

MELBOURNE TRAVEL SURVEY RESEARCH-PROJECT
REPORT NO. 2
SUMMARY FOR WORKSHOP

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1. INTRODUCTION

Information about travel behaviour and transport systems operations is an essential input to a range of policy, planning and design processes. However, such information is difficult and expensive to collect and keep current, so that its collection has been infrequent. Past methods for managing this information have helped to make it expensive to access, maintain and keep current.

In Melbourne, a large scale survey based on a household interview survey (HIS) was conducted in 1964. A smaller update survey was conducted in 1972, and another large scale survey was taken in 1978/79. An indication of the trends in metropolitan travel behaviour between these three surveys is given in MoT (1982). Smaller scale surveys have been carried out from time to time, often using innovative methods, but these have not been large enough to find widespread use outside the purposes behind their collection.

There has been no further large scale survey activity since the 1978/79 HIS, so that much of the available information is now out of date. Many of the factors that affect travel demand have changed significantly in recent years. Thus there is a need to ensure that MoT and the transport Authorities can once again work with an up-to-date information database. The growing requirements for monitoring and performance measurement on different aspects of the transport system intensifies the need for a new database.

At the same time, it is not only travel behaviour and transport systems operations that have changed over the last decade. There have also been significant advances in knowledge and understanding of travel and the factors affecting it, and substantial improvements in the techniques and technology of data collection and information systems management. Further, the issues that can be usefully addressed with the assistance of transport and travel information have evolved well beyond those considered in previous times, with the result that the uses to which data may be put

have changed. Not all of the improvements in knowledge have yet been applied in Victoria, and the ability to address many of the recent policy concerns will be enhanced by data collection that reflects these improved or re-directed techniques.

For these reasons the Ministry and its Authorities decided that, before embarking on the design and execution of another major travel survey in Melbourne, a research project (the Melbourne Travel Survey Research Project - MTSRP) would be sponsored, with the aim of reviewing the broader issues that set the context within which the survey would be undertaken. The authors were commissioned to undertake the research project. This paper and the workshop are two of the products of that research project. The paper is a summary of the full report being prepared for the MTSRP Steering Committee (Taylor, Young, Wigan and Ogden, 1989).

2. PAST USES OF TRAVEL INFORMATION

In November 1988 the MTSRP Study Team distributed an open-ended questionnaire to transport professionals in Victoria, other Australian states and overseas, seeking their experiences with the use of transport survey information and their views on the needs for future surveys and travel information. Interested professionals in the transport portfolio in Melbourne were interviewed as a part of this information gathering. The results of this survey provided the basis for the views and recommendations given in this paper and in the full report of the MTSRP Study Team. The results are fully described in Taylor, Young, Wigan and Ogden (1989). 128 questionnaires were distributed, and 56 responses were received.

The responses indicated that modelling is no longer the major use of travel information in Australia or overseas. There is, however, considerable use of the information to provide empirical evidence in policy and decision making. This information does not always require the same emphasis on network flows and detailed spatial movements as before, but places a greater

weight on other factors, such as those categorising the attitudes and behaviour of different groups of people, or the wider implications of operation of the freight system. Neither of these were considered as primary areas of interest in most of the previous HIS.

Table 1 gives a ranked list of uses of travel information as indicated by the survey respondents. The ranking is in terms of the frequency of citation of the particular use. Network planning and project evaluation were the two most commonly cited uses. Table 2 indicates the types of travel information used in decision making. It shows that origin-destination information is the most frequently used. Socio-economic, road and transit performance information, and freight generation data are also in common use. There was a recognition of the need to relate information on the attitudes of particular market segments to the use and operation of particular transport modes and services. The increasing requirement for attitudinal data indicates that purely cross-sectional surveys are no longer sufficient.

