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QUESTIONNAIRE SURVEY OF USERS OF THE DYNAMIC LISB SYSTEM

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ABSTRACT

This paper describes the design of the third in a series of questionnaires conducted by ITS among users of the LISB route guidance system and then proceeds to give the aggregate results from that questionnaire. Attention is focussed on respondents' use of, and attitudes towards, the LISB system after it had been providing dynamic advice for about six months.

The questionnaire shows a slight decline in the use of the LISB route guidance system since it has become dynamic. However, the majority of the respondents appreciated that LISB advice now varied by time of day and traffic conditions with $^2/_3$ of respondents stating that guidance had improved.

LISB users are more likely to request and to follow advice when making journeys in unfamiliar areas than they are when making journeys in familiar areas. Failure to request advice was most frequently due to the respondents' trip being too short or because the trip involved several stops. The most commonly stated circumstances in which guidance was ignored was when it appeared to be sending the driver in the wrong (compass) direction, when it was provided too late, when it seemed to ignore a short cut or when it seemed to be advising the user to turn off what appeared to be a perfectly acceptable route. In general, it was found that users are more likely to reject LISB guidance if not backed up by the users' direct observations or past experience.

Expectations of time savings through using LISB were highest for journeys in unfamiliar areas or in congested conditions. The majority of respondents rated LISB as good for ease of driving, time and distance saving, destination finding and traffic safety for journeys in unfamiliar areas, but rated LISB as poor, in terms of those measures, for journeys in familiar areas.

The most valued of potential enhancements to the existing LISB system were that the guidance should be available for journeys in other cities and that guidance should be provided right to the destination.

CONTENTS

Contents (Continued)

1. INTRODUCTION AND BACKGROUND

1.1 Scope of the current report.

The current study is funded by SERC and is entitled Questionnaire Survey of Users of the Dynamic LISB System. Its original objectives were to use a combination of questionnaires, traffic surveys and monitoring to study drivers' route choice and travel time variability using data derived from the LISB route guidance system. Our findings on travel time variability are reported elsewhere (Slapa and Bonsall, 1990). the original study brief was subsequently extended to include drivers' prior expectations of the benefits they might gain from using LISB, and, once they had experienced it, their assessment of, and reaction to, the route guidance system.

This part of the study was intended to include a comparison of drivers' route choice behaviour at critical stages of the LISB route guidance experiment:

(i) Before guidance became operational
(ii) After static guidance became operational
(iii) After dynamic guidance became operational.

The prime source of data for this part of the study was a series of three questionnaires administered to a subset of private car users participating in the LISB experiment. The current report is concerned with the design, administration and analysis of the third of these questionnaires although, for completeness, a summary of the findings from the first two questionnaires, and an abortive attempt at automatic monitoring, is also included. The current report does not include disaggregate comparisons of respondents' changing attitudes and behaviour between the various stages of the LISB experiment; these will be reported in a subsequent paper (Joint and Bonsall, 1991).

1.2 The LISB System

LISB is an implementation of Siemens' Ali-Scout system. The LISB network covers almost all the primary roads and most of the relevant secondary links within West Berlin. Communication between equipped vehicles and the systems' central computer is via infrared signals transmitted at nearly 250 beacon intersections. By the final stage of the experiment approximately 700 vehicles were to be equipped. At the end of November 1988 approximately 400 vehicles had the equipment installed. From this time up to May 1989 these equipped vehicles were transmitting travel data information at beacon intersections but not getting route guidance information from the system. Route guidance was first provided at the beginning of May 1989. The route guidance information given to equipped vehicles during the first phase of LISB was "static" that is, based on average link travel times for the time of day. Dynamic route guidance (whereby guidance is based on real-time travel conditions deduced from link travel times reported by equipped vehicles) became fully operational in January 1990.

1.3 Our Previous Questionnaires

1.3.1 Design and Administration

We have administered two previous questionnaires among LISB equipped drivers; one referred to as the LISB I questionnaire was administered prior to the activation of the LISB system in order to assess pre-existing behaviour patterns and expectations, while the other (referred to as the LISB II questionnare), was administered after the system had been activated and was providing static guidance. Its purpose was to establish user reactions and assessment of the system at that stage.

The LISB I questionnaire existed in two versions which differed only in that one version related to journeys-to-work (from home) and the other to journeys-from-work (to home). The respondents were split into two groups such that half received the journey to work version and half the journey from work version. The selection of respondents to receive one version or the other was carried out almost randomly but balanced within the Berlin postcode areas. The LISB I questionnaire was delivered to 133 respondents by SNV consultancy in mid February 1989 (before guidance became operational). 123 completed questionnaires were returned (92% response).

The LISB II questionnaire was administered in mid September 1989 after the LISB system had been in operation (based on static guidance) for five months. The LISB II questionnaire sought information about changes of respondents' route choice behaviour and also on users' impressions and experiences of using the guidance system. As in the LISB I survey, there was a journey-to-work version and a journey-from-work version. The appropriate version of the questionnaire was delivered to 114 of the private car users who had responded to the LISB I questionnaire. 98 completed returns were received (86% response).

1.3.2 Main findings of LISB I

Analysis of respondents' stated route choice criteria for the journey to work shows that although "minimising journey time" was their main criterion (46% of respondents quoted it as being their main criterion), most respondents quoted some other criterion as being most important to them. Particularly popular criteria were "most straightforward route" (23%) and "minimising journey distance" (13%).

Analysis of respondents' expectations of journey time reduction when using LISB on regular journeys to (or from) work, showed that more people expected benefits in bad (89%) and average (65%) traffic conditions than in good traffic conditions (22%). Most people (90%) expected LISB-advised routes to be no better than their existing ones when traffic conditions were good. Those respondents who did expect savings in journey time to result from LISB expected a reduction of between 6 and 17 minutes per journey (19% and 31% of total journey time).

1.3.3 Main findings of LISB II

When finding unfamiliar destinations without LISB's advice, most people seemed satisfied to find a straightforward route and were not seeking to find the quickest, or even the shortest route. When LISB advice became available for finding new

destinations it seems that expectations and aspirations were raised and more people expected to minimise time.

Most drivers did not appear to have been influenced by static LISB to alter their usual choice of route on regular journeys to or from work. About one fifth had changed their normal route as a result of LISB advice but a similar proportion said they would not vary their route even if LISB advised them to. When asked to assess the usefulness of static LISB on regular journeys about 40% said they thought its advised routes were worse than they could achieve themselves and yet about 80% still requested advice. Approximately two thirds said that they deviated from the advised route if it appeared to ignore short cuts on secondary roads and about half said that LISB had taught them some new routes that they would now continue to use even without LISB.

Further details of the findings from the first two questionnaires are given in Slapa and Bonsall (1990).

1.4 Automatic Logging of LISB users'

The original project specification assumed that it would be possible to use the LISB computer's central archive of messages from equipped vehicles to reconstruct their journeys and thus obtain data on route choice and travel time variability. It was also hoped to use the same data source to study drivers' reaction to guidance in specific circumstances. With this in mind the LISB I and LISB II questionnaires included questions which invited respondents to decribe specific journeys which we hoped subsequently to be able to study via the LISB computers' log.

In the event however, despite being theoretically possible to conduct those analyses, the frequency of incomplete or corrupted messages in the log made the task impractical.

2. PREPARATION OF THE LISB III QUESTIONNAIRE

2.1 Introduction

As LISB I and II had provided an extensive analysis of drivers' criteria for route choice and drivers' expectations of travel time benefits by using route guidance information, the principle aim of LISB III was the examination of drivers' assessment of the system's dynamic route guidance.

Although LISB III had to elaborate upon the LISB II questionnaire by virtue of the fact that LISB III was intending to examine responses to a dynamic rather than a static system, it was considered that the LISB III questionnaire should consist of more than simple 'follow-up' questions. Thus, it was decided that a range of issues perceived to be relevant to the assessment of LISB should be produced. These issues were then translated into questionnaire format.

The issues were drawn from previous LISB-related findings, other questionnaire findings and theoretical investigations (Joint 1990b). Particular emphasis was placed upon psychological factors such as knowledge and skill, attention factors, security/confidence and esteem.

The procedure adopted in preparing the questionnaire was to draw up a list of issues that would ideally be considered (Appendix 1), and then to 'prune' this list back to a practical length. We will now discuss the components of our initial list, refering to question numbers by italic numbers in parentheses.

2.2 Issues ideally to be considered

2.2.1 Knowledge and Skill

Problem solving skills are dependent upon the way information is represented in memory and later retrived and applied to a situation in which some of the attendant components are unknown and additional components must be ascertained or determined (Joint, 1990a). Thus, in a problem solving situation, such as the determination of route choice, the acquisition of knowledge and skill is a fundamental requirement if appropriate solutions are to be found.

The initial knowledge state of the problem solver consists of everything he or she knows about the situation at the time the problem is presented. This includes background knowledge as well as the given information.

Knowledge, alone, has an obvious importance in promoting a route choice. Indeed, in the examination of reasons for discrepancies between driver objectives and achievement in route choice Tagliacozzo and Pirzio (1975) concluded that the discrepancies were largely due to the fact that the average road user was just not sufficiently acquantied with the network. As a dynamic route guidance system, LISB may be described as a form of expert system that not only displays 'expert' knowledge of the network but also provides a degree of expert advice in terms of optimising routes-what might be described as route choice 'skill'. The results of the LISB I and LISB II questionnaires, had suggested that LISB had produced a general improvement in the respondents' route optimisation. However, we had no information as to

whether the respondents' use of the system had acutally improved their own knowledge of the network or improved their ability to optimise their route choice when not using LISB. Thus, question (1) was devised with the aim of establishing whether respondents' knowledge of the network had improved.

A further question (2) asked if the respondents' ability to recall appropriate routes had improved. A third sought to establish whether experience of LISB had altered the way in which the users planned their journeys. This was followed-up by a question requesting users to compare LISB's approach to route choice with their own in accordance with certain criteria.

