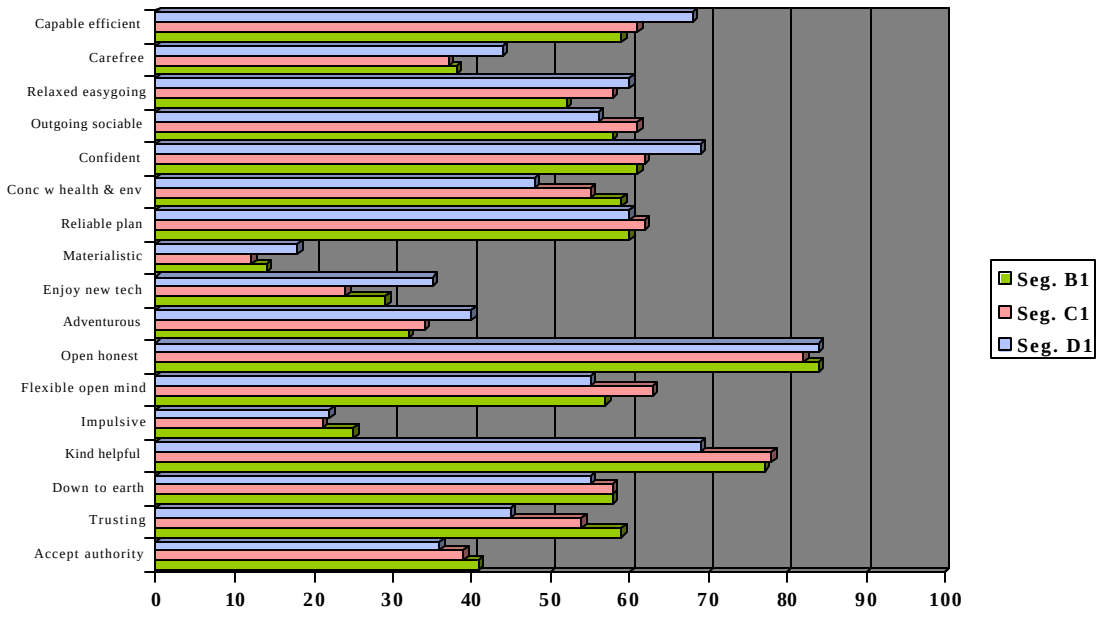


Information and Communication Requirements

	Seg. B1	Seg. C1	Seg. D1
Info comes automat	32	30	38
I can look for inf	54	47	51
Easy to use	66	67	59
Up to date relble	80	83	78
Quick access	62	67	64
Highly visible	58	45	48
Not distract or int	27	23	32
Saves time	58	52	54
Info fed to me	37	36	42
Info before travel	61	69	60
Gives me choice	51	52	42
Only relevant info	35	42	49

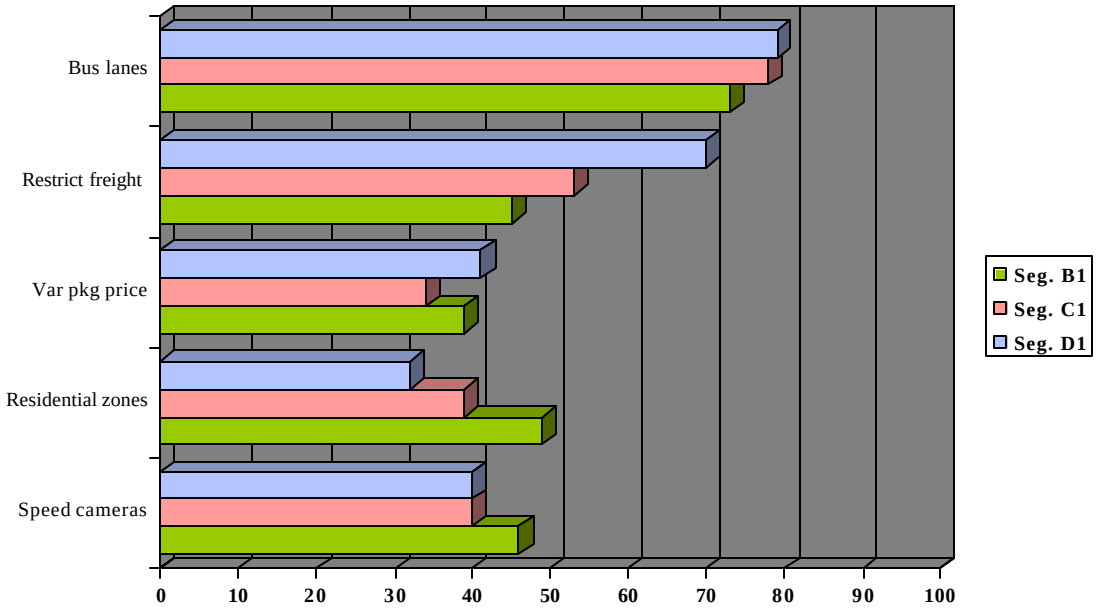
Segment B1 wants ease and visibility. C1 requires ease, speed and prior information. D1 requires automatic feed of relevant information. D1 people may place a higher value on their own time. In this respect their more demanding orientation is consistent with previous findings.

These findings are graphed below.



Transport Problems

Having seen that there are differences in psychological orientation between segments we can now determine whether there are differences in perceptions of policies for dealing with these problems. For example consider the case of 'congestion'.



As can be seen there are major differences between segments in relation to the usefulness of freight restriction and car free residential zones. Segment B1 comprising a higher proportion of urban dwellers is also more in favour of car free residential zones. Segment D1 would rather restrict freight delivery times to ease congestion (and since they are mostly car drivers – to save their time when travelling).

Summary of Segments

In this table we have attempted to provide an 'interpreted' overview of the latent segments revealed through the analyses.

