Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
TX-92/1940-5		

4. Title and Subtitle	5. Report Date
U.S. 75 NORTH CENTRAL EXPRESSWAY RECONSTRUCTION: LEMMON/OAK LAWN/PEAK SCREEN LINE AUTOMOBILE USER PANEL, OCTOBER 1992 SURVEY RESULTS	May 1993
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
Gerald L. Ullman and Raymond A. Krammes	Research Report 1940-5
9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Texas Transportation Institute The Texas A&M University System College Station, TX 77843-3135	11. Contract or Grant No. Study no. 2-18D-92/93-1940
12. Sponsoring Agency and Address	13. Type of Report and Period Covered Interim: December 1992-May 1993
Texas Department of Transportation: Transportation Planning Division P.O. Box 5051 Austin, TX 78763	14. Sponsoring Agency Code

15. Supplementary Notes

Research performed in cooperation with the Texas Department of Transportation
Study Title: Highway Planning and Operations for District 18

16. Abstract

This report summarizes the creation and initial survey (performed in October 1992) of a second panel of automobile users in the North Central Expressway (NCE) corridor. On the average, new panel members reported making a total of 12.2 round trips during the week (Monday-Friday) for various purposes. Approximately 31 percent of these trips (3.8 per week) involve travel on the NCE. Respondents reported using the NCE in about one-third (35 to 36 percent) of all work trips by new panel members. In comparison, the Dallas North Tollway was reportedly involved in about 20 percent of all work trips. Of five arterial streets examined in the corridor, the new panelists reported using them for 8 to 12 percent of the work trips. The same survey instrument was also sent to the remaining members of the original automobile NCE panel created in June 1990. Although direct comparisons between surveys could not always be made due to differences in the format of some of the questions, a few statements about the findings could be made. For example, the original panel members reported making a total of 10.8 round trips per week in October 1992. This is substantially lower than the 12.2 trips per week reported by the new panel members during the same survey, and lower than an estimate of the weekly tripmaking rate by the original panel members in June 1990. Also, the original panel utilized NCE for a greater proportion of these trips than did the new panel (for 43 percent of all trips made). Additional study findings are contained herein.

17. Key Words	18. Distribution Statement
Freeway Reconstruction, Motorist Travel Patterns, Freeway Corridor Management	No Restrictions. This document is available to the public through NTIS (National Technical Information Service) 5285 Port Royal Road Springfield, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	34	

Form DOT F 1700.7 (8-72) Reproduction of form and completed page is authorized

U.S. 75 NORTH CENTRAL EXPRESSWAY RECONSTRUCTION: LEMMON/OAK LAWN/PEAK SCREEN LINE AUTOMOBILE USER PANEL, OCTOBER 1992 SURVEY RESULTS

Report 1940-5

Prepared for

North Central Project Office
Texas Department of Transportation
District 18, Dallas

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Sponsored by
Texas Department of Transportation

Texas Transportation Institute
The Texas A&M University System
College Station, TX 77843

May 1993

METRIC (SI*) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	2.54	centimeters	cm
ft	feet	0.3048	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	6.452	centimeters squared	cm^2
ft^2	square feet	0.0929	meters squared	m^2
yd^2	square yards	0.836	meters squared	m^2
mi^2	square miles	2.59	kilometers squared	km^2
ac	acres	0.395	hectares	ha
		MASS (weight)		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams	Mg
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.0328	meters cubed	m^3
yd^3	cubic yards	0.765	meters cubed	m^3

Note: Volumes greater than 1000 L shall be shown in m^3.

		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

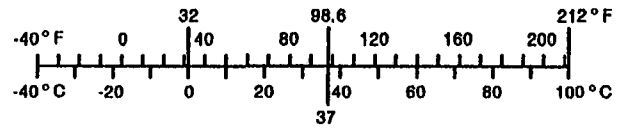
APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
yd	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	millimeters squared	0.0016	square inches	in^2
m^2	meters squared	10.764	square feet	ft^2
yd^2	kilometers squared	0.39	square miles	mi^2
ha	hectares (10,000 m^2)	2.53	acres	ac
		MASS (weight)		
g	grams	0.0353	ounces	oz
kg	kilograms	2.205	pounds	lb
Mg	megagrams (1000 kg)	1.103	short tons	T
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	meters cubed	35.315	cubic feet	ft^3
m^3	meters cubed	1.308	cubic yards	yd^3

		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

These factors conform to the requirement of FHWA Order 5190.1A

*SI is the symbol for the International System of Measurements



IMPLEMENTATION

This report summarizes the development of a new North Central Expressway (NCE) corridor user panel (1250 participants) and the results of an initial survey to collect baseline travel data from this panel in October 1992. On the average, new panel members reported making a total of 12.2 round trips during the week (Monday-Friday) for various purposes. Approximately 31 percent of these trips (3.8 per week) involve travel on the NCE.

Those panelists working outside of their home reported living an average of 13.7 miles from work. Approximately 30 percent of the new panel reported having the Dallas CBD as their work destination. On the average, the trip to work required 26.9 minutes to complete, whereas the travel time back home was slightly longer at 28.3 minutes. On the average, new panel members left for work at 7:30 am. For the trip home, panelists left work at 5:20 pm. This median work-to-home departure time is significantly later than reported by the original NCE panel in earlier surveys. It is hypothesized that more members of the new panel have managerial/professional positions which commonly require them put in more than eight hours in a work day.

The vast majority (93 percent) of the new panel drive alone to and from work. They also reported making an average of 1.6 stops per week on the way to work (typically to drop off children at school or childcare). On the way home, the panel made an average of 2.8 stops per week (most often to shop).

Respondents reported using the NCE in about one-third (35 to 36 percent) of all work trips by new panel members. In comparison, the Dallas North Tollway was reportedly involved in about 20 percent of all work trips. Of five arterial streets examined in the corridor, the new panelists reported using them for 8 to 12 percent of the work trips.