2.2.2 Attention factors

Judgements, as part of the problem solving process, are frequently inaccurate due to the fact that the 'problem solver' attends to variables that should be ignored and ignores variables to which they should attend. Benshoof (1970) concludes that drivers' failure to reach route choice objectives is, at least in part, due to the fact that they do not accurately assess certain characteristics of their routes. Route guidance systems have the potential danger of overloading the driver by providing more information than he or she can safely attend to. On the other hand, by removing the need for the users to process the usual array of available information, LISB can be said to reduce the likelihood of attentional bias. In addition, LISB may create an environment in which the need to attend to route finding and choice, and therefore the driving task is reduced and, thereby increases pleasure or ease of driving and safety.

Tests and field trials carried out for TRRL indicated that the Autoguide route guidance system was relatively safe and neither difficult to use or stressful (West, Kemp and Hack, 1990). Although it was determined to be inappropriate to draw any form of comparison between LISB and alternative guidance systems at this stage the assessment of the LISB system in terms of perceived safety, ease of use and stress was considered worthwhile.

A question (10) was devised with the aim of establishing whether LISB did, in fact, act as an attention/memory aid in indicating routes that would have been otherwise ignored or forgotten. A further question (6) asked respondents if they found journeys more or less demanding in terms of the degree of attention they were able to pay to their surroundings in both familiar and unfamiliar environments. Another question (7) requested respondents to state whether they had ever undertaken journeys, or parts of journeys; 'automatically' without being aware of it and, if so, whether their tendency to do so had increased or decreased since using LISB. Another question (4) was designed to examine the negative effects of LISB upon safety. Respondents were asked to state whether they had more or less confrontations with other drivers (eg near collisions) compared to before they had used LISB.

An additional question (39) sought respondents' assessment of following a route with LISB advice compared with following a route using alternative advice for a variety of attention related criteria, including concentration on task, enjoyment of driving, safety, conversing with passengers, listening to radio/cassette, satisfaction with reaching destination and relaxation.

2.2.3 Security

Humans seem unable to contemplate goals without some emotional arousal or 'ego' involvement (Baron, 1988). Affective components are rarely excluded from the decision making process. In most circumstances people must feel secure and have confidence in an option in order to pursue that choice.

The use of LISB tends to result in a large degree of the user's autonomy being transferred to the system ie the user put their trust in LISB's recommendations. However, should the system prove faulty through providing poor advice or worse still, should the system 'crash', leaving the user without guidance or information in an unfamiliar area, it is likely that the users' confidence in the system would decline substantially. CARGOES (1990) had shown that, on the whole, drivers equipped with Autoguide did not feel it would be off-putting if Autoguide took them off there normal route, but only as long as they could have the utmost confidence in the system.

Based on the above, questions (40,41) were devised in order to ascertain the frequency with which respondents experience a technological breakdown of the system, when driving on both familiar and unfamiliar areas, along with questions relating to the inconvenience users' experienced and the degree to which it put them off relying on the system for such situations in the future (41,42).

2.2.4 Esteem

An area related to security yet considered worthy of investigation in its own right, is user 'pride' or esteem. Self-esteem is another affective component that is rarely excluded from the human decision making process. However the users self-esteem may be more relevant to the users general decision to use the system at all rather than the route choice process itself. Self-esteem is largely derived from the individual's impression of how others regard him or her. Thus, a question was constructed with the intention of examining the respondents' self-esteem as reflected through their perception of how the majority of people assessed the system both generally and in specific situations(43,44). If the user felt that the majority were unimpressed by the system, it is likely that the user would not feel 'proud' to use it e.g. it may be perceived as being comparable to having stabilisers on a bike.

A further question asked respondents to state whether they felt that their driving ability had changed as a result of using LISB. It was hoped that this would give us some indication of the impacts of LISB on drivers' self-esteem.

2.2.5 Technological Aspects

Following on from the above, a series of questions were designed to examine respondents' attitudes towards the dynamic features of LISB.

(CARGOES 1990) reported that almost all drivers taking part in the Autoguide survey believed that the updating of route guidance information in order to take account of prevailing traffic conditions would be crucial. Similarly, when we had, in our B3.1 questionnaire (also reported in CARGOES, 1990), asked drivers in London, Paris and Munich to select desirable additional features to a proposed route guidance system,

"knowledge of current traffic conditions" was generally the most popular feature. It was intended that the LISB III questionnaire should not only establish whether the information provided by LISB was updated with adequate frequency but also whether the information was of sufficient quality and how the updated information facility compared with prior expectations (35,36,37).

2.2.6 Ease of Use

It was intended to ask respondents how easy it was to follow LISB advice compared to the methods they employed prior to obtaining the system, for both familiar and unfamiliar areas (12). this was later followed by a question asking respondents to state whether they found following LISB advice more 'demanding' than following a route without LISB advice, also for both familiar and unfamiliar areas (18).

2.2.7 LISB as an 'Expert'

Implicit in requesting respondents to assess the quality of advice was the question of whether the system's advice was regarded as 'expert'.

A series of questions was devised with the intention of establishing the frequency with which LISB produced advice that respondents may not have percieved as 'expert'. For journeys in both familiar and unfamiliar areas, questions were constructed regarding, how often LISB appeared to divert respondents from its initial route to one they would have taken anyway (14), how often LISB diverted respondents from a route they would have preferred to stay in (15), and how often LISB advised routes which respondents were certain would take longer than an alternative (20). Respondents were also asked to state whether they had ever taken routes on LISB advice that they had previously ignored because they were inappropriate (e.g. appeared to travel in the wrong direction, looked like slower, minor routes etc.) (19), how often LISB made route choices that respondents would have made themselves (13).

2.2.8 'Follow-up' Questions

Where appropriate there were repetitions of certain LISB II questions in the LISB III questionnaire. Question 1 of LISB II had asked respondents to state the proportion of journeys carried out in unfamiliar areas on a four point scale. A similar question (29) was constructed for LISB III with the exception that estimates were to be to the nearest 10%.

Question 11 of the LISB II questionnaire had requested respondents to state their agreement or disagreement with a list of statements. As these statements were constructed with the purpose of elliciting direct evaluations of LISB (as opposed to general driving and route choice characteristics and requirements) it was considered important that we included these questions in LISB III in order for us to make direct comparisons between the user evaluations of LISB as a static system against LISB as a dynamic system. It was proposed that the LISB III version of the question (28) should include an opportunity for us to respond to the statements with reference to journeys in unfamiliar areas.

Some findings from the LISB I and II questionnaires, although suggesting that follow-up questions would be appropriate, indicated that a more thorough examination of

the particular issue should be undertaken. Hence, questions were developed with the aim of elliciting a more detailed response to these issues.

The results of the LISB I and II questionnaires had suggested that when LISB advice was available for finding new destinations the users' expectations and aspirations were raised and more of the users expected to minimise time. It was proposed that LISB III request that respondents evaluate LISB's effectiveness by various criteria, including time saving and that the respondents should make such assessments for journeys in familiar and unfamiliar areas. On the basis that we may infer users' expectations and aspirations through their evaluations of LISB criteria, questions were included to provide us with a more detailed, criteria-orientated analysis of the dynamic LISB system (7). Further questions were developed with the purpose of elliciting quantative estimates of the respondents' time savings through using LISB in different circumstances (27,30).

When asked to assess the usefulness of the static LISB system for regular journeys approximately 40% had said that they thought its advised routes were worse than they could achieve themselves yet 80% had still requested advice. Questions were designed to provide comparative information in the percentages (31,32) of respondents requesting most or all advice (by five categories of frequency) now that LISB advice was dynamic.

It was thought that respondents should also be given the opportunity to give a direct evaluation of the dynamic LISB system compared to the previous static system and encouraged to express their opinions on possible improvements (34, 5,2, 3. 11).

2.3 Prioritisation of the initial list of issues

2.3.1 The Constraints.

The content of the questionnaire was severly restricted, not least because of the problems associated with eliciting clear, well considered responses from a group of subjects that had already completed a large number of questionnaires relating to the LISB route guidance system. Thus, it was decided to limit the questionnaire to no more than 4 sides of A4.

As one of the essential aims of LISB III was to study the long-term effects of the LISB system on drivers' route choice behaviour, and the respondents' acceptance of advice, those questions following-up the responses to questions asked in LISB I and LISB II were given priority for inclusion in the questionnaire, along with those questions directly related to the assessment of LISB as a dynamic system. Thus it was decided that certain categories of question should be considered as beyond the scope of the present questionnaire. Therefore the attention factors and knowledge and skill categories were excluded from the questionnaire while technological aspects were reduced and condensed into a single category. Certain issues were incorporated into questions relating to other categories; thus 'ease of use' was incorporated into questions relating to respondents' assessment of LISB by specified criteria (Q5) while some aspects of 'LISB as an Expert' were incorporated into the evaluative statements.

2.3.2 The LISB III Questionnaire Design - Lessons from LISB II

The LISB II questionnaire had sought to elicit user response regarding both route finding using the LISB system and route finding in general. It may not have been the case that the respondents were always distinguishing their assessments for the two conditions. The LISB III questionnaire avoids the need for such differentiation by concentrating upon the respondents' evaluations of the LISB system alone.

The LISB II questionnaire had been designed to accompany objective data provided by the systems computer log. In the event the computer data proved unobtainable, and so some of the questions proved redundent. Such questions are excluded from the LISB III questionnaire.

In LISB II respondents were asked about their 'use' of LISB. The LISB III questionnaire clarifies this term by differentiating between actually 'following' LISB advice as opposed to simply 'requesting' advice.

2.3.3. Lessons from the 'requirments questionnaire' within the CARGOES project

The results of the B3.1 questionnaire within the CARGOES project (CARGOES 1990) have provided considerable input into the structure of the LISB questionnaires. In particular, the B3.1 findings highlighted the need to examine the differing requirements and assessments of system users according to the purpose of trip and the user's degree of familiarity with the journey environment. They also point out, that drivers may wish to make route choices based upon a broad spectrum of criteria and may reject route guidance for a variety of reasons.

