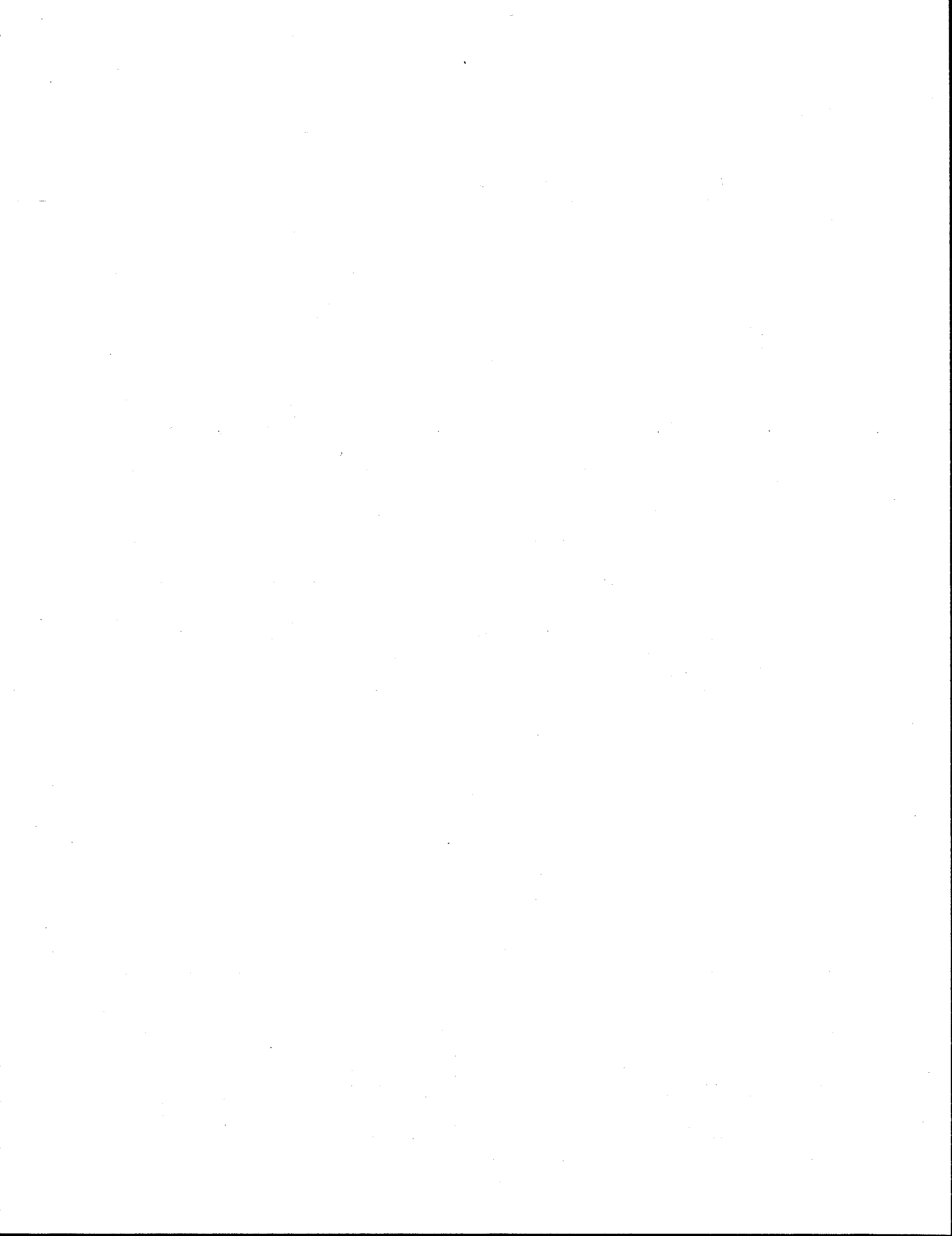


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**U.S. 75 NORTH CENTRAL EXPRESSWAY RECONSTRUCTION:  
LEMMON/OAK LAWN/PEAK SCREEN LINE AUTOMOBILE USER PANEL,  
MAY 1993 SURVEY RESULTS**

Report 1940-6

Prepared for

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

Prepared by

Gerald L. Ullman, P.E.