The October 1992 survey was also sent to the remaining members of the original NCE user panel which was created in June 1990. Although direct comparisons between surveys could not always be made due to differences in the format of some of the questions, a few statements about the findings could be made. For example, the original

panel members reported making a total of 10.8 round trips per week in October 1992. This is substantially lower than the 12.2 trips per week reported by the new panel members during the same survey, and lower than an estimate of the weekly tripmaking rate by the original panel members in June 1990. Also, the original panel utilized NCE for a greater proportion of these trips than did the new panel (for 43 percent of all trips made).

Average travel times to and from work for the original panel in October 1992 matched those reported in June 1990. The percent of panelists driving alone also remains unchanged since June 1990. A 10-minute shift in earlier departure times to work (to 7:20 am from 7:30 am) occurred during the survey period. However, there are no corresponding changes in other travel characteristics which support this adjustment (such as additional stops on the way to work, longer travel times, etc.). For the work trips made by the original panel, the NCE and Dallas North Tollway continue to serve as the primary route.

DISCLAIMER

This study was conducted in cooperation with the Texas Department of Transportation. This report is not intended to constitute a standard, specification, or regulation, and does not necessarily reflect the official views and policies of the Texas Department of Transportation. This report is not intended for construction bidding or permit purposes. Mr. Gerald L. Ullman (Texas Professional Engineer #66876) was the supervising engineer responsible for the preparation of the report.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The reconstruction of the North Central Expressway (NCE) between the Dallas central business district (CBD) and Interstate I-635 is entering its third year. Reconstruction efforts, to date confined to sections north of Loop 12 (Northwest Highways), have forced motorists to endure narrowed freeway lanes, temporary freeway lane closures during off-peak hours, changes in alignment, frontage road detours and closures, and changes in ramp configurations. Throughout the past three years, the Texas Transportation Institute (TTI) has been monitoring the traffic impacts of NCE reconstruction for the Texas Department of Transportation (TxDOT).

As one of its monitoring activities, TTI initiated and periodic surveyed a "panel" of automobile users who regularly travel the NCE corridor. Potential panel members were identified through a license-plate survey performed on the Expressway and on several parallel roadways at a screenline on Loop 12 (Northwest Highway). Travel data were collected from these panel members in June 1990, immediately prior to the start of Expressway construction on sections south of LBJ. Follow-up surveys were then sent to the panelists every six months to monitor how construction was affecting travel patterns and to assess public perception of changes in driving conditions in the corridor. Several interim reports (*1-5*) documented results of the initial and follow-up surveys.

Over its three-year existence, the panel has provided TxDOT and other transportation agencies in the Dallas metropolitan area with very useful information on public attitudes and responses towards NCE construction. However, as with most longitudinal surveys of this type, natural attrition has dwindled the size of the panel. In fact, only 17 percent of those agreeing in June 1990 to participate on the panel responded to the most recent follow-up survey in October 1992.

Meanwhile, construction is scheduled to begin on the southern and middle sections of the NCE in late 1993 and early 1994. The traffic control plans for these sections will require that one freeway lane in each direction be closed completely to traffic for several months at a time, reducing available capacity by more than one-third. Furthermore, very few alternative routes are available to motorists in that section of the corridor, and those which are available already experience significant peak-period congestion. These drastic

cuts in available NCE capacity will undoubtedly have a profound effect upon motorist travel patterns. It will be extremely important to monitor how motorists react to construction, both in terms of their attitudes and perceptions as well as any changes in travel mode, departure time, or choice of route. Certainly, such a monitoring process will require sampling a large number of motorists in order to provide an accurate picture of the construction impacts.

Consequently, researchers decided to identify and contact another group of motorists travelling in the NCE corridor and request their participation in the ongoing monitoring process. These "new" panelists would supplement those "original" panelists who continue to respond to the periodic follow-up surveys. A license-plate survey was again performed to identify corridor users, and an initial survey was sent out in October 1992 to obtain baseline travel data from those users. The survey was also sent to the remaining members of the original panel so that the impact of ongoing construction in the northern sections could be assessed. This report documents the study procedures and results of the October 1992 survey.

STUDY PROCEDURES

License-Plate Survey to Identify Potential New Panel Members in NCE Corridor

A license-plate survey was performed during the first week of October 1992 to identify potential panel members who travel the NCE corridor. Two-person teams read plate numbers from vehicles travelling on the NCE and eight other routes in the corridor. The teams were stationed along the Lemmon/Oak Lawn/Peak screenline to coincide with the traffic count locations also monitored on a biannual basis (see Figure 1). Plates were read weekdays during the morning peak periods (6:30-8:30 am) and during the off-peak period (10:00-11:00 am, 1:00-2:00 pm). On the alternative routes in the corridor the teams collected data from the southbound traffic only. On the NCE, plate numbers were obtained from vehicles in both directions of travel.

Overall, over 14,500 plate numbers were obtained. Table 1 summarizes the distribution of license-plate numbers collected by roadway. Also shown is the relative contribution of each route to the total daily traffic volumes measured in the corridor,