2.4 The Final Questionnaire

The final questionnaire consisted of 15 questions on 4 A4 sheets. (see appendix II) The questionnaire consisted of five main categories:

2.4.1 Requesting and Acceptance of LISB Advice

Questions 1 to 4 were designed to establish the frequency with which the respondents requested advice from the LISB system and the frequency with which they followed LISB advice. Further, these questions sought to establish the reasons why the respondents failed to request LISB advice and, if advice was requested, the reasons why they sometimes failed to follow it.

2.4.2 Qualitative Assessment of LISB by Driving Criteria

Questions 5 to 8 asked the respondents to give a more qualitative assessment of the LISB system according to its value against various driving criteria in various circumstances. Question 5 looked specifically at respondent assessment of criteria and was designed so as to provide us with findings comparable to those produced by LISB I and II and the B3.1 questionnaire.

Questions 6 and 7 examined respondents' percieved time savings through the use of LISB for different environments and levels of congestion. Question 8 asks respondents to make a direct assessment of the quality of LISB's dynamic advice.

2.4.3 Response to Possible Improvements of LISB

Questions 9 to 10 give the respondents an opportunity to express their opinions on a choice of possible improvements/facilities that may be incorporated into the LISB system in the future. Question 9 provides a useful comparison with our B3.1 questionnaire findings relating to respondents' preference for information-only versus guidance systems.

2.4.4 General Evaluation of LISB

Question II requested respondents to evaluate statements relating to the general value and effectiveness of the existing LISB system. The question included three statements additional to those used in the LISB II questionnaire. The additions were made in order to incorporate aspects of certain new issues (as described in section 2.2).

2.4.5 Psychological Aspects

Question 12 to 15 are of a more psychological nature. Questions 12 and 13 relate to confidence and security in relation to technological malfunction, question 14 examined respondents' perception of other peoples impression of the system, while question 15 looked at the effects of LISB on respondents confidence to experiment with routes.

2.5 Administration of the Questionnaire

Having produced an acceptable draft of the questionnaire in English it was translated into German (see appendix III), duplicated, and sent by SNV on our behalf to the 98 people who had responded to the LISB II questionnaire. At this stage, July 1990, the respondents had been receiving dynamic guidance for somewhat over six months.

86 replies were received which equates to an 88% response rate. The forms were then sent back to Leeds for coding and analysis.

3 ANALYSIS AND RESULTS

3.1 Statistical Procedures

All statistical procedures were carried out using SAS via an Amdahl system. The main findings were obtained through using the FREQ procedure, giving frequency, percent, cumulative frequency and cumulative percent for all variables in all conditions. Correlation analyses were carried out using the SAS CORR procedure. This provided a simple correlation coefficient (Pearson Product-Moment) giving the degree and direction of relationship between any two specified variables.

Disaggregate comparison of the data with that from the LISB I and II questionnaires will be presented in a separate paper (Joint and Bonsall, 1991).

3.2 Main Findings of LISB III

3.2.1 Frequency with which LISB Advice is Requested and Followed

The results of the LISB II questionnaire had suggested that static LISB was used fairly regularly by more than 95% of respondents for both journeys to familiar and unfamiliar destinations. Results of the LISB III questionnaire indicate that usage has declined slightly with time and that usage levels are lower with LISB as a dynamic system than they were when it was static. Interestingly however, $^2/_3$ of respondents thought the quality of guidance was now better than it had been, $^1/_3$ thought it had not changed, while none thought it had got worse.

Table 1 shows that when driving in familiar areas about 90% of drivers were now normally requesting advice, but that less than 30% always did so. The proportion always requesting advice when driving in unfamiliar areas was much higher (about 52%).

Table 2 shows that more advice is followed in unfamiliar areas and that the norm is to follow most, but not all, of the advice on a given journey.

3.2.2 Reasons why LISB Advice is not Always Requested or Followed

Table 3 shows that the most common reasons for not requesting advice were that the trip was too short or involved several stops, (in both of which cases the effort involved in coding in the destinations was perhaps greater than the likely reward). Other important reasons were that the driver was in too much of a hurry, found the process of coding in the destination too difficult, or simply forgot.

Table 4 shows the circumstances in which respondents did not follow advice. The most frequently quoted reasons were that they thought that it was sending them in the wrong compass direction, that the advice was given too late and that it suggested they leave a route which was normally good and which had no obvious problems on the day in question. Other important reasons, quoted by more than 20% of respondents, were that it suggested they use a route which was normally very congested, that the system had apparently malfunctioned or that it sent them in a direction contrary to the road signs. All of these demonstrate that unless guidance is backed up by other information available to the user, either from his experience or

from his direct observation of the situation at the time, he may well decide not to follow it.

3.2.3 Perceived Effectiveness of LISB

Tables 5 and 6 show how respondents rated the effectiveness of LISB, relative to what they might achieve without it, in terms of various criteria. For journeys in familiar areas LISB's rating was poor on all counts (most notably fuel, time or distance saving, avoiding congestion or certainty of arrival time, for all of which most respondents rated it as 'poor'). For journeys in unfamiliar areas however, LISB was given a favourable rating (more respondents regarding it as good than as bad) for ease of driving, destination finding, time saving, distance saving and traffic safety.

3.2.4 Expectations of Time Savings

Tables 7 and 8 show that after 6 months of using LISB with dynamic guidance most respondents had come to expect to save time when using LISB for journeys in unfamiliar areas, but only a minority now expected to do so on the journey to work. Amongst those who did expect savings, estimates were generally higher for journeys in heavy traffic conditions than in light. Expectation of savings in excess of 10 minutes for the journey to work were made by 17% of respondents in heavy traffic conditions and by only 5% of respondents in light traffic conditions. Equivalent figures for journeys to unfamiliar parts of West Berlin were 28% and 6% respectively.

3.2.5. Assessment of Alternative Specifications for LISB

Table 9 shows that when offered the choice between the current specification of LISB and an alternative system that provided up to date information but not guidance, most respondents preferred the current system, particularly for journeys in unfamiliar areas. A preference for guidance rather than information for journeys in familiar areas is difficult to reconcile with the generally negative assessment quoted above and is somewhat at odds with results from market research noted in our earlier report (CARGOES 1990). It may reflect a 'brand loyalty' effect amongst our respondents all of whom had been active in the LISB trials.

Table 10 shows the perceived usefulness of certain additional features that LISB might have. All the specified features were thought to be very useful or essential by the majority of respondents. The most popular features were guidance within other cities (almost 60% thought this essential); instant restoration of guidance if you depart from the recommended route (about 50% thought this essential), guidance right to the destination, guidance between cities and knowledge of small roads.

3.2.7 Agreement/Disagreement with Evaluative Statements Concerning LISB

The LISB III respondents' assessments of the evaluative statements concerning the LISB system (Table II) are generally consistent with those given by the respondents to the LISB II questionnaire. There is, however, a notable exception; of those respondents expressing a preference, over 60% of the LISB III respondents agreed with the statement 'I value LISB because I have found that its advice varies by the time of day and traffic conditions' for both journeys to work and to familiar locations. (only 29% of the LISB II respondents had agreed with an equivalent statement for journeys

to work, and only 38% for journeys to familiar locations). Clearly, the shift in response corresponds to the introduction of dynamic guidance.

It is, perhaps, of greater significance that the remaining statements have received similar ratings from both the LISB II and LISB III respondents. Although the systems' dynamic facility has produced a small increase in the respondents' positive assessment of LISB, the findings suggest that the comparably large investment required to establish a dynamic system has failed to produce a proportional increase in the quality of advice as percieved by the users. It is, of course, possible that users' perceptions reflect a disappointment that their high expectations for dynamic guidance were not met in full.

The ratings were generally much more positive in respect of journeys to unfamiliar locations than to familiar locations and they, in turn, were more positive than the ratings in respect of journeys to work. Thus, although more than one in three of respondents thought that LISB-advised routes for the journey to work were 'often' worse than they could achieve themselves, less than one in ten thought that this was true of journeys to unfamiliar locations. Similarly, whereas about six out of ten thought that LISB had informed them of good routes to work that they would not otherwise have tried, almost nine out of ten thought this was true of journeys to unfamiliar locations. And again, whereas about one out of every two respondents thought that LISB usually recommended the route to work that they would have chosen anyway, only about one in four thought this was true of journeys to unfamiliar locations.

Other interesting results include the fact that two out of every three respondents said they did not follow LISB advice if they knew of shortcuts on secondary roads and the fact that the majority of respondents thought that following LISB was 'easier' than the methods they used to use to find destinations or choose routes.

3.2.8 Consequences of Technological Malfunctions by LISB

Table 12 suggests that the frequency with which respondents have been inconvenienced by technological malfunction of LISB is proportionally greater as a % of journeys in unfamiliar as compared to familiar areas. The relative inconvenience of a malfunction in an unfamiliar area is of course greater than a similar malfunction in a familiar area. Taken together, Tables 12 and 13 suggests that although the inconvenience of a malfunction in an unfamiliar area is greater, because more journeys are made in familiar areas the higher total rate of occurence of malfunctions in familiar areas causes them to be the main source of loss of confidence.

3.2.9 Other Findings

Other findings from the LISB III questionnaire that we have not tabulated are that:

(1) a large proportion of respondents (75%) felt that the majority of people were not impressed by the system

and

(2) that having now used LISB, 55% of respondents said that they were now more willing to experiment with routes (when not using LISB) than they used to be. Only 7% of respondents gave the opposite view.

3.3 Correlation Analyses

3.3.1 Introduction

In this part of the analysis we have examined correlations within the datas with the intention of throwing more light on behavioural issues involved in the decisions to use LISB advice. The following is a summary of the correlation results and their implications. All correlations stated are significant at the .01 probability level or below. Detailed tabulations of the correlation statistics are given in appendix IV.

3.3.2 Correlations with Proportion of Driving Carried Out in Familiar/Unfamiliar Areas.

There is a negative correlation between the amount of driving carried out in unfamiliar areas and the likelihood of requesting LISB advice when doing so. This is a significant finding as only 1.6% of respondents carry out 35% or more of their driving in unfamiliar areas while more than 75% carry out 20% or less of their driving in unfamiliar areas.