The main findings from the review of the contemporary uses of travel information were:

- (1) there is a considerable need for good information on which to base policy and measure system performance. This need is increasing with time. The response time required to supply this information is now quite short compared to the delays acceptable for network planning alone;
- (2) the use of HIS information has changed radically. Modelling is no longer the major use;
- (3) the usefulness of HIS information for policy and systems performance applications diminishes rapidly as the data age. The value of the information for modelling persists for a longer period. There is thus a strong need for data collection on a regular basis, coupled with the ability to compare data from surveys over a long period of time;
- (4) procedures are needed for the rapid dissemination of basic 'census-type' HIS information to transport policy makers and planners. The detailed data required for model building could be presented at a slower rate;
- (5) HIS information is not suitable for providing attitudinal data. It is, however, well suited to providing broad indications of transport system performance. It needs to be supplemented by small scale, specific purpose survey data, and longitudinal databases are needed to provide information about the impacts of policy initiatives on travel behaviour.

3. PREVIOUS SURVEY METHODOLOGY

The technology of the travel demand surveys may be segmented as follows:

- (a) design of the survey sample and the survey instrument;
- (b) administration of the data collection, preparation and editing phases. There is considerable scope for the greater use of automated and computer-assisted methods to improve these phases significantly
- (c) initial analysis and publication of overall findings;
- (d) establishment of the continuing archival/clean format data set and access tools, with associated data as used for scaling and sample frame corrections, and
- (e) the operation, interrogation and application of the resulting database.

The traditional instrument for the collection of travel demand data is the household interview survey (HIS), in which each participating household in a sample of households is interviewed at home about their demographic and socio-economic characteristics and their travel behaviour in a recent, limited period. This period is typically one or perhaps two days immediately preceding the time of the

interview. The questionnaire used in the HIS is long and complex, as exemplified by the Melbourne 1978/79 HIS (MoT 1981) and the 1981 Sydney Travel Survey (Ampt, 1982). The HIS is often supplemented by direct observations of traffic loads on the transport system in the study area, e.g. cordon line and screen line traffic counts, and on-board surveys of transit usage, as in the 1964 Melbourne HIS. The HIS provides cross-sectional data, in that it represents a snap-shot of travel demand at one point in time.

There has been an increasing reliance on ABS data, particularly the Census of Population and Housing, to provide a basis for sample frame, for survey factoring corrections, and to underpin the data collection requirements as far as possible. This has forced a five year interval to become the standard cycle for considering HIS surveys, and may have delayed the onset of serious consideration of longitudinal surveys in Australia.

Two problems that can vex the analysis of travel demand data are (1) the means for treating multimodal trips (i.e. a trip by an individual who uses more than one mode of transport to make the trip) and (2) the under-reporting of short distance trips (e.g. those of less than one kilometre).

The definition of a trip, of a linked series of legs of a trip, and of a round trip have all been predicated on different ideas about travel and its description. The use of activity diaries (see section 4.1) has not only improved the reporting of off peak, non-home based and short trips, but also permitted the 'trip' definition to become (in principle) a matter for the analyst rather than the data coder.

The HIS method is well-developed and understood, and is capable of providing detailed information. Its problems relate to the difficulty in administering the survey under conditions of limited resources, e.g. time. On the other hand, the levels of variability inherent in the data have only recently been studied, and it is now quite clear that 'frequency of participation' questions should now be associated with travel reporting in HIS surveys. The survey

is also expensive to administer, which may be an overriding consideration.

The self administered questionnaire (SAQ) has also found widespread use as a technique for collecting travel demand data. The basic difference between the SAQ and the HIS is that the former is completed by the respondents acting on their own, without the assistance or advice of a survey interviewer. Thus the SAQ needs to be clearly set out, without ambiguity and must possess self-contained instructions for its use.

One advantage of the SAQ is that it provides considerable cost savings over the HIS to collect an equivalent amount of data. A disadvantage is that the survey organisers may lose some control over the return of completed questionnaires and hence adherence to the selected sampling procedure. Response rates for SAQs are generally lower than those for HIS.

