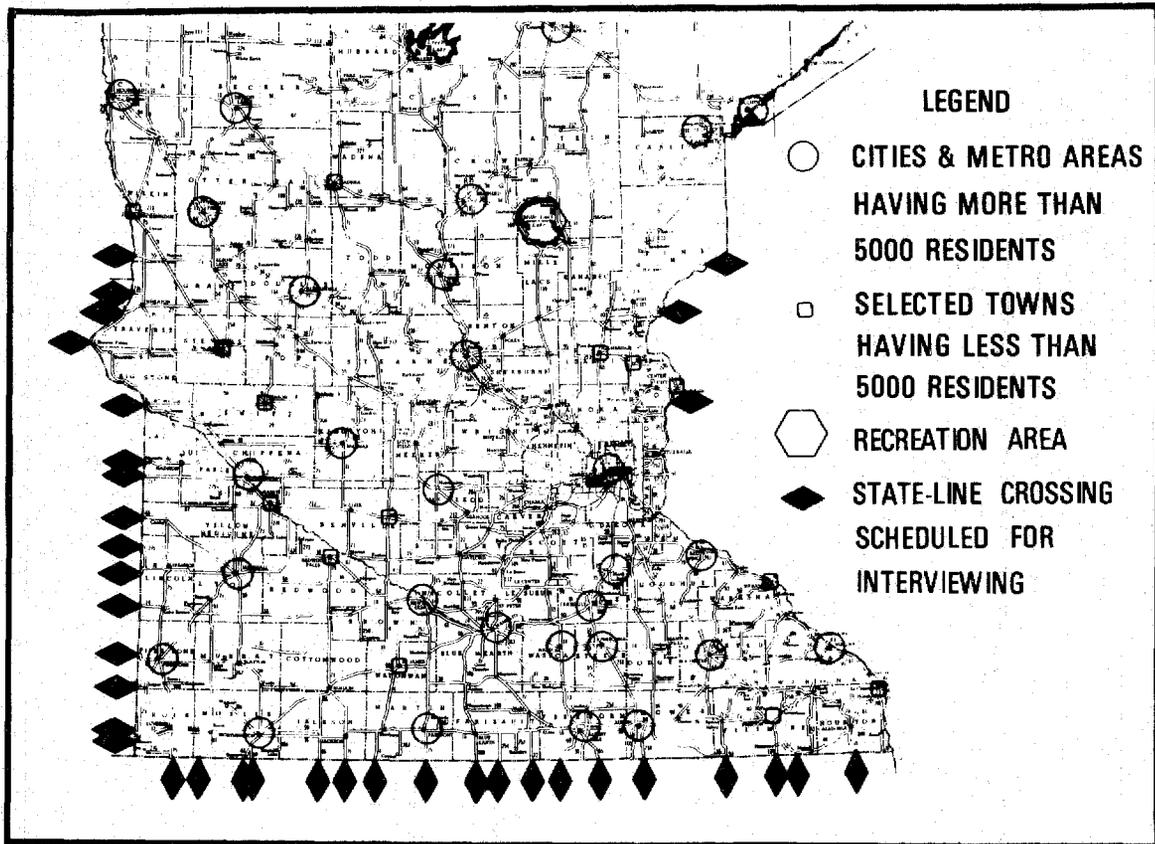


travel survey procedures for statewide transportation planning

HOUSEHOLD/ROADSIDE/MODAL-SURVEYS



APRIL 1976

U.S. DEPARTMENT OF TRANSPORTATION
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16. Abstract This report describes and evaluates alternative travel survey procedures that have been used for or are potentially applicable to statewide transportation planning. The types of survey procedures discussed in the report include household, roadside, and modal passenger survey techniques. The potential uses, strengths, and weaknesses of each type of survey are assessed. The report presents illustrative survey instruments, survey costs, and procedures for administering surveys for statewide transportation planning.					
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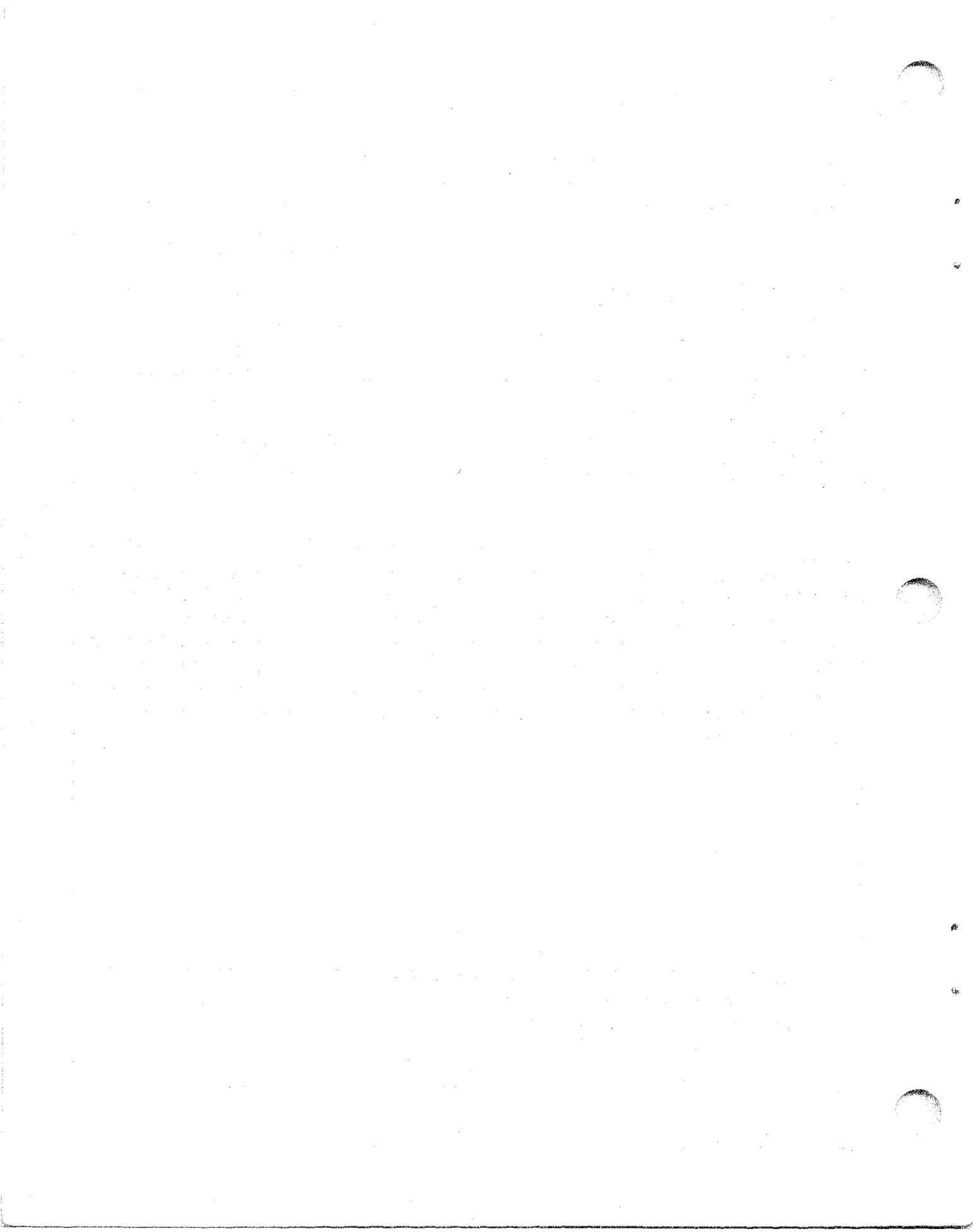


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I. OBJECTIVE AND SCOPE

OBJECTIVE

The objective of this report is to describe, analyze, and evaluate travel survey procedures that have been used for or are potentially applicable to statewide transportation planning.

Based on meetings with and a survey of state officials, there appears to be considerable uncertainty regarding the types of travel data needed for statewide transportation planning, the cost of data collection, and the relative advantages and disadvantages of alternative travel survey procedures. In addition, many states are working under "tight" budgets, particularly for conducting new travel surveys. This increases the importance of designing and conducting cost effective travel surveys.

At present, the data available to assist the states in resolving the above survey related issues are very limited. Reports and other material describing travel surveys conducted for statewide transportation planning have generally not been widely distributed. Information on such surveys is likely to be of use to states having established planning programs and to states contemplating such a planning effort.

This report is intended to provide such information. Travel survey procedures that have been used in or are potentially applicable to statewide transportation planning are described and evaluated. Household, roadside, modal, and specialized (e. g., attitudinal) surveys are analyzed, as are the advantages and disadvantages of alternative travel survey procedures.

This report is a product of the Federal Highway Administration study, "Data Collection for Statewide Travel Including Multi-Modal Demand." It is intended to supplement the final report of this study.

The final report will present sampling plans and travel survey designs for conducting:

- . household travel surveys;
- . alternative types of roadside surveys; and
- . modal surveys.

The following elements of each survey design will be analyzed in the final report:

- . the selection and application of sampling procedures for estimating sample sizes and other sampling parameters;
- . trade-offs between survey sample size and alternative tolerance and confidence levels;
- . the identification and reduction of nonsampling biases such as nonresponse and noncoverage; and
- . generalized cost estimates for conducting such surveys.

ORGANIZATION OF REPORT

Sections II, III, and IV present guidelines for selecting and conducting household, roadside, and modal passenger surveys, respectively. The types of data typically collected using each type of survey procedures, the survey conditions that determine the type of procedure, and survey biases and data collection costs are analyzed in each of these sections. The guidelines presented in these sections are based on the results of travel surveys contained in the appendices to this report.

Selected household, roadside, modal, and specialized travel surveys conducted for statewide transportation planning and related studies are documented in Appendices A, B, C, and D, respectively. The following aspects of these travel surveys are analyzed in the appendices:

- . survey objective;
- . survey location;
- . survey procedures used;
- . sample size and sampling procedures;
- . survey instruments;
- . cost;
- . staffing; and
- . survey problems.

This information should be useful to states in comparing and designing their own travel survey procedures as needed for different types of policy and system planning studies.

II. EVALUATION OF HOUSEHOLD TRAVEL SURVEYS

USES

Household travel surveys, which include home interview, telephone, and mail surveys, are particularly applicable for:

- . determining the number and characteristics of weekday, weekend, or peak period person trips or auto driver trips on a statewide or regional scale for use in alternative policy or highway system planning studies;
- . monitoring over time the changes in the magnitude and mix of travel to determine the impact of energy restrictions and costs, government policy, etc., on travel behavior by type of household;
- . collecting extensive data on the socioeconomic characteristics of households and relating such information to household travel;
- . collecting attitudinal and/or behavioral data (which may require a lengthy and complex survey instrument); and
- . providing the travel data needed for special policy or research studies.

STRENGTHS AND LIMITATIONS

Household surveys are generally less satisfactory than roadside and modal surveys for collecting data on the infrequent or rare trips often of interest in statewide transportation planning. Such trips include:

- . those over 20 miles in length (which typically represent 47 percent of the vehicle miles of travel but less than 8 percent of total person trips or auto driver trips on a statewide basis); and
- . auto, air, rail, and intercity bus trips made between specific city pairs or using specific transportation facilities (e. g., highway, airport).

Although household surveys can be used to collect data on the above types of trips, large sample sizes and/or specially designed surveys are required to collect reliable data because of the large variability in and infrequency of such trips. In addition, auto, air, rail, and bus trips made by nonresidents of the survey area will not be included in a household survey. Such trips may represent a sizable percentage of all trips using transportation facilities within a state, region, or corridor and generally must be surveyed if a complete travel file is to be developed. The strengths and limitations of home interview, telephone, and mail survey procedures are analyzed in the following paragraphs.

Home interview surveys are generally preferable to other household survey procedures if a long and/or complex survey instrument is to be used. Long and complex surveys conducted by telephone or mail may discourage survey participation and may confuse the respondent.

The response rates for home interview surveys are generally higher than telephone and mail survey completion rates (see Table II-1). The lower response rates for telephone and mail surveys increase the chance of nonresponse and noncontact biases being introduced in the survey results. A number of studies have also identified the possibility of underreporting trips in telephone and mail surveys. These are potential problems in all household surveys which can be overcome through careful survey supervision and the use of properly designed survey instruments, experienced interviewers, and a designed survey quality control and call-back program.

Home interview, telephone, and mail surveys have been conducted for statewide transportation planning. Unfortunately, the surveys were conducted in different states at different points in time and using different survey and sampling procedures. Consequently, the survey results do not provide a satisfactory basis for comparing household survey procedures and detecting all of the biases which may be related to each survey procedure.

However, several urban transportation studies have simultaneously tested and evaluated the use of different household survey procedures for collecting urban travel data. Home interview and telephone survey procedures were compared in Kalamazoo (Michigan), Marysville-Yuba City (California), and Spokane (Washington), and home interview and mail survey procedures were compared in New Haven (Connecticut) (see Table II-2). A very important factor which must be considered in evaluating these tests is that households that could not be contacted by telephone were frequently contacted by means of a personal interview to improve survey response. The New Haven mail survey also employed such call-back procedures. The implications of such callbacks are presented below.

TABLE II-1

RESPONSE RATES FOR STATEWIDE HOUSEHOLD TRAVEL SURVEYS

Type of Survey	Location	Completed Interviews (%)	Refusals (%)	Incomplete Interviews (%)
Home Interview	Connecticut	92	1.4	6.6
Mail	Kentucky	40 (Mail) (Telephone + 5 Home Interview) <u>45</u>	---	55
Telephone	New York	63	13	24
	Delaware	90	1.8	8.2

TABLE II-2

COMPARISON OF HOUSEHOLD TRAVEL
SURVEY PROCEDURES

Urban Transportation Study Area	Type of Surveys	Sample Size for Each Type of Survey	Year Conducted
Kalamazoo, Michigan	Home Interview	2,783	1966
	Telephone	2,712	
Marysville-Yuba City, California	Home Interview	2,376	1971
	Telephone	236	
Spokane, Washington	Home Interview	5,319	1965
	Telephone	5,306	
New Haven, Connecticut	Home Interview	2,500	1967
	Mail	400	

Sources:

1. A. M. Voorhees and Associates, Inc. Kalamazoo Area Transportation Study - Comparison of Telephone and Home Interview Surveys, Technical Report No. 1. July 1969.
2. D. L. Ochoa, R. D. Schulze, and E. E. Anderson. Pilot Telephone Origin and Destination Survey - Marysville-Yuba City Area Transportation Study. State of California, Division of Highways. February 1973.
3. E. L. Falk and T. J. Halpin. The Use of the Telephone in Gathering Data in Transportation Studies. Washington State Highway Commission, Department of Highways. July 1966.
4. U. S. Department of Commerce, Bureau of the Census. Census Use Study - Report No. 11 - Area Travel Survey. September 1970.

In all three of the home interview-telephone survey comparisons, it was tentatively concluded that either survey procedure could be satisfactorily used to collect travel data for urban transportation planning. Table II-3 illustrates that average household characteristics for most survey variables in those study areas were similar in the home interview and telephone surveys. However, short, frequent nonhome based trips tended to be underreported in telephone surveys.

A comprehensive quality control program will help to minimize non-response and the underreporting of trips in a telephone survey. Such a program might include reinterviewing 10 percent of the households during the first two weeks of the survey and monitoring a sample of interviews throughout the survey period. Recon Research Consultants Ltd., in its work for the Ontario, Canada, Department of Highways, found that satisfactory results were obtained from telephone surveys by retaining only the best two-thirds of the interviewers that were hired and trained.

The Bureau of the Census compared home interview and mail travel survey procedures in New Haven in 1967.¹ The home interview sample included 400 households, and the mail sample included 2,500 households. Both telephone and personal interviews were made as follow-ups to the mail survey.

The results of the home interview and mail surveys were in close agreement for the overall survey area. The average number of person trips per household was within approximately 5 percent for the surveys (see Table II-4). The total number of person trips in the region were also in very close agreement. Callbacks in the mail survey were particularly important in producing results consistent with the home interview survey. Table II-4 illustrates that if repeated attempts (including telephone and home interviews of nonresponses) to contact sample households had not been made, significantly different trip generation estimates would have been determined from the mail survey. The questionnaire form for mail travel surveys must be carefully designed to appear simple, short, and easy to complete and must contain an easy flow of questions. This may require a modification of the table format for trips that is commonly used in home or telephone interviews.

The above comparisons of telephone and mail survey results with home interview survey results suggest that telephone and mail surveys

¹U.S. Department of Commerce, Bureau of the Census, Census Use Study - Report No. 11 - Area Travel Survey (September 1970).

TABLE II-3

COMPARISON OF TELEPHONE AND
HOME INTERVIEW SURVEY RESULTS^a

Household Characteristics	Survey					
	Spokane		Marysville-Yuba City ^b		Kalamazoo	
	Home Interview	Telephone	Home Interview	Telephone	Home Interview	Telephone
II.6 Person Trips/ Household	7.02	7.68	10.1	9.8	8.78	7.64
Auto Driver Trips/Household	-	-	7.1	7.2	5.68	7.64
Household Size	3.41	3.26	3.1	3.1	3.20	3.03
Autos Owned/ Household	1.29	1.35	1.6	1.7	1.30	1.26

^a See Table II-2 for sources.

^b Statistics based on occupied housing units.

TABLE II-4

COMPARISON OF MAIL AND HOME INTERVIEW
SURVEY RESULTSComparison of Mail and Home Interview
Survey Results

Survey Procedure	Person Trips Per Household	Number of Samples
Mail Survey (Total)	6.06	1963
Initial Mailing	7.24	706
Second Mailing	5.84	258
Telephone Followup	5.59	723
Home Interview Followup	4.46	276
Home Interview Survey	5.74	320

Source: U. S. Department of Commerce, Bureau of the Census. Census Use Study - Report No. 11 - Area Travel Survey. September 1970.

can be satisfactorily used to collect travel data for urban and statewide transportation planning. This finding is important because the field interviewing costs per completed interview for mail and telephone surveys are approximately 80 and 50 percent lower, respectively, than for home interview surveys (see Table II-5). The use of telephone and mail survey procedures may result in substantial cost savings for states planning to conduct a household survey.

TABLE II-5

UNIT COSTS FOR SELECTED TYPES OF TRAVEL SURVEYS

TYPE OF SURVEY	LOCATION	ACTIVITY	COST PER COMPLETED INTERVIEW		
			Current Dollars	Year	1974 Dollars ^a
<u>Statewide (Household)</u>					
Home Interview	Connecticut	Interviewing and Field Work	\$12.00 ^b	1964	\$19.08
Telephone	New York	Interviewing and Field Work	8.71 ^c	1970	11.07
Mail	Kentucky	Interviewing and Field Work	3.60 ^d	1972	4.25 ^f
<u>Regional</u>					
Home Interview	Rochester (N. Y.)	Interviewing and Field Work	\$23.79 ^c	1974	\$23.79
Home Interview	Minneapolis	Interviewing and Field Work	7.94 ^e	1970	10.09 ^g

a Costs were adjusted to a 1974 dollar base using the United States City Average All Item Consumer Price Index.

b Unit cost was provided by CDOT.

c Unit costs were obtained from NYSDOT.

d Unit costs were provided by KDOT.

e Costs are based on data provided by the Federal Highway Administration.

f The cost of coding and data preparation in this survey was \$7.42 per completed interview (in 1974 dollars).

g The cost of coding and data preparation in this survey was \$10.58 per completed interview (in 1974 dollars).

III. EVALUATION OF ROADSIDE SURVEYS

USES

Extensive use has been made of roadside survey travel data in a wide range of statewide transportation planning studies. Roadside surveys are efficient in intercepting and surveying (1) auto trips passing a particular location (e.g., screenline) within a state, region, or corridor; (2) trips between specific city pairs; and (3) trips to major generators (e.g., resort areas). Roadside interview stations can be located to sample trips directly from the population of such trips.

Roadside surveys are particularly applicable to those situations where infrequent long auto trips are to be surveyed and/or where a large proportion of travel is made by nonresidents of a state, region, or corridor (e.g., trips crossing the state line, travel to recreation areas, corridors subject to substantial through travel).

A number of states have made extensive use of urban cordon survey data and screenline survey data to develop trip generation, distribution, and traffic assignment procedures for statewide highway planning. Selected states have followed this course of action because of the availability of cordon survey data for many urban areas. The combined use of cordon survey data for both urban and statewide transportation planning is an important attribute of such surveys.

A major limitation of roadside survey is that only very limited data on total tripmaking, attitudes, or household socioeconomic characteristics can generally be collected without seriously delaying the traveler or disrupting the flow of traffic. Roadside surveys only determine the characteristics of the trip intercepted at the roadside station. Then limitation can be alleviated by conducting follow-up surveys using mail-back, telephone, or home interview survey procedures. However, such follow-up surveys have frequently been administered as mail surveys, which are generally subject to high nonresponse rates unless they are carefully designed.

The cost of roadside surveys may be substantial if a large number of stations must be established, particularly on a statewide basis. For example, the cost of the field work for the New York state-line cordon survey which included 40 roadside stations and 73 station-days of interviewing, was approximately \$94,000 (in 1970 dollars). The cost per completed interview (including wages, meals, lodging, and travel) for interviewing in the New York survey was \$1.45 (in 1974 dollars) or approximately \$1,640 per station-day (in 1974 dollars).

The actual cost of a roadside survey program depends on many factors, including the number of geographic locations of the survey stations, the days and times of station operation, and the number of vehicles to be sampled at each station.

Another disadvantage of roadside surveys is that the stopping of vehicles along the highway may result in congested travel conditions, particularly on high volume routes. In addition, stopping vehicles in poor weather conditions and at locations with poor geometrics may result in accidents or unsafe working conditions for the survey personnel. The advantages and limitations of using license plate survey procedures to conduct roadside surveys are discussed on page III. 5.

The types of roadside surveys conducted for statewide transportation planning include:

- . urban cordon and multiple screenline surveys;
- . stateline cordon surveys;
- . roadside surveys with a follow-up survey; and
- . recreation/peak travel period surveys.

STRENGTHS AND LIMITATIONS

The strengths and limitations of these survey procedures are analyzed below.

Urban Cordon and Multiple Screenline Surveys

Urban cordon survey data are being used by Minnesota, Michigan, Georgia, and Colorado, among other states, for statewide highway planning. Multiple screenline surveys have been conducted and used by Pennsylvania and states which participated in the 1959-60 Mississippi Valley Origin-Destination Survey.

Urban cordon survey and multiple screenline surveys differ in two respects. First, the universe of travel differs in these two surveys. Second, the likelihood of use for other purposes, such as urban transportation planning, differs. The universe of travel in an urban cordon survey is vehicle trips crossing an urban cordon line. The number and characteristics of trips crossing a cordon line can be related to the socioeconomic and developmental characteristics of the cordon area

to project and/or synthesize future traffic. However, such surveys do not intercept either urban or rural area trips not crossing the cordon lines.

In multiple screenline surveys, the number of trips not intercepted is directly related to the spacing between screenlines. If the spacing between screenlines is large (e.g., 50 to 70 miles), as is frequently the case when minimization of survey cost is desired, a substantial number of trips will not be intercepted in the survey. The factoring of multiple screenline data is a complex problem because of long trips crossing multiple screenlines.¹

The multiple use of urban cordon survey data for both urban and statewide transportation planning is an important advantage of a cordon survey program over a multiple screenline survey. This situation potentially allows urban and statewide planning organizations to cooperatively finance such surveys. A practical consideration is that urban areas are required to monitor travel and periodically update their travel data files. This in turn provides updated travel information for statewide highway planning. Multiple screenline survey data are applicable primarily to statewide or corridor transportation planning. They are less likely to be used for other planning purposes than are cordon survey data. Based on this, it appears that urban cordon surveys are generally preferable to multiple screenline surveys for statewide highway planning.²

Stateline Cordon Surveys

Stateline cordon surveys have been conducted to determine the number and characteristics of vehicle trips crossing a state's border. Such surveys supplement travel data collected from either household or urban cordon surveys.

Stateline cordon surveys have the same general advantages and disadvantages as other types of roadside surveys. A particularly important attribute of this procedure is that vehicle trips by residents and

¹Federal Highway Administration, Statewide Travel Demand Forecasting, HPPM, Transmittal No. 147, Vol. 20, Appendix 59 (November 1973), pp. 26, 106, and 107.

²Highway Research Board, Statewide Transportation Planning Needs and Requirements, National Cooperative Research Program, Synthesis of Highway Practice Report No. 15 (1972), p. 28.

nonresidents crossing the state's border are sampled. Conceptually, trips by residents crossing the state line will be surveyed in a random sample of households. However, trips by nonresidents would not be intercepted in a household survey. Although the number of nonresident trips may be small in relation to total trips in a state, such trips may represent a substantial percentage of total travel on certain state highways.

Roadside Surveys with a Follow-Up Survey

Roadside interviews supplemented by a follow-up survey provide a means of sampling certain types of infrequent trips and obtaining more detailed trip, attitudinal, and household socioeconomic data. The combination of survey procedures offers the potential to alleviate the problem of obtaining data on only trips intercepted in a roadside survey.

A number of different types of procedures are applicable to such a survey. These include:

- . interviewing the driver of a vehicle at a roadside station and asking him to complete a mail-back questionnaire;
- . recording the license plates of vehicles passing through a roadside station and distributing a mail-back questionnaire to the owner of the vehicle at his home address; and
- . interviewing the driver of a vehicle to obtain his address or telephone number and conducting a follow-up home interview or a telephone interview survey.

The use of mail-back survey instruments is subject to the same problems discussed for mail household surveys. Response rates are frequently low, and the detection of biases in the survey data is extremely difficult. In the Northeast Corridor project (NEC), the response rate for the mail portion of a combination roadside interview and mail-back survey was 36 percent, and at stations where only the full mail-back instrument was used the response rate was 18 percent. This suggests that the presence of an interviewer may encourage response when "hand out" questionnaires are distributed at roadside stations.

An estimated 74 percent of the mail questionnaires distributed to owners of vehicles identified in a license plate survey in the Sacramento-San Francisco Corridor were returned to the California Department of Transportation (CalTrans); 66 percent of the questionnaires distributed were returned in usable form. The high percentage of return

obtained in the CalTrans survey was attributed to a carefully written letter transmitting the survey instrument and to a second mailing of survey materials to vehicle owners not responding to the first survey mailing.

License plate surveys provide a relatively inexpensive procedure for conducting a roadside survey. In the Sacramento-San Francisco license plate/mail survey, the costs per sample sent out and per usable sample were \$.88 and \$1.59 (in 1974 dollars), respectively, excluding automatic traffic count and data reduction costs. License plate surveys are particularly efficient if most of the vehicles encountered in the survey are registered within the state of interest and computerized vehicle registration files are available to determine the address of the vehicle owner.

License plate surveys eliminate the safety and delay problems of stopping and interviewing vehicles along the highway. This is particularly important on a high volume, high speed route. A large sample of vehicles can be obtained in the survey, particularly if photographic equipment rather than survey personnel are used to record vehicle license numbers. If many out-of-state vehicles are encountered in the survey, vehicle registration files for several states may also be required to process survey results quickly.

Recreation/Peak Travel Period Surveys

Some states may undertake planning or research studies focusing on recreation or peak period highway travel. Trips to specific recreation or other facilities may be of interest, or such studies may analyze all recreation trips in a state or all trips made during a weekend day or a peak travel period (e. g., Thanksgiving or the Fourth of July).

Household surveys would probably have to be conducted to determine the number and characteristics of recreation and peak period trips by all residents of a state. Such trips could include those made over one or more days. The strengths and limitations of household survey procedures previously discussed are also applicable to peak period and recreation travel.

Procedures for surveying recreation or peak period travel to or from one or more major generators include:

- . roadside or license plate surveys on access roads, entrance booths, or routes leading to the generator;

- distribution of mail-back questionnaires at hotels, motels, or major activity centers; and
- interviews and/or questionnaire distribution at toll booths or rest areas.

Surveying travel at major generators provides a method for directly intercepting recreation related trips of interest. Although trips to one or more major generators may be large in number, such trips generally represent a small percentage of total trips in a state. Trips by out-of-state travelers may also represent a sizable proportion of total trips to major generators. These considerations argue against the use of household surveys to identify the number and characteristics of such trips.

IV. EVALUATION OF MODAL SURVEYS

USES

The modal surveys evaluated in this section include:

- on-board and terminal air passenger surveys;
- on-board intercity bus and rail passenger surveys; and
- "ramp" and mail general aviation passenger surveys.

The common characteristic of these survey procedures is that air, bus, rail, and general aviation travelers are directly surveyed. These procedures are particularly suited to:

- intercepting all users of a particular mode, including both residents and nonresidents of a state; and
- surveying passengers using one or more specific transportation facilities (e.g., airport) or services (e.g., trains between cities i and j).

STRENGTHS AND LIMITATIONS

Each of the above travel survey procedures is evaluated in the following paragraphs, and Table IV-1 gives the cost per completed interview for selected on-board modal surveys.

On-Board and Terminal Air Passenger Surveys

Procedures for surveying air carrier passengers for statewide and regional aviation studies potentially include on-board, terminal, and license plate surveys.¹ On-board air passenger surveys have been widely

¹The report, Airport Travel Survey Manual, prepared by Barton Aschman Associates, Inc. for the Federal Highway Administration (July 1973) is a comprehensive handbook of air passenger travel survey procedures. Alternative survey strategies are presented in this report, and criteria are given for the selection of appropriate survey strategies and data collection techniques.

TABLE IV-1

UNIT COSTS FOR ON-BOARD MODAL SURVEYS

Modal Surveys	Location	Activity	COST PER COMPLETED INTERVIEW		
			Current Dollars	Year	1974 Dollars ^a
Air Passenger	4 Intercity Corridors	Interviewing and Field Work	\$0.93 ^b	1971	\$1.14
Rail Passenger	4 Intercity Corridors	Interviewing and Field Work	1.41 ^b	1971	1.72
Rail Passenger	Wisconsin	Pre-Survey	0.69 ^c	1974	0.69
		Field Work	2.01	1974	2.01
		Coding and Data Preparation	0.69	1974	0.69
		Total	\$3.39		\$3.39
Bus Passenger	4 Intercity Corridors	Interviewing and Field Work	\$1.70 ^b	1971	\$2.07
Bus Passenger	Albany, New York	Interviewing and Field Work	\$3.60 ^d	1970	\$4.58

^{a/} Costs were adjusted to a 1974 base using the U. S. City Average All Item Consumer Price Index.

^{b/} Unit costs are for on-board passenger surveys recently conducted for the Federal Railroad Administration.

^{c/} Costs are based on data provided by the Wisconsin Department of Transportation.

^{d/} Unit costs were obtained from New York State Department of Transportation records.

used in aviation planning and in multimodal corridor travel studies (e.g., Northeast Corridor project).

On-board, terminal, and license plate surveys (at airports) possess the important characteristic of directly surveying both air passengers who may be residents of the state or region in question and nonresidents using airport facilities and services of interest.

A review of on-board and terminal air passenger surveys indicates that such surveys are generally successful in collecting information on the socioeconomic characteristics of the traveler's household. Information on travelers' attitudes concerning the characteristics of all intercity modes of travel has also been successfully collected in on-board surveys. The attitudinal/opinion questions have been simple in layout and wording, and this promotes passenger understanding and response.

On-board and terminal air passengers are very similar in terms of the types of data that can be collected. However, the on-board survey appears to offer an advantage in terms of the length of the survey questionnaire that can be used. Travelers on board an aircraft are "captive" respondents, and they are free from the distractions (e.g., friends, families, baggage) in the terminal. The environment on board an aircraft appears to be more conducive to instructing passengers on completing the questionnaire than is the environment in the terminal. Questionnaires can be distributed to all passengers boarding a flight in an on-board survey. Although this is also true for terminal surveys, late-arriving or transfer passengers may have to be issued a mail-back questionnaire if there is sufficient time for completing the questionnaire in the terminal. Standard problems with mail-back surveys are applicable to the use of such procedures in air passenger surveys.

Response rates for on-board and terminal air passenger surveys are generally similar (see Table IV-2). Important considerations in choosing between an on-board and a terminal survey for a particular airport include:

- . number of passengers and flights to be surveyed;
- . number of passengers and flights at the airport; and
- . airport layout.

If the number of passengers and flights to be surveyed is small, a terminal survey may be appropriate. As the number of passengers and flights increase, the layout of waiting and boarding areas at an airport

TABLE IV-2
 RESPONSE RATES FOR ON-BOARD AND TERMINAL
 AIR PASSENGER SURVEYS

TYPE OF SURVEY	PERCENT OF QUESTIONNAIRES RETURNED
<u>On-Board Air Passenger</u>	
Greater Pittsburgh International	52
Philadelphia International	43
Cleveland Hopkins	80
Grand Rapids	61
Lansing	73
New York Southern Tier West Airports	76
<u>Terminal Air Passenger</u>	
Pennsylvania Airports With Less Than 10 Flights Per Day	77
Pennsylvania Airports With Between 11 and 40 Flights Per Day	63
Tri-City (Michigan)	40

becomes an important factor in conducting a terminal survey successfully. The lack of separate waiting areas and available seating for waiting passengers may adversely affect response to the survey. At major airports, onboard rather than terminal surveys are generally conducted. The large number of passengers, flights, and visitors at major airports and the size of such terminals complicate the conduct of a terminal survey.

The number of personnel required to conduct a terminal survey is likely to be substantially larger for a given survey period than it would be for an on-board survey, particularly at large airports. On-board surveys are conducted with the assistance of airline personnel (e.g., stewardesses, supervisors), and this reduces the personnel requirements for the agency undertaking the survey.

The conduct of either type of survey requires close coordination with airport authorities and all affected airlines. If an on-board survey is planned, it is necessary to obtain agreement from the airlines to have their personnel distribute and collect the survey forms on board the aircraft. Although such assistance can be particularly valuable, the agency conducting the survey is also dependent on the performance of cooperating airlines.

Bus and Rail Passenger Surveys

Two types of procedures are generally used to survey intercity rail and bus passengers: on-board surveys and terminal surveys. Although household surveys are potentially applicable to determine the number and characteristics of bus and rail travelers, such surveys are likely to be costly since large sample sizes would be required to obtain accurate data on such infrequent trips. Household surveys could be useful, however, if the latent demand for intercity rail and bus service were of interest.

On-board bus surveys are generally conducted using self-administered questionnaires distributed after passengers have been seated prior to the departure of the bus. Passengers boarding a bus between the origin and destination of the bus run typically would be issued a questionnaire by the bus driver. The questionnaires are usually collected by the bus driver if a passenger exits from the bus prior to the end of his run or by survey personnel stationed at a terminal at the end of a run. Postage paid, addressed mail-back forms also may be used as a means of returning completed questionnaires. On-board rail passenger surveys are generally conducted using self-administered survey instruments distributed and collected by survey personnel riding aboard sampled trains.