There is a positive correlation between the amount of driving carried out in unfamiliar areas and forgetting to request advice when driving in unfamiliar areas. This finding may not only reflect a tendency for those who do a large proportion of their driving in unfamiliar areas to sometimes forget to request advice but may also suggest that when those respondents who carry out most of their driving in familiar areas do not request advice when driving in unfamiliar areas, it is likely to be due to system failure or reasoned explanations rather than forgetting.

The larger the proportion of driving respondents carry out in familiar areas the greater their tendency to follow all LISB advice when driving in familiar areas. This may reflect a tendency of 'unadventurous' drivers to be fairly happy to accept advice.

The larger the proportion of driving in unfamiliar areas the more positive are respondents' perceptions of possible LISB features such as the ability to have full guidance to destinations, guidance restored after failure to follow instructions, knowledge of all roads and guidance within other cities.

3.3.3. Correlations with Tendency to Request LISB Advice

Those respondents who frequently request advice when driving in unfamiliar areas generally find LISB to be poor for saving fuel and avoiding congestion when driving in areas. Further, these respondents demonstrate a greater tendency to have been inconvenienced by technical malfunction of LISB when driving in unfamiliar areas. Obviously, these findings are partly due to the higher rate of request for advice in unfamiliar areas, however, there was no comparable finding for those who frequently request advice when driving in familiar areas. This would suggest that technical malfunction in an unfamiliar area is more inconvenient.

When those respondents who frequently request advice when driving in unfamiliar areas fail to request advice their failure tends to be due either simply forgetting to request advice or because they have previously found the advice to be poor.

3.3.4 Correlations with the Tendency to Follow LISB Advice

Those respondents that tend to follow all LISB advice when driving in unfamiliar areas tend to follow most LISB advice when driving in both familiar and unfamiliar areas.

Those respondents who tend to follow all LISB advice when driving in familiar areas tend to frequently request advice for journeys in unfamiliar areas. Those respondents who tend to follow all LISB advice when driving in familiar areas tend to find LISB poor for both saving fuel and mileage when driving in unfamiliar areas. There were no such significant correlations for driving in familiar areas.

Those respondents who tend to follow all or most LISB advice in unfamiliar areas consider that LISB is poor for saving time when driving in familiar areas but consider that LISB is good for time saving when driving in unfamiliar areas and good for all other criteria.

Those respondents who tend to follow most or all LISB advice when driving in familiar areas tend to find LISB poor for saving mileage when driving in unfamiliar areas. However, those respondents who tend to follow most LISB advice in familiar areas tend to find LISB good for saving fuel and predictability of arrival time when driving in unfamiliar areas. Thus, although the majority of respondents perceive LISB as being poor for saving mileage in unfamiliar areas, a significant proportion consider that it is good for saving fuel and predictability of arrival time in these areas.

Those respondents who tend to follow most or all LISB advice when driving in unfamiliar areas (the majority of the sample) would tend to find it useful to have features that gave full guidance to destination and instant restoration of guidance after failure to follow instructions.

On those occasions when respondents who tend to follow all LISB advice when driving in familiar areas fail to request advice when driving in a familiar area they tend to do so because they are carrying out a multi-stop trip. It is presumed that a multi-stop trip in a familiar area is likely to consist of a number of relatively short journeys with a route that is well known, easily followed and with reasonably predictable congestion rates. Thus, the above finding is not surprising as LISB could offer little additional guidance information. When those respondents who tend to follow most advice when driving in familiar areas (the majority) do not request advice in unfamiliar areas or when those who tend to follow most or all advice when in familiar areas it tends to be because they forget to request it.

On those rare occasions when those respondents who tend not to follow most advice when driving in unfamiliar areas (a small minority) fail to request advice when driving in familiar areas it tends to be because they are in a hurry, have found the LISB advice to be poor or because coding in the destination is difficult.

On those occasions that respondents who tend to follow all LISB advice when driving in familiar areas have not followed the advice it has largely been due to either LISB providing the appropriate information too late or because it has sent them along a road they can see is very congested. These findings indicate that LISB guidance is particularly valued by the users prepared to drive in congested traffic in familiar areas provided the advice is timely and they perceive it as being reliable. When respondents who tend to follow most advice when driving in familiar areas have not followed LISB advice it tends to be because they perceive the advice as poor. Similarly, those who tend to follow most or all LISB advice when driving in unfamiliar areas tend not to follow advice when they perceive it as poor.

4. SUMMARY AND CONCLUSIONS

During the period of dynamic guidance usage of LISB declined somewhat for both familiar and unfamiliar journeys even though two thirds of respondents thought the quality of guidance was now better than it had been. Only 23% of respondents said that they "almost always" followed all LISB's advice when on familiar journeys (a further 49% said they "usually did so"). The equivalent figures for journeys in unfamiliar areas are somewhat higher - 62% and 30%.

The respondents' most frequently quoted reasons for not always following advice were that they thought that it was sending them in the wrong compass direction, that the advice was given too late and that it suggested they leave a route which was normally good and which had no obvious problems on the day in question.

Respondents gave ratings of the LISB system relative to what they might achieve without it. For journeys in familiar areas the ratings were poor on almost all counts. For journeys in unfamiliar areas, however, LISB was given a relatively favourable rating for everything except avoiding congestion and predictability of arrival times. The very low rating for congestion avoidance and time saving on familiar journeys is obviously a particularly serious problem.

After more than a year's experience of using LISB most respondents were still confident of saving time when using LISB for journeys in unfamiliar areas but only a minority now expected ever to do so on the journey to work. Estimates of the magnitude of savings were generally higher for journeys in heavy traffic conditions than in light.

When respondents were asked to rate the value of certain potential enhancements to the LISB system, the features they thought most necessary were: provision of guidance in other cities (almost 60% thought this essential), guidance right to the destination, guidance between cities and knowledge of small roads.

Respondents' assessments of evaluative statements concerning the LISB system indicated that they were, in general, favourably disposed towards it, particularly for journeys in unfamiliar areas. Most of them value the fact that its advice is based on near-real-time information, feel that it has helped increase their knowledge of the network and has made route choice and destination finding easier. These favourable assessments are somewhat at odds with the more negative ratings they gave to specific aspects of LISB advice and it is interesting to note that less than 10% of users think that most people are impressed by LISB.

Expectations of the LISB system were clearly high and there is evidence of a considerable commitment to the experiment by the participating drivers - a large proportion of them continued to request advice on a regular basis even for journeys in familiar areas even though they quite often did not follow the advice, did not expect its advised routes to be superior to their own and were aware that the system itself did not impress others. It is apparent that users thought the dynamic advice sytem was better than that based on average conditions but nonetheless actual usage seems to have declined with time reflecting, perhaps, that the novelty value of the system was wearing thin.

There is a clear distinction to be drawn between t he use of LISB in familiar areas and its use in unfamiliar areas or to find new destinations; it was much more highly valued for the latter than for the former. Drivers seemed quite happy to rely on its advice when their own knowledge was deficient but when they were in a familiar area they found its advice often lacked credibility. If its advice conflicted with their own perception of the correct route in the prevailing circumstances they woulde have little hesitation in deviating from the advised route.

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Table 1: Frequency with which respondents request advice from LISB for journeys in familiar areas

	Never	Almost never	Some-times	Almost always	Always
Familiar areas (%)	0	0	11.6	61.6	26.7
Unfamiliar areas (%)		0	5.8	14.0	27.9	52.3

Table 2: Frequency with which respondents follow advice given by LISB on a particular journey

	Very rarely	Rarely	Some-times	Usually	Almost always
All advice in familiar areas	7.0	4.7	16.3	48.8	23.3
Most advice in familiar areas	3.5	2.4	10.6	36.5	47.1
All advice in unfamiliar areas	1.2	4.7	3.5	29.1	61.6
Most advice in unfamiliar areas	1.2	3.5	3.5	22.4	69.4

Table 3: Reasons why respondents do not request LISB advice

Familiar areas (%)	Unfamiliar areas (%)		
24.4	14.0	-	forget to request advice
27.9	17.4	-	in hurry
38.4	17.4	-	multistop trip
7.0	17.4	-	I have found that the advice is poor
18.6	31.4	-	coding in the destination is difficult
44.2	-	-	short trip
20.9	-	-	good personal knowledge
10.5	-	-	advice never varies for my journey

Table 4: Circumstances in which respondents do not follow advice

Respondents citing reason (%)	Among respondents' three most frequently cited reasons (%)		
7.0	0	-	when I thought advice was poor
29.1	19.8	-	when the system failed
12.8	2.3	-	when the traffic situation demanded my complete attention
40.7	14.0	-	when LISB produced the appropriate information too late
44.2	25.6	-	when it sends me in the wrong (compass) direction
24.4	10.5	-	when it sends me along a road which I know from experience to be very congested
17.4	20.9	-	when it sends me along a road which I can see is very congested today
34.9	20.9	-	when it sends me off a road which I know to be good and has no obvious problem today
12.8	17.4	-	when it ignores a good shortcut
12.8	12.8	-	when it continually ignores a good road so I conclude that LISB does not know about it
18.6	4.7	-	when it sends me in a direction contrary to the road signs

Table 5: Respondents' perception of the effectiveness of LISB by various criteria when driving in familiar areas

	% of respondents assessing criteria as		
	Poor	OK	Good
Time saving	51.8	33.7	14.5
Distance saving	57.5	32.5	10.0
Traffic safety	22.2	56.8	21.0
Avoiding congestion	47.5	37.5	15.0
Fuel saving	69.6	26.6	3.8
Precise destination finding	26.8	43.9	29.3
Predictability of arrival time	60.0	30.7	9.3
Ease of driving	29.3	42.7	28.0

Table 6: Respondents' perception of the effectiveness of LISB when driving in unfamiliar areas