Seg. B1 **Young soft non-motorists**	**Seg. C1** **Young flexible 'workers' modern outlook - not rich**	**Seg. D1** **Hard motorists - concerned for themselves**
Public transport users		Car owners & car users
Younger		Older
Female	Female	Equal male population
Low car ownership		Married
Concerned by noise pollution and ticket fraud		Believe in the right to roads and parking
Oriented towards environment and relationships	Flexible in outlook	Oriented towards themselves
Greater information needs - ease and visibility Moderate acceptors of bus lanes Reject goods vehicle delivery restriction	Information needs - ease, speed and before travel Strongly favour bus lanes Moderately favour goods vehicle restriction	Want relevant information Moderate acceptors of bus lanes Strongly favour goods vehicle restriction
Moderately in favour of parking	Against parking pricing	Somewhat accept parking pricing

pricing Favour car free zones	Somewhat in favour of car free zones	Reject car free zones
Strongly favour speed cameras	Favour speed cameras	Somewhat accept speed cameras

These results demonstrate how STIMULUS enables psychographic segmentation to be carried out within one context and the results applied to other contexts. By using this approach the researcher can build a total understanding of the members of the segments and work towards better brand and communications design that will have immediate appeal to its intended audience.

The example above is clearly only a sample of the possible analytical processes.

Individual Site Results

Results for the individual sites participating in the project have been produced and are available from the partners involved.

Was there consensus on different transport policies at the European level?

Respondents at each site were given a list of issues or problems pertaining to European cities and asked to indicate those they considered to be of most and least concern in their own city.

They were then given a list of management schemes and asked to indicate which they considered most appropriate for dealing with the 3 main problems of congestion, air pollution and road safety.

5 main policies were then examined in detail and respondents asked to rate them against a number of given criteria to demonstrate their acceptance or rejection of each scheme.

Summary

An initial inspection of the results in this section might lead the reader to come to a false assumption that there is broad agreement across Europe. This is not the case. The results reported in the previous sections show that in relation to Management Measures when there is apparent agreement or acceptance the reasons for this may differ between sites. In addition there may be segments within each site that require special consideration.

Concern with peak time congestion and acceptance of bus lanes are perhaps the only two factors common to all sites. In most other respects each site should be treated individually. There is no evidence for a 'European' perspective.

The graphs below give the results for the whole sample and for each site.

Issues of Concern at European Level

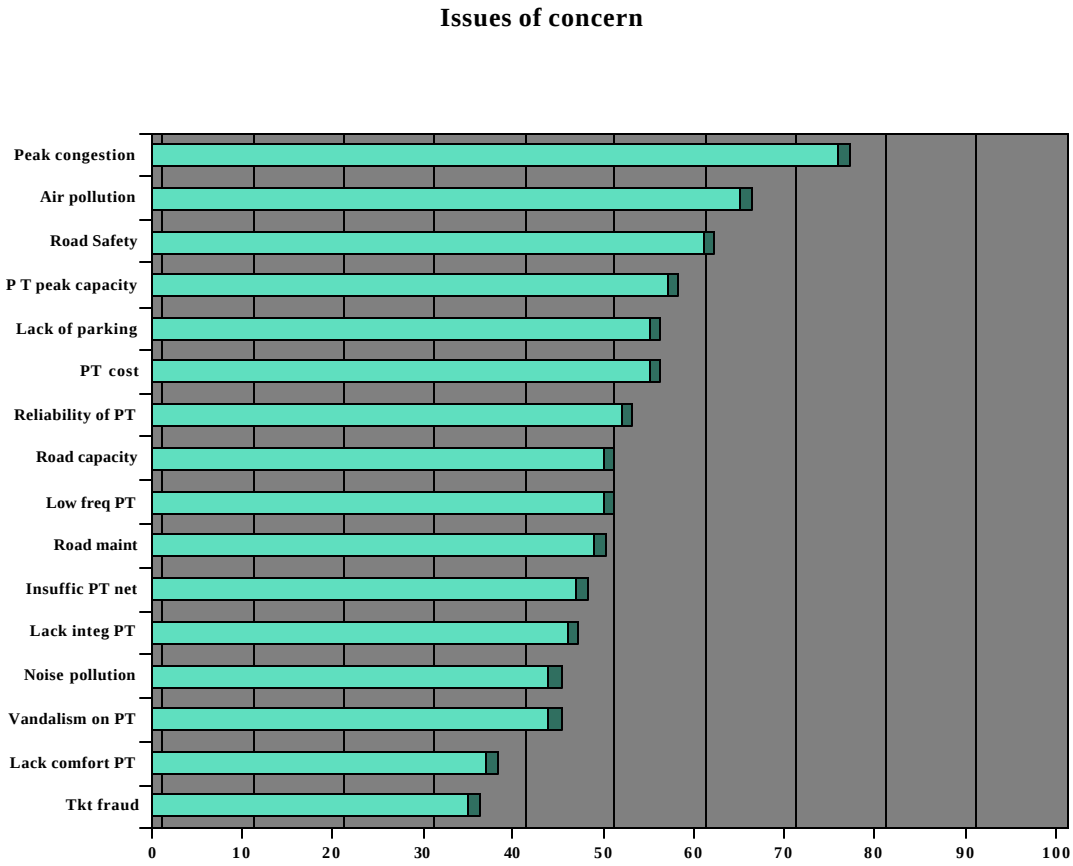
The table below lists in order of relative importance (%) the main issues of concern across all the sites. The main issues are peak-time traffic congestion, air pollution and road safety.