On-board and terminal surveys are similar in terms of the extent and types of trip socioeconomic data that can be collected. Since both rail and bus travelers are captive when aboard their respective vehicles, it appears that on-board surveys offer an advantage in terms of the length of the survey instrument that can be used. Travelers on board a bus or train are free from the distractions (e.g., baggage, lack of seating facilities, friends/family) likely to affect a terminal survey, and this may encourage greater survey response. Late arriving passengers are not a problem in an on-board survey but may be in a terminal survey.

Important factors influencing the use of either on-board or terminal surveys include:

- . the number of passengers and trains or bus runs to be surveyed;
- . the number of passengers and trains or bus runs at the terminals of interest; and
- . the number, layouts, and locations of the terminals in the survey area.

These factors are also major determinants of the cost and number of personnel required for an on-board or terminal bus or rail passenger survey.

Response rates for selected on-board rail and bus passenger surveys are presented below:

<u>CORRIDOR</u>	<u>PERCENT OF QUESTIONNAIRES RETURNED</u>	
	<u>On-Board Rail Survey</u>	<u>On-Board Bus Survey</u>
Chicago-St. Louis	89	55
Chicago-Minneapolis/ St. Paul	92	71
Seattle-Portland	86	80
New York-Florida	71	62
New York-Albany	93 (66 percent usable)	-

Little data documenting response rates for rail and bus passenger terminal surveys are available in the literature.

The lower overall survey response rate for bus surveys relative to rail surveys can be attributed in part to more confined riding conditions and to vehicle movement aboard the bus. Another factor is that, survey personnel are generally on board the trains in rail surveys and are therefore available to answer questions concerning the survey and to encourage passengers to complete the questionnaires.

The relative advantages of on-board or terminal rail passenger surveys in terms of cost and staffing requirements depend on many factors. States and the Federal Government have generally conducted on-board rail surveys, with survey personnel stationed on board the train to administer the survey. Such an approach has generally been feasible because there are relatively few trains operating in most intercity corridors, and the frequency of rail service often facilitates having survey crews make round trips each survey day. This minimizes lodging and meal costs for overnight stays of survey personnel. Having a single survey crew assigned to each sampled train may be easier from a survey management point of view than coordinating several crews at stations along a rail corridor.

On-board bus passenger surveys are generally self-administered surveys. Because of the large number of bus runs generally of interest in a study, survey personnel are typically not stationed aboard the sample buses.

Bus passenger surveys are generally more difficult to administer than rail passenger surveys for several of the reasons cited above and for others as follows. Since interviewers are not stationed aboard survey buses, maintaining accurate counts on the number of passengers boarding and exiting the buses at locations along a corridor is a problem. In high volume travel corridors, additional sections (i. e., buses) may be added to a bus run to accommodate all passengers. Surveying travelers on multisection bus runs is a problem because the operation of such sections is difficult to anticipate. In addition, agencies conducting bus passenger surveys have encountered problems in meeting sampled bus runs at their destination terminal. Although many agencies have identified sampled bus runs by placing a special placard on the bus, the operation of multiple bus sections, heavy bus volumes, schedule delays, and inclement weather have frequently hampered the collection of questionnaires by survey personnel at the destination terminal.

General Aviation Travel Surveys

Planning for general aviation travel is an important activity in selected statewide transportation programs. Household, terminal, and

aircraft operations surveys have been used to survey general aviation travel.

Automatic traffic counters have been used, and manual counts have been conducted to record the number of general aviation aircraft operations at selected airports. Depending on the level of aviation activity at an airport and the survey personnel's knowledge of based aircraft at an airport, an observer may be able to distinguish between local and itinerant operations at an airport. Such information is useful for airport planning.

Household and terminal surveys have been used to determine the characteristics of general aviation travel and tripmakers in a state or region. Household surveys typically entail distributing a mail questionnaire to the owners of general aviation aircraft within a state and possibly in adjacent states. Wisconsin conducted such a survey in which it asked aircraft owners to identify the characteristics of the aircraft, socioeconomic characteristics of the aircraft owner, and annual usage of the aircraft by airport within Wisconsin. Sixty percent of the questionnaires sent to Wisconsin aircraft owners were returned, as were 57 percent of the questionnaires sent to aircraft owners in adjacent states. Wisconsin also conducted a ramp survey of general aviation travelers at 30 airports. Interviewers administered the survey to the "principal passenger" on each general aviation flight originating or terminating at the survey airport. Officials responsible for both surveys indicated that the household survey was preferable if data were required on a systemwide basis, while the ramp survey was preferred if data were required for selected airports for a short period of time.

The ramp and household survey procedures described above have several weaknesses. The household survey employed a 12 month recall period in collecting information on general aviation travel. A recall period of this length increases the possibility of substantial error in survey results. Conversely, erroneous annual general aviation travel statistics may result by using survey data collected over a 1 or 2 week survey period as a basis for developing annual travel estimates.

APPENDIX A

HOUSEHOLD TRAVEL SURVEYS FOR STATEWIDE TRANSPORTATION PLANNING

Household travel surveys conducted for statewide planning are of the following general types:

- . home interview surveys;
- . telephone household surveys; and
- . self-administered mail-out surveys.

Several states have utilized a combination of these survey procedures to conduct a statewide household travel survey. Generally, the overall objective of such surveys has been to obtain information on the socioeconomic and travel characteristics of households. Such surveys have been used extensively in urban transportation planning and have been conducted by the states of New York, Kentucky, and Connecticut in their statewide planning programs. Home interview survey procedures were also employed in the Nationwide Personal Transportation Study (NPTS) conducted for the U.S. Department of Transportation by the Census Bureau in 1969 and 1970. The New York survey was a telephone survey. The Kentucky survey was primarily a mail survey, although both telephone and home interview callbacks were also conducted. The Connecticut and NPTS surveys were home interview surveys. Each of these surveys is discussed below.

NEW YORK TELEPHONE HOUSEHOLD SURVEY

The New York State Department of Transportation (NYSDOT) conducted a telephone household survey in 53 of the state's 62 counties during the summer and fall of 1970 (see Map A-1).¹ The survey area excluded the counties in the New York City metropolitan area. This survey was performed in conjunction with a stateline cordon roadside survey covering the same 53 "upstate" counties.²

¹See NYSDOT, Upstate Telephone Home Interview - 1970. Preliminary Report (Albany, September 1973).

²The New York Stateline Cordon survey and other New York on-board surveys are described in other parts of Section III.

The objectives of the survey were to collect information which would provide a greater understanding of travel on a statewide basis and to provide data for developing statewide highway travel simulation procedures. The survey was designed to obtain reliable information on household and trip characteristics and trip generation rates and lengths for both weekday and weekend travel by region of the state. Auto driver trips made on one weekday and one weekend day were recorded for each sample household in the survey.¹

Telephone interview procedures were employed in the household survey. Such procedures were considered adequate to obtain the necessary travel and socioeconomic information and were assessed to be the most economical method of collecting the required trip and household data on a statewide basis.

A sample size of 8,000 households was established for the survey. The sample size was estimated based on an analysis of the 1963 Rochester Metropolitan Transportation Study home interview survey results, which suggested that 150 completed interviews per county would yield a 13 percent error at the 90 percent confidence level of person trips per household. Consequently, a sample size of 150 households per county was established with the sample selected on a random systematic basis for each county.

NYS DOT used published telephone directories as the sampling frame for the survey. Although households without telephones² and those with unlisted phone numbers were not included in the sampling frame, this limitation was considered less severe than the problems associated with obtaining and/or using other sampling frames. Sixty telephone directories were used in this survey. Duplicate telephone listings were removed from the directories prior to selecting the sample. 200 samples were selected per county which were to yield 150 completed interviews per county.

The telephone survey focused primarily on auto driver trips made by sample households. The questionnaire, contact letter, and trip log used in the telephone survey are presented in Exhibits A-1, A-2, and A-3.

¹Information on the number of non-auto trips by mode made on the survey days was also requested, although the survey focused primarily on auto driver trips.

²According to an NYS DOT analysis of 1970 Census data, approximately 8 percent of New York households did not have a telephone available.

EXHIBIT A-1: QUESTIONNAIRE FOR NYSDOT TELEPHONE SURVEY

HOUSEHOLD DATA SECTION	DAY	DATE	IMPROVED MAIL ADDRESS	DAY	DATE	A B C D E F G
			ZIP CODE		TIME	

- Did you receive our letter about this survey? Yes No
- Do we have your address correct as . . . (read address on sticker, then get additional information if necessary for geographic coding).
- Did you complete the trip logs that were enclosed with our letter? Yes No
- How many cars are owned or regularly used by members of your household?
Any trucks that are used as cars for personal travel? No Yes
- What is the total number of people in your household?
- What type of building do you live in? I-FH, Apt., Other
- Do you enter your living quarters, directly from the outside or through a common hall, or through someone else's living quarters?
What is their name?
- Do you have complete kitchen facilities? By this I mean a sink with piped water, a range or cook stove, and a refrigerator. Yes No
Are they used by your household only? Yes No
- Which of the following categories does your household's total yearly income, before taxes, fall into?
 under \$1,999 \$6,000-\$7,999 \$15,000-\$19,999
 \$2,000-\$3,999 \$8,000-\$9,999 \$20,000-\$24,999
 \$4,000-\$5,999 \$10,000-\$14,999 \$25,000 and over

PERSON DATA SECTION

PERSON NO.	RELATIONSHIP TO HEAD OF HOUSEHOLD	INTERVIEWED	SEX	AGE	EDUCATION	OCCUPATION INDUSTRY	EMPLOYED	WORKED ND, DY.	Driver's License	MAKE AUTO DRIVER TRIPS		MAKE ANY TRIPS BY:		
										-end	-day	PLANE	TRAIN	BUS
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				
		Y	N	M	F				Y	N				

SUMMARY DATA SECTION

	INITIALS	DATE	INITIALS	DATE	Supervisor's Comments
1. Total number of persons living at this address:	1		9		
2. Total number of weekday vehicle driver trips reported at this address:	2		10		
	3		11		
3. Total number of weekend vehicle driver trips reported at this address:	4		12		
	5		13		
	6		14		
4. Total number of licensed drivers making trips:	7		15		
5. Total number of licensed drivers making no trips:	8		16		

PHONE VERIFIED BY _____ DATE _____
 FIELD VERIFIED BY _____ DATE _____
 FINAL APPROVAL BY _____ DATE _____
 SHEET _____ OF _____

EXHIBIT A-1 (Continued)

TEM 895 (8/70)

TRIP REPORT SHEET OF																																																																																																	
A.		B.		C.		D.		E.		F.		G.		H.		I.		J.																																																																															
PERSON NUMBER	TRIP NUMBER	WHERE DID THIS TRIP BEGIN?						ACTIVITY AT THAT ADDRESS		WHERE DID THIS TRIP END?						ACTIVITY AT THAT ADDRESS		TRIP PURPOSE		TIME TRIP STARTED	MODE	TOTAL IN VEH.																																																																											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	FROM	TO	A.M.	P.M.		HSLD.	OTHERS																																																															
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		
29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	1 HOME	2 WORK	3 SHOPPING	4 SCHOOL	5 SOCIAL-REC.	6 EAT MEAL	7 PERS. BUSINESS	8 SERVE PASS.	9 CHANGE MODE	0 DRIVE	1	2	3	4	5	6	7	8	9	0	A.M.	P.M.	CAR	TRUCK		

EXHIBIT A-2

LETTER FOR NYSDOT TELEPHONE SURVEY

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION

T. W. PARKER, Commissioner



1220 Washington Avenue, State Campus, Albany, New York 12226

Dear Householder:

The New York State Department of Transportation in cooperation with the United States Bureau of Public Roads is undertaking a comprehensive Statewide Transportation Study to plan for the future transportation needs of the residents of New York State.

To obtain the kind of information needed, a small number of homes in the State have been selected at random for interviewing. Yours is one of those chosen. Our representative will telephone your home on _____ some time between the hours of 9:00 a.m. and 8:30 p.m. to secure the following:

1. Some information about your household and the persons living in it for comparison to the 1970 census information for your county.
2. The number of trips made by each driver in your household on _____ and _____.
3. Facts about each trip made, including:
 - a. The starting time and the place of the trip beginning and ending.
 - b. The primary purpose of each trip — shop, go to work, visit friends, etc.
 - c. The number of persons in the vehicle on each trip.

The enclosed travel logs are for your convenience in recording the trips made by members of your household on the dates listed above. You will also find a sample form, already filled out, to assist you in maintaining the one for your household. The forms are not to be returned to this office, but by completing them, it will simplify and expedite the actual telephone interview.

The traffic problem affects all of us. We are inviting you to help take effective action toward solving the problem by cooperating with us in this survey. The requested information is completely confidential and will be used for statistical purposes only.

If you would like more information about the survey, a call to 1-800-342-9838 will put you in contact with a Department of Transportation employee who will be happy to answer any questions you may have. This call is toll free from any area of New York State.

Thank you in advance for your contribution of time and information.

Very truly yours,

T. W. PARKER, Commissioner
Department of Transportation

Enclosures

A.6

TEM 636 (8/70)

EXHIBIT A-3: TRIP LOG FOR NYSDOT TELEPHONE SURVEY

TELEPHONE INTERVIEW	DIVISION
TRIP LOG	OF
Day: <u>WED.</u> Date: <u>AUG. 12</u>	PLANNING
Driver: <u>SUE</u> Starting Time: <u>8:30</u> <small>A.M.</small> Start Location: <u>272 LAKEVIEW RD.</u> <small>Street Name and No.</small> <u>CEDARTON</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At Start: <u>HOME</u> End Location: <u>13 WEST ST</u> <small>Street Name and No.</small> <u>HIGHVILLE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At End: <u>TAKE JOHN TO WORK</u> No. of Persons in Vehicle: <u>2</u>	Driver: <u>SUE</u> Starting Time: <u>2:15</u> <small>P.M.</small> Start Location: <u>272 LAKEVIEW RD.</u> <small>Street Name and No.</small> <u>CEDARTON</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At Start: <u>HOME</u> End Location: <u>WASHINGTON PARK</u> <small>Street Name and No.</small> <u>ASHGROVE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At End: <u>TAKE CHILDREN SWIMMING</u> No. of Persons in Vehicle: <u>3</u>
Driver: <u>SUE</u> Starting Time: <u>8:50</u> <small>A.M.</small> Start Location: <u>13 WEST ST</u> <small>Street Name and No.</small> <u>HIGHVILLE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At Start: <u>TAKE JOHN TO WORK</u> End Location: <u>JOHNSON'S MKT, 20 MAIN</u> <small>Street Name and No.</small> <u>HIGHVILLE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At End: <u>GROCERY SHOPPING</u> No. of Persons in Vehicle: <u>1</u>	Driver: <u>SUE</u> Starting Time: <u>4:30</u> <small>P.M.</small> Start Location: <u>WASHINGTON PARK</u> <small>Street Name and No.</small> <u>ASHGROVE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At Start: <u>TAKE CHILDREN SWIMMING</u> End Location: <u>13 WEST ST.</u> <small>Street Name and No.</small> <u>HIGHVILLE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At End: <u>PICKUP JOHN AT WORK</u> No. of Persons in Vehicle: <u>3</u>
Driver: <u>SUE</u> Starting Time: <u>10:30</u> <small>A.M.</small> Start Location: <u>JOHNSON'S MKT, 20 MAIN</u> <small>Street Name and No.</small> <u>HIGHVILLE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At Start: <u>SHOPPING</u> End Location: <u>272 LAKEVIEW RD.</u> <small>Street Name and No.</small> <u>CEDARTON</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At End: <u>HOME</u> No. of Persons in Vehicle: <u>1</u>	Driver: <u>JOHN</u> Starting Time: <u>5:10</u> <small>P.M.</small> Start Location: <u>13 WEST ST</u> <small>Street Name and No.</small> <u>HIGHVILLE</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At Start: <u>WORK</u> End Location: <u>272 LAKEVIEW RD.</u> <small>Street Name and No.</small> <u>CEDARTON</u> <u>N.Y.</u> <small>City or Town State</small> Purpose At End: <u>HOME</u> No. of Persons in Vehicle: <u>4</u>

The field survey was conducted over the period August 25, 1970, to November 9, 1970, excluding the week following Labor Day. Survey personnel consisted of:

- . one field office supervisor;
- . two telephone crew supervisors;
- . one edit crew supervisor;
- . four editors; and
- . thirty-six interviewers.

The four editors and 36 interviewers were temporary personnel hired especially for the telephone survey.

The interviewers were divided into two crews of 18 interviewers each. One crew worked from 2:30 P.M. to 9:00 P.M. (Monday through Friday), and the second crew worked from 8:30 A.M. to 3:00 P.M. (Tuesday through Saturday). The survey personnel received three days of training which covered the purpose and nature of the survey, a review and discussion of the questionnaire, sample and practice interviews, and a telephone behavior and etiquette course conducted by the telephone company.

The telephone equipment required for the survey consisted of two Centrex lines, two inward WATS lines for answering questions raised by sample households, and twelve outward WATS lines (with 15 telephones connected) for conducting the telephone interviews. An average of 318 interviews were conducted per day.

A total of 10,600 samples were contacted in the survey, and 63 percent of the interviews were completed satisfactorily. The total of 6,669 completed interviews was approximately 1,300 interviews below the goal of 8,000 completed interviews. An average of 126 interviews was completed per county compared to the goal of 150.

Approximately 13 percent of the sample refused to participate in the survey, 15 percent of the sample could not be contacted, and an additional 9 percent of the sample comprised partially complete or "other" samples.

Although telephone listings were used as the sampling frame, the survey results were factored to the 1970 Census count of total occupied

housing units by county, stratified by household size, irrespective of telephone availability. Group quarters as defined in the 1970 Census were not considered occupied housing units.

The telephone survey results and 1970 Census data were in close agreement in terms of age and sex distribution of the survey area's population. The data files also compared reasonably well in terms of auto availability. The number of households by household size category was in close agreement with 1970 Census results except in the 1, 6, 7, and 8+ household size categories. Differences in the two data sources in the large household size categories were attributed to the small number of survey samples in these categories. The difference in one-person households was thought to arise from the difficulty of contacting individuals in one-person households and the replacement of such samples with larger household size samples.

OTHER TELEPHONE HOUSEHOLD SURVEYS

In the early 1960s, the Ontario Department of Highways¹ initiated a program of 19 regional transportation studies which, when combined, would provide a province-wide plan. Telephone survey procedures were used to collect trip and household data for each study. Between 4 and 10 percent of the households in each study area were sampled, with a minimum of 30 completed interviews per rural zone. Interviews were completed with an average of 83 percent of the households contacted in the surveys. The cost per completed interview was \$7.92 for households in which auto driver trip data were collected. Three different interview forms were designed to collect auto driver trips in stable rural areas, trips by all modes in high growth suburban areas, and weekend recreational travel data in pertinent areas. The weekend travel survey instrument is included as Exhibit A-4.

In 1966 the Delaware State Highway Department undertook a comprehensive transportation study for Kent and Sussex Counties, which comprised the portion of the state outside the Wilmington urbanized area. A 10 percent sample of households listed in the telephone directory were contacted by telephone in the survey. Interviews were completed with approximately 90 percent of the households contacted. The distribution of completed interviews by number of callbacks follows.

¹G.H. Johnston and B.D. Forest, Travel Data Collection for Rural Highway Planning, unpublished paper for presentation at the Highway Research Board midyear meeting on statewide transportation studies (Washington, D.C.: September 15, 1966).

EXHIBIT A-4 (Continued)

TELEPHONE SURVEY ON WEEKEND TRAVEL HABITS

WEEKEND TRIP DATA

Name	Person No.	Licensed Driver		5.(a)(b) IF "NO"		5.(c)(3) Trips	
		Yes	No	Outside Municipality	In Municipality	2 pm to 12 pm	Sunday
5.(a) Now about the past weekend, did you or any member of your household take a trip outside the limits of your municipality anytime between Friday evening and Sunday night? (RECORD UNDER 5.(a))	1	1	2	1	2	1	2
	2	1	2	1	2	1	2
IF "YES", ARE Q.5.(a)	3	1	2	1	2	1	2
(b) Which household members were they? (RECORD UNDER 5.(b))	4	1	2	1	2	1	2
ASK TRIP DATA OF EACH LICENSED DRIVER, OR IF VEHICLE NOT USED, ASK TRIP DATA OF LEADER OF PARTY	5	1	2	1	2	1	2
IF "YES" TO Q.5.(a) ASK:	6	1	2	1	2	1	2
(c) Last Sunday (yesterday) did any member of your household make a trip between two in the afternoon and midnight? (RECORD UNDER 3.5.(c))	7	1	2	1	2	1	2
(d) Which household members were they? (RECORD UNDER 5.(d))	8	1	2	1	2	1	2
ASK TRIP DATA OF EACH LICENSED DRIVER OR IF VEHICLE NOT USED ASK TRIP DATA OF LEADER OF PARTY	9	1	2	1	2	1	2
6. Now I would like to ask you some questions about the trips you took during the weekend, when you personally were the driver of the vehicle/or when you were the leader of your party.	10	1	2	1	2	1	2

(a) What day did you take your first trip? (RECORD BELOW UNDER DAY OF TRIP)
 (b) What method of travel did you use? (RECORD BELOW UNDER TRAVEL METHOD)
 (c) Where did you begin the first trip? May I have the address please? (RECORD BELOW UNDER ORIGIN)
 (d) Where was the first place you stopped to do something? May I have the address please? (RECORD BELOW UNDER DESTINATION)
 (e) How many persons including the driver did you have in the vehicle, or how many members of your household including yourself were in your party? (RECORD BELOW UNDER NUMBER OF PERSONS)
 (f) How would you describe the place where you began this trip? (RECORD BELOW UNDER TYPE OF PROPERTY AT ORIGIN)
 (g) How would you describe your destination? (RECORD BELOW UNDER TYPE OF PROPERTY AT DESTINATION)
 (h) About what time did you begin this trip? (RECORD BELOW UNDER TIME AT ORIGIN)
 (i) What time did you arrive at your destination? (RECORD BELOW UNDER TIME AT DESTINATION)
 (j) What was the main purpose of this trip? (RECORD BELOW UNDER PURPOSE)

REPEAT Q.6.(a) - (j) FOR EACH TRIP TAKEN, FOR EACH DRIVER/LEADER OF PARTY

TRIP DATA RECORD FORM

PERSON NO.	(a) DAY OF TRIP	(b) TRAVEL METHOD	(c) ORIGIN (ADDRESS)	(d) DESTINATION (ADDRESS)	(h) TIME AT ORIGIN	(i) TIME AT DESTINATION
TRIP NO.	(e) NO. OF PERSONS	(f) PROPERTY AT ORIGIN	(g) PROPERTY AT DESTINATION	(j) PURPOSE		
TRIP NO.	(e) NO. OF PERSONS	(f) PROPERTY AT ORIGIN	(g) PROPERTY AT DESTINATION	(j) PURPOSE		
TRIP NO.	(e) NO. OF PERSONS	(f) PROPERTY AT ORIGIN	(g) PROPERTY AT DESTINATION	(j) PURPOSE		
TRIP NO.	(e) NO. OF PERSONS	(f) PROPERTY AT ORIGIN	(g) PROPERTY AT DESTINATION	(j) PURPOSE		

Attempted Number	Number of Completed Samples	Percent of All Completed Interviews (4,576)	Cumulative Percent of All Completed Interviews (4,576)	Cumulative Percent of All Samples (5,075)
1	2,079	45.43	45.43	40.96
2	1,101	24.06	69.49	62.66
3	519	11.34	80.83	72.89
4	336	7.34	88.17	79.51
5	180	3.93	92.10	83.06
6	123	2.69	94.79	85.48
7	73	1.60	96.39	86.91
8	62	1.36	97.75	88.13
9	30	0.66	98.41	88.72
10	24	0.52	98.93	89.19
11	16	0.35	99.28	89.51
12-17	33	0.72	100.00	90.17

The above data suggest that approximately four callbacks can yield significant increases in the number of completed interviews. Beyond approximately four callbacks, the percentage increase in completed interviews begins to diminish rapidly.

A copy of the Delaware questionnaire is presented in the guide, State-wide Travel Demand Forecasting (FHWA, Highway Planning Program Manual, Vol. 20, App. 59, p. 103).

CONNECTICUT HOME INTERVIEW SURVEY

A home interview survey was conducted throughout much of Connecticut in 1964 as part of the Connecticut Interregional Planning Program, a comprehensive statewide planning effort.¹ The survey area included approximately 60 percent of the state and excluded only those urban areas for which travel surveys were conducted as part of urban transportation studies.

The objectives of the survey were twofold:

- . to collect data required for constructing a travel model for the entire state; and
- . to collect information for Connecticut's comprehensive planning program, including attitudes of the people concerning their environment and leisure-time activities.

¹A.M. Voorhees and Associates, Inc., Connecticut Inter-Regional Planning Program. Home Interview Survey. Final Report (December 1964).

The Connecticut home interview survey included a 1 percent sample of households in the survey area. Telephone listings were used as the sampling frame. The home interview survey was conducted from April through July 1964.

The survey was conducted from three offices: Hartford, Danbury, and Torrington. The staff assigned to each office is as follows:

<u>Hartford (Main Office)</u>	<u>Danbury</u>	<u>Torrington</u>
1 study director	1 supervisor	6 interviewers
1 quality control supervisor	1 office person	
1 production supervisor	6 interviewers	
16 interviewers (average staffing level)		
2 to 3 clerical personnel		

Survey personnel underwent 5 days of training, most of which was devoted to practice interviews. The Connecticut Department of Transportation (CDOT) hired a survey specialist to train the interviewers; officials claimed this procedure worked well. As part of its quality control program, CDOT recontacted a 10 percent random sample of survey households to verify the information contained on the questionnaire.

A pre-interview letter was sent to each sample household several days prior to the interview. The letter and a copy of the questionnaire are included as Exhibit A-5. The data collected in the survey included the socioeconomic characteristics of the household and information on all person trips made by the sample households.

A total of 3,202 households were contacted in the survey. An estimated 92 percent of the interviews were completed. Only 45 households (1.4 percent of the sample) refused to participate in the study.

The average time required to complete each interview, including travel time to and from the sample household, was 1.5 hours. An average of 1.9 telephone calls were required to set up an appointment to complete each interview.

KENTUCKY HOUSEHOLD MAIL SURVEY

A self-administered mail-out household survey was conducted on a statewide basis by the Kentucky Department of Transportation (KDOT)

CDOT HOME INTERVIEW SURVEY

STATE HIGHWAY DEPARTMENT • DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES • DEVELOPMENT COMMISSION

STATE OF CONNECTICUT

CONNECTICUT INTERREGIONAL PLANNING PROGRAM
STATE OFFICE BUILDING • HARTFORD 15, CONNECTICUT

Dear Connecticut Resident:

The State of Connecticut is now undertaking a comprehensive planning study in order to better plan for the orderly development of the State. This study is a joint effort by a number of State agencies including the Development Commission, the Highway Department, and the Department of Agriculture and Natural Resources. In order to obtain basic information about the State and its citizens and thus form a basis for projections and plans, it is necessary to personally interview a sample number of State residents. Your cooperation in this effort will be sincerely appreciated, and will materially aid in planning and development of the State.

Within a few days, a representative of the Connecticut Interregional Planning Program will call on you to obtain information on your travel and living patterns. Proper identification will be shown by the interviewer upon request.

In addition to the personal interview, the interviewer will leave a questionnaire with you. It is hoped that you will take a few minutes to fill out this questionnaire and mail it in a self-addressed and stamped envelope.

In order to carry out the travel interview promptly and efficiently, we have listed several questions and answers below for your better understanding of questions which the interviewer will ask.

What is a trip?

A trip has a beginning called the ORIGIN, and an end called the DESTINATION, with no stops in between. For example, if you go from your home to the store for a loaf of bread, you have made one trip. Your journey back home is a second trip. Your interviewer will ask you to recall the trips made by each member of the household on the day before the interview.

EXHIBIT A-5 (Continued)

Where did the trip begin and end?

You will be asked to give the address of the beginning and ending of each trip. In urban areas, a street address will be sufficient, while in the country, a nearby street intersection will be requested.

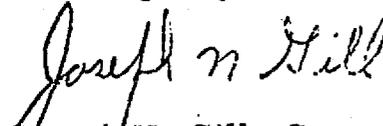
Other questions will deal with the method of travel (auto, bus, etc.) and the reason for making the trip (work, shopping, recreation, etc.).

We will certainly appreciate your cooperation in this undertaking.

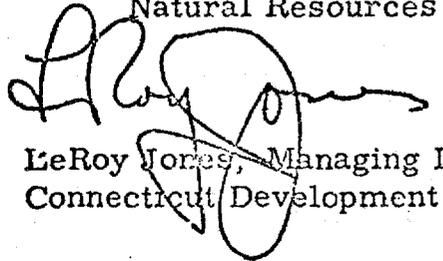
Sincerely,



Howard S. Ives
State Highway Commissioner



Joseph N. Gill, Commissioner
Department of Agriculture and
Natural Resources



LeRoy Jones, Managing Director
Connecticut Development Commission

EXHIBIT A-5 (Continued)

Card Number 1

CONNECTICUT INTERREGIONAL PLANNING PROGRAM

Travel Questionnaire

ADMINISTRATIVE RECORD

Sample Number _____ 123456

Zone Number _____ 8910111213

Scheduled Interview Time

	Date	Time
Calls	Date	Time
1	_____	_____
2	_____	_____
3	_____	_____

Interviewed by: _____

Coded by: _____

Checked by: _____

Comments: _____

Verified by: Telephone _____ Visit _____

ASK ONLY AFTER COMPLETING OTHER SECTIONS OF THE INTERVIEW

O. Do you own or rent your home: (1) Own (2) Rent 14

P. If (1) Own --
What would you estimate to be the average value of homes on this street? 15

If (2) Rent --
What would you estimate to be the average monthly rental for (apartments) (homes) like yours in this area? 16

Q. What is the approximate age of this structure? 17

R. Would you mind telling me in which of the categories on this card your total family income would fall? (If asked, say information is confidential.) 18

(1) Under \$3,000 (4) \$7,000 - \$10,000
(2) \$3,000 - \$5,000 (5) \$10,000 - \$15,000
(3) \$5,000 - \$7,000 (6) Over \$15,000

S. Race: (Do not ask) (1) White (2) Negro (3) Other 19

EXHIBIT A-5 (Continued)

2

Multiple Available
7/23/77

PERSONAL DATA

A. Person Identification

- 1. Is there more than one family living at this address?
(If yes conduct complete interview for each)
- 2. How many persons in this family unit are living here now? 8
- 3. Who is the "head of the household"? (List name below)
- 4. Who are the other members of the household? What is their relationship to the "head"? (List names below in following order: head, wife, married sons and daughters, unmarried sons and daughters, relatives, non relatives, roomers, etc.)

B. Record sex for each person

C. What is (Your) (His) (Her) age at last birthday?

D. How many years of schooling did (You) (He) (She) complete?

E. Has _____ a drivers license, (or learners permit)?

F. Is _____ employed?

G. Part or Full time?

H. What kind of work does _____ do?

I. What type of (Industry) (Place) does _____ work in?

J. Did _____ go to work yesterday (Travel Date)?

K. If "No", Why didn't _____ go to work? (Sickness, Vacation, etc.)

Person Identification	Sex	Age		Schooling Completed	Drivers License Y-N	Employment		Occupation	Business or Industry	Work Y-N	Why Absent
		F	M			Y-N	Part or Full				
A	B	C	D	E	F	G	H	I	J	K	
9											
1		10	11	12	13	14	15	16 17	18	19	20
21											
2		22	23	24	25	26	27	28 29	30	31	32
33											
3		34	35	36	37	38	39	40 41	42	43	44
45											
4		46	47	48	49	50	51	52 53	54	55	56
57											
5		58	59	60	61	62	63	64 65	66	67	68
69											
6		70	71	72	73	74	75	76 77	78	79	80
7											

Total Persons Employed 87

L. How many cars are owned or available for use by members of this family? 82

M. Is there a telephone listed for this residence? (Yes-No) 83

N. What is the telephone number? _____

EXHIBIT A-5 (Continued)

Sample Number **123456**

3

Number **3** Cards

Before going into the trip portion of the interview, I will re-emphasize the point that I would appreciate information on every trip that each member of the household made yesterday (travel date). Remember that these trips represent one trip in every one hundred made in Connecticut. Each trip is important to the study, so please try to recall every one.

Person Number	WHERE DID TRIP BEGIN?	WHERE DID TRIP END?	Land Use Code		Trip Purpose Code	Trip Base (1) Yes (2) No (3) KHB	Departure Code		Travel Mode Code	Number in Car
			From	To			Time	Day		
	Street Address or Intersecting Streets	Street Address or Intersecting Streets								
	City or Town State	City or Town State								
	Number Street Name	Number Street Name								
	Intersecting Street City/State	Intersecting Street City/State								
	Street Address or Intersecting Streets	Street Address or Intersecting Streets								
	City or Town State	City or Town State								
	Number Street Name	Number Street Name								
	Intersecting Street City/State	Intersecting Street City/State								
	Street Address or Intersecting Streets	Street Address or Intersecting Streets								
	City or Town State	City or Town State								
	Number Street Name	Number Street Name								
	Intersecting Street City/State	Intersecting Street City/State								

A.18

- | | | | |
|----------------------|----------------------------------|-----------------|-------------------------|
| <u>Land Use Code</u> | <u>Trip Purpose Code</u> | <u>Day Code</u> | <u>Travel Mode Code</u> |
| 1. Residential | 01. Home Based | 1. Sunday | 1. Auto Driver |
| 2. Industrial | 02. Work | 2. Monday | 2. Auto Passenger |
| 3. Personal Service | 03. Related Business | 3. Tuesday | 3. Bus & Transit |
| 4. Business Service | 04. Personal Business | 4. Wednesday | 4. Other |
| 5. Institutional | 05. Medical-Dental | 5. Thursday | 5. Walk to work |
| | 06. Eat Meal | 6. Friday | |
| | 07. Education | | |
| | 08. Shopping - Convenience Goods | | |
| | 09. Shopping - Shopping Goods | | |
| | 10. Social | | |
| | 11. Recreational | | |

over the period January through July 1972.¹ The mail survey was supplemented by follow-up telephone interviews and home interviews.