	% of respondents assessing criteria as		
	Poor	OK	Good
Time saving	20.5	37.3	42.2
Distance saving	15.9	52.4	31.7
Traffic safety	21.0	48.1	30.9
Avoiding congestion	38.0	39.2	22.8
Fuel saving	53.2	37.7	9.1
Precise destination finding	10.7	46.4	42.9
Predictability of arrival time	58.7	30.7	10.7
Ease of driving	10.7	31.0	58.3

Table 7: Expectation of time savings using LISB

	% of respondents' expecting to save time using LISB for this type of journey
Journey to work	46.5
Journeys in unfamiliar areas	64.7

Table 8: Respondents' expectations of time savings through using LISB

		% expecting the specified saving in the specified conditions	
		Light traffic conditions	Heavy traffic conditions
Journeys to work	<5 mins	26.7	17.1
	5-10 mins	15.1	12.3
	10-20 mins	3.5	14.6
	>20 mins	1.2	2.5
Journeys to unfamiliar parts of W. Berlin	<5 mins	28.7	11.0
	5-10 mins	30.0	25.6
	10-20 mins	6.0	19.5
	>20 mins	0.0	8.5

Table 9: Respondents' attitudes towards LISB relative to an alternative information system

	LISB	Information system	No preference
Journeys in familiar areas	45.9	30.6	23.5
Journeys in unfamiliar areas	87.1	1.2	11.8
Journeys in general	84.5	2.4	13.1

Table 10: Perceived usefulness of possible additional features

	Not useful	Slightly useful	Useful	Very useful	Essential
Full guidance as soon as you start driving	1.2	13.1	29.8	38.1	17.9
Ability to have full guidance to destination	0	5.9	17.6	41.2	35.3
Guidance instantly restored after you fail to follow instructions	0	1.2	10.6	40.0	48.2
Knowledge of all roads (even small ones)	1.2	9.4	23.5	32.9	32.9
Guidance within other cities	0	1.2	11.8	28.2	58.8
Guidance on routes between cities	0	9.4	27.1	32.9	30.9
Ability to choose routes based on other criteria (not just minimum time)	6.0	10.7	34.5	21.4	27.4

Table 11: Respondents' agreement with evaluative statements concerning LISB

	% of respondents agreeing		
	* work	* fam	* unfam
LISB advised routes are often worse than I can achieve myself	36.3	34.2	9.0
LISB always recommends the same routes so I do not ask for it any more	18.0	16.3	
LISB advice seems to be the same every day but I believe it would change if conditions were different on a particular day so I do request advice	85.5	87.5	
I value LISB because I have found that its advice varies by the time of day and traffic conditions	61.1	62.0	
I do not follow advice if I know shortcuts on secondary roads	65.1	67.1	
LISB has informed me of good routes I would not have otherwise tried	63.8	69.2	88.6
Following LISB is easier than the methods I used to use to choose routes	60.8	66.7	90.2
LISB usually recommends the route I would have chosen anyway	51.3	44.9	24.6
LISB is easier to use than methods I used to use to find my destination	63.5	66.2	83.5

*work - in respect of journeys from and to work
*fam - in respect of journeys to familiar locations
*unfam - in respect of journeys to unfamiliar locations

Table 12 Inconvenience caused by techological malfunction of LISB

	% inconvenienced		
	never	sometimes	often
in familiar areas	34.9	46.5	18.6
in unfamiliar areas	12.8	64.0	23.3

Table 13 Affect of LISB malfunction on respondents' confidence in the system

	% experiencing specified degree of loss of confidence		
	not at all	a little	a lot
in familiar areas	5.1	51.3	43.6
in unfamiliar areas	73.7	10.5	15.8

APPENDIX I

LISB III Issue Questions

Skill + Knowledge

1. Since you first used LISB has your ability to recall appro9priate routes improved since you first used the system?

better [ ] no change [ ] worse [ ]

2. Has LISB improved your knowledge of the city's network?

better [ ] no change [ ] worse [ ]

3. Has your experience of using LISB altered the way in which you plan your journeys when not using LISB?

yes [ ] no [ ]

If yes - are the results of your new approach;

better [ ] no change [ ] worse [ ]

4. How does LISB differ in its approach to your own, if at all?

	LISB has more of a tendency	LISB is no different	LISB has less of a tendency
Avoid congestion	[ ]	[ ]	[ ]
Minimise time	[ ]	[ ]	[ ]
Minimise mileage	[ ]	[ ]	[ ]
Find least complicated route	[ ]	[ ]	[ ]

5. Would you say that you are now more or less willing to experiment with routes when not using LISB, but due to experience with LISB?

more [ ] same [ ] less [ ]

Attention Factors

6. Are you able to pay more or less attention to your surrounding on journeys where you are using LISB?

	more	same	less
familiar environment	[ ]	[ ]	[ ]
unfamiliar environment	[ ]	[ ]	[ ]

7. Do you ever find yourself carrying out journeys or parts of journeys "automatically", without being aware of it?

yes [ ] no [ ]

If yes - do you do so more or less often now as compared to that period before you had the LISB system?

more [ ] same [ ] less [ ]

8. How often do you accidentally fail to follow LISB instructions (e.g. miss a turning) now compared to when you first used LISB?

more [ ] same [ ] less [ ]

9. Compared to before you first used LISB, do you have more or less confrontations with other drivers (e.g. near collisions, etc.)?

more [ ] same [ ] less [ ]

10. Does LISB remind you of good routes that you would have otherwise ignored or forgotten?

often [ ] sometimes [ ] never [ ]

LISB Related

11. Including programming time, how much quicker or slower is it to use LISB to plan a route than to do it yourself using some method?

	quicker	same	slower
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

12. How easy is it to follow LISB compared to the methods you employed prior to obtaining a LISB system?

	easier	same	harder
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

13. How often does LISB make route choices that you would have made yourself?

	often	sometimes	never
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

14. How often does LISB appear to divert away from its initial route to a route you would have taken anyway?

	often	sometimes	never
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

15. How often does LISB divert you away from a route that you would have preferred to stay on?

	often	sometimes	never
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

16. Do you ever find that you wish to change your destination on route?

	often	sometimes	never
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

How difficult or inconvenient is this?

	very	a little	no problem
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

17. *Do you ever find that you wish to change criteria on route (e.g. time minimisation instead of distance minimisation)?

	often	sometimes	never
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

* (is this an option?)

How difficult or invonvenient is this?

	very	a little	no problem
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

18. Is following LISB advice more demanding than following a route without LISB advice?

	easier	same	harder
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

19. Have you taken routes on LISB advice that you had previously ignored because they were inappropriate (e.g. appeared to travel in the wrong direction, looked like slower, minor roads etc.)?

often	sometimes	never
[ ]	[ ]	[ ]

20. Does LISB ever advise you to take routes which you are certain will take longer than an alternative?

	often	sometimes	never
familiar area	[ ]	[ ]	[ ]
unfamiliar area	[ ]	[ ]	[ ]

LISB II - largely work-related

Do you have a regular starting time for your journey to work?

yes [ ] no [ ]

If "no" go to question 2 if "yes" continue.....

21. Have you changed your starting time since Jan 1st 1990?

[ ] yes [ ] no

if yes....

what was the reason for your change?

(tick all you agree with)

[ ] - because my time to start work has changed
[ ] - because at this time of year, I prefer other times to start at work
[ ] - because I now like to avoid the worst traffic
[ ] - because the parking space availability has changed
[ ] - because of advice given by LISB
[ ] - other reasons (please specify).....

22. How often do you have to make calls on your way? (e.g. to pick up/delver children)

[ ] yes [ ] no

if yes...

how frequently do you interrupt your journey in this way?

[ ] very rarely [ ] often

[ ] sometimes [ ] always

23. Do you have a route that you use regularly?

[ ] yes [ ] no

if no go to question 6 if yes continue.....

Have you changed your usually used route since January 1st 1990

[ ] yes [ ] no

If yes...

which of the following best describes your reason for choosing this route? (please rank your top 3 criteria i.e. 1,2,3 - 3 being the most important)

[ ] - LISB
[ ] - shortest travel time
[ ] - shortest distance
[ ] - safest route
[ ] - most reliable route
[ ] - most pleasant route
[ ] - most straight forward route
[ ] - other criteria (please specify).....

24a. How often do you use a route which is different to that you usually use?

[ ] never [ ] sometimes

[ ] rarely [ ] often

24b. How often is your choice to take a different route due to.....

	always	sometimes	never
LISB advice before commencing journey*	[ ]	[ ]	[ ]
LISB advice on route	[ ]	[ ]	[ ]
Past experience LISB advice	[ ]	[ ]	[ ]

* is this option available?

24c. Do you take a different route on a regular basis (e.g. every Friday)?

yes [ ] no [ ]

25. Do you usually use the exact same route for your return journey as use for your journey to work?

yes [ ] no [ ]

If no...

