

Simulated Home Interview

By Television

WILLIAM R. McGRATH and CHARLES GUINN, respectively, Director and Transportation Planning Assistant, Dept. of Traffic & Parking, New Haven, Conn.

•DURING 1962 the New Haven Department of Traffic and Parking undertook an origin and destination survey specially designed to meet their technical needs within a severely limited budget. What is believed to be the first attempt to combine the low cost of postal surveys with the inherent advantages of personal interview was employed. Mass interview by television was substituted for the standard door-to-door technique. It was hoped by this means to obtain the accuracy and control of the home-interview method at a fraction of usual costs. This report discusses the factors establishing this interviewing technique, the actual technique employed, and the results of the survey.

The city of New Haven needed an areawide transportation study as a sound base for traffic planning by the traffic department. It was evident that the study must develop detailed information of traffic generation and travel patterns in the greater New Haven area to fulfill the purpose. These also had to be used for all other aspects of the work; therefore, a low-cost field survey technique was mandatory.

An essential phase of the transportation study was a complete O-D survey, because no field survey of this magnitude had ever been conducted for the metropolitan area.

The scope of the planning program to be based on the survey included expansion of the travel pattern, trip distribution by mode, and trip assignment to the street network. The goal was to generate present and future travel patterns on any proposed street network. This would be accomplished by simulating a street network and assigning the O and D movements by computer. In this manner any proposed street change could be checked for its effect on the entire system.

Inasmuch as the survey had to be adaptable to expansion to a target year based on future land use, population, and socio-economic changes, a detailed analysis of traffic generation and travel pattern for the entire metropolitan area was required. Trip characteristics such as mode, purpose and time had to be determined. Also, related factors such as auto ownership, income and persons per dwelling unit were needed. Land use at the trip end was required for analysis of transportation-land use relationships important in determining future travel patterns. A complete land-use survey of New Haven was included in the CRP program, therefore, the necessary land-use data were available for the transportation study.

The need for detailed information to study the effect of changes in the street system required the use of small traffic zones. The use of large traffic zones would not permit adequate simulation of traffic flows on the street network, because any large zone would contain too large a portion of the street system. The number of zones needed for the greater New Haven area was determined to be over 500. A large sample was desired to insure a representative sample for each zone.

The need for a low-cost, large-sample interviewing technique eliminated the standard home-interview technique from consideration; yet, the detail and accuracy obtainable from this interview technique were desired. Therefore, an interview technique that would combine the detail and accuracy of the home-interview approach with the low cost of a postal survey was developed.

By using census tracts as traffic zones and enumeration districts as subzones vast amounts of data concerning land use, population, and transportation characteristics

became available to the survey. These data included population, age distribution, number of dwelling units, housing standards, family income, and actual dwelling unit characteristics. In a similar manner, these data could be used to "debias" the sample by determining the degree of variation and correcting for it.

Census information made possible the use of a postal survey; however, a high degree of accuracy still had to be obtained from this detailed postal questionnaire. To achieve accuracy, the personal contact so important to the home survey had to be injected into the postal survey. The best low-cost method of achieving personal contact with the public seemed to be by television. It was decided that a properly developed television program could provide the necessary contact to generate accurate answers to detailed questions.

The traffic department developed a postal questionnaire which could be coordinated with a television explanation. The questionnaire was adapted from the standard home-interview form; however, some changes were made to accommodate a postal form. The form consisted of two 6- by 9- in. attached cards. One card (Fig. 1) contained the instructions for completing the questionnaire and a plea for public support. The other card (Fig. 2) contained the survey questions. The postal questionnaire itself encouraged the public to watch the television program for a clear explanation in completing the form.

The distribution of the survey questionnaire was similar to most postal surveys. A questionnaire was addressed to each dwelling unit in the fourteen town metropolitan area; this required 100,000 questionnaires. They were mailed under a bulk rate which cost 2.5 cents per questionnaire. They were bundled according to town to facilitate mail handling. The returned questionnaires were received under a business reply permit which cost 6 cents per return. The mailing of the questionnaires was scheduled to have them arrive on the day before the television program.