The objective of the statewide mail survey was to obtain information about the social, economic, and travel characteristics of a representative sample of car owning Kentucky households.

Consultants to KDOT recommended a sample size equal to 1 percent of total state auto registrations, with a minimum of 30 samples per county. The minimum number of samples per county was actually increased to 60 to account for the 50 percent response to a mail pilot survey conducted by KDOT. The total statewide sample was ultimately increased to 1.8 percent of total state auto registrations (i. e., 14,978 households) to ensure that the desired 30 interviews per county were completed.

The sampling frame used in the survey was a computerized file of car owning households developed by the R. L. Polk Company in 1971. This file was used as the sampling frame because a complete computerized data file, which would have been an adequate sampling frame, was not available from state agencies. The computerized sampling frame was adjusted as follows:

- . Multiple vehicle registrations for a household were merged into one record.
- . Vehicle registrations in firm names were eliminated.
- . Government vehicle registrations were eliminated.
- . Vehicles registered to out of state addresses were eliminated.

A car was considered to include autos, station wagons, and similar vehicles used for family transportation; pickup and panel trucks were not considered cars for sample selection purposes. One limitation of the sample frame used in the survey was that households not owning a car would not be included in the survey.

¹H. Bennett, Statewide Traffic Model Technical Report No. 3 - Household Travel Survey, Kentucky Department of Transportation, Office of Transportation Planning (April 1975).

The KDOT mail survey was designed to collect information on week-day auto driver trips using a self-administered mail-out questionnaire. The decision to collect weekday travel data was based on KDOT's interest in planning for repetitive trips and in completing the mail survey in the same general time frame as other planned surveys.

The specific household and auto driver trip information collected in the mail survey is noted in the mail questionnaire shown in Exhibit A-6. An introductory letter, a set of instructions for completing the questionnaire, and a sample completed trip log were also distributed with the questionnaire (see Exhibits A-7, A-8, and A-9).

The mail survey was conducted between January and July 1972. Mailings were not made on days immediately preceding or following major holiday periods or major special events. The staff conducting the mail survey was composed of one supervisor and four clerk-typists with part time supervisory assistance from three staff engineers.

The field survey was conducted by mailing the questionnaire and supporting material to each sample household. A reminder letter asking the household to complete the questionnaire was sent to all sample households. If the questionnaire had not been returned within 12 days after the designated survey day, a second reminder letter was sent, along with duplicates of all of the material originally sent to the household. If the sample household did not respond to the second reminder letter, no further attempt was made to contact the household unless the household was part of a special follow-up subsample.

For those subsample households not responding to the second reminder letter, an attempt was made to conduct a telephone interview 21 days from the second reminder letter. Interviewers also made up to six attempts to verify data on completed subsample questionnaires even if data were reasonable and complete. If telephone contact could not be made with the subsample household, a personal interview follow-up was scheduled only if the questionnaire was incomplete or illogical.

The overall response rate to the survey was 45 percent (see Table A-1). Thirty percent of the sample responded to the initial mailing, and an additional 10 percent of the sample responded to the second mailing of the questionnaire. Forty percent of the sample responded to the mail survey. An additional 622 responses were obtained through the telephone callbacks, and an additional 87 responses were obtained through the personal interview follow-ups.

EXHIBIT A-6

QUESTIONNAIRE FOR KDOT HOUSEHOLD SURVEY

APPENDIX B-3

KENTUCKY STATEWIDE TRAVEL SURVEY
HOUSEHOLD TRAVEL SURVEY QUESTIONNAIRE

Household Data

1. Please record the date of your Survey Day. (See upper right hand corner of TRAVEL DATA sheet for Survey Day)

Mo. Day Yr.

2. Where is your household located?

- a. If it is in a town or city, please record the house number, street name and city.
- b. If it is in a rural area, please record the name of the nearest place or community (no matter how small) or the nearest road intersection. If an intersection is used, please give the name or number of both roads. A RURAL MAIL DELIVERY ADDRESS IS NOT USEABLE IN OUR SURVEY.

Location: _____

3. How many persons live in this household? (Do not count those who are generally away to school and room away from home.)

Number _____

4. What is the age of the head of the household? Check appropriate blank.

- a. If husband - wife family:
 - 1. Under 25 _____
 - 2. 25 - 29 _____
 - 3. 30 - 34 _____
 - 4. 35 - 44 _____
 - 5. 45 - 64 _____
 - 6. 65 and over _____
- b. If other than husband - wife family:
 - 7. Under 65 _____
 - 8. Over 65 _____

5. Please indicate the sum of the gross annual income of all persons living in this household. Check the appropriate blank.

- 1. Under \$2,000 _____
- 2. \$2,000 - \$3,999 _____
- 3. \$4,000 - \$5,999 _____
- 4. \$6,000 - \$7,999 _____
- 5. \$8,000 - \$9,999 _____
- 6. \$10,000 - \$11,999 _____
- 7. \$12,000 - \$14,999 _____
- 8. \$15,000 - \$24,999 _____
- 9. \$25,000 and over _____

6. For each of the vehicle types listed below, please record the number that are normally available for personal use by the members of this household.

<u>TYPE</u>	<u>NUMBER</u>
Passenger Cars or Station Wagons	_____
Pick-up or Panel (Example: Ford Econoline)	_____
Other Single Unit Trucks	_____
Tractor - Trailer Combination	_____

PLEASE DO NOT WRITE
IN THIS SPACE

CARD NO.: 1

SAMPLE NO.:

EXHIBIT A-6 (Continued)

7. Please estimate the miles driven last year in each of the vehicles mentioned above:

Vehicle #1 _____ miles
 Vehicle #2 _____ miles
 Vehicle #3 _____ miles
 Vehicle #4 _____ miles

8. a. Please assign a Person Number to each person living in this household who is 16 years of age or older; and

b. Indicate with a check mark in the appropriate column those who are licensed drivers and those who drove on Survey Day.

Person Number	Relationship to Head of Household or Initials	Licensed Driver	Drove On Survey Day
1	Head of Household	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____

9. For each person employed full-time and living at this household, please list the location of his job. Refer to Question 2 for instructions on the type of location information that is desired.

Person Number	Location of Job
1	_____
2	_____
3	_____
4	_____

10. Telephone Number _____

We may need to call you to make sure we understand all your answers. What would be a convenient time? _____

11. Please continue by filling out the TRAVEL DATA portion of the questionnaire

PLEASE DO NOT WRITE IN THIS SPACE

28

29 30

31 32 33 34 35

36 37 38 39 40

41 42 43 44 45

46 47 48 49 50

51

52 53 54 55 56 57

58 59 60 61 62 63

64 65 66 67 68 69

70 71 72 73 74 75

MS90-7/8/71

VEHICLE TYPE
 CODE
 1 PASSENGER CAR OR STATION WAGON
 2 PICKUP OR PANEL TRUCK (2000 CUBIC INCH)
 3 TRUCK-TRAILER COMBINATION
 4 TRUCK-TRAILER COMBINATION

Code Trip Purpose
 1 - HOME
 2 - SCHOOL - COLLEGE
 3 - SHOP
 4 - PERSONAL BUSINESS
 5 - SERVICE PASSENGER
 6 - SERVICE PASSENGER
 7 - SERVICE PASSENGER
 8 - SERVICE PASSENGER
 9 - SERVICE PASSENGER
 0 - SERVICE PASSENGER

30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
ORIGIN ADDRESS (Please write complete address)														DESTINATION ADDRESS (Please write complete address)													
DAY OF WEEK														DATE													
RESIDENCE ZONE														EXPANSION FACTOR													
CARD NO.														SAMPLE NO.													
TRIP NUMBER														TRIP PURPOSE													
VEHICLE TYPE														TRIP PURPOSE													

TRAVEL DATA
 (Please Do Not Write In The Small, Numbered Blocks)
 Survey Days: Friday

EXHIBIT A-7

LETTER FOR KDOT HOUSEHOLD SURVEY



CHARLES PRYOR, Jr.
COMMISSIONER

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
FRANKFORT, KENTUCKY 40601

WENDELL H. FORD
GOVERNOR

KDH 310.HMB

Dear Citizen:

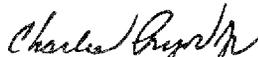
Your kind assistance is hereby requested in this matter of planning a highway program that will best serve your highway transportation needs. The Department of Highways has the need for certain items of information that only you, a citizen of the Commonwealth and user of Kentucky highways, can provide.

The needed information is explained in the enclosed instructions. A questionnaire, similar to that used in the 1970 Census of Population, on which you may record the needed information is enclosed. Also enclosed is a return postage-paid envelope for your use in returning the completed questionnaire to us.

I assure you that the information you supply will be kept strictly confidential. Once we receive your reply, the answers are coded for electronic processing. After that, your name and the information you supplied are permanently separated. From then on, we are dealing only with numbers and averages.

I sincerely urge you to take the time required to read the instructions and fill out the questionnaire. This is an excellent opportunity for you to help us plan better highways for the Commonwealth of Kentucky. Your thoughtful consideration will be greatly appreciated.

Sincerely yours,


Charles Pryor, Jr., Commissioner
Kentucky Department of Highways

Enclosures

EXHIBIT A-8

INSTRUCTIONS FOR COMPLETING QUESTIONNAIRE FOR
KDOT HOUSEHOLD SURVEY

INTRODUCTION
Kentucky Statewide Travel Survey

The information below explains the purpose of the survey and the meaning of a few terms.

<u>QUESTION</u>	<u>EXPLANATION</u>
WHAT IS THIS ALL ABOUT?	Briefly, a travel survey is conducted for the purpose of obtaining data that will permit careful planning of highways to meet your transportation needs. Basically, the survey requests certain household data and a record of the beginning and ending location and purpose of each vehicle trip made by members of the household.
WHO ANSWERS SURVEY QUESTIONS?	The Household Travel Survey Questionnaire is divided into two parts: (1) Household Data and (2) Travel Data. The head of the household is asked to supply the answers to the first ten (10) questions which concern the requested Household Data. Each licensed DRIVER who made trips on survey day is asked to record on the Travel Data portion of the questionnaire each of the trips he made that day while he was the DRIVER of a vehicle. The Travel Data portion of the questionnaire is a fold-out sheet.
WHEN IS SURVEY DAY?	Survey day is one specified day of the week for which we request a record of all the vehicle trips made by members of the household at this address. The day for which you are requested to report your trips is marked in the upper right hand corner of the Travel Data portion of the Household Travel Survey Questionnaire which is attached.
WHAT IS A TRIP?	A trip has a beginning called ORIGIN, and an ending called DESTINATION with no stops in between. Let's take an example: You leave home in the morning and drive your two children to school, going from there to your job location. At 5:00 p.m. you leave your job and return home. For our study, this is considered as three trips. Watch! <ol style="list-style-type: none">1. A trip from home to the school;2. A trip from the school to the job location;3. A trip from the job location to the home.
WHAT IF YOU HAVE TROUBLE FILLING OUT THE TWO-PART QUESTIONNAIRE?	If you have trouble filling out the two-part questionnaire, we request that you return the questionnaire with as much information on it as you can supply. If you will kindly include your telephone number and indicate a convenient time for us to call, a trained interviewer will call you by phone and help you complete the questionnaire.
AND NOW?	Please read the instructions carefully, fill out the questionnaire, and return it to us in the postage-paid envelope as soon as possible.

EXHIBIT A-8 (Continued)

INSTRUCTIONS
FOR
HOUSEHOLD TRAVEL SURVEY
QUESTIONNAIRE

1. HOUSEHOLD DATA PORTION

The questions on this portion of the questionnaire are rather straightforward and/or self explanatory; therefore, no additional instructions are provided in this section.

2. TRAVEL DATA PORTION

This portion of the questionnaire is to be completed by recording each vehicle trip made by each licensed driver in the household while he was the DRIVER of the vehicle. Please use the Person Numbers assigned in Item 8 of the Household Data portion of the questionnaire to identify the DRIVER for each trip. IT IS EXTREMELY IMPORTANT THAT YOU RECORD ALL VEHICLE DRIVER TRIPS AS COMPLETELY AS POSSIBLE.

USE A SEPARATE LINE FOR EACH TRIP REPORTED. If the members of this household need to report more trips than there are lines on the two questionnaire sheets, please record the extra trips on another sheet of paper and attach to the questionnaire.

Beginning with the lettered questions along the left margin below is a list of questions that are to be answered in the corresponding lettered columns of the TRAVEL DATA portion of the questionnaire. Immediately following the lettered questions below is an explanation of the type of information that should be supplied in answer to the questions.

An example is given at the end of the instructions to help clarify any questions you may have.

<u>QUESTION</u>	<u>EXPLANATION</u>
A. WHICH PERSON WAS DRIVER FOR THIS TRIP?	In Item Number 8 of the Household Data portion of the questionnaire, you were requested to assign a Person Number to each individual in this household who is at least 16 years of age. This Person Number should be used to identify the DRIVER of each trip reported on the questionnaire. This information will be helpful in identifying problem areas in case we have to contact you by telephone to make clarifications.
B. WHAT IS THE NUMBER OF THIS TRIP?	Each DRIVER reporting trips should assign a number to each reported trip, using one (1) for the first trip, a two (2) for the second trip, etc. This information will also be helpful in identifying problem areas in case we have to contact you by telephone to make clarifications.
C. WHAT TYPE OF VEHICLE DID YOU DRIVE?	For each trip reported, please indicate the type of vehicle driven using the code given below:

<u>TYPE OF VEHICLE</u>	<u>CODE</u>
Passenger Car or Station Wagon	1
Pick-up or Panel (Example: Ford Econoline)	2
Other Single Unit Trucks	3
Tractor - Trailer Combinations	4

EXHIBIT A-8 (Continued)

D. WHERE DID THIS TRIP BEGIN? (ORIGIN ADDRESS)

and

E. WHERE DID THIS TRIP END? (DESTINATION ADDRESS)

In order to electronically process this data, we have to locate the beginning and end of each of your trips on a map, then assign a numerical code to it. For this reason, we would like you to be as specific as possible.

If the trip begins or ends in an urban area, give the street address, and town or city name. Identification of an intersection nearby the location is also acceptable if the names of both streets and the city name are given.

If the trip begins or ends in a rural area, give the name of the local community. We have a complete list of local place names. The nearest road intersection is also acceptable if the intersecting roads are identified by name and/or number. If you cannot give any of these, give a description. For example: 1 mile west of Beaver Dam on US 62, 1/2 mile north on Luce Road. A RURAL MAIL DELIVERY ROUTE ADDRESS IS NOT USEABLE.

F. HOW MANY PERSONS WERE IN THE VEHICLE?

Indicate the number of all persons in the vehicle including the driver for each trip.

G. & H. WHAT IS THE PURPOSE OF THIS TRIP?

This question is to be answered in the "going FROM (some purpose) TO (some purpose)" fashion. Referring to the example in the Introduction, the purposes would be as follows:

<u>Purpose From</u>	<u>Purpose To</u>
Home (0)	Serve Passenger (8)
Serve Passenger (8)	Work (1)
Work (1)	Home (0)

The numbers in parentheses are code numbers for the trip purposes. The list of purposes and their codes appear below and on the TRAVEL DATA portion of the questionnaire also.

PLEASE USE THE CODES TO RECORD THE TRIP PURPOSE.

<u>Code</u>	<u>Trip Purpose</u>
0	- Home (for all activities at your residence)
1	- Work (at a job location)
2	- Shop (use this even if you didn't make a purchase)
3	- Personal Business Transactions (includes visits to doctor or dentist, to the bank, to pay bills, to post office, etc.)
4	- Outdoor Recreation (golfing, fishing, swimming, hiking, camping, etc.)
5	- Social-Cultural (visit friends, attend church, civic meetings, movies, bowling, other entertainment, etc.)
6	- School (trips by students only, trips by others will be for some other purpose)
7	- Eat Meal
8	- Serve Passenger (drop off someone at school, pick up someone on the way to work, etc.)

EXHIBIT A-8 (Continued)

AND NOW ...

Please follow the above instructions and fill out the TRAVEL DATA portion of the questionnaire as shown in the following example.

Remember! The lettered columns on the questionnaire correspond to the lettered questions in these instructions. Please refer to the instructions as required.

Please complete both parts of the questionnaire and mail it to us as soon as possible. A postage-paid envelope has been included for your use. THE INTRODUCTION AND INSTRUCTIONS SHOULD NOT BE RETURNED!

We urgently solicit your cooperation in this endeavor.

Thank You!

EXAMPLE: The Smiths own a passenger car and the Company furnishes a pick-up truck for Mr. Smith to use. Mr. Smith (Person Number 1) made four trips and Mrs. Smith (Person Number 2) made three trips on Survey Day. On his way to work Mr. Smith stops by a service garage to pick-up Mr. Jones whose car needed some repair. From the repair shop, they proceeded to work. At quitting time, Mr. Smith goes to the feed store to pick-up some pellets for his hogs. From the feed store, Mr. Smith goes home.

Mrs. Smith went to the bank to make a deposit and then dropped by to visit her mother for a few minutes. Mrs. Smith proceeds from her mother's residence back to her house.

(These trips are recorded on the next page. The information in parentheses such as home, service garage, feed mill, etc. need not be recorded. They are shown in the example for clarity only.)

TABLE A-1

RESPONSE RATES FOR KDOT HOUSEHOLD SURVEY

<u>Survey Procedure</u>	<u>Number of Questionnaires Returned</u>	<u>Percent of Sample</u>
First Mailing	4,530	30
Second Mailing	1,471	10
Subtotal	6,001	40
Telephone Callback	622	4
Home Interview Mailback	87	1
Total	6,710	45

Based on an analysis of the survey results, it was found that information on auto driver trip rates per household and per \$1,000 of income were questionable for households contacted by telephone. The problem appeared to be that the number of trips was underreported in the telephone interview, which was caused by poor interviewing techniques. KDOT ultimately decided not to include the telephone survey data in the trip generation phase of its statewide planning program. This emphasizes the need to carefully select, train, and monitor interviewers for telephone surveys.

A comparison of the household travel survey data with 1970 Census data indicated that most average household characteristics from both surveys were in reasonably close agreement. However, it was found that the average household incomes reported in the travel survey were higher than those reported in the Census. Based on a detailed analysis of this data, KDOT concluded that the travel survey data were subject to an income bias. KDOT adjusted its survey results to compensate for this bias. The income bias may have resulted from the use of the auto registrations file as a sampling frame. Such a sampling frame would probably include a greater proportion of higher income households than the population as a whole has.

Except for the problems noted above, KDOT considered that the mail household travel survey data adequately represented the universe of travel in Kentucky.

KANSAS MAIL HOUSEHOLD SURVEY USING AUTOMATED VEHICLE REGISTRATION FILE

In 1968 the FHWA conducted a mail origin-destination survey in Shawnee County, Kansas, which provided a limited test of using an automated vehicle registration file as a sampling frame for a travel survey. A cost per completed interview of \$0.32 was incurred, using a vehicle registration file as a sampling frame and using computerized sample selection procedures. Most of the cost is attributable to questionnaire printing and postage. A computer program was written to select every fourth vehicle for a 25 percent sample. A total of 17,300 vehicle registrations was sampled, and questionnaires were mailed to vehicle owners. The Kansas survey collected data on vehicle trips over 20 miles in length made on a Sunday. The above costs would have increased significantly if follow-up procedures had been incorporated for nonrespondents.¹

¹Additional information is contained in Application of Automated Vehicle Registration Files to Postal O-D Surveys, Highway Planning Technical Report No. 11, (FHWA: April 1969).

NATIONWIDE PERSONAL TRANSPORTATION STUDY

The Nationwide Personal Transportation Study was conducted by the Census Bureau in 1969-1970 for the Federal Highway Administration. The NPTS "was designed to obtain up-to-date information on national patterns of travel."¹ Although the NPTS is a national survey, several characteristics of the survey may be applicable to statewide transportation planning. These characteristics include the design of a small sample survey to monitor travel characteristics, the use of panels to survey travel by season of the year, and use of perceived rather than actual trip distances and time.

The NPTS was designed as a multistaged probability sample of housing units in 235 sample areas.² The sample areas included 485 counties and independent cities representing every state and the District of Columbia. All of the counties and independent cities in the nation were combined into approximately 1,900 primary sample units, which were further combined into 235 strata containing one or more relatively homogeneous primary sample units. For each stratum, one primary sample unit was selected, and within the selected unit a probability sample of housing units was chosen to represent the civilian noninstitutionalized population.

Two panels in the Quarterly Housing Survey performed by the Census Bureau were used to select the households to be interviewed in the NPTS. One panel was interviewed during four different seasons--April, July, and October 1969 and January 1970. Households in the second panel were interviewed during August 1969. Three thousand households were interviewed in each panel.

The NPTS was conducted by the Census Bureau using experienced survey personnel. One day training sessions were conducted for field supervisors and interviewers.

¹U.S. Department of Transportation, Federal Highway Administration, Nationwide Personal Transportation Study, Reports 1 through 11.

²Ibid.

The NPTS collected information on the socioeconomic and travel characteristics of each sample household. The questionnaire, (see Exhibit A-10) requested the following types of information:

- . characteristics of automobiles owned;
- . travel to work for all employed persons 16 years of age or older;
- . estimated annual miles driven by licensed drivers; and
- . travel to school.

The characteristics of all one way trips made by persons 5 years of age or older were also recorded for a specific travel day. Information on weekday and weekend trips made by motor vehicle or a form of public transportation was collected in the survey. In addition, overnight trips lasting one or more nights during the 7 days preceding the preassigned travel day were also recorded. Socioeconomic characteristics of the household were collected only during the April survey period for the panel that was surveyed in each season.

The NPTS questionnaire differs from those typically used in travel surveys in that respondents were asked to estimate travel characteristics such as:

- . annual miles driven for each car owned by the household;
and
- . trip length in terms of distance and time.

Detailed information on the origin and destination locations of each trip was not requested to estimate trip distance and time. Although this approach eliminates the need to geocode trip origin and destination data, the level of accuracy of travelers' responses concerning trip distances, times, and miles driven annually is unknown.

EXHIBIT A-10: QUESTIONNAIRE FOR NPTS

NOTICE - All information which would permit identification of the individual will be held in strict confidence, will be used only by persons engaged in and for the purposes of the survey, and will not be disclosed or released to others for any purposes.

BUDGET BUREAU NO. 41 S69011
APPROVAL EXPIRES DECEMBER 1970

FORM NPT-2 (7-10-69)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
ACTING AS COLLECTING AGENT FOR THE
U.S. DEPARTMENT OF TRANSPORTATION

HOUSEHOLD QUESTIONNAIRE - AUGUST 1969

NATIONWIDE PERSONAL TRANSPORTATION SURVEY

a. Ident. Code **b. Household No.** **c. Control No.**
PSU Rot. Segment Serial Str.

d. Type of structure **e. Race** **f. SMSA** **g. Place** **h. State**

i. Subsample **j. Designated travel day** **k. No. of hhd. members (all ages)** **l. Number of automobiles**
Day of week Mo./day

m. Automobile
Auto No. Year Make Office use

n. Principal user Line No. **o. (If no automobile)**
1 Auto available
2 Not available

p. Income **q. Interviewer's code**

r. OFFICE USE

s. Date of interview **t. Noninterview reason**
1 NOH
2 TA
3 Ref.
4 Other Type A
5 Other type - Specify

(Fill a, b, c, f, g, h, i, j, q.)

Section I - AUTOMOBILE RECORD

Now I have some questions about your -- (first, second, etc., automobile)

1. Is it owned by somebody living here?
1 Yes
2 No (Go to Q. 3)

2a. Was it purchased new or used?
1 New
2 Used

b. In what month and year was it bought? (Examples: 10/67, 04/68)
Month Year Month Year Month Year

3. About how many thousand miles was it driven during the past 12 months?
Miles (Thousands) Miles (Thousands) Miles (Thousands)

4. Is it used at least once a week in going from home to work?
1 Yes - Entire trip
2 Yes - Part-way
3 No (Go to next auto or Sec. II)

5. How many people are usually in the automobile going to work, including the driver?
Number Number Number

CODE KEY
1 - Commercial parking garage or lot
2 - Employer provided space
3 - Fringe parking
4 - Other lot or garage
5 - On the street
6 - No all day parking used
7 - Other

6a. What type of parking facility is usually used for the trip to work - the employer's lot, a commercial lot, on the street, or what?

b. Is there a cost for parking?
1 Yes
2 No (Go to next auto or Sec. II)

c. How much?
\$ 1 Day
2 Week
3 Month

d. Does ... pay by putting coins into a meter?
1 Yes
2 No

Section II - SHOPPING
ASK for SMSA residents only - 1 or 2 as second digit of identification code

Now we are interested in where people shop - (Ask 1 and 2 for (1) wife or (2) female head or (3) male head)

1. During the past 3 months has ... gone to the main business district of ... principally to shop?
1 Yes -> How many times? (Go to Q. 3)
2 No

2. What were the reasons for not shopping there? (Mark all boxes that apply)
1 Goods available locally
2 Too far away
3 Difficulty of parking
4 Difficulty of driving in congested area
5 No automobile
6 Other - Specify

3. How far is it from home to the nearest public transportation line to go to the main business district of ...?
1 Less than one block
2 1-2 blocks (less than 1/4 mile)
3 3-6 blocks (1/4 - 1/2 mile)
4 Over 6 blocks (over 1/2 mile)
5 No public transportation available
6 Lives in main business district

Note: Fill remaining pages for household members 5 years old or over.

EXHIBIT A-10 (Continued)

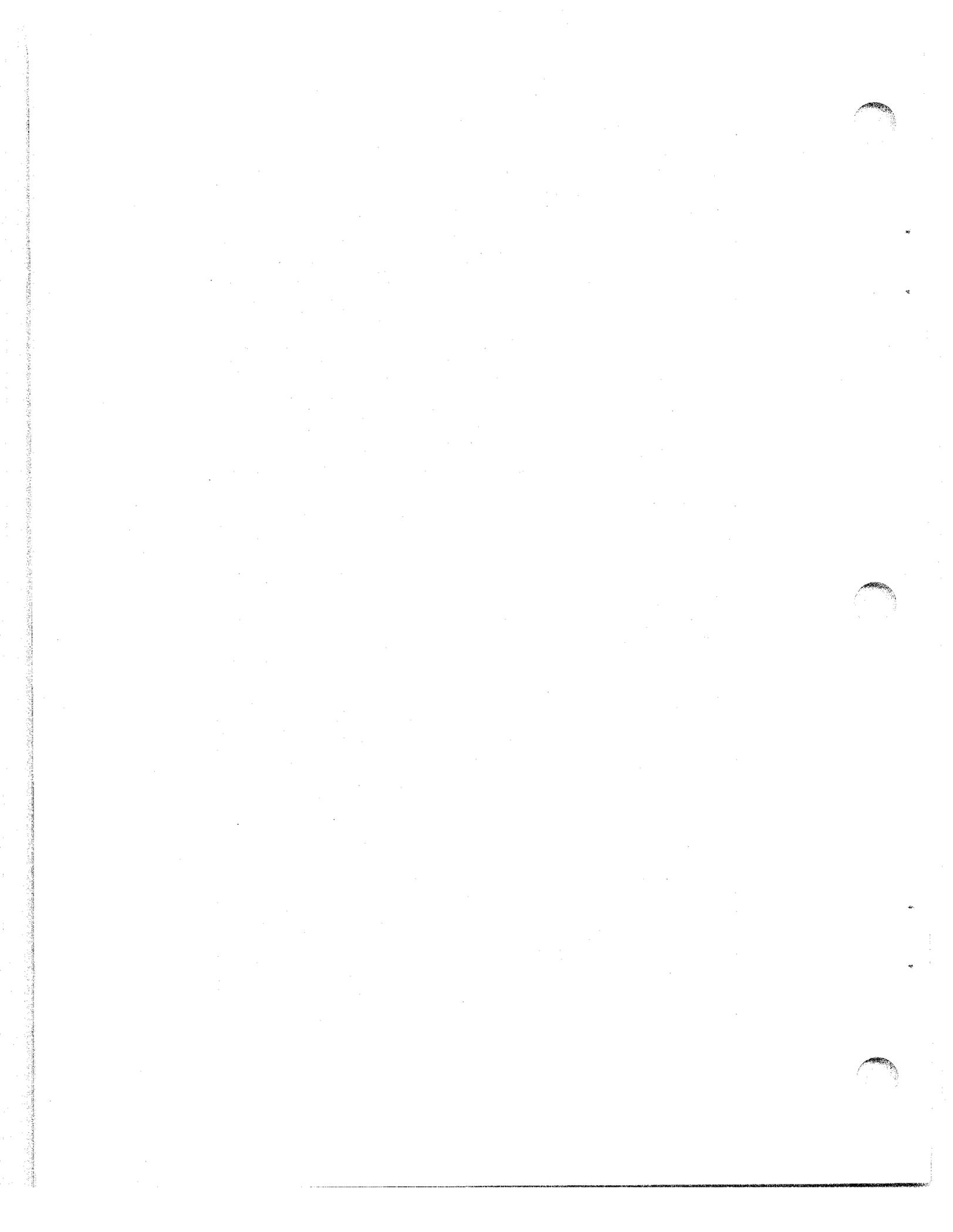
Section III - TRAVEL TO WORK	
1. Line No. 3	2. CHECK ITEM <input type="checkbox"/> This person is 16 years old or older and has an entry in Control Card question 16b. (Fill in Sec. III, IV, and V as applicable) <input checked="" type="checkbox"/> All others (Fill in Sec. IV and V as applicable)
We are interested in where people work and how they get to work.	1. <input type="checkbox"/> Yes → What city? _____ State? _____ 2. <input type="checkbox"/> No 3. <input type="checkbox"/> Don't know
3. Is the place where . . . works located in a city?	Miles 1X <input type="checkbox"/> No fixed place } (Go to Sec. IV) 2X <input type="checkbox"/> At home 3X <input type="checkbox"/> Less than 1/2 mile (5 blocks) <i>(Enter nearest full mile)</i>
4. How far is it from home to the place where . . . works? (Actual travel distance)	Minutes
5. How much time is usually required for . . . to get to work from the time he leaves until he arrives at work?	6. How does . . . usually get to work? <i>(Mark all appropriate boxes)</i>
	1 <input type="checkbox"/> Bus or street car 2 <input type="checkbox"/> Commuter train, subway, elevated, etc. 3 <input type="checkbox"/> Automobile - with other persons 4 <input type="checkbox"/> Automobile - alone 5 <input type="checkbox"/> Truck 6 <input type="checkbox"/> Motorcycle 7 <input type="checkbox"/> Walk only (Go to Q. 10a) 8 <input type="checkbox"/> Other - including bicycle - Specify <u>7</u>
7. How far is it from home to the nearest public transportation line that . . . uses (could use) to get to his place of work?	1 <input type="checkbox"/> Less than 1 block 2 <input type="checkbox"/> 1 to 2 blocks (less than 1/2 mile) 3 <input type="checkbox"/> 3 to 6 blocks (1/2 to 3/4 mile) 4 <input type="checkbox"/> Over 6 blocks (over 3/4 mile) 5 <input type="checkbox"/> None available } (Go to Q. 10a)
<i>(Ask if boxes 1 and/or 2 - is not marked in Q. 6)</i>	1 <input type="checkbox"/> None available 2 <input type="checkbox"/> Not convenient to get to 3 <input type="checkbox"/> Not convenient to place of work 4 <input type="checkbox"/> Too many transfers 5 <input type="checkbox"/> Too expensive 6 <input type="checkbox"/> Too crowded or uncomfortable 7 <input type="checkbox"/> Takes too long 8 <input type="checkbox"/> Need auto for work 9 <input type="checkbox"/> Other - Specify <u>7</u> <i>(Go to 10a)</i>
8. What is the reason . . . does not use public transportation to go to work? Anything else? <i>(Mark all boxes that apply)</i>	1 <input type="checkbox"/> No driver's license 2 <input type="checkbox"/> No car available 3 <input type="checkbox"/> No car pool available 4 <input type="checkbox"/> Cheaper than auto 5 <input type="checkbox"/> Safer than auto 6 <input type="checkbox"/> No parking problems 7 <input type="checkbox"/> No driving strain 8 <input type="checkbox"/> Faster 9 <input type="checkbox"/> Other - Specify <u>7</u>
<i>(Ask if either box 1 or 2 - is marked in Q. 6)</i>	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No 3 <input type="checkbox"/> Not working 5 years ago (Go to Sec. IV)
9. What is the reason . . . uses public transportation to get to work? Anything else? <i>(Mark all boxes that apply)</i>	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No
10a. Does . . . work at some location as 5 years ago? b. Does . . . live at some location as 5 years ago? c. Compared with the time it took . . . to get to work 5 years ago, is the time to work:	1 <input type="checkbox"/> About the same as 5 years ago 2 <input type="checkbox"/> At least 10 minutes more 3 <input type="checkbox"/> At least 10 minutes less
Section IV - DRIVER INFORMATION	
<i>(Ask for licensed drivers only)</i>	1 <input type="checkbox"/> None 2 <input type="checkbox"/> Under 5,000 3 <input type="checkbox"/> 5,000 - 9,999 4 <input type="checkbox"/> 10,000 - 14,999 5 <input type="checkbox"/> 15,000 - 19,999 6 <input type="checkbox"/> 20,000 - 24,999 7 <input type="checkbox"/> 25,000 - 29,999 8 <input type="checkbox"/> 30,000 and over
1. About how many thousands of miles did . . . drive during the past 12 months, including driving as part of work?	
Section V - TRAVEL TO SCHOOL	
<i>Ask Sec. V for persons 5-18 years old</i>	
Now I would like to ask some questions about transportation to school.	
1. Last May was . . . attending or enrolled in school?	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No (Go to Sec. VI)
2. Was it a public or private school?	1 <input type="checkbox"/> Public 2 <input type="checkbox"/> Private
3. What grade was . . . attending?	Grade _____ <i>Enter "0" for kindergarten or 1-12, 13+</i>
4. About how many miles was it from home to . . . 's school? <i>(If less than one mile enter "0")</i>	Miles
5. About how long did it take . . . to get from home to school?	Minutes
6. How did . . . usually get to school? <i>(Mark only one box)</i>	1 <input type="checkbox"/> School bus - No charge 2 <input type="checkbox"/> Public transportation - No charge } (Go to Sec. VI) 3 <input type="checkbox"/> School bus - Charge 4 <input type="checkbox"/> Public transportation - Charge 5 <input type="checkbox"/> Walk, bicycle 6 <input type="checkbox"/> Automobile - Driver 7 <input type="checkbox"/> Automobile - Passenger } (Go to Q. 7) 8 <input type="checkbox"/> Motorcycle 9 <input type="checkbox"/> Other
7. Was free school bus or free public transportation available?	1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No