1.	Peak congestion	76%
2.	Air pollution	65%
3.	Road safety	61%
4.	Peak capacity of PT	57%
5.	Lack of parking	55%
6.	Cost of PT to pass	55%
7.	PT reliability	52%
8.	Capacity of roads	50%
9.	Low frequency PT	50%
10.	Poor maint stds	49%
11.	Insufficient PT net	47%
12.	Lack of PT info	47%
13.	Noise pollution	44%

14.	Vandalism on PT	44%
15.	Lack comfort PT	37%
16.	Ticket fraud on PT	35%

Relative Importance of Main Issues of Concern across all sites

The following series of graphs show the relative importance or relevance of issues. In addition to calculating and displaying results of analyses the STIMULUS software has a number of diagnostic features. In this case we can see that with the exception of Peak time congestion the importance profile of the issues is relatively 'flat', i.e. tending to lie around the 50% mark. This is indicative of heterogeneity within the sample that could lie within and or between sites. The STIMULUS user on encountering results such as these must proceed to drill down into the data and segment until a more meaningful set of results is encountered.



Issues of concern at each site

The following table shows the three main issues of concern at each site. Peak congestion is the main concern at all the sites.

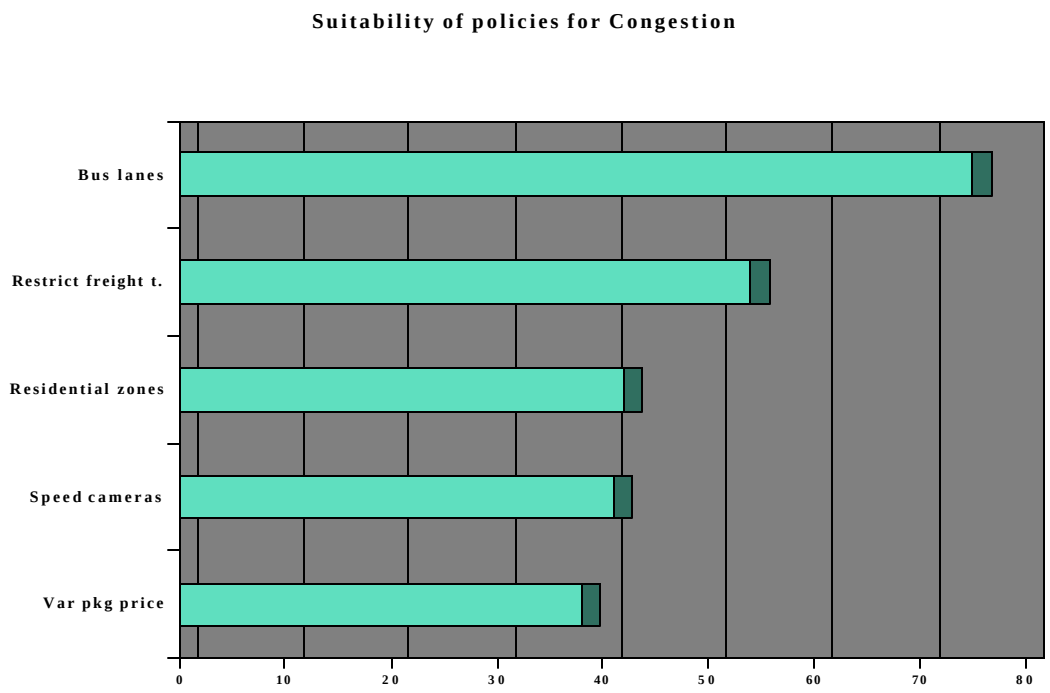
Belfast	**Dublin**	**Bristol**
?? Peak congestion ?? Cost of Public Transport ?? Road safety	?? Peak congestion ?? Peak capacity of Public Transport ?? Road Safety	?? Peak congestion ?? Air pollution ?? Cost of Public Transport
Merseyside	**Bucharest**	**Oslo**
?? Peak congestion ?? Road safety ?? Air pollution	?? Peak congestion ?? Vandalism on Public Transport ?? Air pollution	?? Peak congestion ?? Air pollution ?? Road safety
	Turin	
	?? Peak congestion ?? Lack of parking ?? Road safety	

Suitability of Management Schemes/Policies for Issues

Respondents were asked to indicate which policies/schemes they considered most appropriate for dealing with the 3 main problems of congestion, air pollution and road safety.

N.B. Only the measures common to all sites are shown.

1.	**Bus lanes**	**75%**
2.	**Restrict freight t.**	**54%**
3.	**Residential zones**	**42%**
4.	**Speed cameras**	**41%**
5.	**Var pkg price**	**38%**



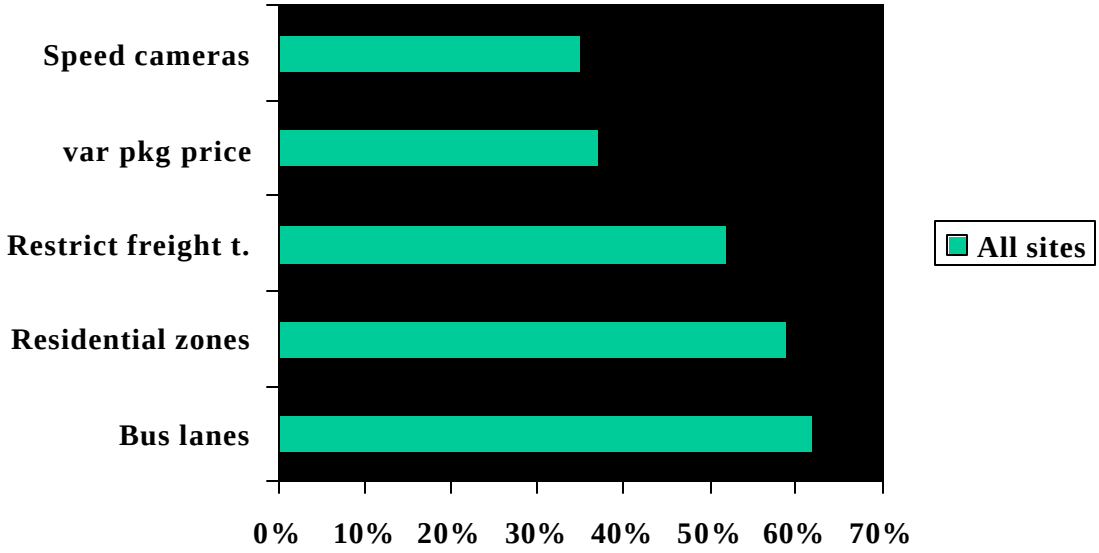
There are some differences among the sites and again we see a relatively flat or undifferentiated structure indicative of heterogeneity; however, all agree that bus lanes are one of the most appropriate methods for dealing with congestion.