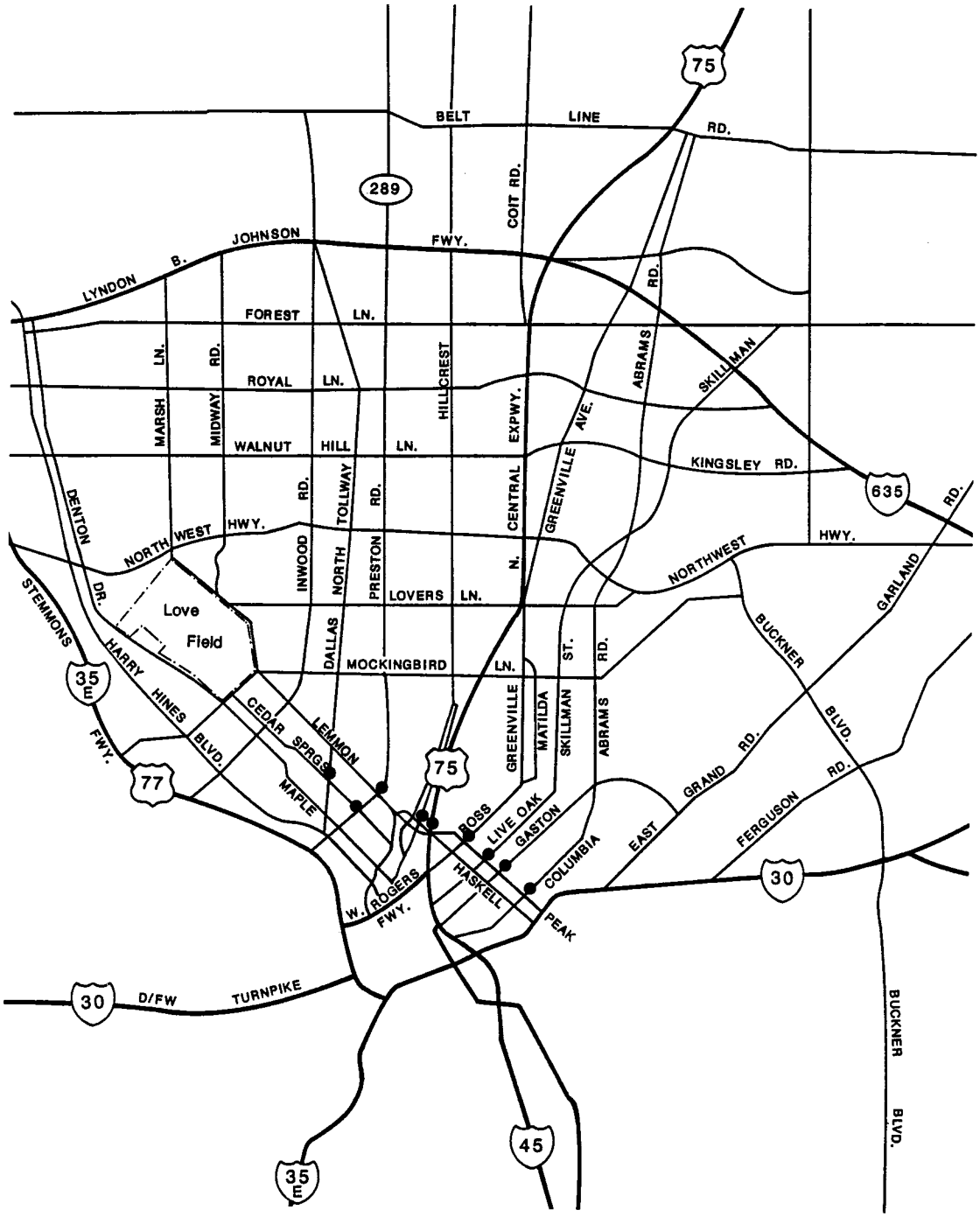


Figure 1. License-Plate Survey Locations

based on count data collected in October 1992 (*6*). It can be seen that relative to these volume counts, a slightly greater proportion of the license-plate numbers came from the various alternative routes in the corridor. However, this is not expected to significantly bias the panel make-up, as many motorists adjust their route choices day by day depending on traffic information they read or hear. Also, previous surveys indicate most motorists do utilize NCE at least occasionally for non-work trips, even if they choose to use other routes for their work-related trips.

TABLE 1. LICENSE-PLATE SAMPLE BY ROUTE

Route	Sample Collected	Percent of Total Sample	Percent of Corridor ADT*
SB NCE	3321	22.7	27.9
NB NCE	2628	18.0	27.9
Dallas North Tollway	2291	15.7	20.2
Live Oak	1440	9.8	3.8
Oak Lawn	1198	8.2	4.5
Cole	1139	7.8	3.3
Cedar Springs	1134	7.8	3.3
Ross	819	5.6	4.2
Gaston	657	4.4	3.6

* ADT=Average Daily Traffic

These license-plate data were consolidated into a single computer file and sorted to remove any duplicates. The file was sent to the Texas Department of Motor Vehicles to identify the addresses of the owners of those vehicles. The addresses were then checked to eliminate automobile lease companies and other non-personal vehicle owners. This database cleansing process reduced the initial license-plate count of 14,500 down to 8889 addresses to which surveys were then sent.

Survey Instrument

A two-part survey form was sent to each of the addresses identified in the license-plate survey, as well as to the 455 motorists who were part of the original NCE user panel and who continue to participate in the follow-up surveys. The survey form utilized in October 1992 is shown in Appendix A. The first section of the survey requested information on the typical total *weekly* tripmaking activity of the respondents. This question was altered from that of previous surveys in which the total *daily* tripmaking activity of the most recent weekday was requested from the panelists. This was done to eliminate some of the day-to-day variability in tripmaking activity observed when comparing individual responses of the original panel between surveys. At the same time, the respondents in the October 1992 survey were asked to indicate how many trips were made on the NCE per week.

The second part of the survey focused exclusively on work-related trips. Detailed information was requested about the following:

- Origins and destinations of the work trip (by zip code),
- Departure times,
- Perceived travel distance,
- Perceived travel times,
- Number and types of intermediate stops made per week,
- Mode of transportation,
- Vehicle occupancy,
- Entrance and exit ramps used for trips made on NCE, and
- Number of times per week the NCE and other alternative routes in the corridor were used to and from work.

To establish the new user panel, the final question requested name and address information from the respondent if he or she was willing to participate in an ongoing traffic monitoring effort. The respondent was also invited to provide any comments or suggestions about travel in the North Central Expressway corridor.