EXHIBIT A-10 (Continued)

Section VI - TRAVEL DAY REPORT																														
a. Line No.	b. Age	c. Sex 1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female	d. Employment status (C.C. 16a) 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No	e. Occupation (C.C. 16b)	f. Retired Code (C.C. 17)	g. Licensed driver (C.C. 18) 1 <input type="checkbox"/> Yes 2 <input type="checkbox"/> No																								
<p>Now I have some questions about the trips taken on _____. A trip is anytime you went from one place to another by motor vehicle or some form of public transportation. For example, going to work by automobile would be one trip, going to lunch by automobile would be a second trip, returning to work from lunch would be a third trip.</p> <p>Reference day is from 4:00 a.m. to 3:59 a.m. the following day</p>																														
<p>1. Did . . . go any place at anytime on _____?</p> <p>1 <input type="checkbox"/> Yes - One or more trips not previously reported (Fill columns) 2 <input type="checkbox"/> Yes - All previously reported (Go to Q. 14a) 3 <input type="checkbox"/> No</p>																														
<p>2. At what time did . . . start the (1st, next) trip he took on _____?</p> <table border="1"> <thead> <tr> <th>Trip 1</th> <th>Trip 2</th> <th>Trip 3</th> <th>Trip 4</th> </tr> </thead> <tbody> <tr> <td>1 <input type="checkbox"/> a.m. 2 <input type="checkbox"/> p.m.</td> </tr> </tbody> </table>							Trip 1	Trip 2	Trip 3	Trip 4	1 <input type="checkbox"/> a.m. 2 <input type="checkbox"/> p.m.																			
Trip 1	Trip 2	Trip 3	Trip 4																											
1 <input type="checkbox"/> a.m. 2 <input type="checkbox"/> p.m.	1 <input type="checkbox"/> a.m. 2 <input type="checkbox"/> p.m.	1 <input type="checkbox"/> a.m. 2 <input type="checkbox"/> p.m.	1 <input type="checkbox"/> a.m. 2 <input type="checkbox"/> p.m.																											
<p>3. How far is it from where . . . started to where he went?</p> <table border="1"> <thead> <tr> <th>Miles</th> <th>Miles</th> <th>Miles</th> <th>Miles</th> </tr> </thead> <tbody> <tr> <td>0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)</td> <td>0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)</td> <td>0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)</td> <td>0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)</td> </tr> </tbody> </table>							Miles	Miles	Miles	Miles	0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)	0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)	0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)	0 <input type="checkbox"/> Less than 1/2 mile (5 blocks)																
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<p>4. How long did it take to get there?</p> <table border="1"> <thead> <tr> <th>1 <input type="checkbox"/> 15 min. or less</th> </tr> </thead> <tbody> <tr> <td>2 <input type="checkbox"/> 16-30 min.</td> </tr> <tr> <td>3 <input type="checkbox"/> 31-45 min.</td> </tr> <tr> <td>4 <input type="checkbox"/> 46 min.-1 hr.</td> </tr> <tr> <td>5 <input type="checkbox"/> Bet. 1 and 2 hrs.</td> </tr> <tr> <td>6 <input type="checkbox"/> 2 hrs. or more</td> </tr> </tbody> </table>							1 <input type="checkbox"/> 15 min. or less	2 <input type="checkbox"/> 16-30 min.	3 <input type="checkbox"/> 31-45 min.	3 <input type="checkbox"/> 31-45 min.	3 <input type="checkbox"/> 31-45 min.	3 <input type="checkbox"/> 31-45 min.	4 <input type="checkbox"/> 46 min.-1 hr.	5 <input type="checkbox"/> Bet. 1 and 2 hrs.	5 <input type="checkbox"/> Bet. 1 and 2 hrs.	5 <input type="checkbox"/> Bet. 1 and 2 hrs.	5 <input type="checkbox"/> Bet. 1 and 2 hrs.	6 <input type="checkbox"/> 2 hrs. or more												
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6 <input type="checkbox"/> 2 hrs. or more	6 <input type="checkbox"/> 2 hrs. or more	6 <input type="checkbox"/> 2 hrs. or more	6 <input type="checkbox"/> 2 hrs. or more																											
<p>5. What was the main reason for this trip? (If "return home" enter the main purpose of the outgoing trip(s), plus "R.H.") (Enter one code.)</p> <p>CODE KEY →</p> <table border="1"> <thead> <tr> <th>Trip 1</th> <th>Trip 2</th> <th>Trip 3</th> <th>Trip 4</th> </tr> </thead> <tbody> <tr> <td>Code</td> <td>Code</td> <td>Code</td> <td>Code</td> </tr> </tbody> </table> <p>1. To work 2. Business, other than to work 3. Shopping 4. Other family or personal business 5. To school or church 6. To doctor or dentist 7. Vacation 8. Visit friends or relatives 9. Pleasure driving 10. Other social or recreational 11. Other Return home (reclassification required)</p>							Trip 1	Trip 2	Trip 3	Trip 4	Code	Code	Code	Code																
Trip 1	Trip 2	Trip 3	Trip 4																											
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<p>6. In addition to . . . did anyone else living here go on this trip? (List line numbers of other household members 5 years old or older who went on this trip.)</p> <table border="1"> <thead> <tr> <th>Line numbers</th> <th>Line numbers</th> <th>Line numbers</th> <th>Line numbers</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							Line numbers	Line numbers	Line numbers	Line numbers																				
Line numbers	Line numbers	Line numbers	Line numbers																											
<p>7. What means of transportation were used for this trip? (If more than one, circle major means.)</p> <p>CODE KEY →</p> <table border="1"> <thead> <tr> <th>Trip 1</th> <th>Trip 2</th> <th>Trip 3</th> <th>Trip 4</th> </tr> </thead> <tbody> <tr> <td>Code</td> <td>Code</td> <td>Code</td> <td>Code</td> </tr> </tbody> </table> <p>1. School bus 2. Other bus and/or street car 3. Elevated or subway 4. Other train 5. Airplane 6. Taxi 7. Automobile - Driver 8. Automobile - Passenger 9. Motorcycle or motor bike 10. Truck (including pick-up) 11. Other</p>							Trip 1	Trip 2	Trip 3	Trip 4	Code	Code	Code	Code																
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Code	Code	Code	Code																											
<p>8. Was public transportation for this trip available within 1/2 mile? (1/2 mile)?</p> <table border="1"> <thead> <tr> <th>1 <input type="checkbox"/> Yes</th> <th>1 <input type="checkbox"/> Yes</th> <th>1 <input type="checkbox"/> Yes</th> <th>1 <input type="checkbox"/> Yes</th> </tr> </thead> <tbody> <tr> <td>2 <input type="checkbox"/> No</td> <td>2 <input type="checkbox"/> No</td> <td>2 <input type="checkbox"/> No</td> <td>2 <input type="checkbox"/> No</td> </tr> <tr> <td>3 <input type="checkbox"/> Don't know</td> </tr> </tbody> </table>							1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Don't know																					
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3 <input type="checkbox"/> Don't know	3 <input type="checkbox"/> Don't know	3 <input type="checkbox"/> Don't know	3 <input type="checkbox"/> Don't know																											
<p>9. What automobile was used? (Transcribe automobile number from C.C.)</p> <table border="1"> <thead> <tr> <th>Automobile No.</th> <th>Automobile No.</th> <th>Automobile No.</th> <th>Automobile No.</th> </tr> </thead> <tbody> <tr> <td>or 9 <input type="checkbox"/> Not an auto listed on the C.C.</td> <td>or 9 <input type="checkbox"/> Not an auto listed on the C.C.</td> <td>or 9 <input type="checkbox"/> Not an auto listed on the C.C.</td> <td>or 9 <input type="checkbox"/> Not an auto listed on the C.C.</td> </tr> </tbody> </table>							Automobile No.	Automobile No.	Automobile No.	Automobile No.	or 9 <input type="checkbox"/> Not an auto listed on the C.C.	or 9 <input type="checkbox"/> Not an auto listed on the C.C.	or 9 <input type="checkbox"/> Not an auto listed on the C.C.	or 9 <input type="checkbox"/> Not an auto listed on the C.C.																
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<p>10. Who drove the automobile for this trip?</p> <table border="1"> <thead> <tr> <th>Line No.</th> <th>Line No.</th> <th>Line No.</th> <th>Line No.</th> </tr> </thead> <tbody> <tr> <td>99 <input type="checkbox"/> Not a household member</td> </tr> </tbody> </table>							Line No.	Line No.	Line No.	Line No.	99 <input type="checkbox"/> Not a household member																			
Line No.	Line No.	Line No.	Line No.																											
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<p>11. Was parking free for this trip?</p> <table border="1"> <thead> <tr> <th>1 <input type="checkbox"/> Yes</th> <th>1 <input type="checkbox"/> Yes</th> <th>1 <input type="checkbox"/> Yes</th> <th>1 <input type="checkbox"/> Yes</th> </tr> </thead> <tbody> <tr> <td>2 <input type="checkbox"/> No</td> <td>2 <input type="checkbox"/> No</td> <td>2 <input type="checkbox"/> No</td> <td>2 <input type="checkbox"/> No</td> </tr> <tr> <td>3 <input type="checkbox"/> Did not park</td> </tr> <tr> <td>4 <input type="checkbox"/> Don't know</td> </tr> </tbody> </table>							1 <input type="checkbox"/> Yes	2 <input type="checkbox"/> No	3 <input type="checkbox"/> Did not park	4 <input type="checkbox"/> Don't know																				
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4 <input type="checkbox"/> Don't know	4 <input type="checkbox"/> Don't know	4 <input type="checkbox"/> Don't know	4 <input type="checkbox"/> Don't know																											
<p>12. How many people were in the automobile including the driver? (Include children under 5 and non-household members.)</p> <table border="1"> <thead> <tr> <th>Number</th> <th>Number</th> <th>Number</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>0 <input type="checkbox"/> Don't know</td> </tr> </tbody> </table>							Number	Number	Number	Number	0 <input type="checkbox"/> Don't know																			
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0 <input type="checkbox"/> Don't know	0 <input type="checkbox"/> Don't know	0 <input type="checkbox"/> Don't know	0 <input type="checkbox"/> Don't know																											
<p>13. Did . . . go anywhere else on _____?</p> <table border="1"> <thead> <tr> <th>1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)</th> <th>1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)</th> <th>1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)</th> <th>1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)</th> </tr> </thead> <tbody> <tr> <td>2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)</td> <td>2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)</td> <td>2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)</td> <td>2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)</td> </tr> <tr> <td>3 <input type="checkbox"/> No</td> <td>3 <input type="checkbox"/> No</td> <td>3 <input type="checkbox"/> No</td> <td>3 <input type="checkbox"/> No</td> </tr> </tbody> </table>							1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)	1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)	1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)	1 <input type="checkbox"/> Yes - One or more trips not recorded (Go to next column)	2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)	2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)	2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)	2 <input type="checkbox"/> Yes - All trips recorded (Go to Q. 14a)	3 <input type="checkbox"/> No															
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3 <input type="checkbox"/> No	3 <input type="checkbox"/> No	3 <input type="checkbox"/> No	3 <input type="checkbox"/> No																											
<p>14a. During the 7 days ending (the day before travel day) did . . . return home from a trip after being away from home one or more nights?</p> <p>1 <input type="checkbox"/> Yes - One or more trips not previously reported (Go to 14b) 2 <input type="checkbox"/> Yes - All trips previously reported } Fill Sections III-VI for next person 5 years old or older 3 <input type="checkbox"/> No</p>																														
<p>b. How many such trips ended during the 7 days?</p> <p>Number _____ (Go to Sec. VII)</p>																														

EXHIBIT A-10 (Continued)

Section VII - OVERNIGHT TRAVEL			
OUTBOUND TRIP	Trip 1	Trip 2	Trip 3
	Line No. (9)	Line No. (10)	Line No. (11)
1. How many miles is it from home to where . . . went? (To farthest point)	Miles	Miles	Miles
2. How much time did . . . spend getting there? (Total time from home to farthest point, not just travel time) (Enter nearest full hour or day)	1 <input type="checkbox"/> Hours	1 <input type="checkbox"/> Hours	1 <input type="checkbox"/> Hours
	2 <input type="checkbox"/> Days	2 <input type="checkbox"/> Days	2 <input type="checkbox"/> Days
3. What time of day did the trip start?	1 <input type="checkbox"/> a.m.	1 <input type="checkbox"/> a.m.	1 <input type="checkbox"/> a.m.
	2 <input type="checkbox"/> p.m.	2 <input type="checkbox"/> p.m.	2 <input type="checkbox"/> p.m.
4. On what day of the week did the trip start?	1 <input type="checkbox"/> Sun. 5 <input type="checkbox"/> Thurs.	1 <input type="checkbox"/> Sun. 5 <input type="checkbox"/> Thurs.	1 <input type="checkbox"/> Sun. 5 <input type="checkbox"/> Thurs.
	2 <input type="checkbox"/> Mon. 6 <input type="checkbox"/> Fri.	2 <input type="checkbox"/> Mon. 6 <input type="checkbox"/> Fri.	2 <input type="checkbox"/> Mon. 6 <input type="checkbox"/> Fri.
	3 <input type="checkbox"/> Tues. 7 <input type="checkbox"/> Sat.	3 <input type="checkbox"/> Tues. 7 <input type="checkbox"/> Sat.	3 <input type="checkbox"/> Tues. 7 <input type="checkbox"/> Sat.
	4 <input type="checkbox"/> Wed.	4 <input type="checkbox"/> Wed.	4 <input type="checkbox"/> Wed.
Code Key →	1. To work 2. Business - Other than to work 3. Shopping 4. Other family or personal business 5. To school or church 6. To doctor or dentist		7. Vacation 8. Visit friends or relatives 9. Pleasure driving 10. Other social or recreational 11. Other
	Trip 1	Trip 2	Trip 3
5. What was the main reason for the trip? (Enter code)			
Code Key →	1. School bus 2. Other bus and/or street car 3. Elevated or subway 4. Other train 5. Airplane 6. Taxi		7. Automobile - Driver 8. Automobile - Passenger 9. Motorcycle or motorbike 10. Truck (including pick-up) 11. Other
	Trip 1	Trip 2	Trip 3
6. What means of transportation were used? (Enter codes) <i>(Include all means such as transportation to and from terminals as well as major means, circle major means.)</i>			
(If either code 7 or 8 has been entered in Q. 6 complete questions 7-9)	Auto No.	Auto No.	Auto No.
	or 9 <input type="checkbox"/> Not an auto listed on the C.C.	or 9 <input type="checkbox"/> Not an auto listed on the C.C.	or 9 <input type="checkbox"/> Not an auto listed on the C.C.
7. What automobile was used? <i>(Transcribe automobile number from C.C.)</i>			
8. Who drove the automobile? <i>(If more than one driver, enter the line number of the person who drove the most miles)</i>	Driver Line No.	Driver Line No.	Driver Line No.
	or 99 <input type="checkbox"/> Not a household member	or 99 <input type="checkbox"/> Not a household member	or 99 <input type="checkbox"/> Not a household member
9. How many people were in the automobile, including the driver? <i>(Include children under 5 and non-household members)</i>	Number	Number	Number
RETURN TRIP	Trip 1	Trip 2	Trip 3
10. How many nights were you away from home?	Number	Number	Number
11. How much time did . . . spend on the return trip? (Enter nearest full hour or day)	1 <input type="checkbox"/> Hours	1 <input type="checkbox"/> Hours	1 <input type="checkbox"/> Hours
	2 <input type="checkbox"/> Days	2 <input type="checkbox"/> Days	2 <input type="checkbox"/> Days
12. What time of day did . . . start on the return trip?	1 <input type="checkbox"/> a.m.	1 <input type="checkbox"/> a.m.	1 <input type="checkbox"/> a.m.
	2 <input type="checkbox"/> p.m.	2 <input type="checkbox"/> p.m.	2 <input type="checkbox"/> p.m.
13. On what day of the week did . . . start on the return trip?	1 <input type="checkbox"/> Sun. 5 <input type="checkbox"/> Thurs.	1 <input type="checkbox"/> Sun. 5 <input type="checkbox"/> Thurs.	1 <input type="checkbox"/> Sun. 5 <input type="checkbox"/> Thurs.
	2 <input type="checkbox"/> Mon. 6 <input type="checkbox"/> Fri.	2 <input type="checkbox"/> Mon. 6 <input type="checkbox"/> Fri.	2 <input type="checkbox"/> Mon. 6 <input type="checkbox"/> Fri.
	3 <input type="checkbox"/> Tues. 7 <input type="checkbox"/> Sat.	3 <input type="checkbox"/> Tues. 7 <input type="checkbox"/> Sat.	3 <input type="checkbox"/> Tues. 7 <input type="checkbox"/> Sat.
	4 <input type="checkbox"/> Wed.	4 <input type="checkbox"/> Wed.	4 <input type="checkbox"/> Wed.
Code Key →	1. School bus 2. Other bus and/or street car 3. Elevated or subway 4. Other train 5. Airplane 6. Taxi		7. Automobile - Driver 8. Automobile - Passenger 9. Motorcycle or motorbike 10. Truck (including pick-up) 11. Other
	Trip 1	Trip 2	Trip 3
14. What means of transportation were used? (Enter codes) <i>(Include all means such as transportation to and from terminals as well as major means, circle major means.)</i>			
(If either code 7 or 8 has been entered in Q. 14 complete questions 15 and 16)	Driver Line No.	Driver Line No.	Driver Line No.
	or 9 <input type="checkbox"/> Not a household member	or 9 <input type="checkbox"/> Not a household member	or 9 <input type="checkbox"/> Not a household member
15. Who drove the automobile? <i>(If more than one driver, enter the Line No. of the person who drove the most miles)</i>			
16. How many people were in the automobile on the return trip, including the driver? <i>(Include children under 5 and non-household members)</i>	Number	Number	Number
17. In addition to . . . did anyone else living here go on this trip both outbound and return? (If outbound or return only, enter the trip in a separate column) <i>(List line numbers of other household members 5 years old or older who went on this round trip)</i>	0 <input type="checkbox"/> No others	0 <input type="checkbox"/> No others	0 <input type="checkbox"/> No others
	Line Numbers	Line Numbers	Line Numbers



APPENDIX B

ROADSIDE TRAVEL SURVEYS FOR STATEWIDE TRANSPORTATION PLANNING

The following types of roadside interview surveys have been conducted for statewide transportation planning:

- . urban cordonline surveys;
- . surveys in major travel corridors between specific city pairs;
- . stateline cordon surveys; and
- . statewide screenline surveys.

The Minnesota Department of Highways (MDH) and Nebraska Department of Transportation have conducted urban cordonline travel surveys as part of their statewide transportation planning programs. States such as New York, Georgia, and Michigan have made extensive use of urban corridor origin-destination data to estimate travel between specific city pairs and/or for the calibration of highway and multimodal travel demand forecasting models.

Roadside surveys in major travel corridors have been conducted as part of many transportation studies. An example of such a survey is the Northeast Corridor Study's roadside screenline survey. Such surveys have frequently been undertaken as part of intercity multimodal corridor studies.

Stateline cordon surveys have been conducted by Kentucky, New York, California, Nebraska, Minnesota, Pennsylvania, Tennessee, Delaware, West Virginia, Connecticut, Rhode Island, Iowa, South Dakota, Missouri, Wyoming, and Oklahoma. The Mississippi Valley Origin-Destination Study is a prime example of a multistate screenline roadside survey. It was conducted by Illinois, Iowa, Kansas, Michigan, Missouri, Nebraska, South Dakota, and Wisconsin. Pennsylvania has also conducted a statewide screenline survey.

Selected roadside surveys which have been undertaken for statewide transportation planning are described below.

URBAN CORDON SURVEYS

The Minnesota Department of Highways conducted a statewide roadside travel survey program in 1966.¹ The surveys were undertaken primarily to provide travel data for bypass studies and, secondly, to develop a statewide highway travel simulation methodology. The surveys were intended to obtain travel information on motorists traveling the state's trunk highways.

The survey program was a combination of cordon surveys around selected urban areas and recreation areas and a stateline cordon survey. Initially, 52 urban areas and one recreation area were selected as cordon survey locations. These areas included urban areas and selected towns having more than 5,000 residents. The actual number of cordon survey locations was reduced to 42 because urban cordon survey data were collected for 10 urban areas in the period 1963 to 1965. The stateline cordon survey was conducted on 41 trunk highways crossing the state border (see Map B-1 for survey locations). Interviews were conducted at a total of 195 stations.

Standard roadside survey procedures were used to conduct the urban and stateline cordon surveys which were undertaken during the summer of 1966. The surveys included weekday travel, and outbound vehicles crossing each cordon line were interviewed.

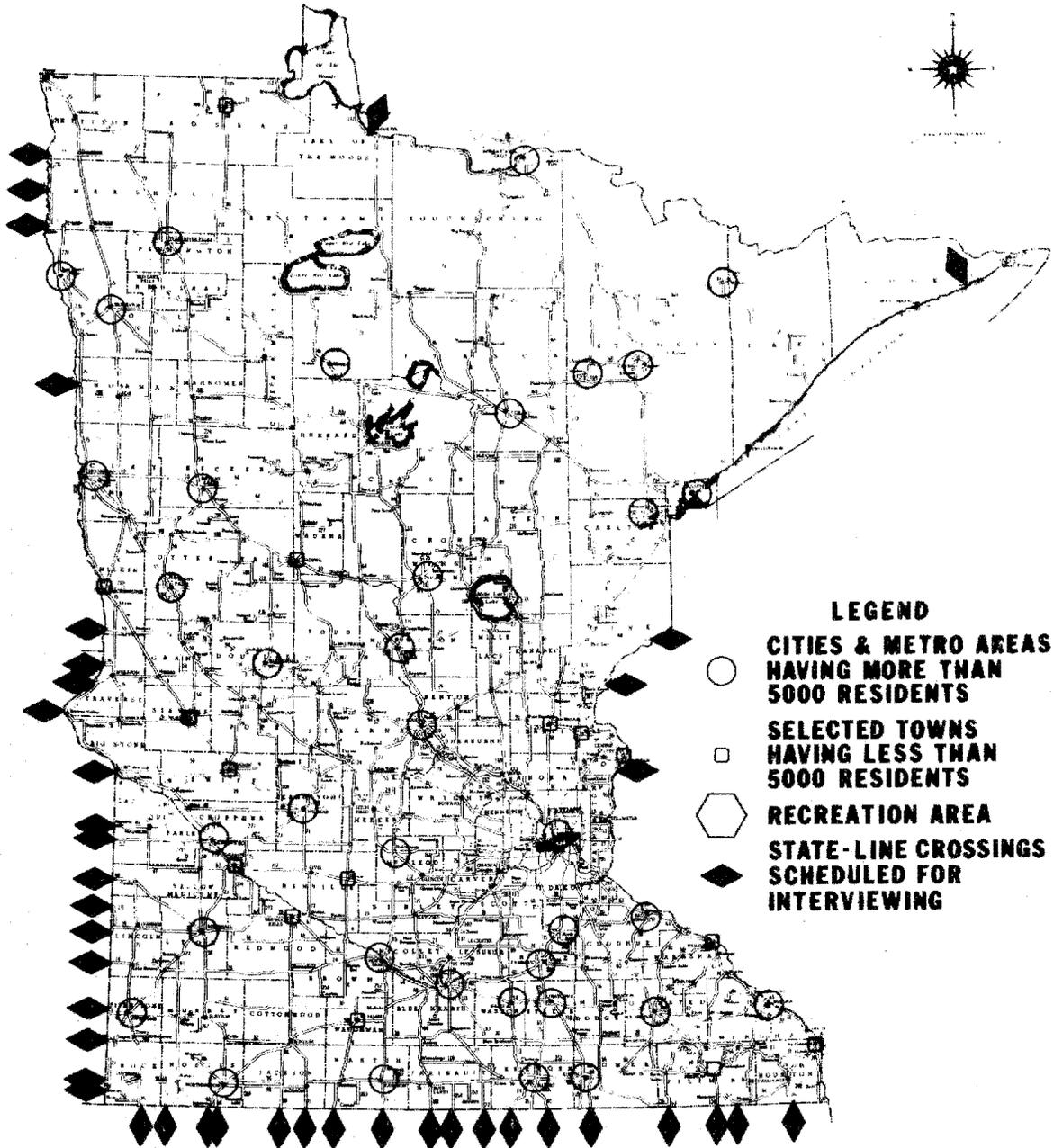
Interviews were conducted over a 14 hour survey period. The number of interviewers assigned to each survey station was based on the intent to interview 20 percent of peak hour traffic and 25 percent of daily traffic. Interviews at each survey station were conducted in two shifts, with each shift generally scheduled at least 5 weeks apart and on different days of the week. A minimum of two and a maximum of six interviews were assigned to each survey station. In those instances where eight or more interviewers were required, interviews were conducted in both directions on the highway facility.

The roadside surveys were supervised by engineers in the Minnesota Highway Department's district offices. The engineers participated in a 3 day training seminar prior to initiating the survey.

An optic sense survey form was used in the survey (see Exhibit B-1). The optic sense form offers the potential to reduce the staff

¹MDH, Minnesota Statewide Origin-Destination Study Interim Report (January 1970).

CITIES, METRO AREAS & STATE-LINE CROSSINGS SCHEDULED FOR INTERVIEWING



time between the completion of the survey and the beginning of the analysis. The optic sense forms were completed and verified in the field. Since keypunching was unnecessary, the normal 3 percent error in this operation was eliminated. Department officials noted that they encountered administrative problems in obtaining an adequate supply of such forms during the survey. Competitive bidding was required to purchase the optic sense forms, but only one supplier produced forms that worked satisfactorily with available optic sense equipment.

In addition to Minnesota, many other states have made extensive use of urban cordon survey data for statewide transportation planning. Nebraska, Michigan, and Georgia have used urban cordon travel data in the development of state highway travel simulation methodologies. Michigan, New York, Wisconsin, and other states have used such information to estimate automobile travel volumes between selected city pairs, a use found frequently in the context of intercity multimodal planning studies. Such uses generally require trip purpose data which may not be collected under guidelines for urban cordon travel surveys.¹ For statewide transportation planning it is important that urban cordon surveys collect and code consistent trip purposes and identifiable traffic analysis zones external to the city but internal to the state.

ROADSIDE SURVEYS IN MAJOR TRAVEL CORRIDORS

Northeast Corridor Project

A major roadside survey project was conducted in the northeast region of the nation in 1969 as part of the Northeast Corridor (NEC) Project. The roadside survey was designed and carried out in conjunction with on-board air, rail, and bus passenger surveys in the corridor. The objective of the NEC Project travel survey program was "to provide reliable data for use in calibrating travel models developed by the U. S. Department of Transportation during earlier phases of the Northeast Corridor Project."² Specifically, the volume of travel and the characteristics of travel by mode between 19 city pairs in the NEC were to be determined from the multimodal surveys.

¹Urban Origin-Destination Surveys, Federal Highway Administration, 1973, p. 83.

²A. M. Voorhees and Associates, Inc., The Northeast Corridor Intercity Travel Survey (March 1971).

To meet this objective, a multimodal travel survey design was developed to yield travel information by mode having equal coefficients of variation subject to an analysis of the estimated unit cost of obtaining each modal sample.

Based on the multimodal survey design,¹ approximately 128,000 interviews of auto drivers were to be conducted along two screenlines within the NEC (see Map B-2). Interview stations were located on major routes potentially carrying large volumes of long trips. Traffic on highways carrying local trips was not surveyed because the cost of such surveys could not be justified.

Approximately two-thirds of the required 128,000 interviews were allocated to the northern screenline. This allocation was based on the estimated volume of intercity auto travel crossing each screenline. The samples allocated to each screenline were further allocated by route also on the basis of estimated intercity auto trips by route.

Roadside interview and mail-back survey procedures were employed in the auto driver survey. On major highways along each screenline, drivers were interviewed concerning trip origin, destination, and purpose. Each sampled driver was also asked to complete and return a mail-back questionnaire designed to collect additional information concerning the surveyed trip (see Exhibit B-2). On routes primarily used by local traffic, mail-back questionnaires were issued to each driver sampled. At selected roadside stations a combination of partial and full mail-back questionnaires were used.

The roadside survey was conducted between October 16 and November 21, 1969. Major interview stations were generally operated over a several day period covering weekday and weekend travel. Weekend travel was collected to provide a basis for expanding the survey to annual volumes. Stations on lower volume routes were generally operated for a 16 hour period which included the heaviest periods of traffic volumes. Weekend and holiday travel and travel generated by special events were not surveyed at the stations on the lower volume routes. Generally, traffic was sampled in only one direction at each survey station, although traffic was interviewed in both directions at selected stations.

¹A detailed discussion of the multimodal survey design is presented in subsequent parts of Appendix B.

A standard roadside survey crew consisted of:

- . one crew chief;
- . one field editor;
- . one to two traffic recorders;
- . one to three traffic police; and
- . varying numbers of interviewers, based on number of lanes, traffic volume, and site configuration at each station.

An additional person was assigned to a survey crew at a night station to maintain and operate required lighting. Training sessions were conducted for all survey personnel.

The required number of completed interviews was not obtained in the roadside survey. Several factors contributed to this situation, including lower traffic volumes than expected on certain routes, insufficient qualified interviewers, and inclement weather during the survey period.

The lack of qualified interviewers was a particular problem in the survey. Because of the time restrictions on the survey program, the consultant responsible for the survey used local employment agencies to hire interviewers; however, this procedure for hiring survey personnel was not considered successful.

Traffic delays caused by the roadside interviews were a problem, particularly along the northern screenline. Travelers, particularly commuters, grew increasingly impatient because of travel delays and repeated requests to complete a mail-back questionnaire. The resistance of commuters to repeated interviewers threatened the representativeness of the sample. Because of these problems, survey stations on I-95 and Connecticut Route 15 were moved south to the Connecticut-New York border at the request of toll authorities.

A 36 percent response rate was obtained for the mail-back survey which supplemented the roadside interview, while only 23 percent of the full mail-back questionnaires were returned. At locations where some interviewing was conducted (i. e., partial mail-backs in combination with full mail-backs), response rates were generally higher than at those locations where no interviews were conducted.

Based on the survey report, an average of 3.5 minutes was required to queue and interview a platoon of cars, including entry and egress movements, with interviews consuming approximately 2.5 to 3 minutes of this period.

Based on the roadside survey report,¹ the following recommendations were formulated for conducting future roadside surveys:

1. Assure that the project staff and budget include sufficient resources to provide adequate field supervision at the supervisor and crew chief levels.
2. Provide sufficient budget to provide for thorough field control and editing of interviews and classification counts. This requires a full time field editor for each crew at each interview location.
3. Carefully screen all interviewers prior to training them (whether they are hired directly or through an agency). Personal cleanliness, appearance, and a pleasant attitude are important to the success of the survey, and these attributes should not be compromised.
4. Employ female interviewers whenever conditions permit.
5. Weather has an important influence on crew efficiency. If a large sample is needed, conduct the survey in good weather, or include sufficient time and costs in the budget to account for lower efficiency.
6. Assure that the contract provides sufficient time and resources for adequate training of field editors and crew chiefs.

Federal Railroad Administration Study

A second study which used roadside survey procedures to collect data on auto trips in major travel corridors is the Study of the Potential for Improved Rail Advanced Vehicle Service² conducted by the Federal Railroad Administration (FRA).

¹A. M. Voorhees and Associates, Inc., The NEC Survey (March 1971).

²Wilbur Smith and Associates, A Study of the Potential for Improved Rail Advanced Vehicle Service: Highway Analysis, prepared for the Federal Railroad Administration (September 1973).

In this study, roadside surveys were conducted at one interview station in each of the following travel corridors:

- . Chicago-St. Louis;
- . Chicago-Minneapolis-St. Paul;
- . Seattle-Portland; and
- . New York-Miami.

The survey was designed to obtain information on "qualified trips" in each corridor. Qualified trips were defined as follows:

1. The trip must have its origin and destination in one of the qualified city pairs in each corridor.
2. The tripmaker's residence must be the origin or destination of his trip.
3. No intermediate stop could be made or planned for a purpose other than meals, lodging, or auto repairs.

A sample of auto trips was interviewed at each station. The information requested of each auto driver included trip origin and destination, trip purpose, vehicle type, auto occupancy, and planned intermediate stops. Based on the driver's response, the interviewer determined if the traveler was a "qualified traveler." Drivers making "qualified trips" were asked to complete a postage paid mail-back questionnaire. The mail-back questionnaire was designed to obtain additional trip information, the socioeconomic characteristics of the traveler and his household, and the attitudes of the tripmaker regarding travel by alternative forms of intercity transportation. Two different questionnaires were used in short corridors, and five different questionnaires were distributed in long travel corridors (see Exhibit B-3).

STATELINE CORDON SURVEYS

California, Kentucky, New York, and Oklahoma, among other states, have conducted stateline cordon surveys using standard roadside survey procedures. The characteristics of the stateline cordon surveys performed by these states are presented in Table B-1.

TABLE B-1

CHARACTERISTICS OF STATELINE CORDON SURVEY

State	Year of Survey	No. of Stations	Percent of Cordon Traffic Intercepted at Survey Stations	Interview Rate	Interview Period	Interview Direction	Survey Day
California*	1970	15 (6 previously surveyed)	97	N. A.	16 hours	Inbound	Weekday Weekend day also on major routes
Kentucky	1968-1971	50 (22 previously surveyed)	95	25-30% on high-volume routes; 100% on low-volume routes	4 hours on low-volume route; up to 24 hours on high-volume routes	Inbound and Outbound	Weekday
New York	1970	40#	47 (on weekday) 33 (on weekend day)	20% (Inbound) 21% (Outbound)	12.5 hours	Inbound and Outbound	Weekday for 39 stations; Weekend day for 18 stations
Oklahoma	1968	15	N. A.	72%	16 hours	Inbound and Outbound	Weekday

* Interviewed out-of-state vehicles and all trucks; recorded license numbers of California vehicles.

Thirty-nine stations were surveyed during weekdays and 18 stations were surveyed on weekend days.

California

The California stateline cordon survey was conducted in the summer of 1970 at 15 of the 45 roads crossing the state border (see Map B-3).¹

Data on crossing the state border were available for six additional stations from urban transportation study data files. The average daily traffic (ADT) intercepted at these 21 stations represented an estimated 97 percent of the ADT crossing the California border in 1970.