Some transport analysts believe that the SAQ can be more accurate than the HIS, by removing some forms of bias in the responses obtained (see Taylor, Young, Wigan and Ogden, 1989).

The research project found that the basic information required from transport surveys is:

- (1) *demographic (person and household) characteristics*, to verify the characteristics of the survey sample against the target population (e.g. through comparisons with census data) and to permit the determination of appropriate weighting and expansion factors;
- (2) *LGA origin-destination trip matrices by mode, purpose and time of day, for persons, vehicles and commodities*, which provides the basic travel information required for most current applications (e.g. in corridor and regional studies);
- (3) *household (person and vehicle) trip production rates by demographic class*, as the primary indicator of person travel;

- (4) *trip generation rates for non-residential land uses*, as primary measures of the transport impact of land use developments;
- (5) *modal use profiles by time of day, to CAD and non-CAD destinations, and mode linkages by purpose*, as indicators of the spread of travel between modes on temporal and regional bases, and
- (6) *individual attitudes on the provision, operation and use of transport facilities*, as indicators of community perceptions and feelings, and as input to policy making.

Information types (1), (2), (3) and (5) may be collected using household-based survey techniques, whereas information types (4) and (6) as best collected by other means. The assumption that a single cross-sectional survey will provide the full range of data needs has been tested and found wanting.

4. TECHNOLOGICAL DEVELOPMENTS

There have been a number of recent significant developments in the technology for conducting and administering transport surveys, and in managing the information generated by these surveys.

4.1 Activity Diaries

Travel and activity diaries kept over a period of one day to a week or more have proved an excellent means for collecting trip data that allows for a proper representation of short distance trips.

4.2 Longitudinal Surveys

Given that the population and travel characteristics of a study area may vary over time, there can be significant needs for longitudinal data, i.e. repeated surveys that can be used to monitor the changes in travel demand that are happening over time.

Longitudinal data can be used for examination of the effects of transport policies on a population of travellers, for

instance in determining the effects of one policy (e.g. transit fare levels) in an environment where there are many other forces influencing travel behaviour. One particularly prominent form of longitudinal data collection is the survey 'panel', a sample of individuals or households that is repeatedly surveyed over an extended period of time. One problem with panels is the attrition of panel members, so that a well-designed initial sample frame is required.

There are, however, other means of gathering longitudinal data. Perhaps the simplest is the 'repeated cross-section survey'. This is a series of single cross-sectional surveys, based on different samples selected from the same target population over an extended time period. Each particular survey is called a 'wave'. (The panel survey uses the same sample for the initial and repeated surveys.)

4.3 Interactive Surveys

Interactive survey methods for travel demand analysis were introduced in the late 1970s, and have subsequently become highly developed survey instruments for use in examining specific transport issues and policies. The interactive methods can probe the attitudes, perceptions and behaviour of respondents at a deeper level than is possible in the conventional HIS or SAQ. To achieve these benefits, however, requires greater levels of skill and expertise during the interview and in subsequent analysis and interpretation.

The techniques are best directed at specific purpose surveys, rather than the general census of travel demand behaviour. Group discussion, graphical display equipment and gaming simulation can be used. Use of the interactive methods by interviewers can also speed up and improve the quality of interviews. These methods should thus be examined for use in any future surveys.

4.4 Telephone Interviews

Most market research interview surveys are now conducted using telephone interview techniques. General opinion is that the

telephone interview is not a suitable medium for the long, involved questionnaire usually associated with surveys of household travel demand. Nevertheless, there is no doubt that this technique cannot be easily dismissed. The telephone interview offers lower costs and better control than direct household interviewing. Telephone interviewing techniques are highly developed, with 'computer assisted telephone interviewing' (CATI) systems available that:

- (a) ensure adherence to sampling schemes;
- (b) streamline the interviewing procedure;
- (c) enable direct data entry and editing into a computer system at the time of the interview, and
- (d) permit easy 'call backs'.