GREATER NEW HAVEN TRAFFIC STUDY

Do YOU wonder why THEY don't do something about
traffic?

YOU are THEY!

YOU can do something about the TRAFFIC PROBLEM

PLEASE COMPLETE AND RETURN THIS QUESTIONNAIRE

Information is needed concerning travel habits of people throughout the entire area to be able to plan further transportation improvements for YOU. Answers from all persons in the Greater New Haven Area are needed for a complete survey.

WATCH TV CHANNEL 8 — TUESDAY — JUNE 5, 8:00 P.M.
Half hour program on Traffic and Transit — aid in completing this form

Please include ALL TRIPS made, during one entire week-day (4 a.m.-4 a.m.) by EACH person, living at your address, over 5 years of age.

Record, separately, each BUS, TAXI, AUTO-DRIVER, and PASSENGER trip, regardless of who owns the car.

A trip (for the purpose of this survey) starts at one point (for example: 113 Campbell Ave., West Haven) and ends at a different point (for example: 2100 Dixwell Ave., Hamden). When you finish there and go to another place (or return to 113 Campbell Ave., West Haven) that would be another trip.

Trips made together, by more than one member of the family, would be recorded as separate trips by each person. Thus a shopping trip, by husband and wife, in the same car, would be entered as two separate trips (one auto-driver and one passenger) to the store, and two separate trips returning from the store.

DROP IN ANY MAIL BOX - - POSTAGE IS PREPAID

This is an official function of the New Haven City Government — No commercial activity of any sort is involved.

Dept. of Traffic & Parking
William R. McGrath, Director

B-52

Figure 1.

GREATER NEW HAVEN TRAFFIC STUDY

Please complete, detach, and mail this questionnaire. All answers will be strictly confidential. Postage is PREPAID — just drop into any mail box.

1. Number of persons in family, living at home, over 5 years old
2. Number of passenger cars owned by persons living at this address
3. Type of parking for passenger cars at home: 1 Garage ☐ 2-Driveway ☐
3-Lot ☐ 4-Street ☐
4. Did you fill this out during the special TV program? Yes ☐ No ☐

Date form completed _____

Please list all trips made, from 4 a.m. yesterday until 4 a.m. today, made by each person, living at your home, over 5 years old. Give complete address or nearest intersection.

	Where did this trip begin		Where did this trip end		Method of Travel	Time	Purpose of Trip
	Address	Town	Address	Town			
	113 Campbell Ave.	West Haven	2100 Dixwell Ave	Hamden	Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	7 A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
1					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
2					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
3					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
4					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
5					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
6					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
7					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
8					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
9					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
10					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
11					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
12					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
13					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
14					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>
15					Bus <input type="checkbox"/> Taxi <input type="checkbox"/> Auto-Drive <input type="checkbox"/> Auto-Pass. <input type="checkbox"/>	A.M. P.M.	Work <input type="checkbox"/> Shop <input type="checkbox"/> Business <input type="checkbox"/> Social & Recreational <input type="checkbox"/> Medical <input type="checkbox"/> School <input type="checkbox"/> Eat Meal <input type="checkbox"/> Home <input type="checkbox"/>

Figure 2.

One half-hour of television time, 8:00 PM to 8:30PM on Tuesday, June 5, was donated by the local station as a public service. A television show was produced by the traffic department and the television studio which would clarify the survey questionnaire and encourage return of an accurately completed questionnaire. The program was made up of film clips and interviews of certain officials designed to associate the viewer with national and local traffic problems so that he might feel something should be done to alleviate the problem and that completion of the questionnaire would contribute substantially to the solution.

A large section of the program was devoted to a detailed explanation of the questionnaire. A large-scale questionnaire was displayed and a step-by-step explanation of the questions was conducted. Various typical travel situations were discussed and clarified. At the close of the program local officials gave a plea for a large return of the completed questionnaires.

An advertising campaign was organized to encourage the public to watch the television program. The major medium employed was the local television station on which the program was to be shown. However, daily and weekly newspapers as well as radio stations were used to get across the "Watch the TV Program and Help Solve the Traffic Problem" message.