Out-of-state vehicles and all trucks entering the state through the survey stations were interviewed. The license numbers of all California vehicles passing through the station were recorded. The roadside survey was conducted over a 16 hour period. Sampling was conducted during different hours during different weekdays to develop a 16 hour survey period. A similar sampling approach was used on high traffic volume routes to obtain weekend travel information. Weekday interviews were conducted on low volume traffic routes. The 16 hour survey period generally represented the dawn to dusk period.

Directional hourly manual classification counts and directional hourly mechanical traffic recorder counts were taken during the interview period. The questionnaire used in the survey is presented as Exhibit B-4.

The files of the California Department of Motor Vehicles, in conjunction with the license plate numbers collected for California vehicles, were used to determine the addresses of the vehicle owners. This address was assumed to be the location of the vehicle's destination within the state.

¹ California Department of Public Works, Division of Highways, 1966 Base Year Calibration Report - California Statewide Transportation Study (May 1971).

LOCATION OF CALIFORNIA STATELINE ROADSIDE STATIONS, CALIFORNIA STATELINE CORDON SURVEY

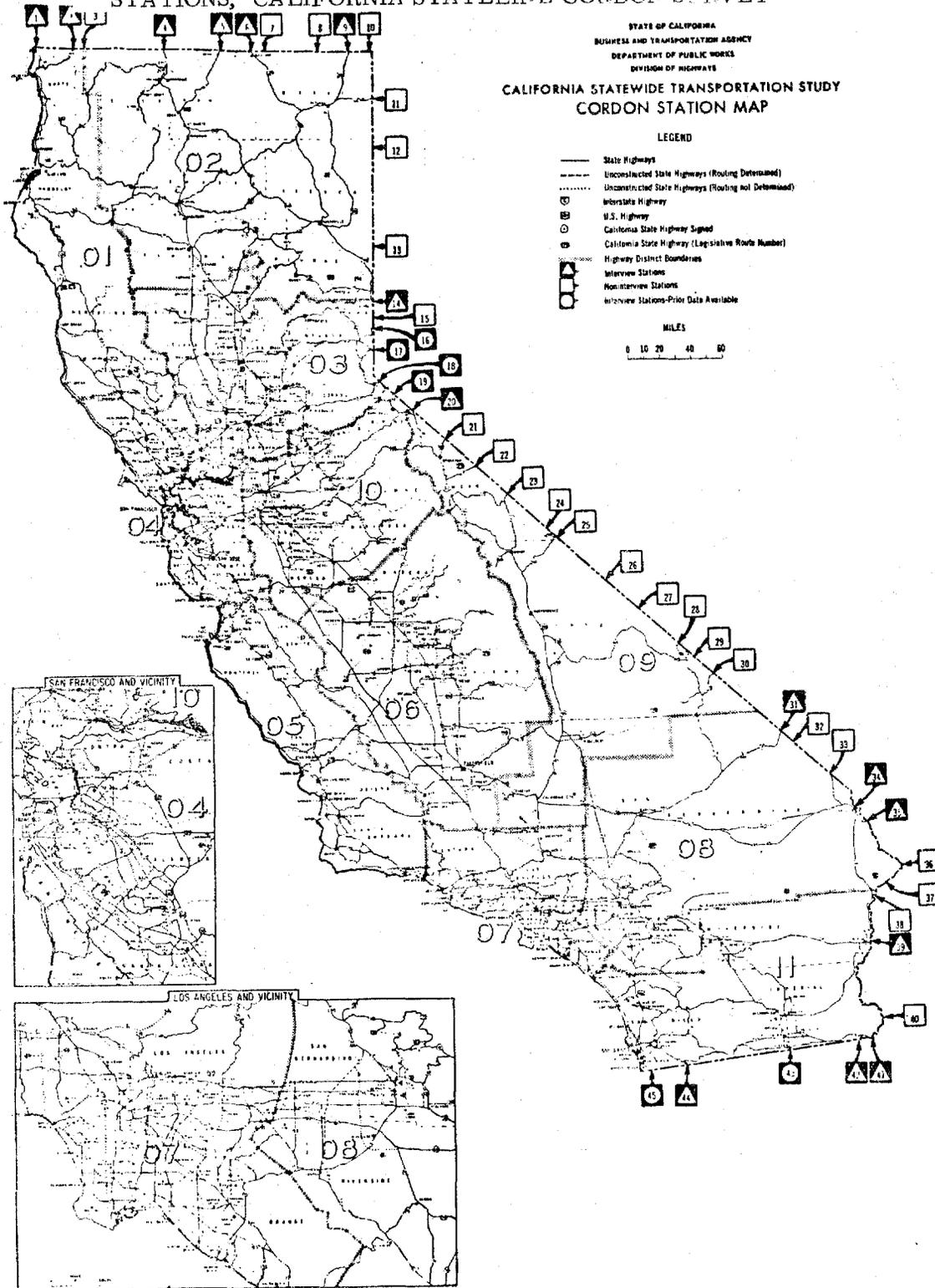


EXHIBIT B-4

QUESTIONNAIRE FOR CALIFORNIA STATELINE CORDON SURVEY

STATION

N	S	E	W
1	2	3	4

STATEWIDE TRANSPORTATION STUDY
ROADSIDE INTERVIEW FORM

SERIAL _____

DATE _____

RECORDER _____

HOUR BEGINNING 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

B.16

(1) Line No.	(2) Total Number in Vehicle Including Driver	(3) Type of Vehicle	(4) Autos and Pickups WHERE DO YOU LIVE? (External City and State) Trucks: WHERE IS HOME BASE FOR THIS VEH.? (Place Normally Garaged)(City & State)	(5) WHERE WAS YOUR LAST STOP? (External City and State) (a)	(6) PURPOSE OF TRIP In Col. 5	(7) WHAT IS YOUR FUTURE MOST DESTINATION? (California City or Place Name) (b)
1.	1	A			A	
	2	P			J	
	3	2			K	
	4	2D			L	
	5	3			M	
	6	4			P	
	7	5			T	
	8	6		X		X
	9 or more	6		X		X
2.	1	A			A	
	2	P			J	
	3	2			K	
	4	2D			L	
	5	3			M	
	6	4			P	
	7	5			T	
	8	6		X		X
	9 or more	6		X		X
3.	1	A			A	
	2	P			J	
	3	2			K	
	4	2D			L	
	5	3			M	
	6	4			P	
	7	5			T	
	8	6		X		X
	9 or more	6		X		X

FORM H-UP-2014(MAY 70)

(a) Can be California Locations for certain stations near Lake Tahoe.

(b) Can be other States for certain stations near Lake Tahoe.

Kentucky

The Kentucky Department of Transportation conducted both internal roadside surveys in major travel corridors and a stateline cordon survey as part of its statewide transportation planning program. The objective of the stateline cordon survey was "to collect data necessary for the development of a file of travel characteristics for traffic entering, leaving, and passing through Kentucky."¹

The objective of the internal roadside survey was "to collect data necessary for the development of a travel characteristics file for traffic on highways in major transportation corridors. . . ."² These data items were used as checks for simulated trip frequency distribution and trip destination.

The stateline cordon survey was conducted over the period 1968 to 1971. Roadside interviews were performed at 50 of the 128 roads crossing the cordon line.

The stateline cordon was actually established around certain urban areas located on the Commonwealth border rather than along the state line. This was done to avoid causing major travel delays and congestion resulting from interviewing within the urban areas.

Roadside origin-destination data were available from previous surveys for an additional 22 routes crossing the cordon line. An estimated 96 percent of the average daily traffic crossing the cordon line was intercepted at the 72 stations for which survey data are available. Tennessee and Kentucky officials jointly undertook the roadside surveys on highways crossing their common border.

Approximately 25 to 30 percent of the vehicles passing through high volume stations were interviewed each hour, and a 100 percent sample was obtained on low volume facilities. Interviews were conducted for 4, 8, 12, 16, or 24 hours, depending upon a highway's traffic volume and its functional classification. Traffic moving in each direction was interviewed at all stations except those located on one-way facilities. Only weekday travel was surveyed in the stateline cordon survey.

¹ H. Bennett and A.M. Taqui, Roadside Origin-Destination Travel Survey Data - Technical Report No. 2 - Kentucky Statewide Traffic Model Study, Kentucky Department of Transportation (December 1974).

² Ibid.

EXHIBIT B-5

QUESTIONNAIRE FOR KENTUCKY STATELINE CORDON SURVEY
 STATE LINE ORIGIN AND DESTINATION SURVEY
 ROADSIDE INTERVIEW TRIP REPORT

INTERVIEWER _____

Card No. 1 2 3 Station Location _____ DIRECTION 1. INBOUND (TO KENTUCKY) 2. OUTBOUND (FROM KENTUCKY) Year _____
 Month _____ Date _____ Weekday _____ Time _____

A				B				C				D				E				F				G				H																							
Sample No				Vehicle Type				Number in Vehicle				Where did this trip begin				Where will this trip end				TRIP PURPOSE				Where is Vehicle Garaged				Ask of thru. trips only.																							
								ADDRESS				ADDRESS				From To				Address				INTERMEDIATE STOP				STATE LINE CROSSINGS																							
																								Location				PURPOSE				Entrance Route				Exit Route															
21 22 23 24				25 26 27 28				29 30 31 32 33 34				37 38 39 40 41 42				45 46				47 48 49 50 51 52				55 56 57 58 59 60				61 62 63 64 65 66 67 68 69 70 71																							

B.18

- | | | | | | |
|---------------------------------|--------------------------------|----------------------|--------------------|----------------------|--------------------|
| 0 - Passenger Car - Kentucky | 6 - 3-Axle, Single Unit | 0. HOME | 5. SOCIAL | 0. OVERNIGHT | 5. SOCIAL |
| 2 - Passenger Car - Other State | 7 - Bus | 1. WORK | 6. SCHOOL | 1. WORK | 6. SCHOOL |
| 3 - Pick-up or Panel | 8 - Taxi | 2. SHOP | 7. EAT MEAL | 2. SHOP | 7. EAT MEAL |
| 4 - 2-Axle, Single Tire | 9 - Tractor Truck Semi-Trailer | 3. PERSONAL BUSINESS | 8. SERVE PASSENGER | 3. PERSONAL BUSINESS | 8. SERVE PASSENGER |
| 5 - 2-Axle, Dual Tire | | 4. RECREATION | | 4. RECREATION | 9. GAS OR OIL |

The information collected in the stateline cordon survey included trip origin and destination, trip purpose at origin and destination, location where vehicle is garaged, vehicle type, and auto occupancy. Drivers passing through the Commonwealth were also asked to identify locations of intermediate stops and routes used to enter and leave the Commonwealth (see Exhibit B-5 for questionnaire).

The internal roadside survey was conducted at 20 locations in major travel corridors. Standard roadside survey procedures were used in the internal survey. The same information collected in the stateline cordon survey was obtained in the internal survey. The field survey procedures (i. e., survey duration, sampling rates) used in the internal survey were similar to those used in the stateline cordon survey.

The Kentucky Department of Transportation also conducted a series of traffic and vehicle classification counts along nine screenlines established in the Commonwealth. The counts compiled traffic data which could be used to check the trip distribution and assignment model output of Kentucky's highway travel forecasting procedures. Seven day counts were scheduled on all roads crossing the screenlines except those having an ADT less than 50 vehicles per day or those routes not on the state highway system. Because of equipment problems and time constraints on the survey, it was not possible to collect seven day counts at all scheduled locations.

New York

The New York State Department of Transportation conducted a state-line cordon survey during the summer of 1950 in 53 "upstate" counties (see Map A-1).¹ This survey was performed in conjunction with the statewide telephone survey performed by NYSDOT in 1970. The stateline cordon survey was undertaken to identify the travel behavior of nonstate residents within the state.

Roadside surveys were conducted at 40 of the 418 routes crossing the state border. Thirty-nine stations were operated on weekdays, and 18 of these stations were operated on a weekend. The interview locations were selected by rank ordering highways on the basis of their traffic volumes and then selecting individual routes for interviewing such that the resources available for 75 interview station days of operation would not be exceeded.

¹NYSDOT, Stateline Cordon Survey - Preliminary Survey Report, Preliminary Data Services Report No. 6 (January 1971).

EXHIBIT B-6: SURVEY FORM FOR NEW YORK CORDON LINE SURVEY

INBOUND TRAFFIC NEW YORK STATE DEPARTMENT OF TRANSPORTATION STATELINE O&D SURVEY

STATION NO. HOUR BEGINNING DIRECTION TRAVEL DAY CODE

SERIAL No. VEHICLE TYPE VEHICLE OCCUPANCY LICENSE PLATE STATE FACTOR

O R I G I N	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	WHAT KIND OF ESTABLISHMENT IS THAT	FREQ. OF TRIP	CAR DRIVER RESIDENCE OR TRUCK BASE
	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN			
	STATE	STATE	STATE			
	PURPOSE	PURPOSE	PURPOSE			

D I S T I N A T I O N	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	WHAT KIND OF ESTABLISHMENT IS THAT	WHERE WILL YOU LEAVE NYS	F OUT OF STATE VEHICLE HOW MANY NIGHTS IN NYS
	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN			
	STATE	STATE	STATE			
	PURPOSE	PURPOSE	PURPOSE			

SERIAL No. VEHICLE TYPE VEHICLE OCCUPANCY LICENSE PLATE STATE FACTOR

O R I G I N	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	WHAT KIND OF ESTABLISHMENT IS THAT	FREQ. OF TRIP	CAR DRIVER RESIDENCE OR TRUCK BASE
	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN			
	STATE	STATE	STATE			
	PURPOSE	PURPOSE	PURPOSE			

D I S T I N A T I O N	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	WHAT KIND OF ESTABLISHMENT IS THAT	WHERE WILL YOU LEAVE NYS	F OUT OF STATE VEHICLE HOW MANY NIGHTS IN NYS
	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN			
	STATE	STATE	STATE			
	PURPOSE	PURPOSE	PURPOSE			

SERIAL No. VEHICLE TYPE VEHICLE OCCUPANCY LICENSE PLATE STATE FACTOR

O R I G I N	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	WHAT KIND OF ESTABLISHMENT IS THAT	FREQ. OF TRIP	CAR DRIVER RESIDENCE OR TRUCK BASE
	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN			
	STATE	STATE	STATE			
	PURPOSE	PURPOSE	PURPOSE			

D I S T I N A T I O N	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	ESTABLISHMENT-STREET ADDRESS	WHAT KIND OF ESTABLISHMENT IS THAT	WHERE WILL YOU LEAVE NYS	F OUT OF STATE VEHICLE HOW MANY NIGHTS IN NYS
	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN	CITY-VILLAGE-TOWN			
	STATE	STATE	STATE			
	PURPOSE	PURPOSE	PURPOSE			

- | | | | | |
|---|--|---|--|--|
| <p>NEW YORK STATE</p> <p>FD Pass. Car
 F1 Pass. Car w/boat trailer
 F2 Pass. Car w/house trailer
 F3 Campo. (self contained)
 F4 Pass. Car w/other trailer</p> <p>OUT OF STATE</p> <p>OD Pass. Car
 O1 Pass. Car w/boat trailer
 O2 Pass. Car w/house trailer
 O3 Campo. (self contained)
 O4 Pass. Car w/other trailer</p> <p>TEM 619 (4/70)</p> | <p>TRUCKS</p> <p>20 2- axle
 30 3- axle
 40 4- axle
 D0 D- axle
 T0 Truck w/trailer
 C0 Combination</p> | <p>AUTO</p> <p>1 Home
 21 Work
 22 Business
 23 Shop
 4 School
 51 Social-visit friends,relat.
 52 Social-other
 6 Recreation
 7 Personal Business
 8 Servs. Passenger
 9 Change Mode
 99 Rest Stop (tol, gas, sleep)
 0 Eat Meal
 X Other</p> | <p>O AND D TRIP PURPOSE</p> <p>61 Picnic
 62 Swim
 63 Boating
 64 Golfing
 65 Fishing
 66 Camping
 67 Sight seeing
 68 Vaccation
 69 Attend Sport Event</p> | <p>TRUCK</p> <p>1 Retail (Pick up and Del)
 2 Wholesale (Pick up and Del)
 3 To and From Construction site
 4 Service (Maintenance and Repair)
 5 Garage Address and Base of Op.
 6 Garage Address Only
 7 Base of Operations Only
 8 Personal Business
 9 Household Mover
 0 Other</p> |
|---|--|---|--|--|

The weekday stations intercepted 47 percent of the ADT crossing the cordon line in 1970. Thirty-three percent of the 1970 ADT crossing the cordon line was intercepted at the weekend stations. Both inbound and outbound vehicles were interviewed in the survey. Interviews were conducted over a 12.5 hour period at the cordonline stations. Approximately 75 interviewers were hired for the survey.

The data collection during the survey included trip origin and destination, trip purpose, travel generating activity at the origin and destination of the trip, residence of the driver, and number of nights non-residents spent in the state (see Exhibit B-6 for survey form).

An estimated 20 percent of the inbound traffic and 21 percent of the outbound traffic passing through the station was interviewed. On certain high volume routes, only 5 to 12 percent of the vehicles passing through the stations during the peak travel hours were interviewed. Approximately 1,170 interviews were conducted per survey station day.

Oklahoma

The Oklahoma Department of Highways conducted a stateline origin-destination survey in 1968. The purpose of the survey was to determine the volume and characteristics of travel on 15 major highways crossing the Oklahoma border.

Standard roadside survey procedures were used in the survey. Weekday interviews were conducted over a 16 hour period from 6 A.M. to 10 P.M. at each station. Vehicle classification counts were conducted for the entire survey day (i. e., 24 hours), and traffic counts were made for a seven day period at each station.

An estimated 72 percent of the vehicles passing through the survey stations were interviewed.

Oklahoma also conducted a tourism survey in the summer of 1968. Questionnaires were distributed to out-of-state travelers at survey stations on major travel routes crossing the state's border. Approximately 21 percent of the 12,590 forms distributed were returned.

STATEWIDE SCREENLINE SURVEYS

The Mississippi Valley Origin-Destination (MVOD) Study¹ and the Pennsylvania Statewide Origin and Destination Study² are examples of

¹E. H. Holmes, Bureau of Public Roads, Mississippi Valley Origin-Destination Study: Summary Report, a circular memorandum to regional and division engineers (January 29, 1965).

²Edwards and Kelcey, Engineers and Consultants, Statewide Origin and Destination Study, prepared for the Commonwealth of Pennsylvania (July 1966).

large scale statewide screenline surveys.

The MVOD was a multistate screenline survey undertaken by Illinois, Iowa, Kansas, Michigan, Missouri, Nebraska, South Dakota, and Wisconsin in 1959 and 1960. The objective of the survey was to identify statewide and interstate travel patterns of the participating states.

Survey screenlines were established in each state at 1/10 degree of latitude and longitude. Map B-4 illustrates the location of the screenlines in Wisconsin. Interview stations were established on major highways (principally on the state's primary system) along each screenline. The number of interview stations along a screenline was based on intercepting a minimum of 80 percent of the traffic.

The screenline surveys were performed from June through September in 1959 and/or in 1960, depending on the state. Weekday surveys were conducted in all eight states, and one state also conducted weekend interviews. Traffic crossing the screenline in both directions was interviewed. The interview stations were operated for periods of 8, 12, 16 or 24 hours, depending upon the importance of the highway and its traffic volume. The number of survey personnel assigned to a station was based on being able to interview a minimum of 25 percent of the peak hour traffic except on the highest volume routes.

The data collected in the survey included trip origin and destination, trip purpose, vehicle type, and location where vehicle is garaged. The origin and destination locations of each trip were coded using a political unit code as well as a geographic code locating each trip end to the nearest 1/10 degree of latitude and longitude.

Although the states participating in the MVOD study cited many uses of the survey data, a number of problems with the survey data were encountered. A major problem was that short trips not crossing a screenline were not surveyed. The coding of trip ends to 1/10 degree latitude or longitude located trip ends within an accuracy range of 6 to 7 miles. Problems were also encountered in factoring trips which crossed more than one screenline.

The Pennsylvania Department of Transportation (formerly the Department of Highways) conducted a statewide screenline survey during 1962 and 1963.¹ The survey was performed to develop a current travel data base for projecting travel in major corridors in the Commonwealth and for developing highway planning travel forecasting procedures. The 1962-1963 survey was also intended to update the Department's 1957-1959 roadside survey, which included 300,000 roadside interviews.

¹Edwards and Kelcey, op. cit.

The survey was actually a combination of an internal screenline and a stateline origin-destination survey. A total of 10 screenlines was established for the survey. Three of the screenlines intercepted east-west traffic; two screenlines intercepted north-south traffic in the Commonwealth; one screenline represented the interchanges on the Pennsylvania Turnpike; and the remaining four screenlines intercepted traffic crossing each of Pennsylvania's four borders.

Roadside interviews were conducted at 292 locations in the Commonwealth, with approximately 130 of these stations located along the stateline. Interviews were conducted for either 16 or 24 hours, and traffic was interviewed in only one direction through each station.

Standard roadside interview procedures were applied in the survey. A total of approximately 500,000 interviews was obtained in the survey.

LICENSE PLATE SURVEYS

License plate survey procedures are an alternative to conducting roadside interviews at locations where speed, volume of traffic, or site geometrics make it unsafe or infeasible to stop and interview travelers. Such procedures also can be used after dark under certain conditions.

The recording of license plate numbers in a roadside survey can be accomplished:¹

- . manually;
- . by tape recorder;
- . by touch tone key input to a tape cassette;
- . by photography; and
- . by a closed circuit television system.

¹Comsis Corporation, Traffic Characteristics Measurement Using License Matching Techniques, prepared for Federal Highway Administration (1974). A summary of the report appears in the October 1975 issue, Traffic Engineering.

License plate numbers are then matched against a computerized motor vehicle registration file to identify the address of the vehicle owner. The computer program, LICMATCH, which was developed for FHWA, matches license plate numbers and produces summary tables.

In selected studies, a mail questionnaire would be sent to each sample vehicle owner, requesting information on the observed trip and socioeconomic characteristics of the vehicle owner. In such a survey, the license plate survey actually represents the sample selection process for conducting a mail survey. The address of the vehicle owner is sometimes assumed to be either the origin or destination of trips sampled in license plate surveys. Selected examples of the use of license plate surveys are discussed below.

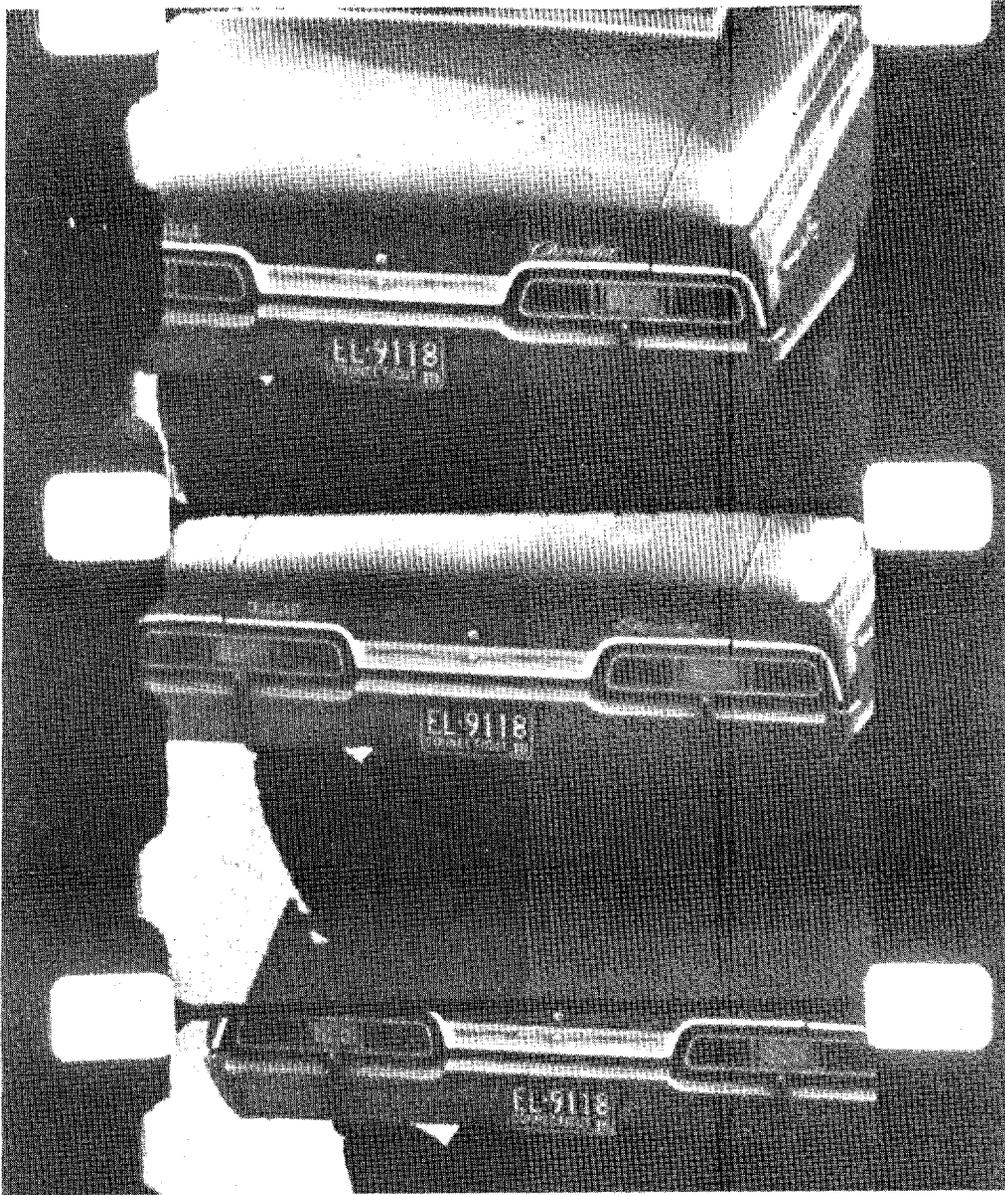
The California stateline survey involved the manual recording of California license plate numbers and automatic lookup of home addresses to determine the destination of California vehicles inbound to the state (see the previous description of the California survey). Likewise, some statewide recreation travel surveys involved the manual recording to license plate numbers at the recreational sites and subsequent lookup of home addresses of in-state vehicles and determination of county and state of residence of out-of-state vehicles (see the description of the 1970 Kentucky recreation travel survey in this section).

Two photo license plate surveys were carried out by FHWA in 1968. In January 1968 such a survey was conducted at four locations in the Boston metropolitan area. Exhibit B-7 provides an example of a license plate photographed on movie film. The automated vehicle registration file in Massachusetts provided rapid and inexpensive lookup of vehicle owners and addresses for the printing of gummed labels. Of the 4,428 license plate numbers obtained, 4,130 or (93.3 percent) were matched. The remaining license numbers were unmatched due to errors in keypunching or to a small lag in updating the vehicle registration file. Of the 4,130 questionnaires sent out, 65 percent were returned, and 60 percent were usable. Approximately 300 vehicles registered in each of the seven states adjoining Massachusetts were also sampled in this study. The addresses of the owners of these vehicles were obtained from each state. The response rates for questionnaires sent to out-of-state vehicle owners were similar to those previously noted.

In August 1968, a photo license plate survey station was located on Interstate 70 in Kansas. Cameras used in this survey were equipped with electronic switches that exposed one frame of film as a vehicle passed the road tube. The names and addresses of vehicle owners who were sampled at the roadside station were printed on the mail

EXHIBIT B-7

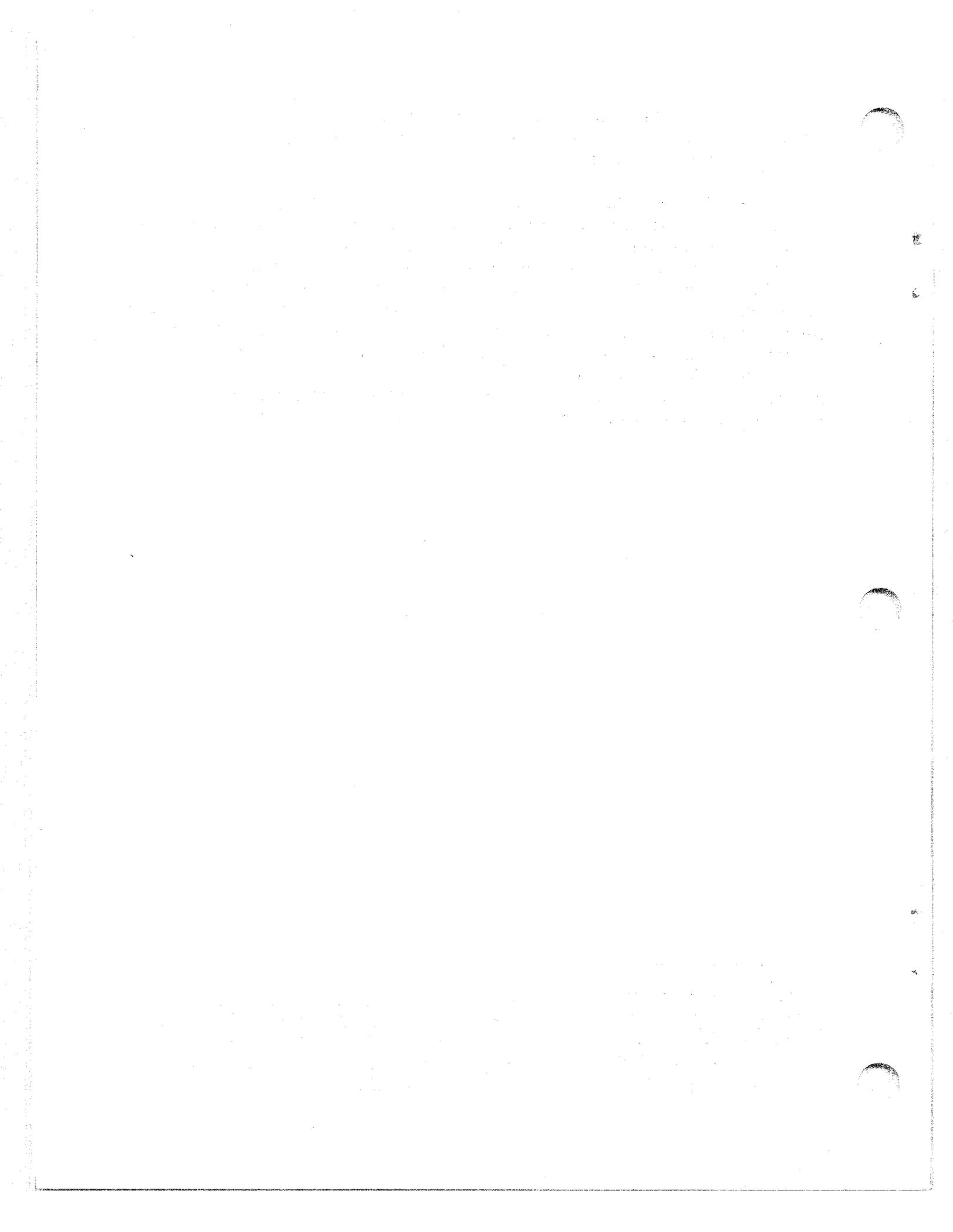
LICENSE PLATE PHOTOGRAPHED ON MOVIE FILM



questionnaire, using computerized procedures. In the Kansas survey 1,815 questionnaires were sent out, 69.1 percent were returned, and 63.5 percent were usable.

In 1971-1972, the Rhode Island Department of Transportation updated its internal and stateline roadside surveys.¹ License plate surveys were used at 35 stateline survey locations to sample 20 percent of both inbound and outbound traffic. The consultant used cassette tape recorders where the ADT was under 8,000 vehicles and a closed circuit television system where the ADT was over 8,000 vehicles. A total of 15,590 questionnaires were distributed; 10,409 were returned; and 6,400 (or 41 percent) were usable. The usable response rates in adjoining states were, respectively: Connecticut, 38 percent; Massachusetts, 28 percent; and New York, 28 percent. The survey cost was \$15.30 per usable questionnaire. The low response rate was partly attributed to the design of the questionnaire.

¹Rhode Island Department of Transportation, External Cordon Survey Report for the 1971-1972 Rhode Island Origin-Destination Update Study, Technical Paper No. 53, Rhode Island Statewide Planning Program (April 1975) and Allison, Inc., Rhode Island Department of Transportation Statewide Travel Pattern Update Study, 1971-1972 (1973).



APPENDIX C

MODAL PASSENGER SURVEYS FOR STATEWIDE TRANSPORTATION PLANNING

Surveys of intercity air, rail, and bus passengers have been conducted by many states as part of their statewide transportation planning programs. A variety of travel survey procedures has been used by the states, depending upon the purpose, scope, and the availability of funding for various studies.

Air passenger surveys have been conducted on board the aircraft, in terminal waiting and boarding areas, and by mail-out survey. Michigan, New York, Pennsylvania, California, and Wisconsin, among other states, have conducted air passenger surveys as part of their statewide planning programs. Surveys of intercity rail and bus passengers have generally been conducted as on-board surveys. New York and Wisconsin, for example, have conducted intercity rail passenger surveys, and New York has also performed intercity bus passenger surveys.

Alternative procedures used to survey air, rail, and bus passengers are described below.

AIR PASSENGER SURVEYS

The air passenger surveys discussed in this section include the Northeast Corridor Project surveys, the Pennsylvania Department of Transportation statewide air passenger surveys, and surveys undertaken by the states of Michigan, New York, and Wisconsin. A useful reference supplementing this discussion is the Airport Travel Survey Manual,¹ a comprehensive handbook on air travel survey procedures. This manual presents alternative survey strategies and data collection techniques that are likely to be useful in statewide transportation planning studies.

Northeast Corridor Project Survey

The Northeast Corridor Project's air passenger survey was designed to survey carrier passengers traveling between 13 city pairs in the Corridor.² In addition, a survey of passengers using air taxis was conducted in 14 cities in the Corridor.

¹See page IV. 1 for complete reference.

²A. M. Voorhees and Associates, Inc., The NEC Survey (March 1971).

The air carrier survey was conducted on 14 airlines at 11 terminals in the Corridor. The survey was performed between November 9 and 23, 1969. The air carrier and air taxi passenger surveys were undertaken as part of the multimodal travel survey program to collect data for use in calibrating travel forecasting models for the Northeast Corridor Project.

The air carrier passenger survey was designed as an on-board survey using a self-administered questionnaire which was distributed and collected by stewardesses aboard sampled flights. The sampling frame for the survey included all the flights between 13 city pairs in the Corridor. Flights to be sampled were randomly selected from the sampling frame. A detailed sampling analysis indicated that approximately 13,300 completed interviews were required to produce information at the desired level of reliability.