At the same time there are some new problems that arise with this new technique. 'Random digit dialling' methods for sampling, for example, may cause confusion with 'market research' sales techniques. There may be data quality problems if the community resistance to intrusion via the telephone were to increase.

It is also important to note that the emerging needs to undertake distributional or environmental impact analysis require knowledge of the density of housing or population along a given street section. The characteristics of the sampled residents will have to be linked to these densities in some fashion, and this will be more difficult in a telephone survey.

The developing need for population-based attitudinal information may also undermine an unquestioning reliance on the telephone interview as the sole survey instrument.

4.5 Database Management

The concept of travel data as an information resource is an important one. Such a resource needs careful management and maintenance so that its full value can be realised. The major use of travel data is now to provide information on observed travel characteristics of the population. This use is best described as database enquiries,

which are best met through an interactive information management system. This area of information technology is one that has become highly sophisticated over the past decade, with many general purpose systems available for use (Taylor, Young, Wigan and Ogden, 1988). There is little need for the development of customised software for a travel information system, indeed such a development would represent a waste of opportunity and resources. Of particular interest for a travel information system is the development of powerful, flexible proprietary geographic information systems, combining full database manipulations with interactive mapping.

The cost of, and accessibility to, such comparatively large data systems can be drastically improved by using CD-ROM as the archival medium, and by catering for the use of personal computers. The ABS census data and other mass data systems are now available in a form suitable for both of these hardware developments.

5. PURPOSE OF INFORMATION

The value of information is only realised when that information can be presented in intelligible and usable form, and when it is relevant to the problem or issue under consideration.

5.1 Data and Information

There is an important distinction between *data* and *information*. Data represent the raw material, i.e. they are what is collected in surveys, from measuring devices, etc. A data set is rarely of much direct use on its own. Rather, it is information that is of use. Information is processed data represented in a relevant, credible and timely form.

Consequently, there is no utility in collecting data for their own sake. The value of data is only realised when they are transformed, processed or interpreted to form information. Information in turn is one of the important inputs to the decision making process. To manage, design or reach any form of decision requires some form of information.

The value of information is not uniform. Various factors affect its usefulness. The three key factors are timeliness, relevance and credibility. Many types and sources of information degrade rapidly with time. This is especially so for information used to monitor and control a system. Relevance, by definition, is crucial, because if it is not relevant then it is not, strictly, information at all. Credibility determines how much notice is taken of the advice; the information must be regarded as reliable and analysed with competence for it to be taken seriously.

Often there is a trade-off between these requirements. If timeliness is crucial, there may be insufficient time to allow for thorough analysis. In this case the reputation and care of the responsible analyst or organisation may well determine how seriously the information is taken and, consequently, how much influence it has in decision making.

The perceived relevance of data can be greatly improved by professional analysis and interpretation of the issues and perspectives inherent in the data, and by their careful presentation (Wigan, 1987). Graphical methods to aid in this process are now widely available, and are economic, rapid and effective. Consequently exploratory data analysis is integral part of the creation of an ongoing, accessible database.

5.2 Applications of Transport Information

A number of general applications of transport and travel information can be suggested. These include:

- (a) *transport policy formulation*: the identification of alternative courses of action and assessment of their effects;
- (b) *transport planning*: development of proposals for transport system improvement, in the light of transport policy objectives;

- (c) *forecasting and modelling*: quantitative assessment of the effects of different policy or planning objectives;
- (d) *project evaluation*: determination of the worth of a transport proposal, especially in economic terms, and the development of an 'optimum' investment program;
- (e) *transport system design*: the design of transport facilities with regard to the traffic they have to carry;
- (f) *transport system operation*: the operation and maintenance of a transport system or facility on a day to day basis;
- (g) *environmental impact assessment*: the effect on the natural and built environment of transport works and operations;
- (h) *traffic impact*: the effect of the traffic generated by new developments on an existing transport system, and associated environmental and social effects;
- (i) *distribution and equity impacts*: the effects on different groups within the population, and
- (j) *feedback to community*: assessment of public opinions, and the facilitation of public support for desired policy directions and planning proposals.