The returns were control coded by home zone (zone of residence) and the total number of returns per zone was tabulated. The percentage return was calculated by comparing the total number of dwelling units in each zone with the total returns for that zone. The total number of dwelling units was determined from the census data.

The returns were analyzed for bias by comparing the return percentages by zone with income, auto ownership and distance from the center. For a further check for bias the number of total trips per dwelling unit reported for each zone was correlated with income, auto ownership and distance from the center.

TABLE 1
GENERATION CHARACTERISTICS

City	Year	Population	Trip/Person	Person/ Car	Trip/ DU	Persons/ DU	Car/ DU
Chicago	1956	5,169,663	1.92	3.85	5.96	3.10	0.80
Detroit	1953	2,968,875	1.77	3.51	5.88	3.31	0.94
Washington	1955	1,568,522	1.67	3.75	5.05	3.02	0.81
Pittsburgh	1956	1,472,099	1.61	3.75	5.26	3.26	0.87
St. Louis	1957	1,275,454	1.94	3.48	6.05	3.12	0.90
Houston	1953	878,629	2.22	3.43	7.16	3.22	0.94
Kansas City	1957	857,550	2.18	3.26	6.69	3.07	0.95
Phoenix	1957	397,395	2.29	2.87	6.88	3.01	1.05
Nashville	1959	357,585	2.29	3.35	7.52	3.28	0.98
Fort Lauderdale	1959	210,850	1.69	2.72	3.63	2.15	0.79
Charlotte	1958	202,272	2.36	3.28	8.10	3.43	1.05
Reno	1955	54,933	2.48	2.43	6.87	2.77	1.14
New Haven	1962	408,172	2.31	2.50	7.25	3.12	1.24

As a means of further control large sample (60%) home interviews were taken for selected zones (7 of 500) and the results of these were compared to the TV-postal survey for those zones. The number of trips per dwelling unit by time, mode and purpose were correlated for each survey technique. In this manner the TV-postal survey was checked for time, purpose and mode bias.

The postal survey was debiased by purpose and mode by applying differential expansion factors. Factors were also used to expand the returns to 100 percent for each zone.

RESULTS

The number of usable returns totaled 11,000, which constituted a 10 percent sample. This was considerably below the originally anticipated and desired return of at least 20 percent. Conversely however, the percentage of unusable replies was quite low, less than 0.5 percent of the total. The percentage usable returns by zones was found to vary directly with income. A 30 percent return was common in zones with a mean family income over \$10,000 per year, but the return was as low as 1.5 percent in zones with family income below \$4,000 per year.

The bias favoring high income groups resulted from the large reply from a higher auto ownership group than the mean. This tended to inflate the survey results since high income, high auto ownership groups exhibited a high trip per dwelling unit rate. The use of many small zones made it possible to dampen this effect since small zones possess more uniform social-economic factors than large zones. The over reporting of trips per dwelling unit was offset by applying reduction factors based on the difference between auto ownership as reported and the actual auto ownership of the zones.

The breakdown of trips per dwelling unit by mode indicated "under reporting" of auto passenger trips. Correction for this bias was achieved by determining auto occupancy as reported and adjusting auto passenger trips to a reasonable auto occupancy rate determined by roadside observation.

The questionnaire asked, "Did you fill this out during the special TV program?" The question was intended to determine the pattern variation between viewer and non-viewer replies. It was hoped that in this manner the effect of the television interview on accuracy could be analyzed. Unfortunately, the format of the TV program as finally developed did not make this possible. The original concept called for an intensive 30-min interview during which the viewer would complete his questionnaire.

There was to be a minimum of extraneous material in the program. The television question was worded with this in mind and the questionnaire form was printed.

The television station officials convinced the traffic officials that a program containing a long interview period would not gain a large audience. As a result, the length of the actual interview time was substantially reduced. The reduction in interview time removed the possibility of the viewer completing the questionnaire during the program; therefore, the wording of the question no longer applied. Many replies were marked that the questionnaire was not completed during the program, but written notes on the cards indicated the person replying had watched the program. The wording problem removed an analysis of the television effect on returns since non-viewer replies could not be compared with viewer replies.