Belfast	**Dublin**	**Bristol**
?? Lower fares ?? Bus lanes ?? Freight restrictions	?? Bus lanes ?? Lower fares ?? Freight restrictions	?? Improve Public Transport Services ?? Park and Ride ?? Bus Lanes.
Merseyside	**Bucharest**	**Oslo**
?? Reduce Car Use ?? Bus Lanes ?? Car Free Zones	?? Bus Lanes ?? Freight Restrictions ?? One-Way Street	?? Bus Lanes ?? Restrict Freight Delivery Times ?? Lower Fares on Public Transport.
	Turin	
	?? Bus lanes ?? Lower fares ?? Parking restrictions	

Appropriate Policies for Dealing with Pollution - European level

Bus lanes, car-free residential zones, lower fares, pedestrianised city centres were all seen as appropriate for dealing with pollution.

1.	Bus lanes	62%
2.	Residential zones	59%
3.	Restrict freight t.	52%
4.	var pkg price	37%
5.	Speed cameras	35%



There is slightly better differentiation in this case, however the results are nevertheless clustered close to the 50% score indicating that the user should be cautious about generalising the conclusions.

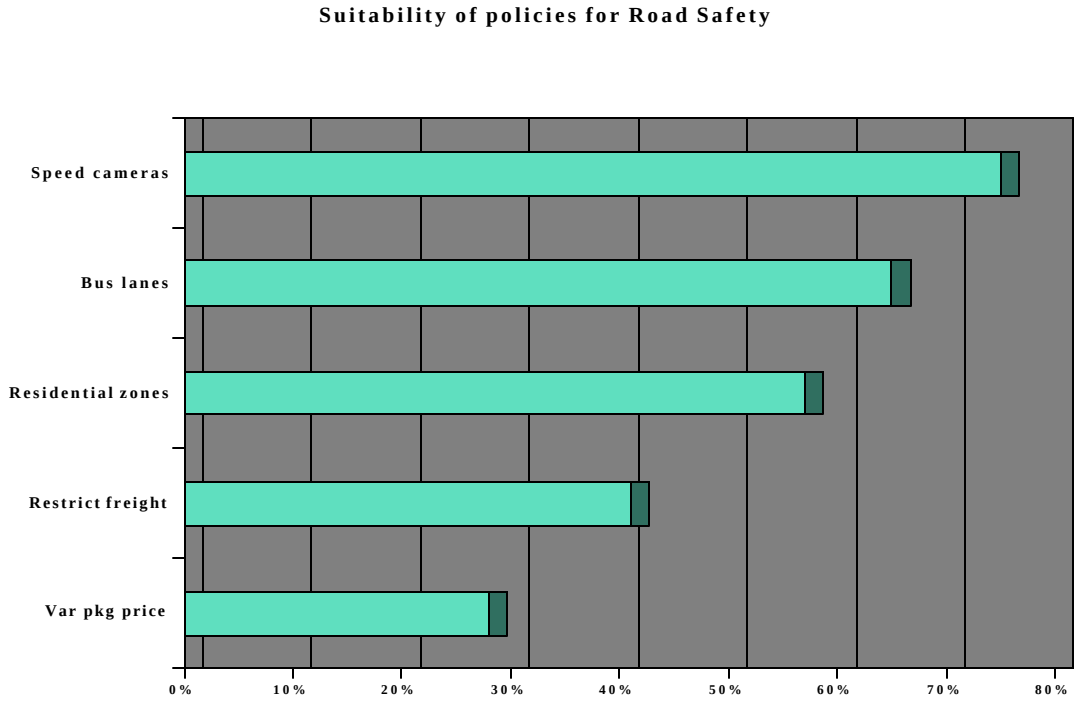
Appropriate Policies for Dealing with Pollution at each site

Belfast	Dublin	Bristol
?? Lower Fares on Public Transport ?? Bus Lanes ?? Car Free Zones.	?? Lower Fares on Public Transport ?? Bus Lanes ?? Car Free Zones.	?? Pedestrianise City Centre ?? Improve Public Transport System ?? Park and Ride.
Merseyside	**Bucharest**	**Oslo**
?? Reduce Car Use ?? Car Free Zones ?? Bus Lanes.	?? Freight restrictions ?? Bus Lanes ?? Car Free Zones.	?? Bus Lanes ?? Car Free Zones. ?? Freight restrictions.
	Turin	
	?? Bus Lanes ?? Car Free Zones ?? Lower Fares on Public Transport.	

Appropriate Policies for Dealing with Road Safety - European level

Speed cameras, bus lanes and car-free residential zones were deemed to be most appropriate for dealing with road safety.