6. POLICY AND PLANNING ISSUES

There are a number of important implications for the use of travel information in policy and planning issues.

6.1 Changing Information Needs

The major current usage of transport data by construction authorities is to estimate vehicle flows, by transit authorities to estimate travel demand and location, and by traffic authorities to appraise development or other capacity management requirements. These are but a small part of the relevance and utility of the data available to those authorities. Why has this narrow view of operational and policy utility become the norm?

The actual usage of HIS data has been inhibited by the perceived ownership of the data and by the complexity of previous processes for accessing and using the data. Further, the limited accessibility to the data was matched by a lack of knowledge of what could be done with them. The delays that arise from 'ownership' of the data may yet be repeated if copyright issues are not resolved in advance in the future, given the current attitudes of ABS and others to public data collections.

The tools for providing responsive and effective analysis have been generally weak and poorly co-ordinated, and therefore little used by the primary users. The inaccessibility of effective models, a lack of expertise in the use of models, and a lack of attention paid to the end user (the affected public) in model applications has led to a general disregard of the modelling process in policy formulation and planning. This has translated into de-skilling and disinvestment in this area. Consequently the policy and operational relevance of much available data has fallen out of line with policy requirements, which need projections, impact estimations, timely response and a usable delivery process.

The normal reaction has been to turn to the basic data themselves. Some authorities collect special data for a specific situation, and use it creatively with good, selective presentation tools to stimulate credible interaction between the various parties. This eases the way for local applications, but does little to help policy-oriented applications at anything beyond the local level. The trend towards many small and special purpose surveys may help the individual authorities to some degree, but does not provide for much cumulative assistance to the portfolio as a whole.

Present policy requirements are increasingly concerned with:

- (a) co-ordination in the development of projects with multiple agency inputs;
- (b) the provision of information on which to base public information and consultation, and
- (c) short term fiscal precision,

to which might reasonably be added the classical issues of:

- (d) differential impacts (positive and negative) on different groups;
- (e) anticipation of future problems and requirements;
- (f) adjustment of unsuccessful measures as the results emerge from a series of information-gathering exercises over time, and
- (g) development of means to minimise the negative effects that forecasts or projections suggest might be likely to arise.

The basic assumptions underlying all of these areas are that such information is actually *wanted* by the decision making process, and that correct identification of losers and gainers is desired. This is not the place to explore these issues. This project is concerned with the positive aspects of having the choice of making use of information, the appropriate selection of information for planning, consultation and evaluation, and the most effective measures to achieve positive goals. However, it cannot be assumed that the mere collection of information will automatically lead to its reduction and transformation into readily communicable conclusions.

6.2 Transport Information and Policy

There is clear place for overall data collection to define the current status of the transport system and its players.

Previous data collection has often suffered from the sheer weight of the data collected, and inadequate means of transforming it into policy perceptible forms. Sometimes this has led to the selection of an unduly narrow range of policy options. The long delays from data collection to recommendations (typically three years or more) has had a further debilitating effect on the use of the information.

Timely information has both positive and negative effects. The continuing monitoring of various attitudes and behaviour patterns will not always provide information in

accord with organisational aspirations, but unless such series become established in the public arena, the effective use of such information will continue to be unduly politically sensitive. Indeed a good test of current requirements might be the initial assessment of its potential political sensitivity, as this will clearly demonstrate those areas where better information could play an effective short (and sometimes long) term role.

6.3 Category of Application and Policy Issues

The areas in which policy can be affected by travel information vary with the type of basic data and the deductions drawn.

The most cogent policy issues that require information inputs are person related (e.g. fare elasticities, transit marketing) or commodity related (e.g. rates, import substitution, etc.). However, most current data sources are more aggregate than this, being based either on fleet aggregation (e.g. age, scrapping, composition, etc.) or on vehicle movements (e.g. traffic generation by land use developments, etc.)