Several problems were encountered in performing the survey. The greatest problem was to gain public attention for the television portion of the survey. Since only one television channel was used in an area which has about four-channel coverage, switchover from the traffic program was possible and very probable. An increased publicity campaign would reduce the number of viewers changing channels, however, a more effective method would be blanket coverage of all channels.

The bias in the sample appears to be no different than a normal postal survey.

The generation factors determined from the New Haven survey are compared with similar generation factors from other transportation studies in Table 1. The New Haven generation seems reasonable especially in view of New Haven's high auto ownership rate of 1.24 autos per dwelling unit which would cause a high trip per dwelling unit rate.

A percentage breakdown of total trips by purpose is given in Table 2 for New Haven and from other transportation studies. The New Haven percentages are close to those of metropolitan areas of similar size. The social-recreational percentage is slightly higher than the other studies, however, this might be due to the later New Haven date, June 5.

The bias encountered in auto ownership was chiefly caused by under reporting for dwelling units from which no trips were made that day. The largest portion of "no trip" dwelling units also were "no auto" dwelling units. Thus, as the percentage of dwelling units without autos decreases and auto ownership increases the bias decreases. An example of this bias is shown by analyzing the lowest income area in the New

TABLE 2
PERCENT BY PURPOSE COMPARISON

City	Survey Date	Home	Work	Business	Shop	Soc. - Rec.
New Haven	1962	39.6	19.0	10.1	9.6	13.1
Chicago	1956	43.5	20.5	12.4	5.5	12.8
Detroit	1953	39.5	23.5	6.9	8.2	12.1
Washington	1955	41.7	23.4	6.6	8.2	7.1
Pittsburgh	1958	43.4	21.0	13.5	8.4	7.9
St. Louis	1957	40.5	20.8	6.0	10.5	12.3
Houston	1953	40.3	18.9	7.1	10.1	10.8
Kansas City	1957	38.4	20.6	6.7	9.9	12.9
Phoenix	1957	37.2	18.2	7.9	11.5	11.2
Nashville	1959	37.6	19.1	6.5	10.5	13.6
Fort Lauderdale	1959	38.6	17.2	11.7	13.8	12.9
Charlotte	1958	36.6	21.9	7.5	9.0	12.8
Reno	1955	38.6	16.9	11.2	10.4	14.3
Average		39.6	20.2	8.7	9.7	11.7

Likewise, it permits the removal of erroneously listed buildings or addresses. It permits the proportion of sample to total dwelling units to be systematically adjusted.

Survey Techniques

Assuming that the list of dwelling places selected as a sample is representative of all dwelling places in the urban area, how good is the interview process in obtaining complete household trip information? What improvements can be made to insure the complete reporting of all travel taking the traveler outside of the block origin?

The standard interview procedure involves the following: (1) the mailing of a "Dear Householder" letter to the sample address in advance of the travel day, and (2) a personal interview with at least one responsible adult living at the sample address within three days after the travel day. This procedure has been extensively used in the past. It consistently under reports travel.

To overcome this systematically occurring discrepancy, three modifications to the basic interviewing procedure have been devised. The first of these modifications is simply requiring the interviewer to interview all persons 16 years of age and older at the assigned sample address. This is accomplished by making at least one personal visit to the sample household to obtain detailed information on the travel made by all members of the household. Additional callbacks, either in person or by telephone, are made to those members of the household not originally interviewed in person to verify the completeness and correctness of the information already obtained.

The second modification, not used in the Niagara Frontier home interview survey, is to encourage the voluntary reporting of trips made by the respondents but not remembered until after the completion of the personal interview. This is done by leaving a small card with the respondent at the close of the interview. On the card is a request for any additional travel information and instructions for reporting such travel by telephone.

The third modification is that exemplified by the "pre-interview" technique. Pre-interview identifies an interviewing procedure which features before and after travel date visits to the household by the interviewer. Trip cards on which travel data can be recorded are left for each member of the family on the interviewer's first visit, who at the same time explains their use and arranges for a return visit to the household as soon after the travel date as is mutually convenient. On the second visit, the interviewer reviews the trip cards completed by members of the household and transfers this information plus additional household and person data to the standard interview form or document.