How often do you use a different route going home from work?
always [ ] often [ ] sometimes [ ] never [ ]

Why do you use a different route? (tick all you agree with)
[ ] - because pre-journey LISB advice recommends a different route
[ ] - because LISB advice on route recommends a different route
[ ] - one way streets and forbidden turnings
[ ] - different traffic conditions
[ ] - required stops on the journey
[ ] - just for variety
[ ] - other reasons

26. Have you in the last 2 months made any journeys to destinations in unfamiliar areas within Berlin?
[ ] yes [ ] no
if yes....
a) Generally, how did you find your destinations?
(tick all methods used)
[ ] using a map
[ ] signposts
[ ] general knowledge of the network
[ ] instructions before start
[ ] stopped and asked people
[ ] using LISB advice before commencing journey
[ ] using LISB advice on route

b) which of the above was most useful to you?
..... ? check ?

c) which of the above do you find easiest to use? (please rank your top 3 criteria i.e. 1,2,3 - 3 being the most important)

[ ] using a map
[ ] signposts
[ ] general knowledge of the network
[ ] instructions before start
[ ] stopped and asked people
[ ] using LISB advice before commencing journey
[ ] using LISB advice on route

d) what were you seeking? (tick all you agree with)
[ ] - shortest travel time
[ ] - shortest distance
[ ] - most straightforward route
[ ] - other criteria

e) do you think you chose a good route?
[ ] yes, absolutely
[ ] yes, fairly
[ ] no

27. How good did you find LISB for

	good	satisfactory	poor
- time saving	[ ]	[ ]	[ ]
- better orientation	[ ]	[ ]	[ ]
- traffic safety	[ ]	[ ]	[ ]
- avoiding congestion	[ ]	[ ]	[ ]
- fuel saving	[ ]	[ ]	[ ]
- precise destination finding	[ ]	[ ]	[ ]
- predictability of arrival time	[ ]	[ ]	[ ]

28. How often do you request advice

	always	sometimes	never
in familiar areas?	[ ]	[ ]	[ ]
in unfamiliar areas	[ ]	[ ]	[ ]

why do you not always request advice? (tick all you agree with)

[ ] - forget
[ ] - in hurry
[ ] - multistop trip
[ ] - can't be bothered
[ ] - short trips
[ ] - good personal knowledge
[ ] - I have found the advice is poor
[ ] - advice never varies for my journey

29. How often do you follow LISB advice

	always	sometimes	never
in familiar areas?	[ ]	[ ]	[ ]
in unfamiliar areas	[ ]	[ ]	[ ]

If you always follow LISB advice go to question 10, if not.....

when do you not follow advice? (tick all you agree with)

[ ] - when I thought advice was poor
[ ] - when the system failed
[ ] - when I wanted to stop on route
[ ] - when the traffic situation demanded my complete attention
[ ] - when guidance direction was unexpected
[ ] - when LISB produced the appropriate information too late
[ ] - when it sends me in the wrong (compass) direction
[ ] - when it sends me along a road which I know from experience to be very congested
[ ] - when it sends me along a road which I can see is very congested today
[ ] - when it sends me off a road which I know to be good and has no obvious problem today
[ ] - when it ignores a good shortcut
[ ] - when it continually ignores a good road so I conclude that LISB does not know about it

30. Given your experience of LISB in different situations, how much time do you expect that a route advised by LISB would save compared to the route you would have used if you had never had LISB?

a) on your journey to work

traffic conds.	LISB route is slower	no difference	up to 2 quicker	2-5 min. quicker	6-10 mins quicker	>10 minutes
good	[ ]	[ ]	[ ]	[ ]	[ ]	
average	[ ]	[ ]	[ ]	[ ]	[ ]	
bad	[ ]	[ ]	[ ]	[ ]	[ ]	

b) on journeys to unfamiliar parts of W.Berlin

traffic conds.	LISB route is slower	no difference	up to 2 quicker	2-5 min. quicker	6-10 quicker	> 10 minutes
good	[ ]	[ ]	[ ]	[ ]	[ ]	
average	[ ]	[ ]	[ ]	[ ]	[ ]	
bad	[ ]	[ ]	[ ]	[ ]	[ ]	

31. Compared to before Jan. 1st 1990 do you think the quality of information provided by LISB is ....
better [ ] same [ ] worse [ ]

32. Do you find that the information provided by LISB is updated
too often [ ] satisfactorily [ ] too little [ ]

33. How useful is regularly updated information provided by LISB?
very [ ] satisfactory [ ] poor [ ]

34. How do your experiences of the updated information facility compare with your prior expectations?
better [ ] as expected [ ] worse [ ]

35. If you could choose between LISB and an alternative systemm which displayed information about current road traffic conditions but did not give guidance which would you prefer?

	LISB	Alternative system	no preference
familiar areas	[ ]	[ ]	[ ]
unfamiliar areas	[ ]	[ ]	[ ]
in general	[ ]	[ ]	[ ]

36. Compared to your opinion of LISB before 1st January 1990, how has your attitude towards the system changed if at all?
improved [ ] same [ ] worsened [ ]

37. Are there any facilities that LISB does not possess that you wish it did?
.....

38. Please state your agreement or disagreement for each of the following statements:

A only in respect of journeys from and to work
B only in respect of journeys to familiar locations

	A		B	
	True	Not True	True	Not True
I have come to believe that LISB advice is worse than I can achieve myself				
I have come to believe that LISB advice is worse than it used to be (pre Jan 1990)				
Because LISB always recommends the same routes I do not ask for it any more				
LISB advice seems to be the same every day but I believe it would change if conditions were different on a particular day so I do request advice				
I value LISB because I have found that its advice varies by the time of day and traffic conditions				
LISB has taught me some new routes that I did not know before and I would use them now even without LISB				
I do not follow advice if I know shortcuts on secondary roads				
LISB is no use to me if only compass direction and distance is shown whilst autononmous mode is operating				

(A)

39. How does following a route without LISB advice compare with following a route using alternative, non-LISB advice:

	better	same	worse
concentration on task	[ ]	[ ]	[ ]
enjoyment of driving	[ ]	[ ]	[ ]
Safety	[ ]	[ ]	[ ]
conversing with passengers	[ ]	[ ]	[ ]
listening to radio	[ ]	[ ]	[ ]
Satisfaction with reaching destination	[ ]	[ ]	[ ]
relaxation	[ ]	[ ]	[ ]
Security	[ ]	[ ]	[ ]

40. How frequently has the system "crashed" while you were using it (ON AVERAGE PER MONTH)?

Never [ ] 1-3 [ ] 3-5 [ ] 6+ [ ]

41. How often has this occured while you have been driving in an unfamiliar area?

Never [ ] 1-3 [ ] 3-5 [ ] 6+ [ ]

How inconvenient was this?

not at all [ ] slightly [ ] fairly [ ] very [ ]

42. To what degree did it put you off relying on the system for such situations in the future?

not at all [ ] slightly [ ] fairly [ ] very [ ]

Esteem

43. In general, do you feel that the majority of people are impressed by the system?

yes [ ] no [ ] don't know [ ]

44. Are there any circumstances in which other people (e.g. passengers) have expressed a dislike of the system?

.....

45. Do you feel that your driving ability has changed as a result of using LISB?

improved [ ] same [ ] worsened [ ]

APPENDIX II

LISB III QUESTIONNAIRE - ENGLISH VERSION WITH CODING ABBREVIATIONS
- Coding abbreviations denoted with *

1. What proportion of your driving is carried out in unfamiliar areas? (to the nearest 10%)
   .....% *UNFAM

2. a) How often do you request advice from LISB for journeys in familiar areas?
   *RFAM

never	almost never	sometimes	almost always	always
[ ]	[ ]	[ ]	[ ]	[ ]

b) if not always, why not?
(tick all you agree with)

[ ]	forget to request advice	*FR
[ ]	in hurry	*HUR
[ ]	multistop trip	*MULTI
[ ]	short trips	*STRIP
[ ]	good personal knowledge	*PKNO
[ ]	I have found that the advice is poor	*PADV
[ ]	advice never varies for my journey	*ANV
[ ]	coding in the destination is difficult	*DIFCOD

3. a) How often do you request advice from LISB for journeys in unfamiliar areas?
   *RFAM

never	almost never	sometimes	almost always	always
[ ]	[ ]	[ ]	[ ]	[ ]

b) if not always, why not?
(tick all you agree with)

[ ]	forget to request advice	*FRI
[ ]	in hurry	*HUR
[ ]	multistop trip	*MULTI
[ ]	I have found that the advice is poor	*PADVI
[ ]	coding in the destination is difficult	*DIFCODI

4. a) How often do you follow ALL the advice given by LISB on a particular journey?

	very rarely	rarely	sometimes	usually	almost always
in familiar areas	[ ]	[ ]	[ ]	[ ]	[ ]
in unfamiliar areas	[ ]	[ ]	[ ]	[ ]	[ ]
			*AFAM	*AUNFAM	

b) How often do you follow MOST of the advice given by LISB on a particular journey?

	almost never	rarely	sometimes	usually	almost always
in familiar areas	[ ]	[ ]	[ ]	[ ]	[ ]
in unfamiliar areas	[ ]	[ ]	[ ]	[ ]	[ ]
			*MFAM	*MUNFAM	

If you always follow all the LISB advice go to question 5 if not.....

c) In what circumstances have you not followed LISB advice? (tick all you agree with)

[ ]	when I thought advice was poor	*PADU2
[ ]	when the system failed	*SYSF
[ ]	when the traffic situation demanded my complete attention	*ATTRAF
[ ]	when LISB produced the appropriate information too late	*LATEINF
[ ]	when it sends me in the wrong (compass) direction	*COMPAS
[ ]	when it sends me along a road which I know from experience to be very congested	*EXPCON
[ ]	when it sends me along a road which I can see is very congested today	*CON
[ ]	when it sends me off a road which I know to be good and has no obvious problem today	*OFFRD
[ ]	when it ignores a good shortcut	*SHORT
[ ]	when it continually ignores a good road so I conclude that LISB does not know about it	*IGNRD
[ ]	when it sends me in a direction contrary to the road signs	*SIGNS

if you have ticked 3 or less of the above go to question 3 if you have ticked four or more.....

d) Which three of the above are your most frequent reasons for not following LISB advice? (put a second tick in the appropriate boxes)

5. a) Compared to the methods you used to use how good have you found LISB for each of the criteria below when driving in familiar areas?

	poor	O.K.	good	
time saving	[ ]	[ ]	[ ]	*TIMSAVE
distance saving	[ ]	[ ]	[ ]	*MILSAVE
traffic safety	[ ]	[ ]	[ ]	*SAFE
avoiding congestion	[ ]	[ ]	[ ]	*AVD
fuel saving	[ ]	[ ]	[ ]	*FSAVE
precise destination finding	[ ]	[ ]	[ ]	*DEST
predictability of arrival time	[ ]	[ ]	[ ]	*PREARV
ease of driving	[ ]	[ ]	[ ]	*EASE

b) Compared to the methods you used to use how good have you found LISB for each of the criteria below when driving in unfamiliar areas?

	poor	O.K.	good	
time saving	[ ]	[ ]	[ ]	*TIMSAVE1
distance saving	[ ]	[ ]	[ ]	*MILSAVE1
traffic safety	[ ]	[ ]	[ ]	*SAFE1
avoiding congestion	[ ]	[ ]	[ ]	*AVD1
fuel saving	[ ]	[ ]	[ ]	*FSAVE1
precise destination finding	[ ]	[ ]	[ ]	*DEST1
predictability of arrival time	[ ]	[ ]	[ ]	*PREARV1
ease of driving	[ ]	[ ]	[ ]	*EASE1

6. a) Given your experience of LISB would you ever expect to save time by following LISB advice for your journey to work?
yes [ ] no [ ] *TI

b) if no go to question 8 if yes.....
How much time would you expect to save in such journeys in light taffic conditions? .....mins. *T2

c) How much time would you expect to save on such journeys in heavy traffic conditions? .....mins. *T3

7 a) Given your experience of LISB would you ever expect to save time by following LISB advice for journeys to unfamiliar parts of W.Berlin?
yes [ ] no [ ] *T4

b) How much time would you expect to save on such journeys in light traffic conditions? .....mins. *T5

c) How much time would you expect to save on such journeys in heavy traffic conditions? .....mins. *T6

8. Compared to before Jan 1st 1990 do you think the quality of information provided by LISB is .....
worse [ ] same [ ] better [ ] *INFO

9. If you could choose between LISB and an alternative system which displayed information about current road traffic conditions but did not give guidance which system would you prefer for each journey type (a,b and c)?