1	Speed cameras	75%
2	Bus lanes	65%
3	Residential zones	57%
4	Restrict freight t.	41%
5	var pkg price	28%

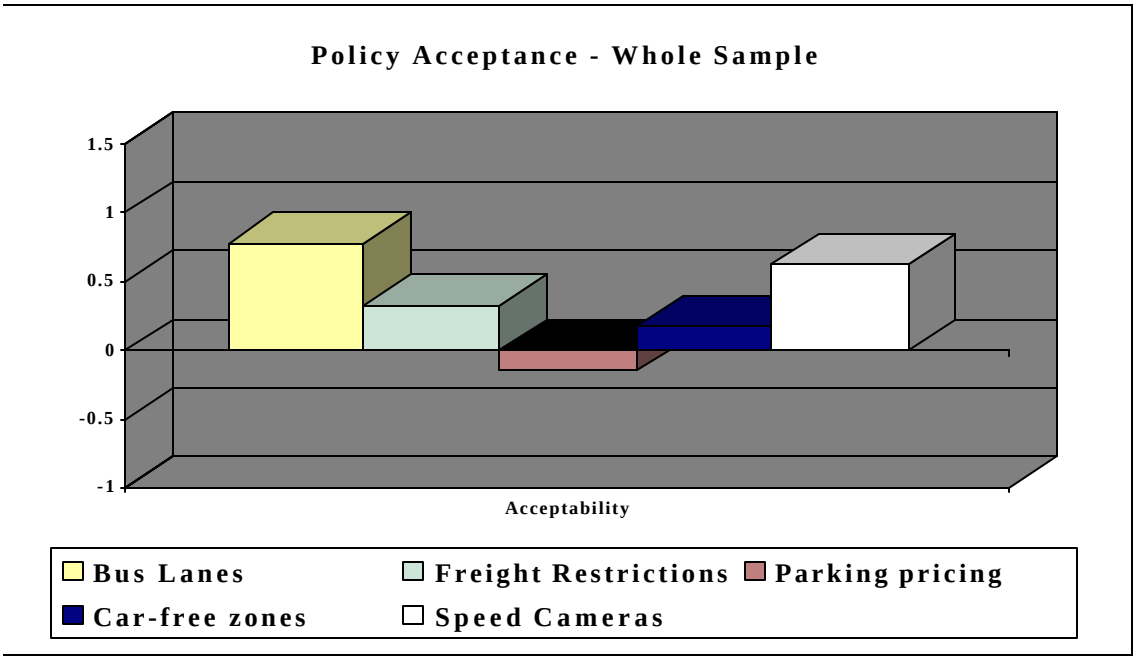


There is much more differentiation in this case indicating higher levels of agreement between sites.

Belfast	Dublin	Bristol
?? Speed Cameras ?? Bus Lanes ?? Car Free Zones.	?? Speed Cameras ?? Bus Lanes ?? Car Free Zones.	?? Pedestrianise City Centre ?? Speed Cameras ?? Car Free Zones.
Merseyside	**Bucharest**	**Oslo**
?? Speed Cameras ?? Car Free Zones ?? Reduce Car Use.	?? Bus Lanes ?? Speed Cameras ?? One-way Street.	?? Speed Cameras ?? Bus Lanes ?? Car Free Zones.
	Turin	
	?? Speed Cameras ?? Bus Lanes ?? Car Free Zones.	

Policy Acceptance and Rejection - European level

The chart below shows the level of acceptability for each policy for the whole sample. Five common policies were measured across the sites.



?? Bus Lanes are acceptable as are Speed Cameras
?? Freight Restrictions are less acceptable
?? Car-free Residential Zones are only slightly acceptable
?? Increased Parking Pricing is unacceptable

The following graphs show the perception across all sites of each of the five policies on 14 given criteria.

?? Bus lanes are acceptable because they are time-saving, helpful, regulating and reduce congestion.

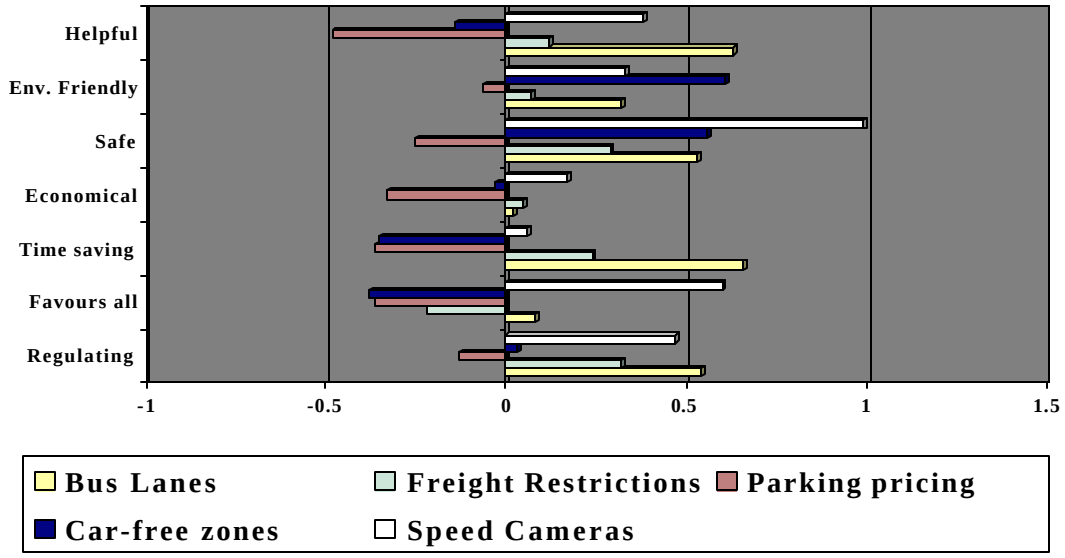
?? Speed cameras are primarily seen as safe and treating all people equally.

?? Car-free residential zones are seen as environmentally-friendly and safe.