Data Reduction

Table 2 summarizes the response rates to the October 1992 survey. Approximately 24 percent of the 8889 surveys mailed out were returned. For comparison purposes, the response rate to the survey for the creation of the original panel in June 1990 is also shown. As can be seen, the more recent survey generated a significantly lower response rate. Also, the October 1992 survey obtained a lower percentage of respondents who volunteered to participate on the panel (in comparison to the June 1990 survey). There was significant media attention and an increased overall public awareness of the NCE construction project when the June 1990 survey was conducted, whereas construction was receiving very little emphasis in the media when the October 1992 survey was performed. The increased media attention may have attributed to the higher response and volunteer rates in the earlier survey.

TABLE 2. SURVEY RESPONSE RATES

Survey	Number Distributed	Number Returned	Percent Returned	Number Volunteering	Percent Volunteering
October 1992	8889	2103	23.6	1253	14.1
June 1990	8500	2658	31.3	1825	21.5

To facilitate processing the basic origin and destination information requested in the survey, the zip codes in the Dallas area were collapsed into 16 large zones. These zones are illustrated in Figure 2. In this way, a very coarse work trip affinity table could be computed (discussed in the Results section).

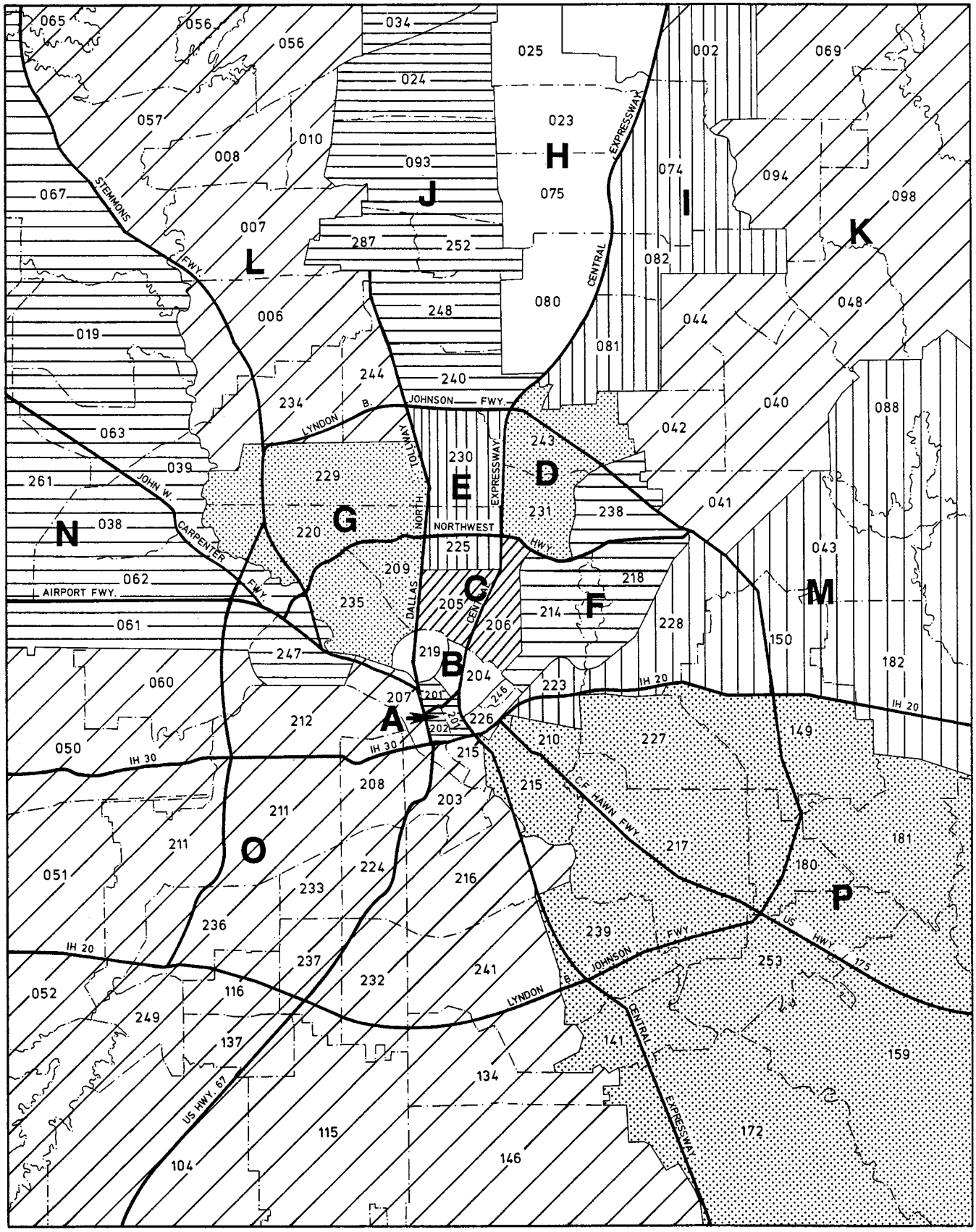


Figure 2. Origin-Destination Zones Used in Survey

The same survey was also sent to the 455 panel members remaining from the original panel created in June 1990. Of these, 306 surveys were returned (67.3 percent). These surveys were analyzed separately to compare October 1992 estimates of tripmaking activity and work trip departure times, travel times, etc. to those recorded for the same panelists in June 1990. Unlike previous follow-up surveys, however, these panelists were not asked directly if they perceived any changes in travel conditions in October 1992 as compared to June 1990 (before NCE construction began).

RESULTS

Travel Characteristics of New Panel Members

The total number of responses (2103) received from those addresses identified in the October 1992 survey were consolidated and analyzed to provide a baseline for future impacts of NCE construction. These results are referred to as the "new panel" responses in the next section. However, the data includes the responses from those who returned the survey but did not volunteer to participate in future surveys. This is not a critical point since each time a follow-up survey is performed, the October 1992 responses are recalculated for those responding to the follow-up survey.