		LISB	information system	no preference
a)	journeys in familiar areas *SYSFAM	[ ]	[ ]	[ ]
b)	journeys in unfamiliar areas *SYSUNFAM	[ ]	[ ]	[ ]
c)	journeys in general *SYSGEN	[ ]	[ ]	[ ]

10. If the following features were incorporated into a new version of LISB how useful would you find them?

		not useful	slightly useful	useful	very useful	essential
a)	full guidance as soon as you start driving *F1	[ ]	[ ]	[ ]	[ ]	[ ]
b)	ability to have full guidance to destination *F2	[ ]	[ ]	[ ]	[ ]	[ ]
c)	guidance instantly restored after you fail to follow instructions *F3	[ ]	[ ]	[ ]	[ ]	[ ]
d)	knowledge of all roads (even small ones) *F4	[ ]	[ ]	[ ]	[ ]	[ ]
e)	guidance within other cities *F5	[ ]	[ ]	[ ]	[ ]	[ ]
f)	guidance on routes between cities *F6	[ ]	[ ]	[ ]	[ ]	[ ]
g)	ability to choose routes based on other criteria *F7 (not just minimum time)	[ ]	[ ]	[ ]	[ ]	[ ]

11. Do you agree or disagree with each of the following statements? - for each journey type tick ( ) boxes if you agree, put a cross (x) if you dissagree, put a question mark (?) if you have no opinion.

	*A @work	*B @fam	*C @unfam
LISB advised routes are often worse than I can achieve myself *S1	[ ]	[ ]	[ ]
Because LISB always recommends the same routes I do not ask for it any more *S2	[ ]	[ ]	[ ]
LISB advice seems to be the same every day but I believe it would chang if conditions were different on a particular day so I do request advice *S3	[ ]	[ ]	[ ]
I value LISB because I have found that its advice varies by the time of day and traffic conditions *S4	[ ]	[ ]	[ ]
I do not follow advice if I know shortcuts on secondary roads *S5	[ ]	[ ]	[ ]
LISB has informed me of good routes I would *S6	[ ]	[ ]	[ ]
Following LISB is easier than the methods I used to use to choose routes *S7	[ ]	[ ]	[ ]
LISB usually recommends the route I would have chosen anyway *S8	[ ]	[ ]	[ ]
LISB is easier to use than methods I used to use to find my destination *S9	[ ]	[ ]	[ ]

@work - in respect of journeys from and to work
@fam - in respect of journeys to familiar locations
@unfam - in respect of journeys to unfamiliar locations

12. Have you been inconvenienced by technological malfunction of LISB?

	never	sometimes	often
in familiar areas	[ ]	[ ]	[ ] *MALFAM
in unfamiliar areas	[ ]	[ ]	[ ] *MALUNFAM

13. To what degree did it put you off relying on LISB for such situations in the future?

	not at all	a little	a lot
in familiar areas	[ ]	[ ]	[ ] *LISBFAM
in unfamiliar areas	[ ]	[ ]	[ ] *LISBUNFAM

14. In general, do you feel that the majority of people are impressed by the system?

no [ ] yes [ ] don't know [ ] *IMPRES

15. Would you say that, due to your experience with LISB, you are now more or less willing to experiment with routes when not using LISB?

less [ ] same [ ] more [ ] *EXP

APPENDIX III German Version of Questionnaire and Introductory Letter

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L I S B Leit- und Informationssystem Berlin

Sehr geehrte Dame, sehr geehrter Herr !

Das Institut für Verkehrsstudien(ITS) der Universität Leeds in England bedankt sich herzlich für Ihr bisheriges Engagement mit dem Sie an unseren zwei Befragungen in der Vergangenheit teilgenommen haben.

Wir möchten heute ein letztes Mal an Sie herantreten und Sie nochmals befragen nach Ihren persönlichen Eindrücken und Erfahrungen, die Sie insgesamt im Verlauf des LISB-Ex - periments gewonnen haben.

Die Beantwortung der Fragen erfolgt in jedem Fall freiwillig. Wir sichern Ihnen zu , daß Ihre Angaben strikt vertraulich behandelt und nur zu Versuchszwecken statistisch ausgewertet werden.

Wir würden uns sehr freuen, wenn Sie durch Ihre erneute wertvolle Mitarbeit bei dieser dritten Befragung unser Forschungsvorhaben unterstützen.

Mit herzlichem Dank im Voraus !

i. A. Hapa

ITS Institut für Verkehrsstudien

Schicken Sie bitte den ausgefüllten Fragebogen im beiliegenden Umschlag an die SNV Studiengesellschaft Nahverkehr mbH, Auguste-Viktoria-Straße 62, 1000 Berlin 33 zurück

1. Gemessen an Ihren gesamten Pkw - Fahrten innerhalb Berlins,wieviel unternehmen Sie davon in etwa in solche Zielgebiete, die Ihnen weniger gut bekannt sind ?
(abgerundet auf 10%)

..... (%)

---

2. a) Wie oft benutzen Sie LISB bei Fahrten in solche Zielgebiete, die Ihnen gut bekannt sind?

[] nie [] fast nie [] manchmal [] fast immer [] immer

falls nicht immer ...

b) was sind Ihre Gründe hierfür ?
(kreuzen Sie alle Antworten an, die zutreffen)

[] wenn ich vergaß , die Leitempfehlungen anzufordern

[] wenn ich in Eile bin

[] wenn ich mehrere Zwischenziele anfahre

[] bei kurzen Fahrten

[] bei guter persönlicher Streckenkenntnis

[] Ich habe herausgefunden , daß die Leitempfehlungen für mich von geringer Bedeutung sind

[] wenn sich die Routenempfehlungen für meine Fahrt nie unterscheiden

[] die Eingabe der Zielkoordinaten ist zu umständlich

---

3. a) Wie oft benutzen Sie LISB bei Fahrten in solche Zielgebiete, die Ihnen weniger gut bekannt sind ?

[] nie [] fast nie [] manchmal [] fast immer [] immer
falls nicht immer ...

b) was sind Ihre Gründe hierfür ?
(kreuzen Sie alle Antworten an , die zutreffen)

[] wenn ich vergaß , die Leitempfehlungen anzufordern

[] wenn ich in Eile bin

[] wenn ich mehrere Zwischenziele anfahre

[] Ich habe herausgefunden , daß die Leitempfehlungen für mich von geringer Bedeutung sind

[] die Eingabe der Zielkoordinaten ist zu umständlich

---

4. a) Wie oft kommt es vor , daß Sie <u>alle Leitempfehlungen</u> von LISB befolgen für eine bestimmte Fahrt ?

	sehr selten	selten	manch-mal	gewöhn-lich	fast immer
in gut bekannten Gegenden	[]	[]	[]	[]	[]
in weniger gut bekannten Gegenden	[]	[]	[]	[]	[]

b) Wie oft kommt es vor , daß Sie die Leitempfehlungen <u>überwiegend</u> befolgen für eine bestimmte Fahrt ?

	fast nie	selten	manch-mal	gewöhn-lich	fast immer
in gut bekannten Gegenden	[]	[]	[]	[]	[]
in weniger gut bekannten Gegenden	[]	[]	[]	[]	[]

falls Sie immer <u>alle Leitempfehlungen</u>(4a) befolgen...
—→ *Gehen Sie bitte zu Frage 5*

<u>falls nicht immer</u> ...

c) In welchen Fällen haben Sie die Leitempfehlungen nicht befolgt ? *(kreuzen Sie alle an, die zutreffen)*

wenn ...

[] ich meinte, daß die Empfehlungen für mich lediglich von geringer Bedeutung sind

[] Störungen im System auftraten

[] die Verkehrssituation meine vollständige Aufmerk - samkeit erforderte

[] LISB die erforderlichen Informationen zu spät angab

[] LISB mich in die falsche Richtung schicken wollte

[] LISB Routen empfiehlt, die nach meiner Erfahrung stark staugefährdet sind

[] LISB eine Route empfiehlt,die heute besonders stark gestaut ist, wie ich augenscheinlich einsehen kann

[] LISB mich von der Strecke schickt von der ich weiß, daß sie günstig ist und offensichtlich heute keine Probleme hat

—→

noch zu Frage 4c) .. wenn ...

[] LISB gute Abkürzungen einfach ignoriert

[] LISB überwiegend günstige Straßen ignoriert, so daß ich daraus schließe , daß LISB diese Strecken nicht kennt

[] LISB Fahrtrichtungen anzeigt, die ein Befahren aufgrund der Verkehrszeichen nicht erlaubt

falls Sie <u>drei</u> oder weniger Gründe angekreuzt haben..
... → *Gehen Sie bitte zu Frage 5*

falls Sie <u>vier</u> oder mehr Gründe angekreuzt haben ...