This distinction between disaggregate *needs* and current aggregate *data* is one of the major problems in the application of travel information, and is therefore one of the most pressing issues for resolution as part of any future travel survey. This means that any future surveys must:

- (a) collect data that can provide policy-relevant information, and
- (b) enable cross-comparisons with aggregate data of the type collected by (for example) ABS surveys and MTA counts.

7. RECOMMENDATIONS

The recommendations of this project fall into three categories, each of which is determined by the areas where information and policy sensitivity are important:

- (1) the types of surveys worth doing;
- (2) the contents of these surveys, and
- (3) the application of the results.

The essential lesson from the project is that the basic reasons for obtaining travel information are:

- (1) the quantification of current movements and demands for individual and freight movements on the transport system;
- (2) anticipation of any changes in these patterns of movement, in the light of anticipated changes or policy initiatives, and
- (3) evaluations of the benefits and disbenefits of these changes and their impacts.

The consequence is the necessity for a mixture of longitudinal and cross-sectional survey instruments, coupled through an integrated information system that allows for the maintenance of the travel database, and the ready dissemination of travel information for policy and planning applications.

A general observation from the survey of uses of travel information is that *the detailed lists of data items that were covered in earlier surveys have proved to be largely unused, and even their existence has remained effectively unknown to many potential users.* The efforts expended in collecting much of these data can be effectively transferred to other, more urgent, areas.

In the past, data have not been widely used. This has been due as much, if not more, to the lack of backup interpretation and archival units as to any deficiencies in the data themselves. The management and interpretation of data collected in any new program must reflect this experience, and provide for continuing husbandry, interpretation and communication activities.

A large scale cross-sectional survey (comprising a household interview survey and associated screen line and special activity centre surveys) is required to establish a relevant, comprehensive and contemporary datum that can be used for present planning needs for metropolitan Melbourne and to provide a relevant starting point for future information needs. These

future needs will be best served by the establishment of a longitudinal survey program, preferably in the form of a transport panel, to follow the large scale survey. *The panel will provide indications of trends in travel behaviour and needs.* A variety of special purpose surveys (e.g. on attitudes and markets) should be run under the umbrella of the transport survey program, as there will always be substantial needs for special information that cannot be efficiently gathered in the large scale survey framework. This special information is of maximum value if it can be linked to the large scale database. *The database itself is of maximum utility if it consists of high quality data, containing clear results, and available for release with the shortest possible delay ('reaction time') after data collection.*

There is a real need for new and ongoing travel surveys for metropolitan Melbourne. The Study Team's preferred plan is for a large scale household interview survey, together with associated surveys of special activity centres (e.g. to observe commodity and freight movements) and of transport systems performance, to be followed and supplemented by an ongoing program of longitudinal surveys, in the form of a travel behaviour panel. The transport survey program should be built around a modern information system that can readily provide relevant transport data to aid in decision making. A geographic information system is most appropriate, and well-developed GIS shells already exist.

The new cross-sectional survey should be closely aligned with the 1991 ABS Census of Population and Housing to ensure firm regional and demographic foundations for weighting and expansion of the travel survey sample data.

A pilot study is needed, in advance of the main surveys, to test the use of the new technology for data collection and preparation. Two essential elements of the survey program should be the use of modern computer technology (e.g. portable personal computers) for use in direct recording of interview data, and the establishment of the travel information database system to provide travel

information for planning needs. The collection of high quality data, possible through direct computer recording, will substantially reduce the time and effort required in data coding and editing. This offers considerable promise as a means to reduce the time required in the post-survey processes of data coding and editing, thus enabling the early release of 'clean' data. It may also offer opportunities for reduced sample size, by ensuring the capture of high quality data.