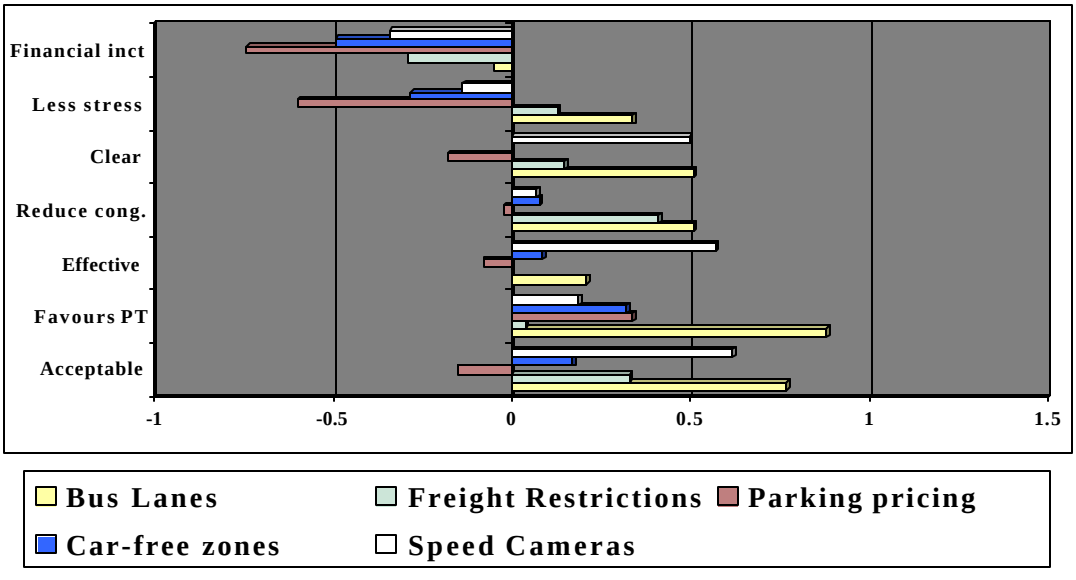
?? Increased parking pricing is perceived negatively on all criteria. It is viewed as favouring public transport users, unhelpful, stressful and financially penalising.

?? None of the policies are seen as particularly effective in making people change their behaviour except freight restrictions.

Policy Acceptance - Whole Sample

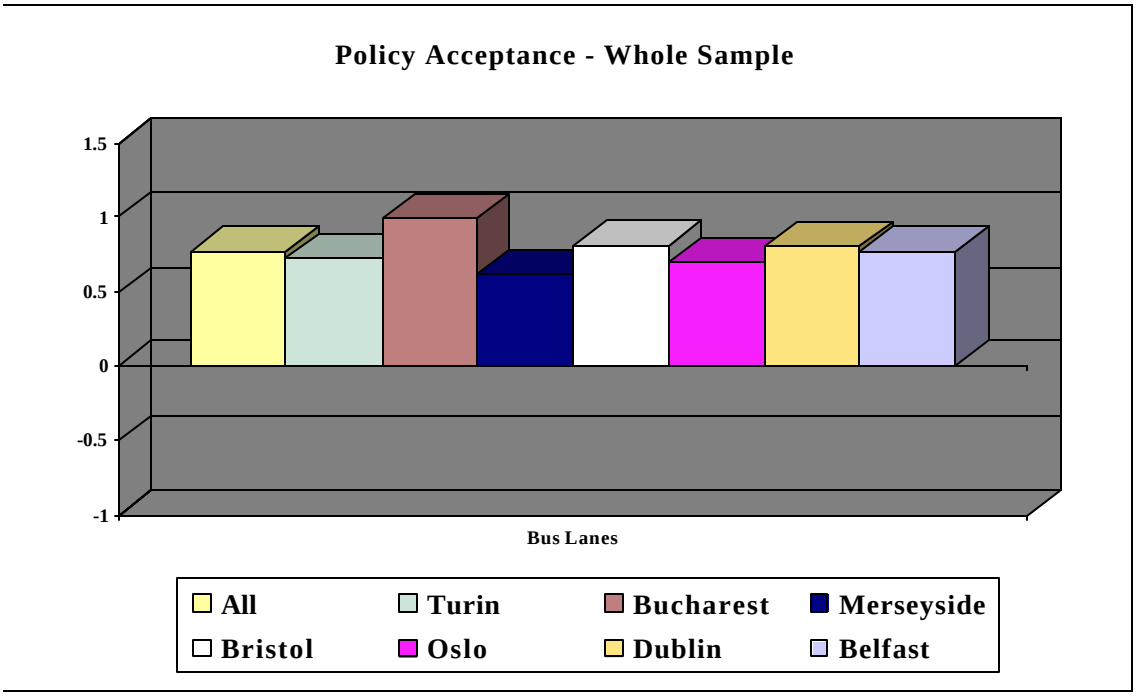


Policy Acceptance - Whole Sample (Cont.)