Total Tripmaking Characteristics

The new panel members were first asked to indicate how many round trips per typical work week (Monday-Friday) they made for each of seven different types of trips, and how many of these trips were made on the NCE. The average responses are summarized in Table 3. Although direct comparisons between the October 1992 survey and previous surveys are not possible (since the question had been in terms of daily trip rates), the numbers in Table 3 do appear consistent with those of earlier surveys. For example, a daily rate of 2.67 trips per day was reported by the original panel in the June 1990 survey (*1*). If this value is converted to an estimate of the weekly rate by multiplying by five, the result (13.3 trips) is only slightly greater than the 12.2 trips per week shown in Table 3 for the new panelists.

Although the total tripmaking activity from the new panel is similar to that of the original panel, there are significant differences in the relative usage of the NCE for those trips. Whereas the original panel has consistently reported making nearly 50 percent of all trips on the NCE, the new panel reported using NCE for only 31 percent of their trips in October 1992.

TABLE 3. WEEKLY TRIPMAKING RATES OF NEW PANELISTS

Type of Trip	Total Trips/Week	Trips/Week on NCE	NCE Trips as Percent of Total Trips
To and from work	5.5	1.9	35
Other work-related	1.8	0.7	38
To and from school or childcare	0.9	0.2	17
To and from social activity	2.6	0.7	29
To and from personal business	1.3	0.3	27
To and from transit stop	0.1	0.0	17
Total	12.2	3.8	31

Work Travel Characteristics

Survey respondents were asked to indicate the zip code in which they lived as well as the one in which they worked. From this information, a very coarse origin-destination affinity table was developed, and is shown in Appendix B. Table 4 provides a summary of the distribution of the new panel members by the major zones identified in Figure 2. As would be expected, the majority of the respondents reside in zones along the NCE within the defined corridor. Major neighborhoods represented include the Village/White Rock Lake area, Richardson, Plano, University Park, and Highland Park. In addition, a significant proportion of the panel comes from the southeast and southwest Dallas area. Presumably, most of these are the motorists identified in the northbound direction of NCE during the license-plate studies.

Meanwhile, survey results indicate that a significant proportion (30 percent) of the potential panelists have work destinations located within the Dallas CBD. Areas immediately to the north and east of the CBD are also major work destinations. This was the intended result and the reason the license-plate study was conducted on a screenline close to the CBD. It is exactly these types of motorists who will likely be forced to alter their work-trip travel patterns once construction commences on the southern sections of the project.

TABLE 4. MAJOR HOME AND WORK LOCATIONS OF THE NEW PANEL BY ZONE

Zone	Percent of Responses
Home zones:	
F (Village/White Rock Lake)	13
H & I (Richardson/Plano)	12
C (Highland Park/Village)	11
J (North Dallas/Plano)	10
O (Southwest Dallas et al)	9
D (Northeast Dallas)	9
E (University Park/North Dallas)	8
All others	28
Work zones:	
A (Dallas CBD)	30
B (North and east of CBD)	16
O (Southwest Dallas) et al)	9
C (Highland Park/University Park)	7
N (West Dallas)	6
All others	32

Table 5 presents a summary of the major work-trip travel characteristics of the new panel. The respondents reported a median departure time for work of 7:30 am, and a 5:20 pm departure time for home. This work-to-home departure time is significantly later than the 5:00 pm median departure time consistently reported by members of the original

panel. Given the high percentage of panelists who travel to the CBD for work, a later median work-to-home departure time may suggest a greater number of white-collar professionals participating in the panel (these types of individuals may work later than 5:00 pm by choice or necessity to finish their work for the day).

New panel members reported living an average of 13.7 miles from work. On the average, the trip to work takes 26.9 minutes, whereas the trip home requires a slightly greater 28.3 minutes to complete. These travel times convert to average travel speeds of 30 mph and 29 mph for the home-to-work and work-to-home trips, respectively. With respect to travel mode, the vast majority (93 percent) of the new panel drive alone to and from work.

TABLE 5. WORK TRIP CHARACTERISTICS FOR NEW PANELISTS

Characteristic	Home-to-Work Trip	Work-to-Home Trip
Median departure time	7:30 am	5:20 pm
Average travel distance	13.7 miles	13.7 miles
Average travel time	26.9 minutes	28.3 minutes
Average travel speed	30 mph	29 mph
Percent driving alone	93%	93%

The average frequencies of intermediate stops made on the way to and from work are summarized in Table 6. Intermediate stops provide a simple measure of the trip-chaining activity of the panel on the way to and from home. It is quite possible that this trip-chaining may be significantly affected by upcoming construction if motorists are forced to alter their travel route choices. As of October 1992, the new panel members reported making an average of 1.6 stops per week on the way to work, and an average of 2.8 stops per week on the way home. The majority of the stops (33.8 percent) on the way to work are at a school or childcare center. On the way home, the most common reason for stopping is to shop (31.8 percent of the total stops made per week are for shopping).

New panelists were asked about their choices of routes they utilized for their trips to and from work, again in terms of the number of times per week each one was used. No attempt was made to distinguish between those motorists who rely on more than one roadway to get to or from work on each day (those who travel on the NCE for part of the trip, Abrams Road for part of the trip, etc.) and those who regularly oscillate between two or more routes during the week because of traffic conditions or personal needs (an example of this would be the husband and wife who take turns taking a child to childcare on the way to work and so use different routes depending on whether or not it was their turn to drop off the child).