In comparison, the "standard" technique involves one visit to the household by the interviewer, conducted as soon after the travel date as is possible. In this case, the interviewer obtains the data by question and answer either directly from the respondent or from members of the household present and familiar with the travel of those members not present at the time of the interview. No trip cards or other respondent travel logs or diaries are used.

BACKGROUND OF PRE-INTERVIEW TECHNIQUE

How did the pre-interview technique come about? Unfortunately, no complete history is available. It has long been believed that if person contact could be established with the household prior to the travel date, then more complete and accurate travel data could be obtained from that household. The question then was as it is now: Would the improvement in trip reporting more than compensate for the additional interviewer time and cost involved in using this procedure?

The first attempt to determine this came about with an origin and destination survey conducted in New Orleans several years ago. No conclusive results were obtained at that time. Since then this technique has been experimentally utilized in the Pittsburgh and Penn-Jersey Transportation Studies. In the former application, the results were promising, although not conclusive enough to warrant a full-scale adoption of technique for the home interview survey in Buffalo. The results obtained in the latter application indicated no basic improvement over the standard interviewing technique developed during the past several decades.

THE NIAGARA FRONTIER HOME INTERVIEW SURVEY

The Niagara Frontier Transportation Study cordon area encompasses an area of approximately 800 square miles, containing over 400,000 dwelling places. It includes the cities of Buffalo, Niagara Falls, and Lockport and the suburban towns and villages adjacent to these cities.

In this area, 4 percent of the field-listed dwelling places were selected as sample units. This produced a total of over 16,000 scheduled interviews, of which 13,000 interviews were completed. The selected samples were divided into three groups: 80 percent to be interviewed by the study's consultant, 10 percent to be interviewed by NFTS personnel using "regular" interview techniques, and 10 percent to be interviewed by NFTS personnel using pre-interview technique. Personnel employed by the study's consultant were under instructions requiring that the interviewer or the editing staff personally contact each respondent sixteen years of age and older by means of personal visit or a telephone call after the initial interview. The same instructions were in effect for NFTS personnel only during the last five weeks of the interviewing period. Otherwise interviewing instructions, data requirements, personnel supervision and administration were essentially identical between the two organizations.

In brief, interviews have been classified into groups, depending on the organization to which the sample was assigned and the degree of personal contact obtained with the residents of the household. Emphasis is placed on the effectiveness of intensive interviewing and the pre-interview technique, taken singly and in combination with each other, in improving trip reporting in comparison with conventional techniques.

RESULTS

Figure 1 gives the basic Niagara Frontier home interview survey results as a function of the organizations and techniques involved. The completed interviews and trips reported for the NFTS regular, NFTS pre-interview, contractor, and total home interview survey are shown. In this paper, trips reported are raw data, since no trip linking or collapsing of passenger ride-to-ride trips has been done. These data have also been calculated and graphed as reported trips per household and reported trips per capita. There is a difference in the household rates (7.5 for NFTS versus 8.0 for the contractor) and a similarity in the per capita rates (each is on or about 2.3 trips per person).

Is there any appreciable difference in the average household characteristics of the interviews completed by each organization? In addition to trip and interview data, Figure 1 also gives average persons per household, average automobile ownership, and average family income. The numeric values shown for each of the listed family characteristics remained practically identical between organization and technique group. This substantiates the contention that each group is a representative sample of the same universe of dwelling places. It also shows that any differences in interview rate or trip reporting cannot be attributed to differences in family characteristics but are a function of organizational efficiency and the interviewing techniques.

Figure 2 shows the number of completed interviews and trips in households where one person 16 years of age and older was interviewed and in households where two or more persons 16 years of age and older or all persons 16 years of age and older were interviewed for the same organization and technique groupings as before. These data have also been calculated and plotted as reported trips per household and reported trips per capita.