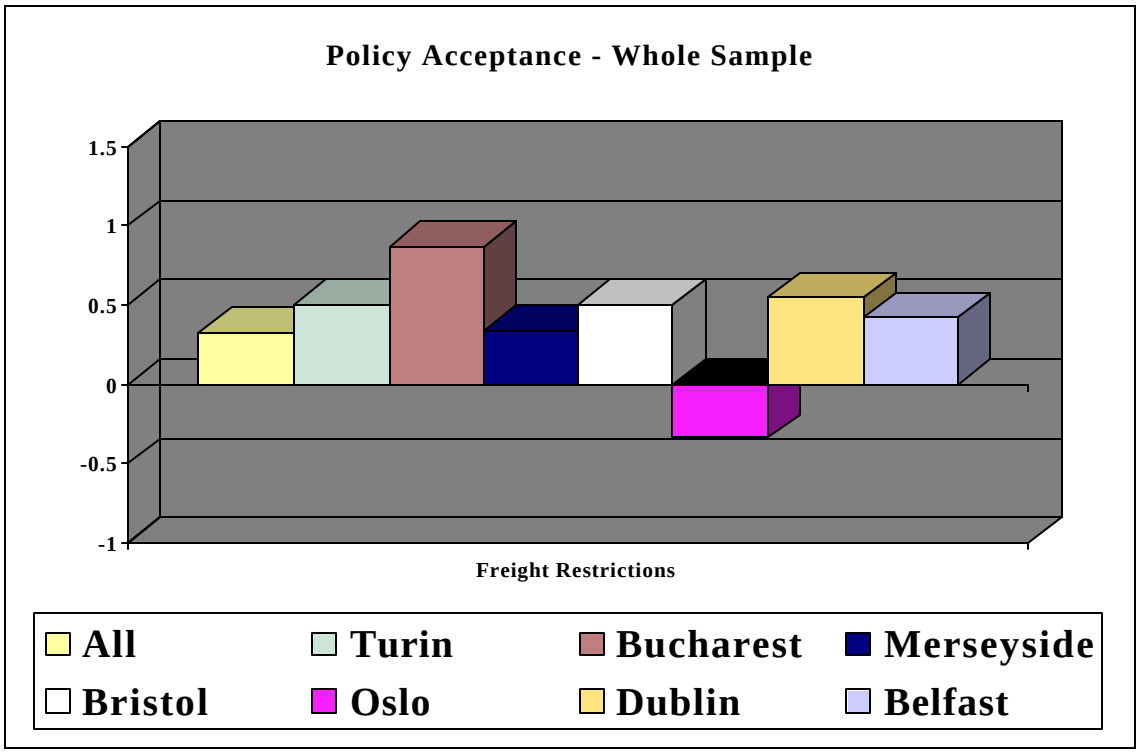


Policy Acceptance and Rejection at each site

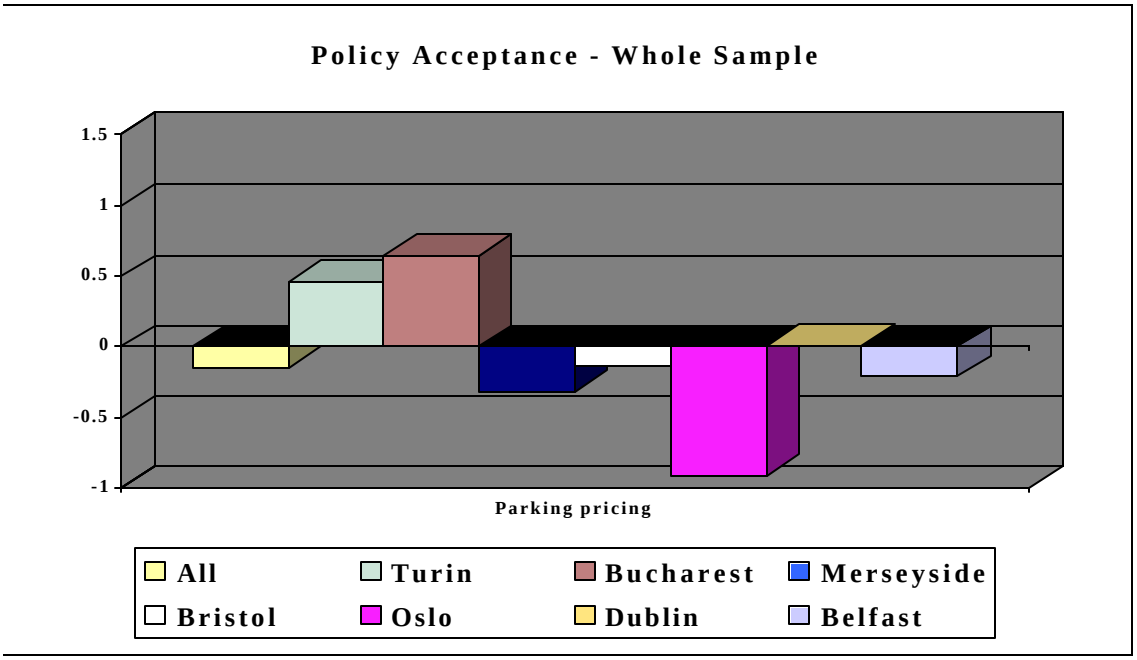
Bus lanes are accepted across all sites particularly Bucharest. They are least acceptable in Merseyside, but differences are small.



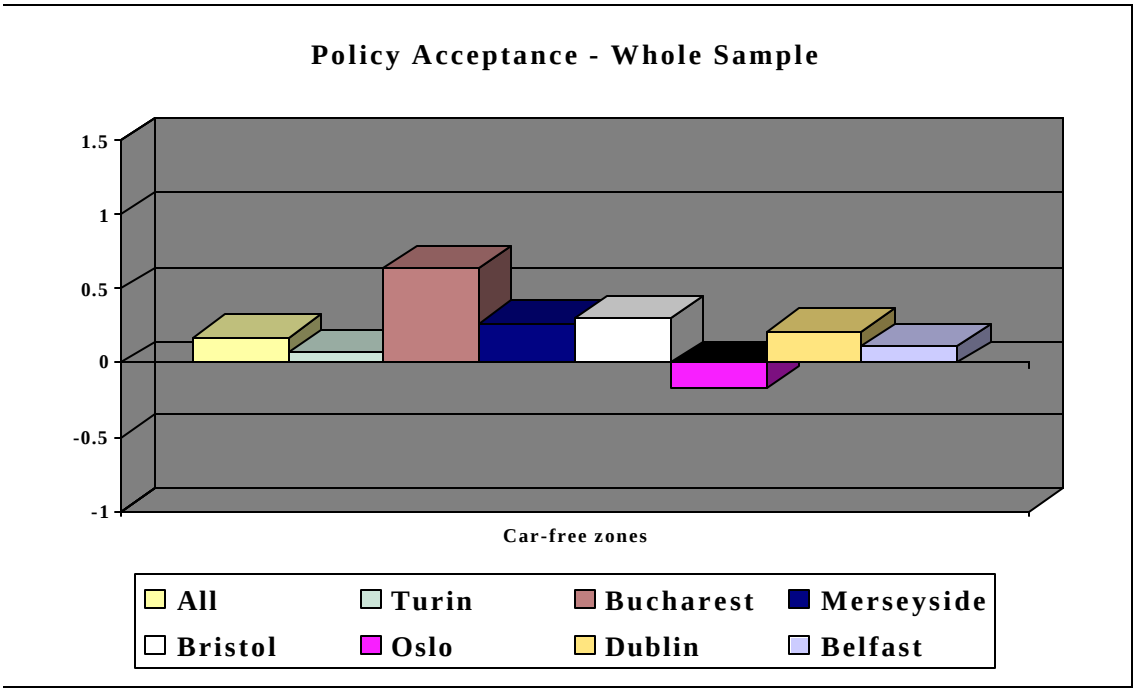
Freight restrictions are most acceptable in Bucharest and unacceptable in Oslo.