Although the sampling plan indicated that a minimum of 348 flights was to be surveyed over a 1 week period, the number of surveyed flights was increased to 521 to allow for flights cancelled and flights missed because of administrative problems. The 521 flights represented 14 percent of the weekly flights between the city pairs of interest. The sample of 521 flights was further allocated to specific city pairs based on the estimated passenger volumes carried between specific city pairs.

Consultants conducting the survey worked closely with the airlines in developing survey procedures. For each sampled flight, an envelope was prepared which included a questionnaire and a pencil for each seat on the aircraft. Each envelope contained a label (see Exhibit C-1) requesting the information summarized below:

- . name of airline;
- . flight number;
- . date and time of flight departure;
- . terminal at which the envelopes would be boarded and retrieved; and
- . serial number range of questionnaires enclosed.

Each envelope described the survey briefly and listed instructions for administering it, including a sample announcement to be made aboard the aircraft prior to distributing the questionnaires.

EXHIBIT C-1

ENVELOPE LABEL FOR NEC PROJECT
AIR PASSENGER SURVEY QUESTIONNAIRE

Date _____, 1969

Airline _____ Flight _____ Equipment _____

Scheduled Departure Time _____ From: _____ To: _____

NORTHEAST CORRIDOR INTERCITY TRAVEL SURVEY

ABOUT THIS SURVEY

The U.S. Department of Transportation and the airlines serving the Northeastern United States are cooperating in the conduct of a special intercity travel survey to determine characteristics of passengers traveling between major metropolitan areas. Passengers on this flight are requested to complete questionnaires. The information obtained will be utilized by the Federal and local governments in preparing recommendations for transportation facilities of the future that will more efficiently serve the travelling public.

ENVELOPE CONTENTS

This envelope contains a sufficient number of questionnaires for all passengers, as well as pencils for passengers who may need them.

SURVEY INSTRUCTIONS

1. The following announcement should be made on the public address system as early as possible in the trip just prior to distribution of the questionnaires.

ANNOUNCEMENT

LADIES AND GENTLEMEN-
AIRLINES FLIGHT NO. _____ HAS BEEN SELECTED FOR PARTICIPATION
IN A SURVEY BEING CONDUCTED BY THE U.S. DEPARTMENT OF
TRANSPORTATION. THE INFORMATION COLLECTED BY THIS SURVEY
WILL BE USED TO DETERMINE HOW WE CAN MAKE YOUR FUTURE
TRAVEL MORE CONVENIENT AND ENJOYABLE. YOU WILL NOW BE
GIVEN A QUESTIONNAIRE FORM WHICH SHOULD ONLY TAKE A FEW
MINUTES OF YOUR TIME TO COMPLETE. A STEWARDESS WILL COLLECT
THESE FORMS BEFORE PASSENGERS DEPLANE AT OUR NEXT STOP.
PENCILS ARE AVAILABLE FOR THOSE WHO NEED THEM. THANK YOU!

2. Distribute questionnaires as early as possible.
3. Airline personnel should not complete questionnaires.
4. Collect questionnaires and return them to the envelope.
5. CHECK your flight number, equipment, and today's date against the label information on this envelope. If they are not the same, please enter the current information in the spaces provided at the top of the envelope.

Return this envelope to the Passenger Agent or Station Manager at the next stop.

RETURN INSTRUCTIONS FOR AGENTS AND STATION MANAGERS

THE AGENT RECEIVING THIS ENVELOPE WILL FORWARD IT TO THE
STATION MANAGER OF THIS AIRLINE AT NATIONAL AIRPORT IN
WASHINGTON BY COMPANY MAIL (COMAT). THANK YOU.

The envelopes were shipped to each airline's station manager, who in turn transmitted the survey material to the stewardesses on the sample flight. The consultant conducting the survey also stationed full time survey personnel at Logan (Boston), La Guardia, and Washington National Airports to check that the envelopes had been placed aboard each sampled aircraft prior to departure. Survey personnel also telephoned airline personnel at airports where survey attendants were not stationed to check that the survey material had been placed aboard the sampled flights.

Stewardesses were responsible for distributing and collecting the questionnaires aboard the aircraft and for returning the envelope, including the completed questionnaires, to the airline's station manager, who forwarded the questionnaires to the consultant.

A copy of the questionnaire used in the air passenger survey is shown in Exhibit C-2.

No major problems were encountered in obtaining the required number of completed interviews in the air carrier passenger survey, primarily because of the oversampling of flights. A substantial number of sampled flights were missed in the survey because:

- . station managers did not receive the survey material in time for distribution;
- . stewardesses did not administer the survey (a significant problem on short flights); and
- . conflicts arose with other surveys being conducted by the airlines.

The missed flights were surveyed during the second week of the survey period.

The following recommendations were made by the survey consultant regarding the conduct of future air passenger surveys:²

1. Avoid starting a survey on a weekend or other heavy travel period. Survey crews require at least 1 day to establish a routine and complete their training. This can best be accomplished in the low volume period. Tuesday is a good day to start.

¹A. M. Voorhees and Associates, Inc., The NEC Survey.

²ibid.

QUESTIONNAIRE FOR NEC PROJECT AIR PASSENGER SURVEY



**NORTHEAST CORRIDOR INTERCITY
TRAVEL SURVEY**

The information you provide by completing this questionnaire will assist the U.S. Department of Transportation in development of recommendations for future transportation facilities that will more effectively serve you and other travelers in the Northeastern United States.

- ONLY A FEW MINUTES OF YOUR TIME IS NEEDED
- YOUR NAME OR IDENTIFICATION IS NOT REQUESTED
- YOUR RESPONSES WILL BE KEPT COMPLETELY CONFIDENTIAL AND ANONYMOUS
- A QUESTIONNAIRE SHOULD BE COMPLETED FOR EACH PERSON INCLUDING ANY CHILDREN TRAVELING WITH YOU

Please answer all of the questions in the questionnaire. Airline Survey personnel will request the return of completed questionnaires before the next stop.

THANK YOU!

Bureau of the Budget No. 04-S 69046
Approval Expires June, 1970

EXHIBIT C-2 (Continued)

NOTE: If you are making a round trip today, your answers should refer only to the direction you are traveling now.

1. At what airport did you board this airplane?

_____ airport _____ city _____ state

2. Airline _____
(flight) (number)

Departure Date _____ Time _____
(mo.) (day)

3. How did you get to that airport today?
(please check all that apply)

- another flight:
- taxi
- rented car
- local bus, subway
- private car, parked at airport or other parking lot
- private car, driven away by someone
- train
- long distance bus
- airport limousine, bus
- courtesy car from hotel
- other _____
(please describe)

4. From what address did you begin your ground trip to the airport?

_____ city, town, or post office _____ county _____ state

_____ street address, or nearest intersecting streets

5. Is this your home?

yes no

6. How long did it take you to get from that address to the airport where you boarded this plane?

_____ hours _____ minutes

7. How much did it cost to get from that address to the airport where you boarded this plane?

\$ _____

8. At what airport will you get off this airplane?

_____ airport _____ city _____ state

9. To what address will you go after leaving this plane?

_____ city, town, or post office _____ county _____ state

_____ street address, or nearest intersecting streets

7A. 10. Is this your home?

yes no

11. How do you plan to get to that address when you leave this airplane? (check all that apply)

- another flight:
- taxi
- rented car
- local bus, subway
- private car, parked at airport or other parking lot
- private car, driven to airport by someone
- train
- long-distance bus
- airport limousine, bus
- courtesy car to hotel
- other _____
(please describe)
- don't know

12. How long do you think it will take to get to that address from the airport where you will get off this plane?

_____ hours _____ minutes

13. How much do you think it will cost to get to that address from the airport where you will get off this plane?

\$ _____

EXHIBIT C-2 (Continued)

14. What is your home address, if not already given?

city, town, or post office county state

street address, or nearest intersecting streets

15. What is the main purpose of your trip?

- | | |
|---|---|
| <input type="checkbox"/> business in connection with employment | <input type="checkbox"/> vacation/recreation |
| <input type="checkbox"/> regular trip to work | <input type="checkbox"/> military leave |
| <input type="checkbox"/> shopping | <input type="checkbox"/> military official travel |
| <input type="checkbox"/> personal affairs | <input type="checkbox"/> student travel to or from school |
| <input type="checkbox"/> visit relatives or friends | |
| <input type="checkbox"/> other _____
(please describe) | |

16. How many nights will, or did, you spend away from home on this trip?

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> none (return same day) | <input type="checkbox"/> 4-6 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 7-15 |
| <input type="checkbox"/> 2-3 | <input type="checkbox"/> 16 or more |

17. About how many times, in the last 12 months, have you made a trip between the same two cities as today?

- | | |
|---|-----------------------------------|
| <input type="checkbox"/> never before this time | <input type="checkbox"/> 21-50 |
| <input type="checkbox"/> 1-5 | <input type="checkbox"/> 51-100 |
| <input type="checkbox"/> 6-10 | <input type="checkbox"/> over 100 |
| <input type="checkbox"/> 11-20 | |

18. Is your ticket: one-way round trip

19. What was the cost of your ticket for this plane trip?

\$ _____

20. Are the costs of the trip chargeable as a business expense?

- yes no partly

21. What type ticket are you using on this trip?

- regular fare (first class)
- regular fare (coach, economy, shuttle)
- excursion/Discover America
- family-fare plan, full fare member
- family-fare plan, reduced fare member
- youth-fare plan, reservation
- youth-fare plan, standby
- military reservation
- military standby
- other _____
(please describe)

22. How many people are travelling with you?

- 0 none 2
- 1 3 or more

23. How many pieces of baggage did you check in for airline handling on your air trip today?

- 0 none 2 4
- 1 3 5 or more

24. How many items did you carry on the airplane?

- 0 none 2 4
- 1 3 5 or more

25. If you could change the departure and arrival time of this flight for your convenience, which of the following would you prefer? (please fill in one)

- a. depart and arrive earlier by _____ hours _____ minutes
- b. depart and arrive later by _____ hours _____ minutes
- c. no change from this flight schedule

26. What is your family's total yearly income? (if exact amount is not known please give your best estimate)

- | | |
|--|--|
| <input type="checkbox"/> less than \$3,000 | <input type="checkbox"/> \$12,500-\$14,999 |
| <input type="checkbox"/> \$3,000-\$4,999 | <input type="checkbox"/> \$15,000-\$19,999 |
| <input type="checkbox"/> \$5,000-\$7,499 | <input type="checkbox"/> \$20,000-\$24,999 |
| <input type="checkbox"/> \$7,500-\$9,999 | <input type="checkbox"/> \$25,000 or more |
| <input type="checkbox"/> \$10,000-\$12,499 | |

Space is provided on the back for additional comments

2. If COMAT (i. e., company mail) is to be utilized as a means of distributing survey materials, allow at least 3 weeks for delivery, and establish a follow-up procedure in cooperation with each airline to assure timely delivery. If there is insufficient time to utilize COMAT with assurance, arrangements should be made for delivery through commercial channels.
3. Success of the survey depends on the cooperation of the Chief Stewardess, Station Manager, and Chief of Schedules. Prior to starting the survey, arrange for the survey field supervisor to contact these individuals personally under the official auspices of each airline to develop a harmonious working relationship.
4. Assure that a survey contract provides sufficient resources for supervisory backup at all times during the survey.

The air taxi survey conducted in the Northeast Corridor Project was performed over a 5 day period. Five air taxi lines serving 14 airports were included in the survey. A 100 percent sample of all air taxi flights of interest was taken. Approximately 95 percent of the questionnaires distributed on the air taxi flights were completed.

Pennsylvania Air Passenger Survey

The Pennsylvania Department of Transportation (PennDOT) is currently developing a 1995 Statewide Airport System Plan. As part of this study, consultants to PennDOT conducted air passenger surveys at all reports in the Commonwealth having air carrier or air taxi service. Two types of surveys were conducted at in-state airports. On-board air passenger surveys were conducted at the two largest airports in the Commonwealth, Greater Pittsburgh International and Philadelphia International, and terminal passenger surveys were conducted at the remaining 18 air carrier/air taxi airports in the Commonwealth.

The on-board surveys were scheduled to be conducted over a 3- to 4-day period.¹ The terminal surveys were scheduled over a 5- to 6-day period.

The same self-administered questionnaire was used for both the on-board and the terminal surveys (see Exhibit C-3). Questions were asked concerning the traveler's air trip, his trip to the airport, and his socioeconomic characteristics.

¹Information on the survey was supplied by PennDOT personnel.

QUESTIONNAIRE FOR PENNDOT AIR PASSENGER SURVEY

Travel Survey

For Each Airline Passenger Using Pennsylvania Airports

The information you provide in this survey is important in planning future air transportation facilities in the Commonwealth of Pennsylvania.

Only a few minutes of your time are needed

Your name or identification is not required

Your response will be kept completely confidential. Only statistical summaries of data will be published.

Please fill in the information below and answer the appropriate questions on the reverse side. The attendant will collect your completed questionnaire. Please do not write in the large boxes adjacent to the questions, as these will be used for coding the information which you provide.

Thank you

This Survey is Being Conducted for the

Commonwealth of Pennsylvania
Department of Transportation

By
The Airlines Serving Pennsylvania

R. Dixon Speas Associates, Inc.
Aviation Consultants

Michael Baker, Jr. Inc.
Consulting Engineers

Airport _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Airline _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flight No. _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Day of Week _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scheduled Departure	AM			
Time _____	PM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EXHIBIT C-3 (Continued)

About Your Flight Today

1. Did your air travel today by commercial airline begin at the airport where you received this questionnaire?
- YES, Please answer question 3 next
 NO, PLEASE CHECK ONE OF THE FOLLOWING:
- (1) a) I was on board this flight when it arrived at this airport and I am continuing on this flight to another city. (If you check box (a) please return this form to the attendant without answering any further questions).
- (1) b) I was transferred to this airplane from another flight. (If you check box (b) please go on to question 2).
- (1) c) I am returning to the Pennsylvania city at which my air travel began today. (If you check box (c) please go on to question 3).
- (1) d) I am returning to the non-Pennsylvania city at which my air travel began today. (If you check box (d) please go on to question 3).
- (1) e) I had a specific purpose for being in this city today and am now on my way to another city other than that at which my air travel began today. (If you check box (e) please go on to question 3).

2. If you checked box (b) above, please answer this question and then return the form to the attendant.
- I was transferred to this flight from a connection flight of:
- a) The airline which I am now flying YES NO
 b) If NO, the name of the airline from which I was transferred is _____

3. If you checked box (c), (d), or (e) in question 1 or if your reply was YES to question 1, please answer this question and all the remaining questions.
- Will you change airplanes during THIS TRIP today?
- NO
 YES - If YES, please name the Airport(s) at which you will change airplanes _____

4. At what airport will the air travel portion of your trip end?
- _____

5. Where will this trip end?
- _____

Street Address or Name of Building, Hotel, etc.

City, Borough, Township State Zip Code

Why are you going to this location?

- 1 Your home residence
- 2 Your place of employment
- 3 Business you will visit
- 4 Vacation
- 5 Combination business/pleasure
- 6 Your school
- 7 Personal/family matters
- 8 Military assignment
- 9 Other (please specify) _____

6. After your air travel is completed, how are you planning to travel from the airport to your final destination?
- 1 Private car
 2 Rented car
 3 Taxi
 4 Commuter airline
 5 Airport bus/limousine
 6 Hotel/Motel courtesy car
 7 Transit bus
 8 Rail
 9 Private aircraft
 10 Other (please specify) _____

7. What time do you expect to arrive at your final destination?
- _____ AM
 _____ PM

8. Is the cost of your trip a personal or business expenditure?
- Personal Business

About Your Trip To The Airport Today

9. What time did you leave for the airport?
- _____ AM

10. What time did you arrive at the airport?
- _____ AM

11. From what location in the area did you leave for the airport?
- _____ PM

Street Address or Name of Building, Hotel, etc.

City, Borough, Township State Zip Code

Why were you at this location?

- 1 Your home residence
- 2 Your place of employment
- 3 Business you were visiting
- 4 Vacation
- 5 Combination business/pleasure
- 6 Your school
- 7 Personal/family matters
- 8 Military assignment
- 9 Other (please specify) _____

12. How did you travel to the airport today?

- 1 Privately owned car
 2 Rented car
 3 Taxi
 4 Airport bus/limousine
 5 Hotel/Motel courtesy car
 6 Transit bus
 7 Private aircraft
 8 Company owned or government owned car
 9 Other (please specify) _____

13. If you traveled to the airport in a privately owned vehicle, was the car:

- 1 Driven directly to parking
 2 Driven to terminal and then parked
 3 Driven to terminal and not parked
 4 Valet parked
 5 Did not travel to airport in a privately owned car

14. What was the total cost of public transportation used to travel to the airport or the estimated parking charges if a privately-owned vehicle was used?

- 1 No cost
 2 \$0.01-\$1.00
 3 \$1.01-\$2.00
 4 \$2.01-\$3.00
 5 \$3.01-\$5.00
 6 \$5.01-\$10.00
 7 \$10.01 to \$20.00
 8 over \$20.00

About Yourself

15. What is your home address?
- Same as response to question 5
 Same as response to question 11
 Other (please specify below) _____

Number and Street

City, Borough, Township State Zip Code

16. What is your occupation?
- 1 Housewife
 2 Student
 3 In Armed Forces
 4 Professional/Technical
 5 Manager/Official
 6 Secretary/Clerk
 7 Craftsman/Foreman
 8 Operator/Laborer
 9 Farmer
 10 Salesman
 11 Retired
 12 Other (please specify) _____

17. What is your sex?
- Female Male

18. What is your age?
- 1 Under 12
 2 12-17
 3 18-24
 4 25-34
 5 35-44
 6 45-54
 7 55-64
 8 Over 65

19. What was your family's income in 1972? (Before taxes)
- 1 Under \$5000
 2 \$5000-\$8000
 3 \$8000-\$10,000
 4 \$10,000-\$15,000
 5 \$15,000-\$20,000
 6 \$20,000-\$25,000
 7 \$25,000-\$30,000
 8 \$30,000-\$40,000
 9 \$40,000-\$50,000
 10 Over \$50,000

Thank You

Table C-1 presents the response rates for the on-board and terminal surveys. The terminal surveys were undertaken at airports having less than 50 flights per day, and the on-board surveys were conducted at the major airports having more than 300 daily flights.

The response rate for the on-board surveys conducted at Pittsburgh and Philadelphia were 52 percent and 43 percent, respectively. Higher response rates, typically exceeding 60 percent, were obtained in the terminal surveys at the smaller airports. The overall terminal survey response rate at airports having fewer than 10 daily flights was 77 percent, compared to a response rate of approximately 63 percent at airports having more than 10 daily flights. The lowest response rate for any airport was 34 percent for the terminal survey at the Allentown-Bethlehem-Easton airport. The unusually low response rate at this airport was related to the terminal's being under construction during the survey.

PennDOT also surveyed Pennsylvania residents who utilize out-of-state airports for their air trips. Such travelers were identified by conducting parking lot surveys at 12 out-of-state airports such as those serving the Baltimore, Cleveland, and New York City areas. In these surveys, the license numbers of vehicles registered in the Commonwealth were recorded. The license numbers were then matched against Pennsylvania's vehicle registration files to determine the names and addresses of the vehicle owners.

A total of 1,529 vehicles with Pennsylvania registrations was identified at the out-of-state airports. After removing duplicate license plate numbers for persons parking for several days and numbers for rental cars, a mail-out questionnaire (see Exhibit C-4) was distributed to 737 vehicle owners. According to available information, a 42 percent response to the mail questionnaire was obtained.

Michigan Air Passenger Survey

Michigan conducted air passenger surveys at the five air carrier airports listed in Table C-2.¹ The surveys were undertaken to identify the mode of travel used by air passengers to reach an airport and also to determine the passenger service areas of each airport. On-board air passenger surveys were conducted at the Flint, Grand Rapids, Kalamazoo, and Lansing Airports between January 24 and 30, 1972. All air carrier and commuter airline flights were surveyed at each airport.

¹Michigan Aeronautics Commission, Department of Commerce, Airline Passenger Survey at Selected Michigan Airports.

TABLE C-1

RESPONSE RATES FOR PENNDOT AIR PASSENGER SURVEY

<u>On-Board Survey</u>	<u>Number of Daily Flights</u>	<u>Number of Passengers During Survey Period</u>	<u>Percent of Question- naires Returned</u>
Greater Pittsburgh International	303	19,611	52
Philadelphia International	310	19,381	43
<u>Terminal Survey</u>			
Bradford	7	107	81
Williamsport/Lycoming County	7	177	61
Altoona/Blair County	9	109	75
Capital City	2	13	100
Chess-Lamberton	4	66	92
DuBois/Jefferson County	4	89	96
Hazleton Municipal	4	11	91
Mid-State	8	95	80
North Philadelphia	8	189	76
Penn's Landing Seaplane Base	5	48	69
University Park	2	20	<u>80</u> 77
Erie International	15	712	54
Johnstown/Cambria City	11	132	80
Lancaster	16	194	84
Reading Municipal	13	179	<u>64</u> 63
Wilkes-Barre/Scranton	31	616	63
Harrisburg International	40	1,613	<u>61</u> 62
Allentown-Bethlehem-Easton	42	1,092	34

Source: Pennsylvania Department of Transportation.

MAIL-OUT QUESTIONNAIRE FOR PENNDOT OUT-OF-STATE
AIRPORT SURVEY

Travel Survey

FOR PENNSYLVANIA RESIDENTS USING OUT-OF-STATE AIRPORTS

This Survey is Being Conducted for the

Commonwealth of Pennsylvania
Department of Transportation

By

R. Dixon Speas Associates, Inc.
Aviation Consultants

Michael Baker, Jr. Inc.
Consulting Engineers

The information you provide in this survey is important in planning future air transportation facilities in the Commonwealth of Pennsylvania.

Only a few minutes of your time are needed

Your name or identification is not required

Your response will be kept completely confidential. Only statistical summaries of data will be published.

Please answer the appropriate questions and return the form in the stamped envelope provided. In most instances, you need only circle or check off the appropriate answer.

Thank you

If you drove someone to the airport where your vehicle was observed but did not take a flight yourself, please give this questionnaire to whomever you drove to the airport. If someone other than yourself was using your vehicle on the day it was observed please give this questionnaire to the person who was using your vehicle.

1. Did you take a flight from the airport where the vehicle was observed?
 YES . . . If YES, please fill in the information below and answer questions 2 to 23
 NO . . . If NO, please specify your reason for being at the airport then return this form in the stamped envelope provided without answering any further questions. I was at the airport because:

2. At which airport did your air travel begin? _____

3. On which airline did you travel? _____

4. What was the number of the flight? _____

5. What was the scheduled departure time of the flight? _____ AM
PM

6. What was the date of the flight? _____

EXHIBIT C-4 (Continued)

About Your Flight

7. Did you change airplanes during your trip?

- NO
 YES If YES, please name the airport(s) at which you changed airplanes

8. At what airport did the air travel portion of your trip end?

9. Where did this trip end?

Street Address or Name of Bldg, Hotel, etc.

City, Borough, Township State Zip Code

Why did you go to this location?

- Your home residence
 Your place of employment
 Business you were visiting
 Vacation
 Combination business/pleasure
 Your school
 Personal/family matters
 Military assignment
 Other (please specify) _____

10. How did you travel from the destination airport to your final destination address?

- Private car
 Rented car
 Taxi
 Commuter airline
 Airport bus/limousine
 Hotel/Motel courtesy car
 Transit bus
 Rail
 Private aircraft
 Other (please specify) _____

11. What time did you arrive at your final destination?

_____ AM
 _____ PM

12. Was the cost of your trip a personal or business expenditure?

- Personal
 Business

About Your Trip To The Airport

13. What time did you leave for the airport?

_____ AM
 _____ PM

14. What time did you arrive at the airport?

_____ AM
 _____ PM

15. How many people who drove to the airport in your vehicle, including yourself, took a flight from the airport?

- one four over six
 two five
 three six

16. From what location in the area did you leave for the airport?

Street Address or Name of Bldg, Hotel, etc.

City, Borough, Township State Zip Code

Why were you at this location?

- Your home residence
 Your place of employment
 Business you were visiting
 Vacation
 Combination business/pleasure
 Your school
 Personal/family matters
 Military assignment
 Other (please specify) _____

17. What was the cost of your parking charges?

- No cost \$3.01-\$5.00
 \$0.01-\$1.00 \$5.01-\$10.00
 \$1.01-\$2.00 \$10.01-\$20.00
 \$2.01-\$3.00 over \$20.00

About Yourself

18. What is your home address?

- Same as response for question 9
 Same as response for question 16
 Other (please specify below)

Number and Street

City, Borough, Township State Zip Code

19. What is your occupation?

- Housewife Craftsman/Foreman
 Student Operator/Laborer
 In Armed Forces Farmer
 Professional/Technical Salesman
 Manager/Official Retired
 Secretary/Clerk Other (please specify) _____

20. What is your sex?

- Female
 Male

21. What is your age?

- Under 12 35-44
 12-17 45-54
 18-24 55-64
 25-34 over 65

22. What was your family's income in 1972? (Before taxes)

- Under \$5000 \$20,000-\$25,000
 \$5000-\$8000 \$25,000-\$30,000
 \$8000-\$10,000 \$30,000-\$40,000
 \$10,000-\$15,000 \$40,000-\$50,000
 \$15,000-\$20,000 over \$50,000

23. We would appreciate any comments you would like to make concerning present air transportation service and facilities in Pennsylvania.

Thank You

TABLE C-2

RESPONSE RATES FOR MICHIGAN AIR PASSENGER SURVEY

<u>Airport</u>	<u>Total Responses</u>	<u>Usable Responses</u>	<u>Boarding Passengers During Survey</u>	<u>Usable Responses as a Percent of Boardings</u>
Flint	978	896	1,475	61
Grand Rapids	3,202	2,791	4,562	61
Kalamazoo	1,239	1,100	1,738	63
Lansing	1,771	1,624	2,230	73
Tri-City	<u>1,299</u>	<u>1,166</u>	<u>2,910</u>	<u>40</u>
Totals:	8,489	7,577	12,915	59

Source: Michigan Aeronautics Commission
and Stanford Research Institute

Kalamazoo, and Lansing airports between January 24 and 30, 1972. All air carrier and commuter airline flights were surveyed at each airport.

The survey was administered so that only boarding passengers were requested to complete a questionnaire. The questionnaires were distributed and collected in flight by the stewardesses (see Exhibit C-5). A flight packet similar to that prepared in the NEC Project's air passenger survey was assembled for each flight. The packet included questionnaires precoded with flight information. The stewardesses were instructed to return the questionnaire to the airline agent meeting the flight at its next stop. Between 61 and 73 percent of the boarding passengers at the four airports provided usable responses to the survey.

In September 1972, Michigan conducted an air passenger survey at the Tri-City Airport. The same general survey procedures and questionnaire that were used at the other four airports were applied in this survey except that the survey was administered in the terminal's passenger lounges. The response rate for the terminal survey was 40 percent, which was considerably lower than that for the on-board surveys.

New York Air Passenger Survey

The New York State Department of Transportation has conducted air passenger surveys in several regions of the state, including one survey in the Southern Tier West region (see Map C-1)¹. The survey was designed to study the short and long range aviation needs of the region. Three air carrier airports serving the region were surveyed: Jamestown and Olean Airports in New York and the Bradford Airport in Pennsylvania. The survey at the Bradford Airport was done in cooperation with the Commonwealth of Pennsylvania.

An on-board survey was conducted using a self-administered questionnaire. All air carrier flights leaving each airport were included in the survey. The survey was conducted for a 14 day period that included two weekends. A survey packet similar to that used in the Northeast Corridor and Michigan air passenger surveys was prepared for each outbound flight. The packet identified the number of the flight and presented an announcement concerning the survey and instructions for distributing and collecting the questionnaires. (See Exhibit C-6 for questionnaire.) Survey personnel personally contacted the stewardesses on

¹R. H. Bisnett, New York State Department of Transportation, Southern Tier West Regional Aviation Study - Field Survey Report (August 1970).

EXHIBIT C-5

QUESTIONNAIRE FOR MICHIGAN AIR PASSENGER SURVEY

FRONT

REAR

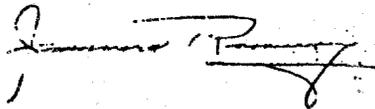
MICHIGAN AERONAUTICS COMMISSION
Department of Commerce

PASSENGER SURVEY

The Michigan Aeronautics Commission, is conducting a survey of air passengers boarding at this airport. The results of this survey will assist the state of Michigan in developing a better aviation system.

PLEASE TAKE A MINUTE TO ANSWER THE QUESTIONS ON THE BACK OF THIS CARD.

THANK YOU!



JAMES D. RAMSEY, Director
Michigan Aeronautics Commission
Department of Commerce



Airline	Flight	Date	Time
1	2 3 4	5	6 7

SURVEY QUESTIONS
(See Reverse Side for Instructions)

1. At what airport did you board this airplane?
 1 Grand Rapids 2 Flint 3 Other
 4 Lansing 5 Saginaw _____
2. Where did you start your trip to the above airport?
 1 Home 2 Business 3 Hotel/Motel 4 Other
3. Where is the starting point in question "2" located?

 (City or Town - or County, if starting point not in City or Town) (State)
4. What kind of transportation did you use to get to this airplane?
 1 Another Airplane from _____
 2 Private auto parked at airport 3 Rental Car
 4 Private auto driven away by others 5 Local rail or bus system
 6 Airport limousine or bus 7 Motel/hotel courtesy car
 8 Taxi 9 Other _____
5. About how many minutes did it take you to travel from your starting point to the airport?

 (Minutes) (your "best guess" will suffice)
6. What is the furthest point of your air travel today?

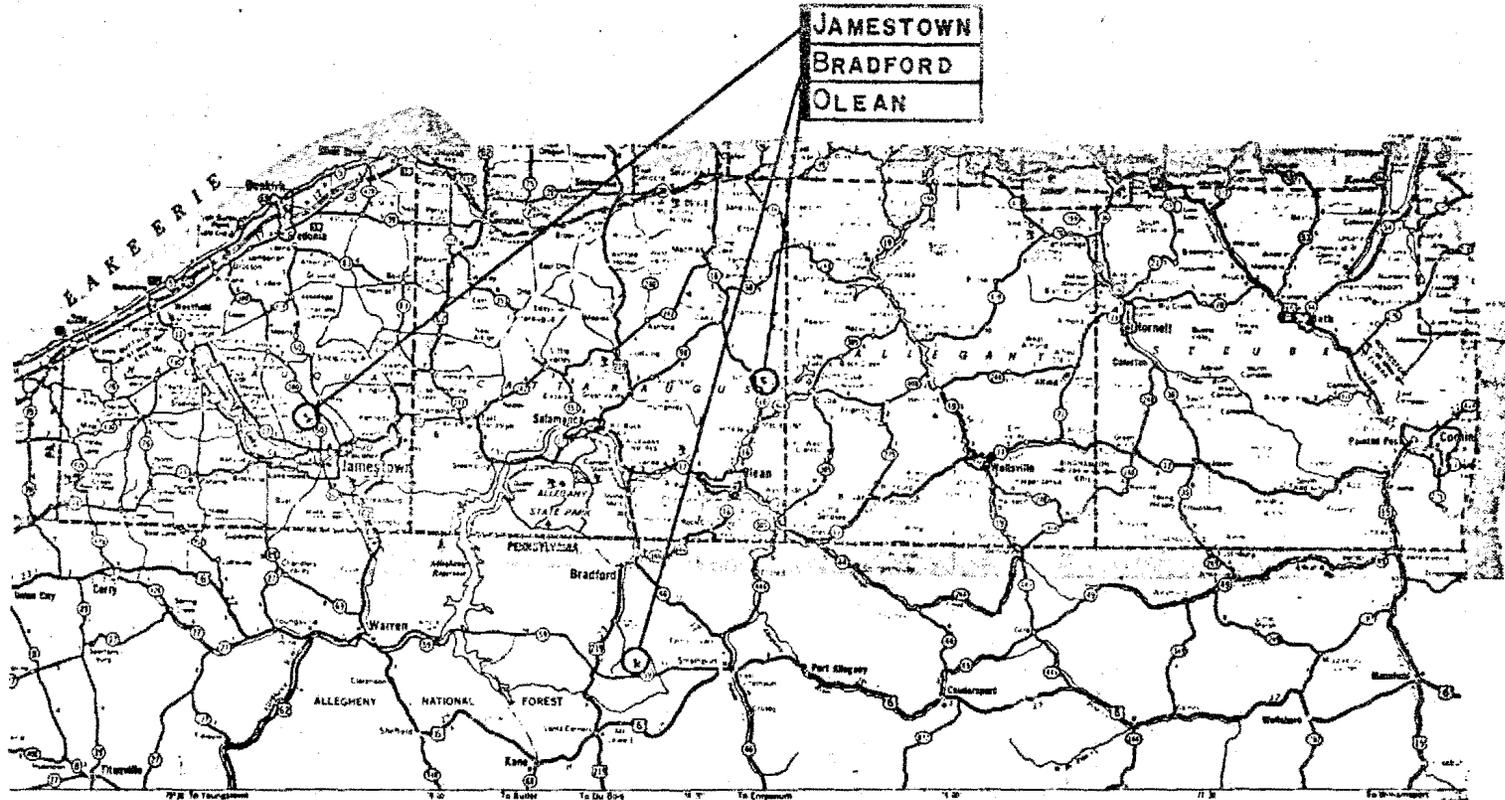
 (City & State)
7. Are you ...
 1 Leaving home to go on a trip? 2 Returning home from a trip?
 3 Traveling between non-home cities? (If you are a college student consider school as your "home")
8. What is the main purpose of your trip?
 1 Business 2 Other Personal
 3 Vacation/Recreation 4 Other

DO NOT WRITE IN SHADED AREA

Please hand your completed questionnaire to your stewardess.
THANK YOU FOR YOUR COOPERATION.

MAP C-1

NEW YORK SOUTHERN TIER WEST SURVEY AREA: NYSDOT
AIR PASSENGER SURVEY



JAMESTOWN
BRADFORD
OLEAN

○ COMMERCIAL AVIATION AIRPORTS

XXXX STUDY AREA (INCLUDES THE BRADFORD REGIONAL AIRPORT)

C. 18

EXHIBIT C-6

QUESTIONNAIRE FOR NYSDOT AIR PASSENGER SURVEY

AIR PASSENGER SURVEY

TO THE AIR TRAVELER:

The New York State Department of Transportation, in cooperation with the Commonwealth of Pennsylvania and the airlines serving the Jamestown and Clear, New York and Bradford, Pennsylvania areas, is conducting this important passenger survey to determine pertinent characteristics and travel patterns of airline passengers.