The results are somewhat contradictory. NFTS interviewers show a higher household trip reporting rate in families where only one person 16 years of age or older was interviewed. The opposite of this is indicated by the trip reporting rates of interviews conducted by the contractor. Here the higher trip reporting rate occurs in families where two or more persons or all persons 16 years of age and older were interviewed. The major difference between NFTS and contractor interviews lies in the percent of households where two or more or all persons 16 years of age and older were interviewed. The values are 52, 57, and 87 percent for the NFTS regular, NFTS pre-

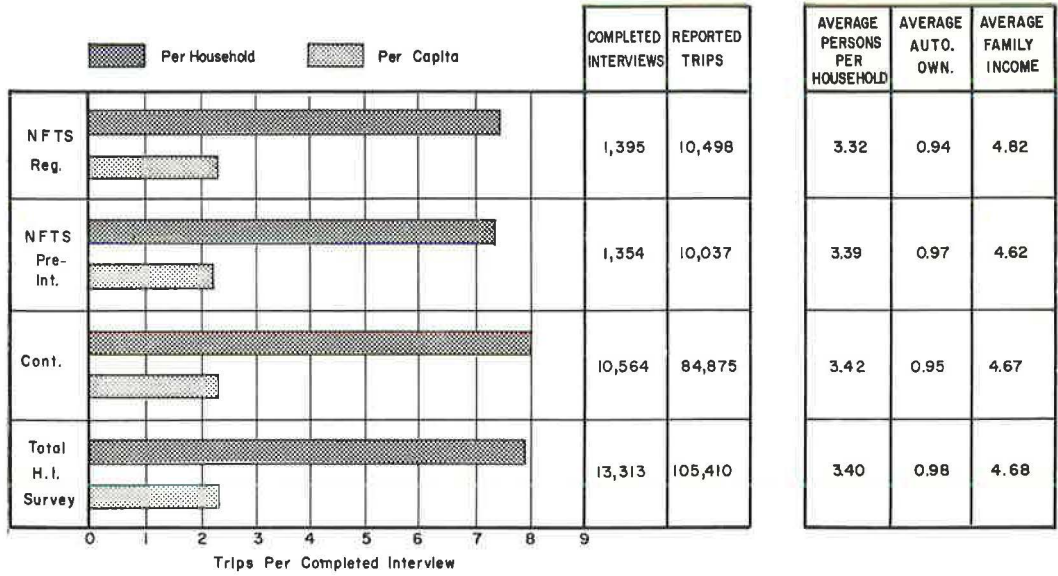


Figure 1. Niagara Frontier home interview survey results.