The pilot data can be used to establish an initial travel information system for satisfying needs for data in transport planning and decision making. *The Study Team is ready to undertake the piloting tasks, to determine the best course of action for the survey program to yield its results.*

The estimated maximum cost of the new large scale travel survey, given the following assumptions:

- (1) a survey program consisting of pilot testing of the data collection, coding and editing methods, a household interview survey, broadly comparable to the 1978/79 survey, a smaller sample survey using one week travel diaries (to provide a proper benchmark reference for the future 'longitudinal' surveys that are essential to preserve the utility and relevance of the cross-sectional survey) and special activity centre surveys;
- (2) use of new data collection and analysis technology (particularly the use of portable personal computers for direct data recording);
- (3) a HIS sample size of 20 000 households, and
- (4) the establishment of travel demand database for the collected data,

is estimated at *approximately* \$3.2 Million (1989 dollars), over an initial period of two years. *A further budget would be needed to maintain the panel and the travel information database system.* This further budget would consist of two items: (1) funding of a core unit (of perhaps two people plus

hardware and software support) to maintain the travel information database and ensure its continuing utility and availability), estimated at \$150 000 p.a., and (2) funding to maintain and tap the panel, estimated at \$150 000 p.a.

The need to be able to pick up changes in the nature of demand as well as its location also points towards the need for an ongoing survey activity, best given to a core unit. Longitudinal surveys of any kind will demand a continued level of detailed understanding at each stage, to obtain the value from the emerging time trend data. This travel information unit would also be charged with the upkeep and maintenance of the travel data information system, and with the dissemination of information from that system. The location of the unit (perhaps within one of the Authorities, a university or consultancy) is much less important than the recognition that the value of data depends largely on the information that can be derived from them. This requires understanding and skills, as well as access and release rights. These issues are not trivial and require substantial discussion.

The shift from the use of an intermittent series of single cross-sectional surveys to a blend of longitudinal and cross-sectional coverage will not be achieved without some innovative investigations, and the conservation of the skills created within the travel information unit and/or its associates. The form and location of such a unit is one subject worthy of debate in the Workshop, as the functions and continuity required are a result of the perspectives provided by the Study team, and may be modified in the wider debate. *There is considerable benefit to be gained by strengthening links with units in other states (notably New South Wales and South Australia) who have maintained high levels of expertise in transport surveys.*

A number of these recommendations would be valuable across the nation, and the workshop provides an excellent forum for these to be considered as a possible new initiative at the same time as the usage, format and modes of operation and application of new transport survey data are debated.

8. REFERENCES

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TABLE 1: USES OF TRAVEL INFORMATION CITED BY RESPONDENTS TO THE MTSRP SURVEY

Use	Frequency of Citation
Network planning	19
Project evaluation	19
Model development and calibration	17
Estimating patronage or demand	16
Fares and prices	14
Safety	13
Environmental impact assessment	12
Monitoring	10
Estimating impacts of projects	9
Information feedback to public	8
Non-transport uses (land use, economic development, etc.)	8
Others(specified)	15
(investigating user attitudes	2)
(bus route planning [operations]	2)
(infrastructure investment [including toll roads]	2)
(parking arrival rates and durations	2)
(subsidy assessment	1)
(contingency planning	1)
(domestic air transport	1)
(provision of services	1)
(business planning	1)
(comparison of accessibility of regions	1)
(marketing strategies	1)

TABLE 2: CITED USE OF PARTICULAR CATEGORIES OF TRAVEL INFORMATION IN DECISION MAKING

Category of Travel Information	Frequency of Citation
Origin-destination patterns for persons, vehicles or commodities	21
Road and/or transit system performance information	19
Freight generation, flow and delivery information	19
Socio-economic information	17
Land use-related trip generation information	17
Vehicle information	16
Parking accumulation and duration	14
Price information	12
Activity information	11
Pedestrian and bicycle generation and flow	9
Special market segment coverage	9
Other(specified)	7
(amount of travel by different users, purposes and modes	3)
(stated preference data	1)
(value of time	1)
(transport for the disabled	1)
(mode of travel	1)