All information will remain confidential and anonymous and will be used to plan and improve facilities for your future use.

A questionnaire for persons under 12 years of age need not be completed. Please answer all questions as accurately as possible and return this questionnaire to your stewardess.

Thank you for your cooperation.

T.W. Parker
Commissioner



PLEASE ANSWER THE FOLLOWING QUESTIONS REGARDING THE ONE-WAY TRIP YOU ARE NOW MAKING (INCLUDE ONLY ONE-WAY PORTION OF ROUND TRIP)

1. At what airport did you first begin your air trip today? (If you transferred at any time, give original airport.)

airport _____ city _____ state _____

2. From what address did you begin your trip to the above airport?

number and street, motor building or major intersection _____

city, town or post office _____ state _____

Please describe the above address (summer cottage, motel, factory, department store, resort, insurance office, etc.)

3. a. What time did you leave for the above airport?

_____ a.m. _____ p.m.

b. What time did you arrive at the above airport?

_____ a.m. _____ p.m.

4. Please check all of the methods of transportation used in arriving at the above airport today:

- private car
- railroad
- bus
- rented car
- subway
- private plane
- taxi
- airport limousine
- air taxi
- other _____ specify _____

5. If you drove to the airport, did you park the car in a parking lot?

- yes
- no

If yes, how long will it remain there?
_____ hours _____ days

6. What airport are you going to on this trip today? (If a transfer is to be made, give final airport.)

airport _____ city _____ state _____

7. Where will you end today's trip after you leave that airport?

number and street, motor building or major intersection _____

city, town or post office _____ state _____

Please describe the above address (summer cottage, motel, factory, department store, resort, insurance office, etc.)

8. Please check all the methods of transportation you will use to reach the above address after you leave the airport today:

- private car
- railroad
- bus
- rented car
- subway
- private plane
- taxi
- airport limousine
- air taxi
- other _____ specify _____

9. Please check one box in each group:

Your reason for being at address in question # 2 _____ Your reason for going to address in question # 7 _____

- home
- work
- personal business
- shopping
- social or recreational or vacation
- accompany another passenger
- military
- other _____ specify _____

10. How many nights will you or did you spend away from home on this trip?

returning some day _____ nights.

11. How many times in the last 12 months did you make a trip by air between these same two locations as today? (Count a round trip as two trips.)

_____ trips.

12. Are the costs of this air trip chargeable as business expense?

- yes
- no
- partly

13. What class of ticket do you have for this flight?

- first class
- military
- coach or tourist
- airline employee
- family plan
- other _____ specify _____

14. What is your age? _____ Sex? male female

15. Highest schooling completed:

- less than high school
- attending high school
- graduated high school
- some college
- attending college
- college graduate
- some graduate school
- attending graduate school
- graduate degree

16. In what kind of business or industry are you now employed? Please check single most appropriate category.

- mining
- manufacturing, processing
- wholesaling
- agriculture, forestry, fisheries
- finance, insurance, real estate
- transportation, public utilities, communication
- professional services (medical, legal, educational, etc.)
- other services (personal, recreational, entertainment)
- other _____ specify _____

17. What kind of work do you do? If unemployed or retired please indicate.

salesman, housewife, retired, student, clerk, etc.

18. Where do you live?

number and street _____ city, town or post office _____ state _____

19. How many people live in your household?

20. How many passenger cars are owned by members of your household?

21. What is your family's total yearly income before taxes? If not living with your family report your own income.

- under \$1,999
- \$2,000-\$3,999
- \$4,000-\$5,999
- \$6,000-\$7,999
- \$8,000-\$9,999
- \$10,000-\$14,999
- \$15,000-\$19,999
- \$20,000-\$24,999
- \$25,000 and over

22. Please check the main reason you took the plane rather than some other mode of transportation.

- more frequent
- more convenient
- more enjoyable
- cheaper
- shortest travel time
- schedule is reliable
- safer than other modes
- more scenic
- other modes unavailable

23. In your opinion, what could be done to make your trip more enjoyable and/or efficient?

TW 306 (5-70)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

C. 19

each flight and provided them with the survey packet. Verbal instructions concerning the survey were given to the stewardesses in addition to the written instructions on the survey packet. A total of 214 flights were scheduled at the three airports, and 193 of these flights were surveyed. Nine flights were not surveyed; 12 flights were cancelled. Of the 2,466 questionnaires distributed during the survey, 1,885 were completed, which represents a 76 percent response rate.

Wisconsin Air Passenger Survey

The State of Wisconsin Department of transportation (WDOT) conducted "before and after" air passenger surveys in 1969 and 1971 at air carrier airports located in central Wisconsin.¹ The objective of the surveys was to identify the impacts of the opening of a new regional airport at Mosinee on the usage of and travel to four other air carrier airports in the same region. The five airports included in the air passenger survey were Wausau Airport, Stephens Point Airport, Central Wisconsin Airport (Mosinee), Marshfield Municipal Airport, and Alexander Field.

The air passenger surveys were conducted as terminal surveys. They were conducted during August 1971. All outbound passengers beginning their trip at each airport were issued a preaddressed survey postcard when the passenger's ticket was validated for the flight. The passengers were asked to complete the questionnaire in the terminal. Survey personnel personally collected the completed questionnaires whenever possible. Following this procedure, an estimated 95 to 100 percent of the questionnaires were returned. In previous surveys, a similar postcard questionnaire was used, and air travelers were requested to return the questionnaires by mail. The response to the mail-back survey was considered poor by Wisconsin officials. The questionnaire used in the Wisconsin air passenger survey was relatively short, and this facilitated its use in the terminal survey (see Exhibit C-7).

Wisconsin General Aviation Survey

Wisconsin also conducted a survey of all arriving and departing general aviation pilots at three of the five airports. The pilots were interviewed over the period 6 A.M. to 10 P.M. on the survey days. The general aviation pilot questionnaire is presented in Exhibit C-8.

¹State of Wisconsin Department of Transportation, Central Wisconsin Area Airports Bi-Modal Traffic Survey - Phase II.

QUESTIONNAIRE FOR WDOT AIR PASSENGER SURVEY

<p>BUSINESS REPLY MAIL No Postage Stamp Necessary if Mailed in the United States</p>	<p>FIRST CLASS Permit No. 1761 MADISON, WIS. 53701</p>
<p>POSTAGE WILL BE PAID BY --</p> <p>State of Wisconsin / Department of Transportation DIVISION OF PLANNING Chief of Traffic Planning 149 E. Wilson Street Madison, Wisconsin 53702</p>	

A 0409

AIR TRAVEL SURVEY
P-S-590-69

This survey is being made by the state to make air travel more convenient and economical. Your answers will help reach the desired goals.

1. Where are you going on this trip? _____
(City/Town) (State)
Is this Home?
 Yes No

2. Where did you start your ground trip to the airport?

(Address, prominent building or street intersection) (City/Town) (State)
 Home
 Business
 Motel/Hotel
 Other

3. How did you get to the airport? (If more than one mode of travel was used, check each.)

<input type="checkbox"/> Private car (dropped-off at airport)	<input type="checkbox"/> Taxi	<input checked="" type="checkbox"/> Bus
<input type="checkbox"/> Private car (parked at airport)	<input type="checkbox"/> Airport limousine	<input type="checkbox"/> Motel/Hotel courtesy car
<input type="checkbox"/> Rental car	<input type="checkbox"/> Railroad or subway	<input type="checkbox"/> Other (specify) _____

4. What is the MAIN purpose of your trip?

<input type="checkbox"/> Company business	<input type="checkbox"/> Military	<input type="checkbox"/> Accompany family member on business trip
<input type="checkbox"/> Personal business	<input type="checkbox"/> School	<input checked="" type="checkbox"/> Pleasure
		<input type="checkbox"/> Other (specify) _____

5. Are you Male or Female

PLEASE RETURN THIS CARD

the Post Card Distributed to Airline Passengers

EXHIBIT C-8

QUESTIONNAIRE FOR WDOT AVIATION PILOT SURVEY

AIRPORT SURVEY - GENERAL AVIATION
 WS-491-69

State of Wisconsin / Department of Transportation

Airport	Date	Time	Weather <input type="checkbox"/> Beacon On <input type="checkbox"/> Beacon Off	Interviewer
Aircraft Number	Make & Model		No. of Engines 1 2 3 4 <input type="checkbox"/> Jet <input type="checkbox"/> Prop	
Aircraft Home Base (Airport, City & State)				

THE FOLLOWING INFORMATION IS REQUIRED OF ALL ARRIVALS:

Arrived From - City & Airport	Address of Ground Destination (if none, indicate and proceed to next 2 items)
Stop Purpose <input type="checkbox"/> Eat <input type="checkbox"/> Service <input type="checkbox"/> Pass. Discharge <input type="checkbox"/> Fuel <input type="checkbox"/> Pass. Pick-up <input type="checkbox"/> Other	Ultimate Destination - City & Airport

THE FOLLOWING INFORMATION IS REQUIRED OF ALL DEPARTURES:

Departing to - City & Airport	Address of Ground Origin
Time from Ground Address to Airport _____ Min.	Any Delays Encountered at Airport <input type="checkbox"/> No <input type="checkbox"/> Yes If Yes, Describe:
Time of Interview	Time of Liftoff

THE FOLLOWING INFORMATION IS REQUIRED OF ALL FLIGHTS:

Flight Purpose <input type="checkbox"/> Business <input type="checkbox"/> Air Carrier Conn <input type="checkbox"/> Cargo <input type="checkbox"/> Pleasure <input type="checkbox"/> Mail <input type="checkbox"/> Other	No. People Aboard	Paid Professional Crew <input type="checkbox"/> Yes <input type="checkbox"/> No
Inst., Rates <input type="checkbox"/> Yes <input type="checkbox"/> No	IFR Flight Plan Filled <input type="checkbox"/> Yes <input type="checkbox"/> No	Aircraft Equipment <input type="checkbox"/> Transponder <input type="checkbox"/> Localizer Receiver <input type="checkbox"/> Auto Dir Finder <input type="checkbox"/> Glide Slope Receiver <input type="checkbox"/> Dist Meas Equip <input type="checkbox"/> Auto Pilot <input type="checkbox"/> Radar <input type="checkbox"/> Couplers <input type="checkbox"/> Full Panel <input type="checkbox"/> 2 or more Nav. Radios <input type="checkbox"/> Flight Director <input type="checkbox"/> 2 or more Transceivers

In addition, Wisconsin conducted mail surveys of general aviation aircraft owners in Wisconsin and neighboring states in 1965¹. The surveys were undertaken to collect information which could be used to project future general aviation activity in the state. A mail-back questionnaire was sent to all registered general aviation aircraft owners in Wisconsin and to a 10 percent random sample of registered aircraft owners in Illinois, Indiana, Iowa, Michigan, and Minnesota. The questionnaire distributed to aircraft owners in Wisconsin solicited information on the characteristics of the aircraft, characteristics of the aircraft owner, and the annual usage of the aircraft (see Exhibit C-9). Sixty percent of the questionnaires sent to Wisconsin aircraft owners were returned. The response rate was 46 percent for owners of single engine aircraft and 69 percent for owners of twin engine aircraft.

The survey of aircraft owners in neighboring states was undertaken because of the high volume of activity associated with out-of-state aircraft at Wisconsin airports. The questionnaire sent to aircraft owners in neighboring states focused on aircraft usage within Wisconsin (see Exhibit C-10). The response rate for the survey of out-of-state aircraft was 57 percent.

In August 1964, the Wisconsin Department of Resource Development and the State Aeronautics Commission conducted a 7-day general aviation "ramp" survey.² The ramp survey was conducted at 30 airports in Wisconsin to identify the characteristics of general aviation activity for use in forecasting aircraft traffic and airport usage. The ramp survey was conducted from August 12 to 18, 1964. It was supervised by the managers or operators of the surveyed airports and designed so that the principal passenger of each general aviation flight was interviewed. The principal passenger was considered the person "who was the main reason for the particular trip."³ If the principal person was not available, survey personnel were instructed to administer the questionnaire to the pilot or to another passenger, who was asked to respond for the principal passenger. The survey was administered by an interviewer as the principal passenger either disembarked from an arriving flight or prepared to board a departing flight. It was to be completed for all

¹State of Wisconsin Department of Resource Development, State Airport System Plan: Technical Supplement (1966).

²State of Wisconsin Department of Resources, op. cit.

³Ibid.

EXHIBIT C-9

WDOT SURVEY OF AIRCRAFT OWNERS IN WISCONSIN



DON A. OLSON, TWO RIVERS
CHAIRMAN

T. K. JORDAN, DIRECTOR

The State of Wisconsin

STATE AERONAUTICS COMMISSION

ROOM 994
HILL FARMS STATE OFFICE BUILDING
4802 SHEBOYGAN AVENUE
MADISON, WISCONSIN 53702

DONALD L. LOVE, GREEN BAY
VICE-CHAIRMAN

ARLYN G. WEST, PLOVER
SECRETARY

TED COLE, CASHTON
MEMBER

GORDON D. LEONARD, MILWAUKEE
MEMBER

April 8, 1965

Note: Same letter with slight modification was used
for out-of-state aircraft owners in Exhibit C-10.

Dear Aircraft Owner:

Our agency and the Wisconsin Department of Resource Development are cooperating in an effort to update our state's airport plan. We hope to have a plan which will recognize the many important, growing, and changing needs of our aircraft owners.

We ask your cooperation in filling out the enclosed questionnaire and returning it in the stamped envelope. You may keep the second copy of the questionnaire.

It is important to you to answer and return the questionnaire since unreturned questionnaires will result in understating the needs in your area for airports, air navigation aids, etc.

Please be sure to fill out both sides of the questionnaire. We also hope you use the "comments" section of the questionnaire or even additional paper to let us know about any specific or general improvements you think the state should be providing to make flying more convenient, safer, and more enjoyable.

Sincerely,

A handwritten signature in cursive script that reads "T. K. Jordan".

T. K. Jordan, Director

Enclosures

EXHIBIT C-9 (Continued)

WISCONSIN STATE AERONAUTICS COMMISSION
Madison, Wisconsin 53702

General Aviation Survey

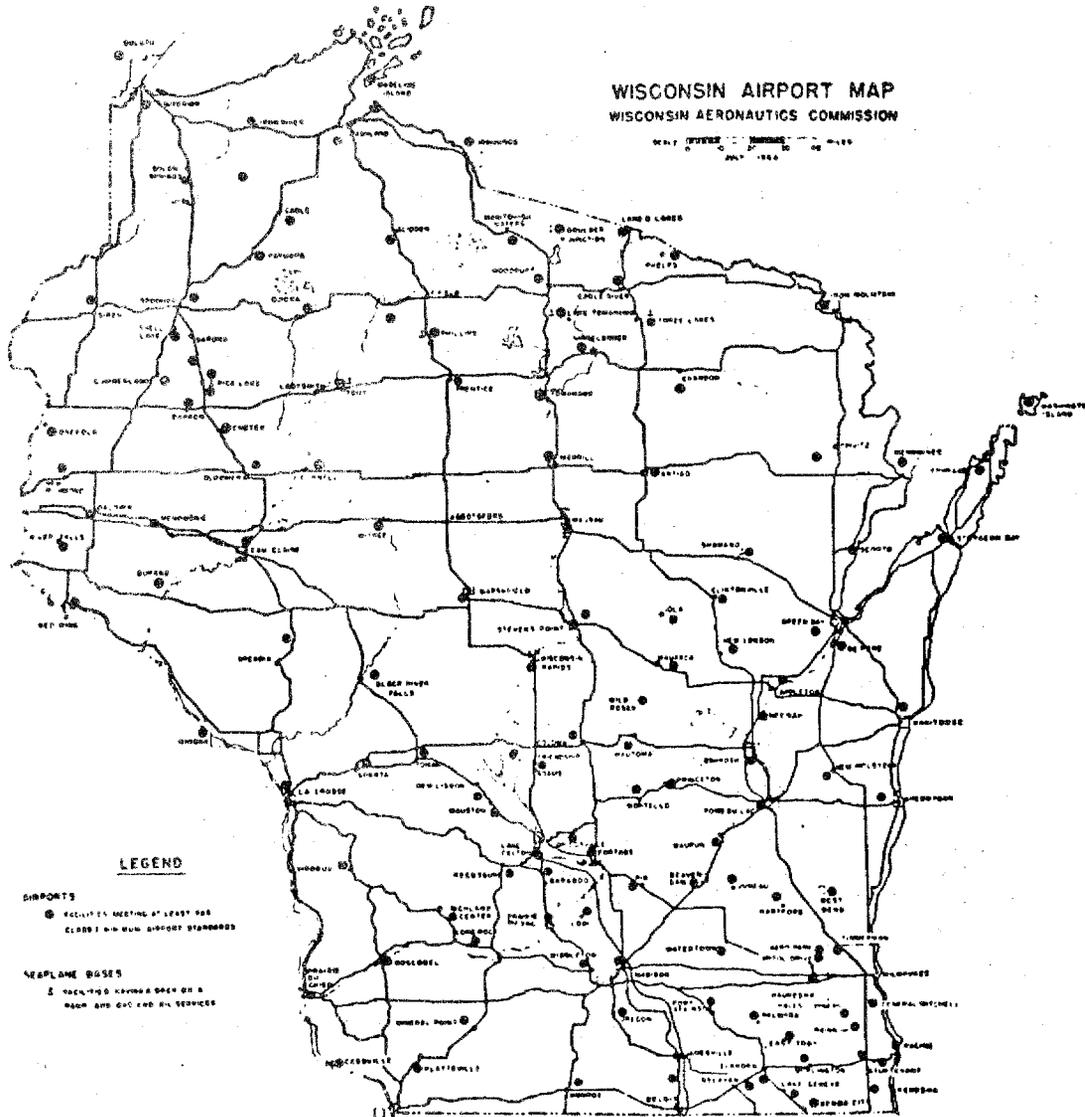
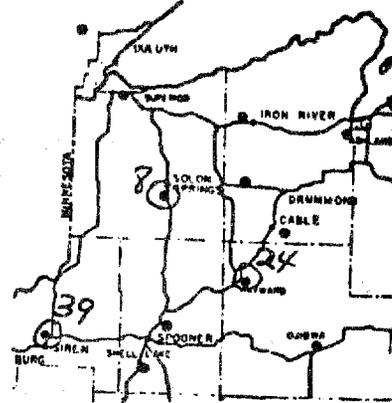
Please answer all questions. There is one question on the back.

1. Aircraft make _____; model _____; number of seats _____
2. Is aircraft hangered in the summer? Yes _____ No _____
3. Is aircraft hangered in the winter? Yes _____ No _____
4. At what airport is your aircraft usually based? _____
5. What is road mileage between your home and this airport? _____ miles.
6. How long does it take to drive this distance? _____ minutes.
7. What certificate(s) is held by the plane's principal pilot?
Student _____; Private _____; Commercial _____; ATR _____;
Instrument rated _____; Multi-engine _____; Single-engine _____.
8. Please specify the radio equipment in the plane: No radio equipment _____
Receiver _____
low/mf _____ Omnidrange (VOR) _____ VHF (voice only) _____
fan marker _____ ILS _____ DME _____ ADF _____
Other _____
Transmitter _____
High frequency _____ VHF _____
9. What is your aircraft's average hourly fuel consumption? _____ gal/hr.
10. Did you own this aircraft prior to January 1, 1964? Yes _____ No _____
If "yes" please answer questions 11 through 14 for calendar 1964 or
some other recent 12-month period. If "no," please answer questions
11 through 14 for however many months you have owned the plane.
11. How many hours was your plane flown? _____ hours in _____ months
12. Per cent of hours plane flown for: Personal (vacation, etc.) _____ %
Business _____ %, Commercial (dusting, photography, etc.) _____ %,
Air freight _____ %, Training _____ %, Other () _____ %
13. Per cent of hours plane flown inside Wisconsin _____ %
outside Wisconsin _____ %

14. Circle each Wisconsin airport you use and indicate the NUMBER OF TIMES it was used over a 12-month period. Be sure to include the airport where your aircraft is based.

See example on right. Show number of take-offs.

If not a 12-month period, how many months are shown below? _____ months.



COMMENTS: _____

Thank You!

EXHIBIT C-10

WDOT SURVEY OF OUT-OF-STATE AIRCRAFT OWNERS

WISCONSIN STATE AERONAUTICS COMMISSION
Madison, Wisconsin 53702

General Aviation Survey for Out-of-State Owners

Please answer all questions. There is one question on the back.

1. Did you fly into Wisconsin at all during the past year? Yes ___ No ___

If yes, please continue with the rest of the questionnaire.

If no, you need not continue with the questionnaire. However, please return the questionnaire in the enclosed return envelope. Thank you.

2. Aircraft make _____; model _____; number of seats _____

3. At what airport is your aircraft usually based? _____
City _____ State _____

4. When flying into Wisconsin do you usually stay over night? Yes ___ No ___

5. After landing at Wisconsin airports what means of ground transportation do you use?

Friends or relatives _____ rent-a-car _____ taxi _____

Business clients or associates _____ own car _____ other () _____
describe

6. Are there areas in Northern Wisconsin where you restrict your flying to the daylight hours? Yes ___ No ___

If so, which areas? _____

7. Did you own this aircraft prior to January 1, 1964? Yes ___ No ___

If "yes" please answer questions 8 through 10 for calendar 1964 or some other recent 12-month period. If "no" please answer questions 8 through 10 for however many months you have owned the plane.

8. How many hours was your plane flown in Wisconsin? _____ hours in _____ months

9. Per cent of hours plane flown in Wisconsin for:

Personal (vacation, etc.) _____% Business _____% Air freight _____%

Commercial (dusting, photography, etc.) _____% Training _____%

Other () _____%

Note: Reverse side was same as previous exhibit.

departing and arriving flights at all survey airports even if a flight had been or would be surveyed at another airport. The questionnaire used in the ramp survey is presented in Exhibit C-11.

State officials concluded that the ramp survey was a less reliable data source than other procedures used to survey general aviation traffic.

A major problem with the ramp survey was the "lack of consistency and a rather wide variation in degree of completeness among the various interviews."¹ The mail-out surveys previously described were viewed as having provided more comprehensive and consistent information at less cost than had the ramp survey procedures. The ramp surveys were more effective than mail surveys in collecting activity data for short periods of time at specific airports, but the mail survey procedures were better for obtaining systemwide data for statewide aviation planning.

RAIL PASSENGER SURVEYS

Surveys of intercity rail travelers have been undertaken by the FRA as part of the NEC Project and by the states of New York and Wisconsin, among others.

Federal Railroad Administration Rail Passenger Surveys

Consultants to the FRA conducted on-board rail passenger surveys in the New York-Florida, Chicago-St. Louis, Chicago-Minneapolis/St. Paul, and Seattle-Portland Corridors.² The rail passenger surveys were undertaken in conjunction with auto, air, and bus passenger surveys in these corridors. A total of 8,000 completed interviews were to be obtained using on-board survey procedures. The survey was conducted on a sample of trains in each corridor and was generally performed as a train traveled between two cities within the corridor rather than along the total length of the corridor. Survey personnel distributed the questionnaires to and collected them from all passengers on board each sample train. The survey personnel also answered questions concerning the survey while moving through the train. The questionnaire

¹State of Wisconsin Department of Resources, op. cit.

²Peat, Marwick, Mitchell & Co., Survey to Determine the Potential for Improved Rail Advanced Vehicle Service - Common Carrier Historical and Survey Data - Volume I, Prepared for the Federal Railroad Administration (December 1972).

EXHIBIT C-11

QUESTIONNAIRE FOR WISCONSIN GENERAL AVIATION
RAMP STUDY

WISCONSIN GENERAL AVIATION SURVEY

DATE _____ AIRPORT _____
INTERVIEWER _____ WEATHER _____

1. Aircraft number N- _____ 2. Number of engines _____ 3. Number of seats _____
4. Number of Persons in plane _____ 5. Arrival _____ 6. Departure _____
(including pilot) _____ time _____ time _____
7. Aircraft based at _____ 8. Type of flight: local _____ itinerant _____
city & state _____
9. Is this a training flight? YES _____ NO _____
9a. For local training flight, total number of take-offs and landings _____
10. Ownership: personal _____ company _____ government _____ military _____ chartered _____
rented _____ leased _____ air taxi _____ other _____

QUESTIONS TO PILOT OR ADULT PASSENGER(S)

11. Home of principal passenger (city & state) _____
12. What is principal passenger's occupation? _____
13. If non-resident, does principal passenger own property in this area?
YES _____ NO _____
14. How frequently does principal passenger use this airport? _____ times per _____
14a. Does he use it less during the winter than during the summer?
YES _____ NO _____
15. PURPOSE OF THE FLIGHT
A. Personal: Recreation _____ Vacation _____ Visit _____
Passenger pickup _____ Other _____
B. Business: (transportation of people on business)
_____ firm name, city, product or service _____
C. Commercial: (Plane use other than carrying passengers)
Spraying _____ Photography _____ Survey _____ Other _____
D. Air freight a. Weight _____ b. Type of freight _____
b. Shipper(s) _____ d. Receiver(s) _____
e. Is this a fairly regular freight movement? YES _____ NO _____
_____ times per _____

Wisconsin Department of Resource Development
Madison, Wisconsin 53702

EXHIBIT C-11 (Continued)

ARRIVING FLIGHTS

- 16A. Airport of origin today _____
 How far did principal passenger travel on ground from origin (home, office, etc.) to reach airport of origin? _____
- 17A. Did you stop at any airports between airport of origin and this airport? Yes ___ No ___
 If yes, where? _____
- 18A. What is the principal passenger's ground destination? _____
 distance and direction from this airport? _____
- 19A. How long do you expect to be here? _____
- 20A. How frequently does the principal passenger make this SAME FLIGHT? _____ times per _____
- 21A. Does principal passenger ever make this same trip by auto ___ airline ___ other _____
- 22A. For a ONE-WAY trip, how much time is saved? (door to door) _____
 Better scheduling Yes ___ No ___

DEPARTING FLIGHTS

- 16D. Where was principal passenger's ground origin? _____
 distance and direction from this airport? _____
- 17D. Airport of destination today _____
 How far will principal passenger travel on ground from airport of destination? (home, office, etc.) _____
- 18D. Will you stop at any airports between here and the airport of destination? Yes ___ No ___
 If yes, where? _____
- 19D. Did you buy gas at this airport TODAY? Yes ___ No ___
- 20D. How frequently does the principal passenger make this SAME FLIGHT? _____ times per _____
- 21D. Does principal passenger ever make this same trip by auto ___ airline ___ other _____
- 22D. For a ONE-WAY trip, how much time is saved? (door to door) _____
 Better scheduling Yes ___ No ___

FOR NON-RESIDENTS ONLY

- 23D. How long were you here? _____
- 24D. How much did you spend in area for
 Aircraft fuel, maintenance \$ _____
 Food & lodging \$ _____
 Entertainment \$ _____
 Other \$ _____

WITH REFERENCE TO GENERAL AVIATION

25. Why did you use this airport?
 location ____, facilities ____, _____ other _____
 which?
26. What improvements, if any, are needed at this airport? _____
27. What improvements, if any, are needed in Wisconsin to better serve general aviation? _____

used in the survey is presented in Exhibit C-12, and return percentages are shown below:

<u>Corridor</u>	<u>Questionnaires Returned as a Percent of Persons Interviewed</u>
Chicago-St. Louis	89
Chicago-Minneapolis/St. Paul	92
Seattle-Portland	86
New York-Florida	71

Wisconsin Rail Passenger Survey

The WDOT conducted on-board rail passenger surveys on AMTRAK trains serving Wisconsin twice during 1974.¹ The survey program was undertaken for the following purposes:

- . to identify the characteristics of current AMTRAK passengers;
- . to determine the attitudes of travelers about the adequacy of AMTRAK service; and
- . to determine how AMTRAK service could be improved in Wisconsin.

All passengers riding the 10 daily trains between Chicago and Milwaukee were sampled in the survey. On trains between Chicago and Minneapolis, only passengers either originating at or destined to locations in Wisconsin were requested to complete the survey form. The survey was conducted as an on-board survey. Survey personnel distributed and collected the survey questionnaires (see Exhibit C-13) and were instructed to encourage passengers to complete the questionnaire. State officials suggested that the assignment of congenial personnel to the survey was an important factor contributing to the high response to the questionnaire.

New York Rail Passenger Survey

The New York State Department of Transportation conducted an on-board rail passenger survey in 1970 on trains operating between New York City and Albany, New York.² The survey was undertaken primarily

¹Working papers provided by the WDOT were used as references.

²NYS DOT, Albany-New York City Corridor Rail Passenger Survey (Draft Report) (February 1973).

EXHIBIT C-12

QUESTIONNAIRE FOR FRA PROJECT RAIL PASSENGER SURVEY

OMB No. 4517-018
Approved Expires 6/30/72

ORC No. 51057
Form Train 2
OVI 34

U.S. DEPARTMENT OF TRANSPORTATION
INTERCITY TRAVEL SURVEY



OFFICIAL QUESTIONNAIRE

Dear Traveler:

The United States Department of Transportation, with the cooperation of this railroad, is collecting train information which will be used to improve transportation for you and other travelers.

We cannot do this job without your help. Please take a few minutes to answer the questions below. The information you furnish will be used for statistical purposes only.

Please do not identify yourself in any way.

Thank you for your help.

• ONLY A FEW MINUTES OF YOUR TIME IS NEEDED

• YOUR NAME OR IDENTIFICATION IS NOT REQUESTED AND YOUR RESPONSES WILL BE KEPT COMPLETELY CONFIDENTIAL AND ANONYMOUS

• A QUESTIONNAIRE SHOULD BE COMPLETED FOR EACH PERSON INCLUDING ANY CHILDREN 5 YEARS AND OVER TRAVELING WITH YOU

• PLEASE ANSWER ALL OF THE QUESTIONS IN THE QUESTIONNAIRE

• SURVEY PERSONNEL WILL REQUEST THE RETURN OF COMPLETED QUESTIONNAIRES BEFORE THE NEXT STOP

18. For each of the items listed below, please mark an "X" under the form of transportation that you think is the worst for a trip like the one you are making today.

	Bus Worst	Plane Worst	Train Worst	Auto Worst
a. Comfort of the ride	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
b. Cleanliness	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
c. Economy of travel	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
d. Travel time	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
e. Safety	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
f. Dependability in getting you there on time	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
g. Convenience of departure and arrival times	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
h. Meals along the way	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
i. Reliability in bad weather	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
j. Ease of getting your baggage in your destination	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
k. Pleasantness of the people who serve you during the trip	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
l. Pleasantness of the people who ride in the same vehicle	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
m. Seeing the country along the way	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
n. Overall door-to-door ease of travel	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
o. Ease of purchasing tickets	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
p. Ease of traveling to and from the terminal	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
q. Attractiveness of terminal	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
r. Adequacy of parking facilities at the terminal	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>

These last questions are for statistical purposes only, and your answers are anonymous.

20. What is your family's total yearly income? (If exact amount is not known, give your best estimate.)

- Mark One Box Only:
- 1 Less than \$5,000 a year
 - 2 \$5,000 - \$7,499 a year
 - 3 \$7,500 - \$9,999 a year
 - 4 \$10,000 - \$14,999 a year
 - 5 \$15,000 - \$19,999 a year
 - 6 \$20,000 a year or more

21. How many nights will you, or did you, spend away from home during your total trip?

- Mark One Box Only:
- 1 None
 - 2 One
 - 3 2 - 3
 - 4 4 - 6
 - 5 7 - 15
 - 6 More than 15

22. Your age:

- Mark One Box Only:
- 1 2 - 4 years
 - 2 5 - 11 years
 - 3 12 - 22 years
 - 4 23 - 35 years
 - 5 36 - 50 years
 - 6 51 - 65 years
 - 7 66 years or older

23. Your sex:

- 1 Male
- 2 Female

THANK YOU VERY MUCH FOR YOUR COOPERATION

Please answer the questions by placing an "X" in the box next to your answer. IF YOU ARE TAKING A ROUND TRIP TODAY, YOUR ANSWERS SHOULD REFER ONLY TO THE DIRECTION YOU ARE TRAVELING NOW.

1. At what station did you get on this train?
 1 Chicago
 2 Bloomington
 3 Springfield
 4 St. Louis
 5 Other (Specify): _____

2. From what community did you begin your trip to the station?
 City, Town or Post Office (County) _____
 State _____ Zip Code _____

3. How did you arrive at the station at which you got on this train?
 1 Commuter train
 2 Taxi
 3 Rented car
 4 Local bus, subway
 5 Private car parked at station or other parking lot
 6 Private car - someone drove you
 7 Walked
 8 Limousine service, airport bus
 9 Intercity plane, train or bus
 10 Other (Please Describe): _____

4. About how long did it take you today to get from your starting point to the station where you boarded this train?
 _____ Hours _____ Minutes

5. About how much did it cost you to get from your starting point to the station where you boarded this train?
 _____ Dollars _____ Cents

5. At what station will you get off this train?
 1 Chicago
 2 Bloomington
 3 Springfield
 4 St. Louis
 5 Other (Specify): _____

7. To what community are you going when you leave this train?
 City, Town or Post Office (County) _____
 State _____ Zip Code _____

8. How will you leave the station when you get off this train?
 1 Commuter train
 2 Taxi
 3 Rented car
 4 Local bus, subway
 5 Private car parked at station or other parking lot
 6 Private car - someone drove you
 7 Walked
 8 Limousine service, airport bus
 9 Intercity plane, train or bus
 10 Other (Please Describe): _____

9. About how long do you think it will take you to get to your destination from the station when you get off this train?
 _____ Hours _____ Minutes

10. Which of the above two communities (Items 2 and 7) is the home end of your trip? Mark One Box Only:
 1 The community where you began your trip to the station.
 2 The community you are going to when you leave this train.
 3 Neither one.

IF NEITHER COMMUNITY REPRESENTS THE HOME END OF YOUR TRIP, PLEASE RECORD YOUR HOME ADDRESS BELOW.