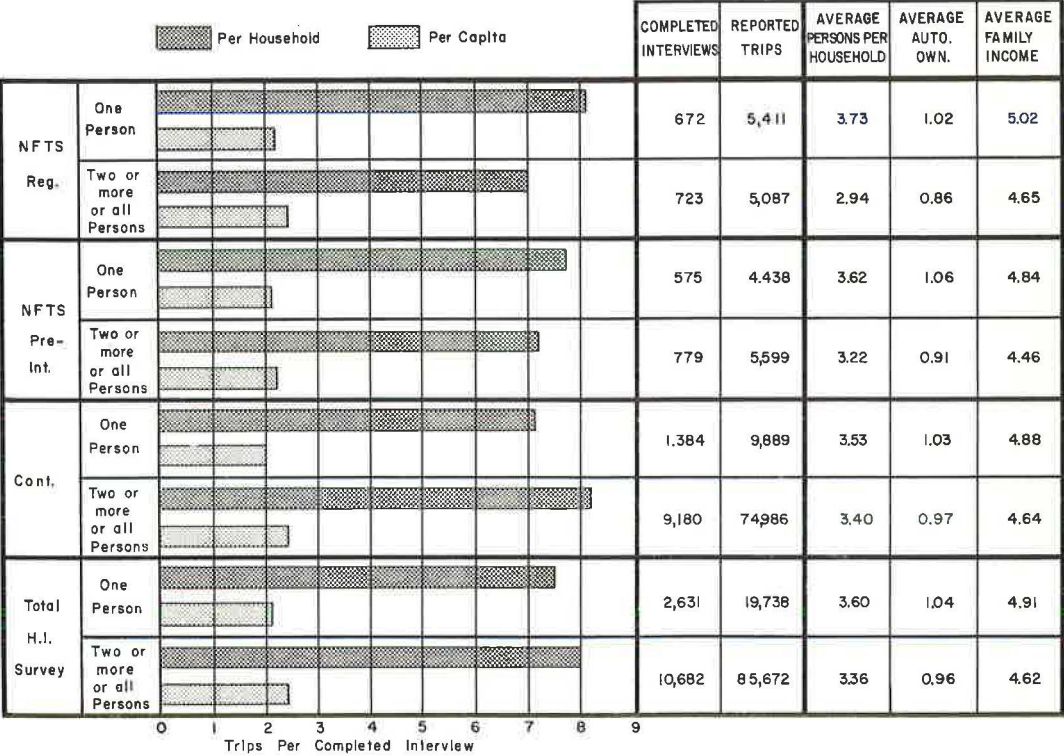


Figure 2. Trip reporting vs number of persons interviewed.

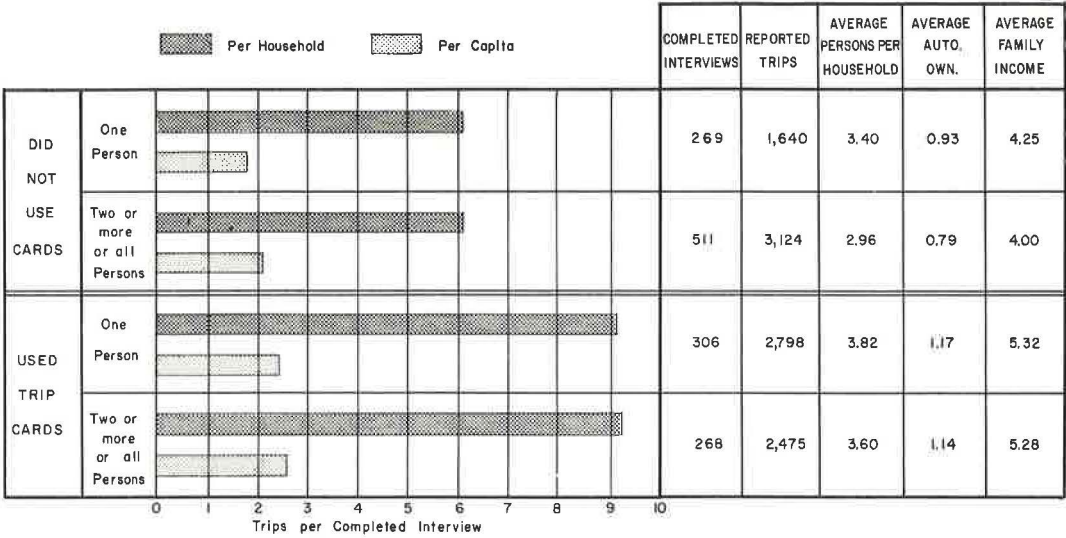


Figure 3. Trip reporting vs use of trip cards.