Policy Acceptance - Whole Sample
1.5
1
0.5
0
-0.5
-1
Freight Restrictions
All
Turin
Bucharest
Merseyside
Bristol
Oslo
Dublin
Belfast

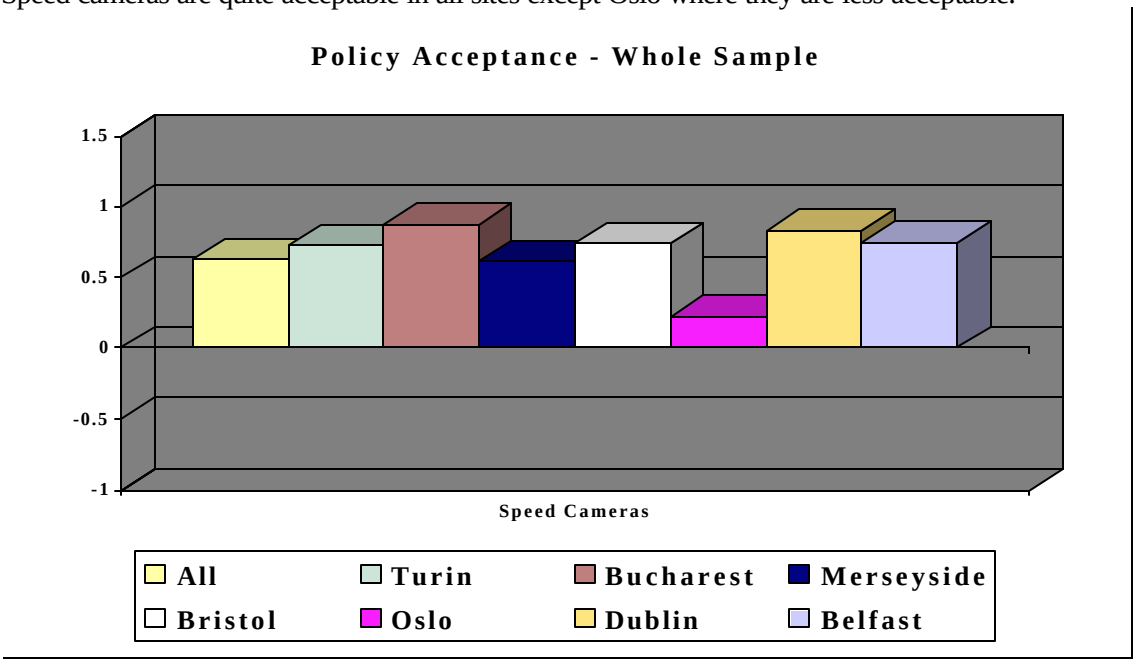
While increased parking pricing was rejected overall by the whole sample, this chart shows that it is acceptable in Turin and Bucharest, and unacceptable at the other sites particularly Oslo.



Bucharest is most accepting of car-free zones while Oslo rejects them.



Speed cameras are quite acceptable in all sites except Oslo where they are less acceptable.



Motorists in Oslo are highly regulated both in terms of road-tolling, access restriction and speed control. To the casual observer, compliance seems high yet Oslo is the most 'rejecting' of sites. This may indicate a greater need for more sensitive management of schemes and policies.

Conclusions

1. Consensus at a European level is not to be taken for granted. It may be achieved in certain cases provided policy makers, service providers and 'designers' take account of the perspectives of people in their countries.

2. Attitudinal and latent psychological structure segmentation leads to better understanding and prediction of the target audience than behavioural segmentation.

3. The initial hypotheses concerning the existence and importance of attitudinal segmentation has been demonstrated.

4. A design for a research database has been developed and demonstrated.

5. Software for analysis of the database has been developed and is capable of segmentation and analyses in four ways:

   Lifestyle, behaviours and demographics
   Attitudes
   Importance of criteria

Latent psychological structures common to groups or segments of the population.

6. The products and services developed in this project are ready for extension to other transport projects and capable of adaptation to other markets.

Annex

Conferences, papers and presentations

?? Conference - POLIS (Bucharest 1998), International academic group

?? Conference - Expert meeting at University of Stuttgart August 1999

?? Launch conference (Rome September 1999)

?? Market research seminar (Bucharest, September 1999)

?? Discussion group - Transport operators local authorities and road authorities (Oslo November 1999),

?? User training (London, November 1999),

?? Romanian Transport Forum (Bucharest, November 1999)

?? Transport conference (Trondheim January 2000)

?? European Personal Construct Conference (Malta April 2000)

?? Full investigation of the data base and report on the Norwegian results submitted to the Norwegian Roads Authority.

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