...Welche sind davon die drei am häufigsten vorkommenden Gründe, die Sie dazu veranlassen, LISB - Empfehlungen nicht zu befolgen ?*(kreuzen Sie hierzu Ihre bereits angegebenen Gründe ein zweites Mal an)*

---

5. Verglichen mit Ihren herkömmlichen Methoden,die Sie bei der Routenwahl anwenden,wie gut fanden Sie die Wirksamkeit von LISB für jedes der nachfolgend angegebenen Kriterien bei Fahrten in Zielgebiete, die Ihnen ...

...	A gut bekannt sind ?			B weniger gut bekannt sind ?		
	gering	O.K.	gut	gering	O.K.	gut
-Zeiteinsparung	[]	[]	[]	[]	[]	[]
-Wegeinsparung	[]	[]	[]	[]	[]	[]
-Verkehrssicherheit	[]	[]	[]	[]	[]	[]
-Vermeidung von Verkehrsstau	[]	[]	[]	[]	[]	[]
-Kraftstoffeinsparung	[]	[]	[]	[]	[]	[]
-genaue Zielfindung	[]	[]	[]	[]	[]	[]
-Vorhersagefähigkeit für die Zielankunftszeit	[]	[]	[]	[]	[]	[]
-Erleichterung beim Fahren	[]	[]	[]	[]	[]	[]

6. Aufgrund Ihrer Erfahrung mit LISB , hatten Sie jemals den Eindruck gehabt,Zeit einzusparen,wenn Sie den Leitempfehlungen folgten bei Ihrer Fahrt zur Arbeit ?

[] ja [] nein

wenn ja ...

a)Wieviel Zeit würden Sie schätzen eingespart zu haben bei solchen Fahrten in guten Verkehrsbedingungen ?

.....*(Minuten)*

b)Wieviel Zeit würden Sie schätzen eingespart zu haben bei solchen Fahrten in schlechten Verkehrsbedingungen

.....*(Minuten)*

---

7. Aufgrund Ihrer Erfahrung mit LISB , hatten Sie jemals den Eindruck gehabt,Zeit einzusparen,wenn Sie den Leitempfehlungen folgten bei Fahrten in Ihnen weniger bekannten Gegenden innerhalb Berlin (West) ?

[] ja [] nein

wenn ja ...

a)Wieviel Zeit würden Sie schätzen eingespart zu haben bei solchen Fahrten in guten Verkehrsbedingungen ?

.....*(Minuten)*

b)Wieviel Zeit würden Sie schätzen eingespart zu haben bei solchen Fahrten in schlechten Verkehrsbedingungen

.....*(Minuten)*

---

8. Verglichen mit der Zeit vor Januar 1990 (*statisches Leiten*), wie schätzen Sie heute die Qualität der Leitempfehlungen *ein (dynamisches Leiten)* ?

[] schlechter ... [] genauso ... [] besser als vorher

---

9. Wenn Sie wählen könnten zwischen LISB und einem alternativen System,daß zwar Informationen zur gegenwärtigen Verkehrslage,aber keine Leitempfehlungen geben würde... .. Welches von beiden Systemen würden Sie vorziehen für jeden der nachfolgenden Fahrttypen ?

	LISB	alternatives Informations-system	keinen Vorzug beider Systeme
a) Fahrten in gut bekannten Gegenden	[]	[]	[]
b) Fahrten in weniger bekannten Gegenden	[]	[]	[]
c) insgesamt bei allen Fahrten	[]	[]	[]

10. Vorausgesetzt, daß die folgenden Zusatzkomponenten in einer neuen erweiterten Version von LISB einbezogen werden, wie nützlich würden Sie diese finden ?

	überhaupt nicht nützlich	kaum nütz-lich	nütz-lich	sehr nütz-lich	sehr wichtig
-vollständiges Leiten schon bei Fahrtbeginn	[]	[]	[]	[]	[]
-vollständiges Leiten bis zum Ziel	[]	[]	[]	[]	[]
-bei versäumter Befolgung von Routenempfehlungen wird die Leitung sofort wiederhergestellt	[]	[]	[]	[]	[]
-Einbeziehung aller Straßen (sogar kleine Nebenstraßen) in die Leitempfehlungen	[]	[]	[]	[]	[]
-mit Leitempfehlungen auch innerhalb anderer Städte	[]	[]	[]	[]	[]
-mit Leitempfehlungen zwischen verschiedenen Städten	[]	[]	[]	[]	[]
-Fähigkeit des Systems, die Routenwahl auch nach anderen Kriterien vorzunehmen (nicht nur geringste Reisezeit)	[]	[]	[]	[]	[]

11. Geben Sie bitte an,inwieweit die folgenden Behauptungen für jeden der aufgeführten Fahrttypen (A) bis (C) Ihre Zustimmung finden !

(A) für Fahrten von und zur Arbeit

(B) für Fahrten,deren Zielgebiete Ihnen gut bekannt sind

(C) für Fahrten,deren Zielgebiete Ihnen weniger gut be - kannt sind

[X] *trifft zu* [O] *trifft nicht zu* [?] *keine Meinung*

	(A)	(B)	(C)
-LISB Routenempfehlungen sind oft ungünstiger im Vergleich zu den von mir selbst ausgewählten Fahrtrouten	[ ]	[ ]	[ ]
-Da das Leitsystem immer gleiche Fahrtrouten empfiehlt , erübrigt sich die Eingabe des Fahrziels	[ ]	[ ]	
-Die Routenempfehlungen scheinen zwar jeden Tag gleich zu sein, ich glaube jedoch,daß an besonders ungünstigen Tagen auch andere Empfehlungen gegeben werden könnten, so daß ich LISB weiterhin benutze	[ ]	[ ]	
-Ich schätze das Leitsystem , da ich herausgefunden habe, daß die Routenempfehlungen sich je nach der Tageszeit und den Verkehrsverhältnissen unterscheiden	[ ]	[ ]	
-Ich befolge die Leitempfehlungen dann nicht, wenn ich Abkürzungen in Nebenstraßen kenne	[ ]	[ ]	
-LISB hat mich auf gute Fahrtrouten aufmerksam gemacht , die ich sonst nie ausprobiert hätte	[ ]	[ ]	[ ]
-Den Leitempfehlungen zu folgen ist einfacher als die Methoden , mit denen ich sonst normalerweise meine Routenwahl vornehme	[ ]	[ ]	[ ]
-LISB empfiehlt gewöhnlich die Routen, die ich sowieso auch selbst gewählt hätte	[ ]	[ ]	[ ]
-LISB ist einfacher anzuwenden als die Methoden,die ich sonst gewöhnlich zur Auffindung meiner Ziele anwende	[ ]	[ ]	[ ]

12. Sind Ihnen die technischen Funktionsstörungen des Leitsystems, die manchmal vorkommen, in irgendeiner Weise bisher lästig gefallen ?

	nie	manchmal	oft
- in gut bekannten Gebieten	[]	[]	[]
- in weniger bekannten Gebieten	[]	[]	[]

---

13. In welchem Umfang hat es Sie dabei in solchen Situationen gestört bzw. auch abgelenkt sich auf LISB zu verlassen ?

	überhaupt nicht	ein wenig	beträchtlich
- in gut bekannten Gebieten	[]	[]	[]
- in weniger bekannten Gebieten	[]	[]	[]

---

14. Insgesamt betrachtet, glauben Sie, daß die Mehrheit der Leute von diesem Leitsystem beeindruckt ist ?

[] ja [] nein [] weiß nicht

---

15. Würden Sie sagen , daß Sie aufgrund Ihrer Erfahrung mit LISB nun mehr oder weniger bereit sind bei der Wahl Ihrer Routen zu variieren,wenn Sie nicht LISB benutzen?

[] weniger [] genauso,wie zuvor [] mehr

Vielen Dank für Ihre Mitarbeit !

APPENDIX IV

Correlations

All questionnaire variables were intercorrelated using the SAS CORR procedure. The following tabulations detail correlations significant at the ≤ .01 probability level. Certain significant correlations have been omitted from the tables to avoid unecessary repetition. The direction of the correlation is indicated by the sign at the beginning of the row in which the particular variable is placed. The key to the variable abreviations are provided in appendix.

Correlations with the proportion of driving carried out in unfamiliar areas.

UNFAM: + FR1, F2, F3, F4, F5.
- RUNFAM, PADVI, AFAM.

Correlations with the frequency with which advice is requested for journeys in familiar areas.

RFAM: + MILSAVE, SAFE, FSAVE, PRARV, EASE, TIMSAVE1, SAFE1,
+ FSAVE1, DEST1, EASE1.

Correlations with the frequency with which advice is requested for journeys in unfamiliar areas.

RUNFAM: + PADV1, MALUNFAM
- FR1, AVD1, FSAVE1.

Correlations with the frequency with which all advice is followed for journeys in familiar areas.

AFAM: + RUNFAM, MULTI, LATEINFO, CON
- MILSAVE1, FSAVE1

Correlations with the frequency with which all advice is followed for journeys in unfamiliar areas.

AUNFAM: + FR, MFAM, MUNFAM, PADV2, F2, F3, TIMSAVE1, MILSAVE1
+ SAFE1, AUD1, FSAVE1, DEST1, EASE1
- HUR, PADV, RUNFAM, TIMSAVE

Correlations with the frequency with which most advice is followed for journeys in familiar areas.

MFAM: + FR1, DADV2, FSAVE1, PREARV1
- HUR1, MILSAVE1

Correlations with the frequency with which most advice is followed for journeys in unfamiliar areas.

MUNFAM: + FR, DADV2, F2, F3, MILSAVE, FSAVE, DEST, PREARV, EASE
+ TIMSAVE1, MILSAVE1, SAFE1, AUD1, DEST1, EASE1
- PADV, DFCOD, TIMSAVE