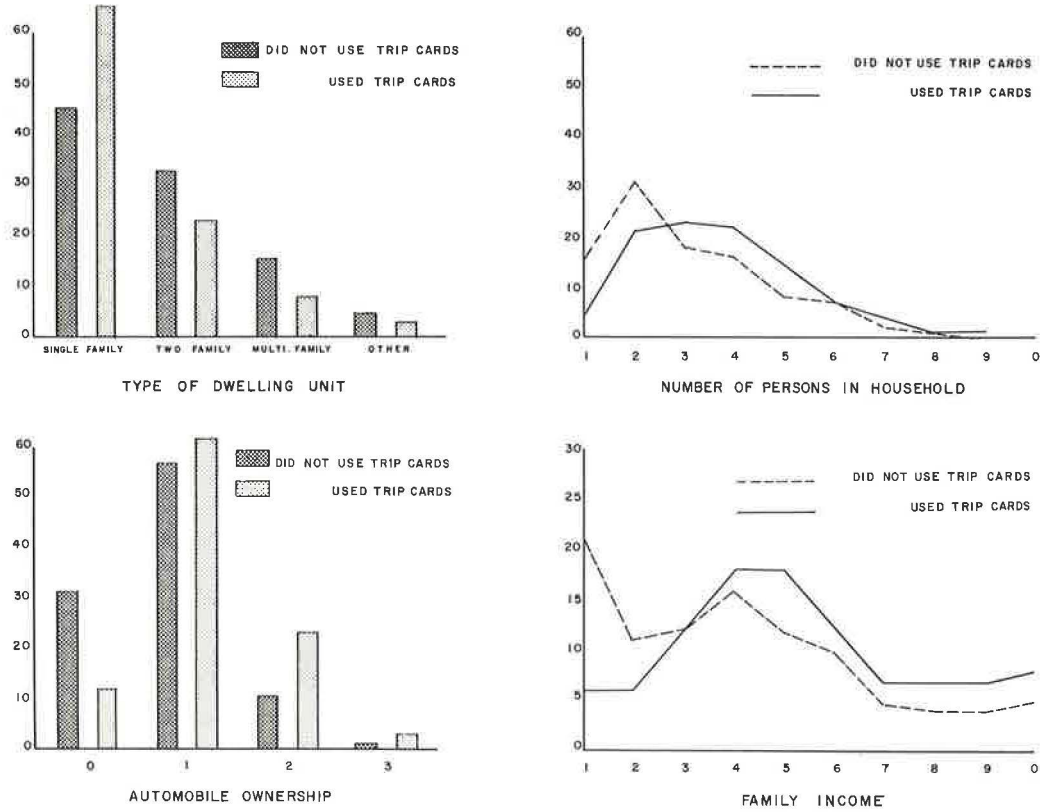


Figure 4. Household characteristics and use of trip cards.

interview, and contractor, respectively. Herein lies one explanation for apparent differences in household trip reporting. In NFTS interviews, households where two or more or all persons 16 years of age or older were interviewed were those which tended to be small in size, own fewer cars, and have a lower family number than the comparable contractor group. In NFTS interviews, the interviewer was usually able to complete interviewing the adult members of this household on a single visit — hence those 16 years of age and older were considerably easier to reach and, as a household, made fewer trips than the comparable contractor group.

Therefore, the 30 to 35 percent difference consists of households having an above average number of trips per household, persons per household, automobile ownership, and family income.

The results for reported trips per capita are as expected. Households where only one person 16 years of age and older was interviewed report approximately 2.1 trips per capita, whereas, households where two or more or all persons 16 years of age or older were interviewed report approximately 2.4 trips per capita. This indicated that interviewing more than one adult member of the household does pay off in terms of increased per capita trip reporting. However, these figures are not inclusive enough to warrant further estimates as to the total effects of intensive interviewing.

Figure 3 analyzes the basic results of the NFTS pre-interviews in terms of those households using or not using trip cards. If in any household one or more members used trip cards, then that household is considered to be one using trip cards.

Households not using trip cards report an average of 6.1 trips per household, while those using trip cards over 9 trips per household. Similar results are indicated for trips per capita. Households not using trip cards report approximately 2.0 trips per capita while those using trip cards report approximately 2.5 trips per capita. This is 3 trips per household and half a trip per person greater per day for those using trip cards. Clearly there must be an explanation for this phenomenon.

Figure 4 shows the differences in household characteristics between those using or not using trip cards. The users as a group are more likely to be residents of single-family dwelling units, to own more automobiles, to have a higher average family income, and to have larger families. The household differences between the two groups are of such a magnitude that they must not be ignored.

CONCLUSIONS

The two basic conclusions obtained are as follows:

1. The pre-interview technique does not increase trip reporting. It facilitates the reporting of trips by those who are willing to complete the trip cards. Those who do use trip cards normally make more trips and have different household characteristics than those who do not use trip cards.

2. Intensive interviewing, where the goal is personally to interview all members of the household 16 years of age and older, does increase trip reporting in proportion to the attainment of this goal.

Both the pre-interview and intensive-interviewing techniques are somewhat more expensive in terms of interviewer man-hours and miles driven than the standard technique. Therefore, increased expenditures on intensive interviewing are justifiable inasmuch as better data can be obtained for the incremental investment. This is not true for the pre-interview technique.

Therefore, use of intensive interviewing procedures is recommended in future home interview surveys.