TABLE 6. FREQUENCY OF INTERMEDIATE STOPS ON WAY TO OR FROM WORK

	Home-to-Work	Work-to-Home
Total # stops/week	1.6	2.8
Percentage of stops by purpose:		
Shopping	16.%	31.%
School	33.%	14.%
Personal business	21.%	26.%
Social/recreation	28.%	27.%

The average weekly usage rates for the various routes in the corridor are shown in Table 7. As would be expected, the average usage rate of all routes is approximately 5 per week (equivalent to about 1 per day). Furthermore, the NCE is used for 35 percent of the total work trips made per week, on the average. The Dallas North Tollway is also used quite frequently, representing about 20 percent of the total work trips reported per week. The NCE value compares very similarly to the 31 percent NCE utilization rate for all types of trips made by new panel members as reported in Table 3.

TABLE 7. AVERAGE ROUTE UTILIZATION PER WEEK FOR NEW PANELISTS

Roadway	Home-to-Work Trips		Work-to-Home Trips	
	Ave. times /week	Percent of total	Ave. times /week	Percent of total
NCE	1.77	35	1.73	36
Dallas North Tollway	0.99	20	0.93	19
Skillman	0.61	12	0.49	10
Greenville	0.47	9	0.43	9
Abrams	0.43	8	0.45	9
Hillcrest	0.41	8	0.40	8
Preston	0.39	8	0.41	9
TOTAL	5.07	100	4.84	100

As stated previously, some of the new panelists specified that they used more than one roadway when travelling to and from work. Table 8 shows the percentage of new panelists who reported utilizing one, two, or more than two routes per week when travelling to and from work. Overall, about 60 percent of the panel specified a single route they used to and from work. Conversely, 25 to 30 of new panelists identified two routes that they typically used, and 12 to 13 percent indicated that they typically used more than two routes to and from work in a given week. From this data, it appears that a significant proportion of motorists within the corridor may be quite flexible in terms of route selection to and from work depending on conditions. Such flexibility will be needed to accommodate the day-to-day variations in travel conditions that will undoubtedly be magnified once construction on NCE restricts peak period capacity.

Survey respondents were asked to indicate the entrance and exit ramps utilized if they travelled on the NCE for all or part of their work trips. Essentially all ramps along NCE were mentioned by the new panel. As expected, the ramps to both I-635 and Northwest Highway (Loop 12) were identified by new panelists several times, as were the ramps to and from Mockingbird Lane, Lovers Lane, and Yale. The connection of NCE with Woodall Rogers was also reported as a major entry and exit point by the panel as a whole.

TABLE 8. NUMBER OF ROUTES REPORTEDLY USED BY NEW PANELISTS FOR WORK TRIPS

Number of Routes Specified	Home-to-Work Trip	Work-to-Home Trip
1 Route	62%	57%
2 Routes	26%	30%
3 or More Routes	12%	13%

Travel Characteristics of Original Panel Members

The same survey was sent to the remaining 455 members of the original panel. Because some of the questions of the October 1992 survey were asked in a different form than how they were asked in June 1990, direct comparison of the responses by the original panel to the June 1990 and October 1992 surveys was not always possible. It was possible in some instances to "normalize" the June 1990 responses to a question which allowed for a subjective comparison to the October 1992 survey results.

For example, many of the questions in the June 1990 survey were asked in terms of daily rates. The averages obtained for these questions in June 1990 were multiplied by five to provide an estimate of weekly rates, which was the form in which the questions were asked in October 1992. Of course, it is recognized that the normalized daily rates of some of the variables may not be directly comparable to true weekly rate data collected from the panelists in October 1992.

Total Tripmaking Characteristics

Comparing the June 1990 adjusted rate of 13.4 trips/week reveals that the October 19922 rate of 10.8 is substantially lower. As an additional check the October 1992 weekly total for the original panel was also compared to the average obtained from new panel

members. Similarly, the October 1992 weekly total for the original panel was also compared to the average obtained from the new panel members. Again, the value of 10.8 trips/week is also slightly lower than that reported by the new panel members (who indicated an average of 12.2 trips/week, as shown on page 9 in Table 3).

Given that the original panel reported little change in tripmaking activity up to this point, it is very likely that the change in survey format is responsible for the differences observed in October 1992. However, if a reduction has occurred, it may reflect seasonal differences (June versus October travel patterns). It is also possible that many of those original panel members who continue to participate in the surveys have reduced their travel activity, because of perceptions of worse travel conditions in the corridor or because of other factors. In fact, one would expect those who believed they have been affected by construction to be more likely to continue to respond to follow-up surveys than someone who has reported "no change" in travel conditions over the past several year.

The original panel reported using the NCE for 43 percent (4.6 trips per week) of all trips made per week in October 1992. This is a substantially greater percentage than that reported by the new panel for the same period. However, it is slightly less than the approximately 50 percent utilization of NCE that has been consistently reported by the original panelists over the past two-and-one-half years (*1-5*). Again, it is assumed that these changes are likely due to the change in survey format for this question.

Work Travel Characteristics

Table 9 summarizes the typical work trip characteristics for the remaining original panel members as measured in October 1992 and shows the same characteristics as determined in June 1990. Overall, there has been essentially no change in average travel times, average travel speeds, or vehicle occupancy (as measured by the percent of the panel driving alone) over the two-and-one-half years the panel has been monitored. The only noticeable difference is an apparent 10-minute shift in median departure times to work in the morning. Again, the exact reasons for this change are not known. However, as discussed in the previous section on total tripmaking characteristics, the seasonal and sampling format changes offer a plausible explanation to the observed differences.

TABLE 9. WORK TRIP CHARACTERISTICS FOR ORIGINAL PANEL MEMBERS

Characteristic	Home-to-Work Trip		Work-to-Home Trip	
	October 1992	June 1990	October 1992	June 1990
Median departure time	7:20 am	7:30 am	5:00 pm	5:00 pm
Average travel time	29.0 min	29.1 min	32.5 min	32.8 min
Average travel speed	29.0 mph	28.7 mph	26.0 mph	25.8 mph
Percent driving alone	91%	92%	92%	92%

Table 10 presents the average number of intermediate stops made per week on the way to and from work by the original panel members in October 1992. In relation to the new panel members also surveyed in October 1992 (see Table 6), original panel members reported making fewer stops (1.2 stops/week versus 1.6 stops/week for new panelists on the way to work; 2.1 stops/week versus 2.8 stops/week for new panelists on the way to home). However, the relative distribution of stops by type (school, shopping, social activities, other personal business) was consistent between survey groups.