11. _____
 City, Town or Post Office (County) _____

State _____ Zip Code _____

12. What is the purpose of your trip?
 Mark as Many as Apply:
 1 Business/work
 2 Personal affairs
 3 Recreation/vacation

13. Was an automobile available to you for this trip today?
 Mark One Box Only:
 1 Yes, had automobile available
 2 No, did not have automobile available

14. Are the costs of this trip chargeable or deductible as a business expense?
 Mark One Box Only:
 1 Yes
 2 No
 3 Partly

15. About how many times, in the last 12 months, have you made a round trip between the same two places as your trip now?
 Mark One Box Only:
 1 None before this time
 2 1 - 5 times
 3 6 - 10 times
 4 11 or more times

16. What class of service are you traveling on today?
 Mark One Box Only:
 1 Coach
 2 Parlor car or sleeper
 3 Other (Please Describe): _____

17. What type of fare plan are you traveling on?
 1 Regular ticket
 2 Family plan
 3 Child fare
 4 Special excursion
 5 Reduced military rate
 6 Commuter
 7 Railroad employee rate
 8 Other (Please Describe): _____

18. Are you traveling by yourself or with a group? Mark as Many as Apply:
 1 Alone
 2 With family
 3 With friends, associates
 4 Charter group

How many, other than yourself?
 _____ Family Members
 _____ Friends and Business Associates.

19. If you are traveling on a family plan ticket and you are the head of the family, what was the total cost of your family's ticket?
 _____ Dollars _____ Cents

PLEASE TURN PAGE

EXHIBIT C-13 (Continued)

27. Listed below are reasons some people have offered **FOR NOT** taking a train. As in question 26, indicate your agreement or disagreement by checking the appropriate box.

Please Do Not Write in this Space

TRAIN TRAVEL IS:	Agree Strongly	Agree	Neither Agree Nor Disagree	Disagree	Disagree Strongly	
- too slow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- too expensive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- old fashioned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- dirty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- inconvenient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- patronized by "undesirable" people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- unsafe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- uncomfortable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- served by unpleasant personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- unreliable, never on time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- too infrequent or poorly timed schedules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

28. Will you take the train again?

for this trip? Yes No Maybe

for other trips? Yes No Maybe

29. How are you traveling today?

First class Coach Slumber coach

30. How many people are in your party?

Alone 2 3 4 5 or more

31. How many children under twelve are traveling with you?

0 1 2 3 4 or more

32. Your sex is:

Male Female

33. Your family income is:

0 - \$4,999 \$5,000 - \$9,999 \$10,000 - \$19,999 \$20,000 - \$29,999 \$30,000 - \$49,999 Over \$50,000

34. Your marital status is:

Single Married Widowed Other

35. Your age bracket is:

Under 18 18 - 25 26 - 40 41 - 65 Over 65

36. Do you have a current drivers license?

Yes No

to collect information on the characteristics of rail travel in this corridor for use in a high speed rail passenger service study. The survey results were also intended to be incorporated in a multimodal intercity travel data file to be developed by the department.

In organizing its survey program, NYSDOT worked with officials of the Penn Central Railroad. Close coordination was maintained between railroad and state officials from the conceptual design of the survey through the development of detailed survey procedures. The on-board rail passenger survey was designed to survey travelers on each train operating between New York City and Albany on each day of the week. At the time of the survey, there were eight trains operating daily in each direction, or a total of 112 trains in a 1 week period.

Self-administered questionnaires were distributed to passengers on board each train (see Exhibit C-14). The questionnaire used in the rail survey was essentially the same as those used in on-board bus and air passenger surveys conducted in the Albany area by NYSDOT. Passengers were requested to complete the questionnaire on board the train so that the questionnaires could be collected by survey personnel. A stamped self-addressed envelope was provided to passengers who could not complete a questionnaire during their trip. Two interviewers were assigned to each train. This number of interviewers was considered adequate to survey the 2 to 5 car trains operated in the corridor. Interviewers generally boarded a train in the Albany area, rode the train to New York City, had a 2 hour layover, and then boarded a return train to the Albany area. Survey personnel were responsible for counting the number of entraining and detraining passengers at each station between New York City and Albany, including passengers at the station where the train was boarded. In addition, they distributed a questionnaire to each rail passenger over 12 years of age and made counts of passengers on board the train between stations. The interviewers assisted respondents in completing the questionnaires and collected the questionnaires as they were completed. They were also responsible for determining the consist (i. e., number of cars) of each train.

NYSDOT hired and trained eight temporary employees to conduct the rail passenger survey. Two permanent state employees were also trained as backup survey personnel. Both male and female interviewers were hired; they were primarily college students. Each interviewer received 2 days of training and spent a third day riding trains between Albany and New York to review field survey conditions and survey procedures. A total of 8,958 questionnaires was distributed in the survey, and 93 percent of these were collected. However, only 66 percent of the questionnaires distributed could be coded. Fifty-seven percent of the

EXHIBIT C-14

QUESTIONNAIRE FOR NYSDOT RAIL PASSENGER SURVEY

TRAIN PASSENGER SURVEY

TO THE TRAIN PASSENGER:

The New York State Department of Transportation, in cooperation with the Penn Central Company, is conducting this important survey to determine characteristics and travel patterns of railroad passengers.

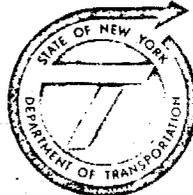
All information will remain confidential and anonymous and will be used to plan and improve facilities for you use.

Persons under 12 years of age need not complete this form.

Please answer all questions as accurately as possible and return this questionnaire to the survey representative.

Thank you for your cooperation.

T.W. Parker
Commissioner



C. 37

PLEASE ANSWER THE FOLLOWING QUESTIONS REGARDING THE ONE-WAY TRIP YOU ARE NOW MAKING (INCLUDE ONLY ONE-WAY PORTION OF ROUND TRIP).

1. At what railroad station did you first begin your train trip today? (if you transferred at any time, give original railroad station.)

_____ railroad station _____ city _____ state

2. From what address did you begin your trip to the above railroad station?

_____ number and street, major building or major intersection

_____ city, town or post office _____ state

Please describe the above address (summer cottage, motel, factory, department store, resort, insurance office, etc.)

3. a. What time did you leave for the above railroad station?

_____ a.m. _____ p.m.

b. What time did you arrive at the above railroad station?

_____ a.m. _____ p.m.

4. Please check all of the methods of transportation used in arriving at the above railroad station today:

- private car bus commercial airline
 rented car subway private plane
 taxi airport limousine air taxi
 other _____
specify

5. If you drove to the railroad station, did you park the car in a parking lot?

- yes no

If yes, how long will it remain there?
 _____ hours _____ days

6. What railroad station are you going to on this trip today? (if a transfer is to be made, give final railroad station.)

_____ railroad station _____ city _____ state

7. Where will you end today's trip after you leave that railroad station?

_____ number and street, major building or major intersection

_____ city, town or post office _____ state

Please describe the above address (summer cottage, motel, factory, department store, resort, insurance office, etc.)

8. Please check all the methods of transportation you will use to reach the above address after you leave the railroad station today:

- private car bus commercial airline
 rented car subway private plane
 taxi airport limousine air taxi
 other _____
specify

9. Please check one box in each group:

Your reason for being at address in question #2 Your reason for going to address in question #7

- | | | |
|--------------------------|----------------------------------|--------------------------|
| <input type="checkbox"/> | home | <input type="checkbox"/> |
| <input type="checkbox"/> | work | <input type="checkbox"/> |
| <input type="checkbox"/> | personal business | <input type="checkbox"/> |
| <input type="checkbox"/> | shopping | <input type="checkbox"/> |
| <input type="checkbox"/> | social @ recreational @ vacation | <input type="checkbox"/> |
| <input type="checkbox"/> | accompany another passenger | <input type="checkbox"/> |
| <input type="checkbox"/> | military | <input type="checkbox"/> |
| <input type="checkbox"/> | other _____ | <input type="checkbox"/> |
| | <small>specify</small> | |

10. How many nights will you, or did you, spend away from home on this trip?

returning same day. _____ nights.

11. How many times in the last 12 months did you make a trip by train between these same two locations as today? (Count a round trip as two trips.)

_____ trips.

12. Are the costs of this train trip chargeable as business expense?

- yes no partly

13. What kind of ticket do you have for this trip?

- regular weekend excursion
 commutation furlough
 family plan group economy
 one-day excursion free
 other _____
specify

14. What type of car is this ticket for?

- coach sleeper coach sleeping car

15. What is your age? _____ Sex? male female

16. Highest schooling completed:

- | | |
|--|--|
| <input type="checkbox"/> less than high school | <input type="checkbox"/> college graduate |
| <input type="checkbox"/> attending high school | <input type="checkbox"/> some graduate school |
| <input type="checkbox"/> graduated high school | <input type="checkbox"/> attending graduate school |
| <input type="checkbox"/> some college | <input type="checkbox"/> graduate degree |
| <input type="checkbox"/> attending college | |

17. In what kind of business or industry are you now employed? Please check single most appropriate category.

- | | |
|--|---------------------------------------|
| <input type="checkbox"/> mining | <input type="checkbox"/> construction |
| <input type="checkbox"/> manufacturing, processing | <input type="checkbox"/> government |
| <input type="checkbox"/> wholesaling | <input type="checkbox"/> retailing |
| <input type="checkbox"/> agriculture, forestry, fisheries | |
| <input type="checkbox"/> finance, insurance, real estate | |
| <input type="checkbox"/> transportation, public utilities, communication | |
| <input type="checkbox"/> professional services (medical, legal, educational, etc.) | |
| <input type="checkbox"/> other services (personal, recreational, entertainment) | |
| <input type="checkbox"/> other _____ | <small>specify</small> |

18. What kind of work do you do? If unemployed or retired please indicate.

_____ salesman, housewife, retired, student, clerk, etc.

19. Where do you live?

_____ number and street _____ city, town or post office _____ state

20. How many people live in your household?

21. How many passenger cars are owned by members of your household?

22. What is your family's total yearly income before taxes? If not living with your family report your own income.

- | | | |
|--|--|--|
| <input type="checkbox"/> under \$1,999 | <input type="checkbox"/> \$6,000-\$7,999 | <input type="checkbox"/> \$15,000-\$19,999 |
| <input type="checkbox"/> \$2,000-\$3,999 | <input type="checkbox"/> \$8,000-\$9,999 | <input type="checkbox"/> \$20,000-\$24,999 |
| <input type="checkbox"/> \$4,000-\$5,999 | <input type="checkbox"/> \$10,000-\$14,999 | <input type="checkbox"/> \$25,000 and over |

23. Please check the main reason you took the train rather than some other mode of transportation.

- | | |
|--|--|
| <input type="checkbox"/> more frequent | <input type="checkbox"/> shortest travel time |
| <input type="checkbox"/> more convenient | <input type="checkbox"/> schedule is reliable |
| <input type="checkbox"/> more enjoyable | <input type="checkbox"/> safer than other modes |
| <input type="checkbox"/> cheaper | <input type="checkbox"/> more scenic |
| <input type="checkbox"/> other _____ | <input type="checkbox"/> other modes unavailable |
| | <small>specify</small> |

24. In your opinion, what could be done to make your trip more enjoyable and/or efficient?

TP 315 (6/70)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

questionnaires distributed were completed with valid trip origin and destination information. Of the 34 percent of the questionnaires that could not be coded, approximately 14 percent of the passengers refused to complete the questionnaire, and 20 percent of the questionnaires distributed were blank or could not be coded because of incomplete data.

BUS PASSENGER SURVEYS

Intercity bus passenger surveys have been completed as part of the NEC Project by the Federal Railroad Administration and by the State of New York as part of its statewide planning programs.

Northeast Corridor Project

The Northeast Corridor bus survey was conducted as an on-board survey between November 6 and 14, 1969. Based on a detailed statistical analysis, it was determined that 18,700 completed interviews were required to provide the information at the desired level of reliability. Bus runs serving 12 bus terminals in the corridor were the sampling frame in the survey. A bus run is the schedule of runs a bus makes over a "line which is defined by a route and terminals. Thus a line between Washington and New York may have several runs, making different sets of scheduled stops along that line."¹ Only bus runs for major intercity bus companies were included in the survey. The number of samples by selected bus run was based on the estimated travel demand by run. The bus passenger survey was complicated by the fact that passengers leave and board the bus at stops between the terminal points of a run. Although consideration was given to stationing survey personnel on board the bus to account for this condition, this option was not considered financially feasible.

Self-administered questionnaires were distributed by survey personnel to passengers boarding sample bus runs. The passengers were requested to complete the questionnaires on board the bus. Questionnaires were collected at selected destination terminals as passengers disembarked from the bus. It was recognized that a certain number of questionnaires would not be returned if passengers did not leave their questionnaires with the bus driver when they left the bus at an intermediate stop.

¹A. M. Voorhees and Associates, Inc., The Northeast Corridor Intercity Travel Survey (March 1971).

Other Major Corridors

A consultant to the Federal Railroad Administration conducted an on-board bus passenger survey during November 1971 in the New York-Florida, Chicago-St. Louis, Chicago-Minneapolis/St. Paul, and Seattle-Portland corridors.¹ The bus survey was undertaken in conjunction with the auto and rail passenger surveys discussed elsewhere in this section. Based on the objective of the FRA study and available resources, a total of 8,000 interviews per mode were to be completed. The 8,000 interviews per mode were allocated by corridor as follows:

Corridor	Desired Interviews
New York-Florida	4,000
Chicago-St. Louis	1,500
Chicago-Minneapolis/St. Paul	1,500
Seattle-Portland	1,000

The number of bus runs to be surveyed was determined based on an assumed number of qualified travelers per run and the desired number of bus passenger interviews per corridor. The bus runs to be sampled were selected from a chronological list of the universe of runs, using a random start, a randomly selected sampling interval, and sampling without replacement.

The FRA bus survey was conducted using survey procedures essentially the same as those used in the NEC Project bus survey. Survey personnel distributed the questionnaires on board the bus and disembarked before the bus left the terminal. The questionnaires were retrieved at the next major terminal by an attendant who met the bus. Each bus surveyed was identified by placing a red placard in the window of the bus. Extra sections of buses on a run were also surveyed, as was the case in the NEC Project survey.

¹Peat, Marwick, Mitchell & Co., Survey to Determine the Potential for Improved Rail Advanced Vehicle Service - Common Carrier Historical and Survey Data - Vol. I, Prepared for the Federal Railroad Administration (December 1972).

The response rates by corridor for the bus survey were as follows:

Corridor	Interviews Returned as a Percent of Passengers Interviewed
New York-Florida	62
Chicago-St. Louis	55
Chicago-Minneapolis/St. Paul	71
Seattle-Portland	80

These response rates for the bus survey were generally lower than the rates in the same corridors for the air and rail passenger surveys.

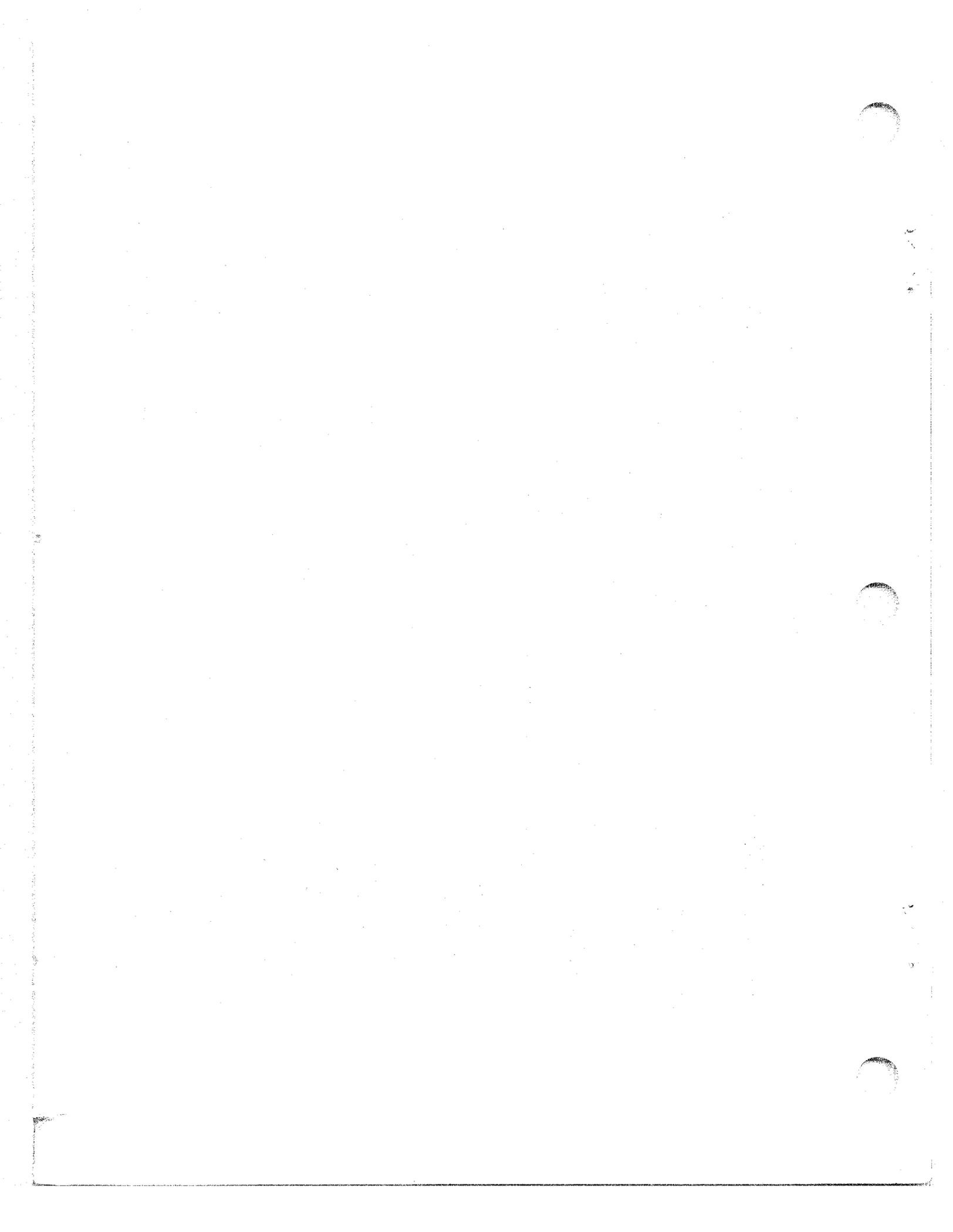
New York Bus Passenger Survey

NYS DOT conducted an intercity bus survey for the Albany area in December 1970. This survey was intended to provide information on bus travel for use in the department's high speed rail service study and in developing a statewide person travel simulation methodology. The bus survey was also designed to complement intercity rail and air carrier passenger surveys conducted in the Albany area in 1970. The state's procedure for conducting the survey is described below.¹

Two different methods were used for administering the survey. On bus runs which had their final stop within the Albany area cordon line at a bus terminal, mail-back questionnaires were distributed on board the bus at the terminal. For buses which stopped before reaching the cordon line, a survey attendant boarded the bus at the last stop within the cordon line and distributed mail-back questionnaires to all passengers. The attendant then remained on the bus to answer questions concerning the survey until the next stop outside the cordon line, where the attendant disembarked and returned to his boarding location to meet his next scheduled bus.

The survey was to be conducted over a 7 day period on all long distance and immediate distance bus lines. Bus routes crossing the cordon line and serving local travel were also included in the bus survey, although these routes were only to be surveyed for two weekdays and one weekend day. Passengers were encouraged to complete their questionnaires and deposit them in a prominently displayed envelope at the front of each bus. Records were maintained on the serial numbers of the questionnaires distributed on each bus route and run to control the survey. A copy of the questionnaire used in the NYS DOT bus survey is presented in Exhibit C-17.

¹A general description of the survey is presented in a memorandum sent to FHWA by NYS DOT.



APPENDIX D

SPECIAL SURVEYS FOR STATEWIDE TRANSPORTATION PLANNING

Several states have undertaken special purpose surveys as part of their statewide transportation planning programs. Other agencies have also conducted special purpose surveys that appear to be applicable to statewide planning. The special purpose surveys documented in this section include attitudinal surveys conducted by New York and Wisconsin, a recreation travel survey conducted by Kentucky, and travel surveys of the rural poor.

WISCONSIN ATTITUDINAL SURVEY

The Wisconsin Department of Transportation conducted an attitudinal survey as part of its statewide rail passenger service study.¹ The objectives of the survey were (1) to determine the views of state residents making trips of 50 miles or longer concerning the characteristics of all modes of intercity travel and (2) to identify the priorities for funding improvements to individual modes of travel.

The survey was conducted by mailing a self-administered questionnaire to drivers renewing their driver's licenses during October 1974. The questionnaire was distributed along with the driver's license renewal application, and the driver was requested to complete and return the survey form with the application.

The questionnaire solicited information on the number of trips of 50 miles or more in length made annually (see Exhibit D-1). The respondents were also asked to identify their preferred mode of travel as a function of trip length and trip purpose. The respondents' views concerning the characteristics of individual modes were also requested, as were their priorities on funding transportation improvements for individual modes. The socioeconomic characteristics of the respondents were also requested.

An estimated 14,000 questionnaires were distributed, and 58 percent of these were returned. An analysis of the survey returns indicated that

¹Working papers provided by the WDOT were used as references.

EXHIBIT D-1

QUESTIONNAIRE FOR WDOT ATTITUDINAL SURVEY

T-120D-74

TRANSPORTATION SURVEY

The Wisconsin Department of Transportation is currently engaged in long-range planning to meet the future transportation needs of our citizens. We would appreciate your help in this effort. Please fill out the questionnaire below and return it to us with your driver's license renewal. Do not write your name on this questionnaire because we prefer all respondents to remain anonymous.

DO NOT
WRITE
IN THIS
SPACE

Except for Question 1, answer by checking like this

1. In what city or town and county do you reside? _____

2. Indicate in the appropriate box how often you take trips of more than 50 miles in one direction (100 miles round-trip) for the following purposes. (Check one box for each purpose.)

	Once a year or less	2 - 6 times a year	7 - 12 times a year	13 - 24 times a year	more than 24 times a year
a. Work or business purposes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Personal business (doctor, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Vacation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Visit friends or relatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Other (Specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. If all types of transportation were available at your home town, check what you believe would be the best way to make WORK OR BUSINESS trips of the following distances?

	Air	Auto	Intercity Bus	Rail
a. 50 - 99 miles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. 100 - 249 miles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. 250 - 500 miles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. more than 500 miles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Again assuming that all types of transportation serve your home town, check what you believe would be the best way to make NON-BUSINESS trips of the following distances?

	Air	Auto	Intercity Bus	Rail
a. 50 - 99 miles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. 100 - 249 miles	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. 250 - 500 miles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. more than 500 miles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EXHIBIT D-1 (Continued)

5. Check the type or types of transportation which you believe fit the following characteristics. SELECT ONE OR MORE for each characteristic.

DO NOT
WRITE
IN THIS
SPACE

	Air	Auto	Intercity Bus	Rail	None	
a. Reasonable priced	<input type="checkbox"/>	_____				
b. A safe way to travel	<input type="checkbox"/>	_____				
c. Dirty facilities	<input type="checkbox"/>	_____				
d. Not harmful to environment	<input type="checkbox"/>	_____				
e. A fast way to travel	<input type="checkbox"/>	_____				
f. Harmful to the environment	<input type="checkbox"/>	_____				
g. Too slow	<input type="checkbox"/>	_____				
h. Comfortable and relaxing	<input type="checkbox"/>	_____				
i. Inconvenient departure times	<input type="checkbox"/>	_____				
j. Convenient departure times	<input type="checkbox"/>	_____				
k. Clean facilities	<input type="checkbox"/>	_____				
l. Rude or discourteous service	<input type="checkbox"/>	_____				
m. Friendly and helpful service	<input type="checkbox"/>	_____				
n. A dangerous way to travel	<input type="checkbox"/>	_____				
o. Uncomfortable	<input type="checkbox"/>	_____				
p. Too expensive	<input type="checkbox"/>	_____				

6. Should the State of Wisconsin spend more money to improve or develop:

	Yes, much more	Yes, somewhat more	About the same	No, somewhat less	No, much less	
a. Airports	<input type="checkbox"/>	_____				
b. Highways	<input type="checkbox"/>	_____				
c. Passenger trains	<input type="checkbox"/>	_____				
d. Intercity Bus service	<input type="checkbox"/>	_____				
e. Local bus transit service	<input type="checkbox"/>	_____				

7. Check your age category.

Under 18 18 - 25 26 - 40 41 - 65 Over 65

8. Your sex is:

Male Female

9. Check your approximate annual family income.

(Remember, these responses are anonymous) \$0-4,999 5,000 - 9,999 10,000 - 19,999 20,000 - 29,999 30,000 - 49,999 Over 50,000

10. Including yourself, check how many there are in your household.

1 2 3 4 5 or more

11. Check the category that best fits your occupation.

Professional or Technical Sales or Clerical Service worker Operative or craftsman Owner or manager Home-maker Student

General labor None of those (Specify) _____

THANK YOU!

socioeconomic groups less likely to have a driver's license were under-represented in the survey. To correct this bias, a supplementary survey was conducted using social service records as a sampling frame.

NEW YORK ATTITUDINAL SURVEY

NYSDOT conducted a small sample statewide household survey in 1974 to determine citizen attitudes toward and potential response to alternative urban transit policies (e. g., fares, levels of service, sources of revenue).¹ A stratified quota sample was selected for the survey. The following four strata, each having a quota of 252 interviews, were defined for the survey:

- . places having 1, 000, 000 population or more;
- . places having 50, 000 to 999, 999 population;
- . urban places having less than 50, 000 population; and
- . nonurban places.

The quota of 252 interviews was further subdivided within each stratum to represent the distributions of selected socioeconomic and household characteristics for the stratum.

A lengthy and complex questionnaire was used in the survey. Data were collected on members of sample households over the age of 18. The selected respondent for each household was asked questions regarding:

- . the agencies and levels of government that should be primarily responsible for funding transit service;
- . characteristics of local transit service; and
- . the respondent's current usage of transit services.

Alternative urban transit service concepts were defined, and the respondent was asked to rank his/her preferred combination of transit service attributes for each concept (see Exhibit D-2 for concepts and Exhibit D-3 for alternative attributes of the service concepts). Sophisticated ranking and analysis procedures were employed to evaluate the potential impacts and citizen response to each alternative transit concept.

¹Survey documentation was provided by NYSDOT.

EXHIBIT D-2

ALTERNATIVE TRANSIT SERVICE CONCEPTS ANALYZED IN NYSDOT ATTITUDINAL SURVEY

CONCEPT A

All places in the state, including rural areas, would be given money to support or develop public transportation. This would make much more transit service available in your community than there is now. However, in order to pay for it, the average rider would be charged 60¢ or more, and everyone in the state, regardless of place of residence would have to pay \$30 per year in increased personal income taxes.

CONCEPT B

Only places in the state that now have public transportation would be given money to support it or develop it further. This would keep the amount of transit service available in your community about the same as there is now. In order to pay for it, the average rider would be charged 25¢ to 35¢, and everyone who lives within 1/2 a mile of public transportation service would pay increased property or general sales taxes of \$10 per year.

CONCEPT C

All places in the state with over 10,000 people would be given money to support or develop public transportation. This would make much more transit service available in your community than there is now (if you live in a place with over 10,000 people). In order to pay for this, the average rider would be charged 0 to 10¢ and everyone in the state, regardless of place of residence, would have \$50 per year off from his automobile-related taxes like the auto sales tax, fuel tax, parking tax, tolls, etc.) allocated to public transportation. This would mean no increase in taxes but a reduction in the amount of money spent for other transportation programs, like highway construction.

EXHIBIT D-3

TRANSIT SERVICE ATTRIBUTES ANALYZED
IN NYSDOT ATTITUDINAL SURVEY

The Presence or Absence of Fare
Differences Among Groups

Same Cost for Everyone
Less for Some Groups

Ways of Attracting Riders

Lowering Fares
Improving Transit Service
Raise Auto Costs

Tax Source of Funds

Transit Aid -- Car Taxes
Transit Aid -- Pers. Inc.
Transit Aid -- Prop/Sales

The Group that Pays for Transit

Riders Only Pay
People Near Transit Pay
Everyone Pays

Ways of Raising Funds for Transit

Reduce Other Transp. Prog.
Reduce Money for Schools
Reduce Money for Health-Wel.
Increase Taxes

The Cost per Ride

\$.00 - .10 Per Ride
\$.25 - .35 Per Ride
\$.60 or More

Amount of Transit Aid

\$10/Year Transit Aid Per Household
\$30/Year Transit Aid Per Household
\$50/Year Transit Aid Per Household

The Level of Transit Service

More Transit Service
About Same Transit Service
Less Transit Service

RECREATION TRAVEL SURVEYS

The Kentucky Department of Transportation conducted a recreation travel survey in the summer of 1970. The objective of this survey was to "investigate the nature of travel demand to outdoor recreation facilities in Kentucky and to develop a model for predicting this demand for use in planning and design of recreational and other routes...."¹

Recreation travel was surveyed at 42 recreation areas considered to generate the major share of recreation activity in Kentucky. The types of areas included in the survey ranged from small fishing lakes to major national parks. The recreation areas surveyed were distributed throughout the Commonwealth. At the 42 recreation areas, 170 sites were surveyed, including 65 sites in the state parks, 64 sites on Kentucky Lake and Land Between The Lakes, three sites at national parks, four sites at Daniel Boone National Forest, and 16 miscellaneous sites. Information on all vehicles entering and leaving the survey sites was recorded. All entrances and exits for each site were surveyed on the same day.

The recreation travel survey was conducted on Sundays from June 7 to August 23, 1970.² A Sunday survey was conducted because recreation travel in Kentucky peaks on Sundays. Travel generated by each survey site was counted only once during the survey period, with the exception of several sites which were counted each month. The recreation travel survey was conducted as a license plate survey. This procedure was selected based on the manpower available for the survey effort. Survey personnel assigned to each site were instructed to record for each arriving and departing vehicle the vehicle type, auto occupancy, license number (or county), and state in which the vehicle was registered (see survey form in Exhibit D-4). The survey was conducted over the period 10 A.M. to 8 P.M. Depending on the volume of travel through each survey location, one to three personnel were assigned to each station. Personnel for the survey were made available from seven different state and federal agencies responsible for operating the recreation areas or providing highway facilities serving such areas.

¹J. G. Pigman, Kentucky Department of Highways, Influence of Recreation Areas on the Functional Service of Highways, Research Report 310 (August 1971).

²The Sunday during the Fourth of July holiday weekend was not included in the survey.

EXHIBIT D-4

SURVEY FORM FOR KDOT RECREATION TRAVEL SURVEY

KENTUCKY DEPARTMENT OF HIGHWAYS
RECREATIONAL O-D SURVEY

Date: DAY MO. YR.

1	2	3	4	5

Location:

7	8	9

Weather: A/ 10

Sheet Number:

11	12	13

Survey Made By:

14	15	16	17

Hourly Total:

14	15	16	17

Time: START

18	19	20	21	

 END

22	23	24	25	

FORM A

LINE NUMBER	O			LICENSE NUMBER OR COUNTY	OUT-OF-STATE ABBREVIATION	LINE NUMBER	I			LICENSE NUMBER OR COUNTY	OUT-OF-STATE ABBREVIATION	LINE NUMBER	B/			LICENSE NUMBER OR COUNTY	OUT-OF-STATE ABBREVIATION
	ARRIVING	DEPARTING	VEHICLE CLASS				ARRIVING	DEPARTING	VEHICLE CLASS				ARRIVING	DEPARTING	VEHICLE CLASS		
1						2						3					
4						5						6					
7						8						9					
10						11						12					
13						14						15					
16						17						18					
19						20						21					
22						23						24					
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28						29						30					
31						32						33					
34						35						36					
37						38						39					
40						41						42					
43						44						45					
46						47						48					
49						50						51					
52						53						54					
55						56						57					
58						59						60					
61						62						63					
64						65						66					
67						68						69					

CODES: A 1. CLEAR & SUNNY
 2. CLOUDY & PARTLY SUNNY
 3. CLOUDY & NO SUN
 4. LIGHT RAIN
 5. INTERMITTENT SHOWERS
 6. HEAVY THUNDERSHOWERS

B/ 1. TWO-AXLE VEHICLE
 2. (1) WITH BOAT & TRAILER
 3. BOAT ON CARTOP OR PICKUP
 4. (1) WITH CAMPER TRAILER OR HOUSE TRAILER
 5. CAMPER PICKUP OR SINGLE UNIT CAMPING VEHICLE
 6. (5) WITH BOAT & TRAILER
 7. MISCELLANEOUS

D.8

The application of license plate survey procedures was considered very successful by Kentucky officials. However, two problems with the survey results were noted. During periods of heavy traffic flow, it was only possible to count the number of vehicles passing through a survey location. Since license plate numbers were not recorded during such periods, it was not possible to detect the double counting of vehicles re-entering the recreation areas. A second survey problem was that in a license plate survey it was not possible to determine accurately the origin location of a trip to the recreation area. The "true origin" was inferred based on the county or state where the vehicle was registered.

Telephone surveys also have been conducted to obtain weekend travel and household socioeconomic characteristics to develop weekend recreation travel models. Such surveys have been carried out by the Ontario Department of Highways, by Midwest Research Institute for NCHRP Project 7-9, and by the University of Wisconsin for the Upper Great Lakes Regional Commission. The questionnaire used in the Ontario survey is included as Exhibit A-4.

TRAVEL SURVEYS OF THE RURAL POOR AND ELDERLY

A subject of increasing importance in statewide transportation planning is the travel problems of the rural poor and elderly. An example of a travel survey undertaken for such a study is documented in the report A Study of the Transportation Problems of the Rural Poor.¹ This study was undertaken to analyze the transportation needs of poor persons in five rural areas of the nation and to recommend transportation systems to satisfy the needs of such persons.

The survey was designed to meet the following objectives:

- . to identify the underlying factors affecting travel of the rural poor;
- . to determine current travel patterns of such individuals;
- . to determine the minimum level of transportation service required by the rural poor; and

¹Resource Management Corporation, prepared for the U.S. Office of Economic Opportunity (January 7, 1972) distributed by FHWA Notice dated August 9, 1972.

- to determine the attitudes of the poor regarding their transportation problems and the characteristics of transportation systems considered to be important to such travelers.

The transportation survey of the rural poor was conducted as a home interview survey. It was performed in four of the five areas during January, February, and March 1971; the survey at the fifth location (in South Carolina) was performed during May and June 1971. The surveys in each area were performed over a 6 week period.

The home interview survey of the rural poor differed from standard travel surveys in that data were collected on trips taken over a 1 month period. Specifically of interest in the survey was the number of trips made by the respondents for each trip purpose specified in the survey. A lengthy questionnaire was used in the survey.

The survey was stratified by county within a state, with individual households selected on a systematic random basis within a county. The survey was designed to yield estimates of a "proportion of households in which a given characteristic in a target population is to be within .05 of the true proportion with a confidence level of 95%."¹ Based on these requirements, a sample size of 384 households was required for each state.

¹Resource Management Corporation, op. cit.

PL 6