It was determined that original panel member responses to intermediate stop frequencies in June 1990 and October 1992 could not be compared directly. As with the total tripmaking frequencies, the survey format was changed from daily frequencies to weekly frequencies. Multiplying the average daily rate in June 1990 by five yielded a value that was not at all similar to that of the weekly rate reported in October 1992. The difference was so great that comparison was not appropriate.

TABLE 10. FREQUENCY OF INTERMEDIATE STOPS TO OR FROM WORK BY THE ORIGINAL PANEL

	Home-to-Work Trips	Work-to-Home Trips
Total # stops/week	1.2	2.1
Percentage of stops by purpose:		
Shopping	16.%	37.%
School	34.%	14.%
Personal business	30.%	28.%
Social/recreation	20.%	21.%

Table 11 summarizes the weekly work trip frequencies on the various roadways in the NCE corridor for the original panel members. Over all the routes, total weekly rates are very similar to those of the new panelists, as reported in Table 7. However, comparison of Tables 7 and 11 illustrates that the relative utilization of the various routes does differ between panels. In particular, the original panel reported using the NCE more often for their work trips than did the new panel. Whereas the new panel members reported using the NCE for 35 to 36 percent of their weekly work trips, 45 to 46 percent of the work trips per week for the original panel members involve the NCE.

Again, direct comparisons were not possible between the June 1990 and October 1992 surveys responses by the original panel, due to differences in how the questions regarding route usage were worded. The differences in question format could not be accounted for through a simple conversion factor (such as a daily to weekly frequency), and so no comparisons could be attempted.

TABLE 11. AVERAGE ROUTE UTILIZATION PER WEEK FOR ORIGINAL PANELISTS

Roadway	Home-to-Work		Work-to-Home	
	Ave. times /week	Percent of total	Ave. times /week	Percent of total
NCE	2.29	45	2.25	46
Dallas North Tollway	0.63	12	0.77	16
Skillman	0.35	7	0.36	7
Greenville	0.40	8	0.27	5
Abrams	0.35	7	0.29	6
Hillcrest	0.54	11	0.52	11
Preston	0.49	10	0.46	9
TOTAL	5.05	100	4.92	100

SUMMARY

This report summarizes the development of a new NCE corridor user panel (1250 participants) and the results of an initial survey to collect baseline travel data from this panel in October 1992. With respect to the new panel members, the following summary statements can be made.

- On the average, new panel members reported making a total of 12.2 round trips during the week (Monday-Friday) for various purposes. Approximately 31 percent of these trips (3.8 per week) involve travel on the NCE.

- Those panelists working outside of their home reported living an average of 13.7 miles from work. Approximately 30 percent of the new panel reported having the Dallas CBD as their work destination. On the average, the trip to work required 26.9 minutes to complete, whereas the travel time back home was slightly longer at 28.3 minutes.

- On the average, new panel members left for work at 7:30 am. For the trip home, panelists left work at 5:20 pm. This median work-to-home departure time is significantly later than that reported by the original panel in earlier surveys. It is hypothesized that more members of the new panel have managerial/professional positions which commonly require them put in more than eight hours in a work day.

- The vast majority (93 percent) of the new panel drive alone to and from work. They also reported making an average of 1.6 stops per week on the way to work (typically to drop off children at school or childcare). On the way home, the panel made an average of 2.8 stops per week (most often to shop).

- The NCE was reported as being used in about one-third (35 to 36 percent) of all work trips by new panel members. In comparison, the Dallas North Tollway was reportedly involved in about 20 percent of all work trips. Of five arterial streets examined in the corridor, panelists reported using them for 8 to 12 percent of the work trips.

The October 1992 survey was also sent to the remaining members of the original NCE user panel which was created in June 1990. Although direct comparisons between surveys could not always be made due to differences in the format of some of the questions, several statements about the findings can also be made.

- The original panel members reported making a total of 10.8 round trips per week in October 1992. This is substantially lower than the 12.2 trips per week reported by the new panel members during the same survey, and lower than an estimate of the weekly tripmaking rate by the original panel members in June 1990. Also, the original panel utilized NCE for a greater proportion of these trips than did the new panel (for 43 percent of all trips made).

- Average travel times to and from work for the original panel in October 1992 were identical to those reported in June 1990. The percent of panelists driving alone has also been unchanged since June 1990. A 10-minute shift in earlier departure times to work (to 7:20 am from 7:30 am) occurred during the survey period. However, there are no corresponding changes in other travel characteristics which support this adjustment (such as additional stops on the way to work, longer travel times, etc.).

- For the work trips made by the original panel, the NCE and Dallas North Tollway continue to serve as the primary route.

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3. Ullman, G.L. and R.A. Krammes. U.S. 75 North Central Expressway Reconstruction: Northwest Highway Screen Line Automobile and Transit User Panels, May 1991 Survey Results. Research Report TX-92/984-4. Texas Transportation Institute, College Station, TX. November 1991.

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APPENDIX A: SURVEY FORMS

TEXAS TRANSPORTATION INSTITUTE

CORRIDOR OPERATIONS
ANALYSIS PROGRAM

Area Code 409
Telephone 845-9898
TexAn 857-9898
FAX: (409) 845-6254

October 20, 1992

Dear Motorist:

As part of its efforts to provide the best possible travel conditions for motorists, the Texas Department of Transportation is sponsoring a study of travel patterns in the north Dallas area. The study is being performed by the Texas Transportation Institute, Texas A&M University. This information is helpful in developing plans for serving the motoring public during the ongoing reconstruction of the North Central Expressway.

Survey forms are being sent to individuals in the Dallas area according to license plate registration information. Your license plate number (shown on the mailing label of the envelope) was selected. Please take a few minutes and fill out the enclosed survey. We would appreciate it if you or the person in your home who most regularly uses the vehicle would fill out the form. The information being requested is for the most recent work week (Monday-Friday). If you are already a member of the existing automobile panel, please indicate so on your form and return it to us anyway.

Because of the small number of motorists contacted, your reply is essential to ensure the success of the study. All information you provide will remain strictly confidential. The data will be used for statistical purposes only. Your cooperation and timely return of the completed questionnaire in the enclosed postage-paid envelope will be greatly appreciated. Thank you for your time and assistance in this important effort.

NORTH CENTRAL EXPRESSWAY CORRIDOR TRAVEL SURVEY

1. **What is the zip code of your home address?** _____

2. **During your most recent work week (Monday - Friday), how many separate round trips by passenger vehicle (car, van, or pickup truck) did you make for the following purposes? Please indicate the total number made, as well as the number of those trips made using the North Central Expressway.**

	Total per week	Total per week on North Central Expressway
to/from work	___	___
other work-related	___	___
to/from school/child daycare	___	___
to/from social/recreation/eat a meal	___	___
to/from shopping	___	___
to/from personal business (bank, doctor, etc.)	___	___
to/from bus stop	___	___

****

Questions 3 - 10 relate to trips made to and from work. If you do not travel to or from work, please skip to Question 11.

3. **What is the zip code of your work address?** _____

4. **At what time do you typically leave to go:**
   From home to work? _____ AM or PM?
   From work to home? _____ AM or PM?

5. **How far is it from your home to your work?** _____ miles

6. **How much time in your vehicle do these trips typically take (to the nearest 5 minutes)?**
   From home to work _____ minutes
   From work to home _____ minutes

7. **How many stops do you typically make per week on the way to and from work for each of the following purposes?**

	From home to work	From work to home
school/child daycare	___	___
social/recreation/eat a meal	___	___
shopping	___	___
personal business (bank, doctor, etc.)	___	___

8. **How do you typically make these trips? (check one)**
   From home to work: ___ drive alone ___ carpool (with __ people) ___ bus ___ other
   From work to home: ___ drive alone ___ carpool (with __ people) ___ bus ___ other

9. **How many times per week do you typically use any of these roads on your way to and from work?**

	From home to work	From work to home
North Central Expressway	___	___
Skillman/Live Oak St.	___	___
Abrams Rd./Gaston Ave.	___	___
Greenville/Ross Ave.	___	___
Hillcrest/Cole/McKinney Ave.	___	___
Preston Rd.	___	___
Dallas North Tollway	___	___

10. **If you use the North Central Expressway to and from work, please indicate at what ramps you typically enter and exit the Expressway:**
    From home to work: enter at _____ exit at _____
    From work to home: enter at _____ exit at _____

****

11. **Would you be willing to respond to similar follow-up surveys about your driving activities during the ongoing construction of the Expressway? If yes, please provide:**
    Name (person filling out survey) _____
    Street Address _____
    City _____ State _____ Zip code _____
    Total number of vehicles available for use in your household _____

12. **On the back of this questionnaire, please provide any additional comments or suggestions you wish to make about travel in the North Central Expressway corridor.**

APPENDIX B: WORK TRIP ORIGIN-DESTINATION TABLE OF NEW PANELISTS

PERCENT OF TRIPS FROM HOME (HZONE) TO WORK (DZONE) FOR NEW PANELISTS

HZONE/ DZONE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	0.9	1.0	0.1	0.3	0.1	0.0	0.3	0.0	0.1	0.0	0.1	0.2	0.0	0.3	0.6	0.1
C	3.8	1.9	0.8	0.1	0.4	0.1	0.2	0.1	0.2	0.3	0.0	0.3	0.0	1.0	1.3	0.2
D	3.8	1.4	0.5	0.6	0.2	0.4	0.3	0.2	0.1	0.5	0.0	0.1	0.0	0.2	0.5	0.1
E	2.9	1.3	0.5	0.6	0.7	0.1	0.6	0.0	0.1	0.0	0.0	0.3	0.0	0.2	0.5	0.2
F	6.0	1.7	0.6	0.5	0.3	0.7	0.5	0.2	0.1	0.6	0.1	0.4	0.0	0.6	0.6	0.1
G	1.9	0.6	0.1	0.2	0.1	0.1	0.5	0.1	0.1	0.1	0.0	0.2	0.0	0.3	0.2	0.2
H	2.0	1.4	0.4	0.3	0.2	0.2	0.2	0.8	0.3	0.5	0.0	0.4	0.0	0.2	0.4	0.1
I	1.4	0.7	0.3	0.3	0.2	0.1	0.1	0.2	0.3	0.1	0.1	0.2	0.0	0.1	0.3	0.1
J	3.3	1.5	0.5	0.1	0.2	0.2	0.7	0.3	0.1	0.7	0.1	0.4	0.1	0.3	1.1	0.1
K	0.8	0.7	0.2	0.3	0.1	0.1	0.3	0.2	0.3	0.2	0.6	0.3	0.1	0.2	0.2	0.1
L	0.9	0.7	0.3	0.1	0.0	0.0	0.2	0.0	0.1	0.3	0.0	0.6	0.0	0.5	0.3	0.0
M	1.4	1.3	0.1	0.2	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.5	0.2	0.3	0.2
N	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.2	0.1	0.9	0.2	0.0
O	0.9	1.1	1.6	0.8	0.6	0.2	0.4	0.2	0.2	0.3	0.0	0.2	0.0	0.5	2.0	0.2
P	0.1	0.8	0.3	0.3	0.2	0.0	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.7