Sponsored by  
Texas Department of Transportation

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

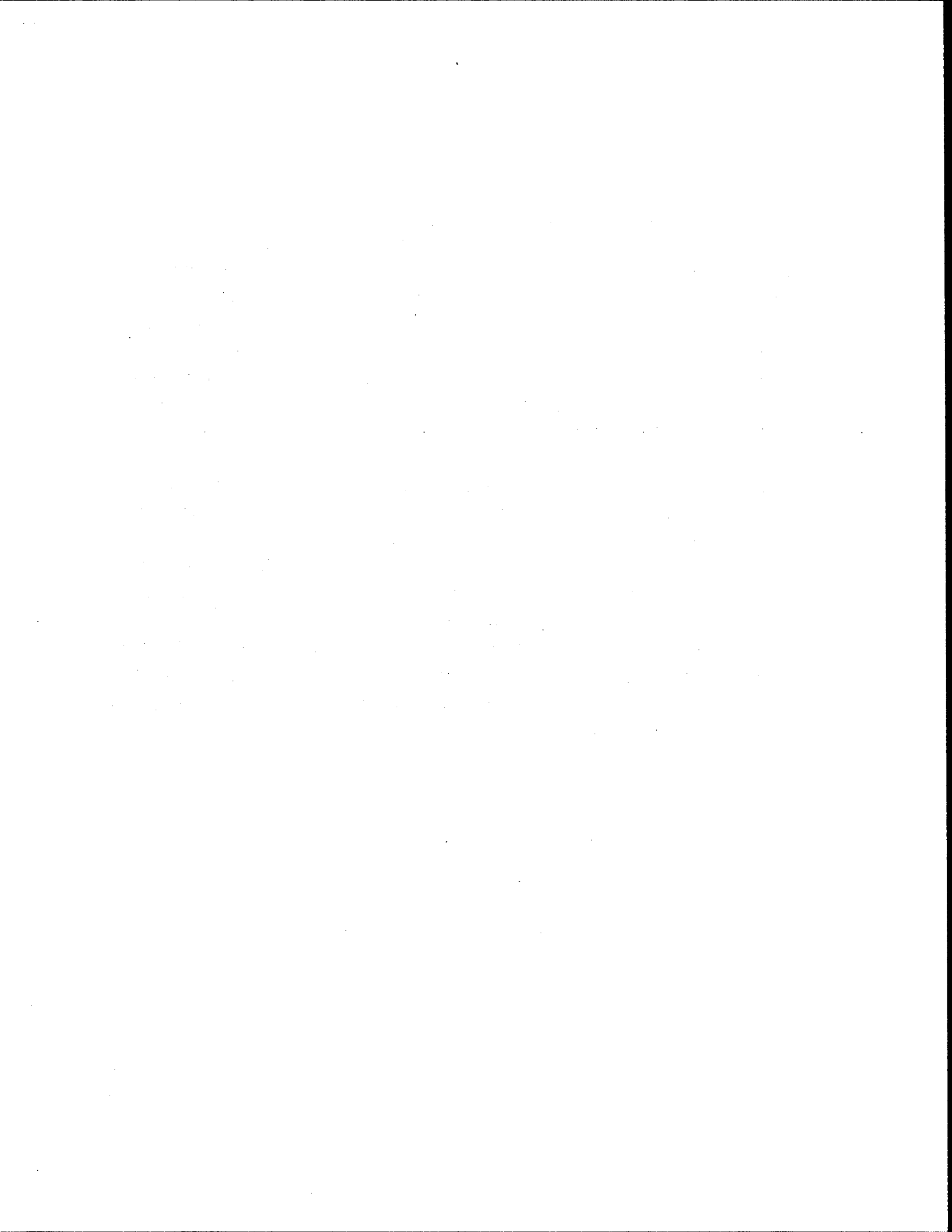
November 1993



## IMPLEMENTATION

This report presents the results of the May 1993 survey of the automobile user panel established to assist in monitoring the traffic impacts of the North Central Expressway (NCE) reconstruction. Overall, only minimal changes in travel patterns and operating conditions between October 1992 and May 1993 were detected. Perhaps more importantly, the majority of panelists believed that their travel patterns had not changed. The few individuals who did feel they had altered their travel patterns actually reported departure times, travel times, and/or other travel characteristics in May 1993 that were different from what they reported in October 1992. In other words, panelist perceptions were consistent with their reported behavior and the changes they had made in behavior between October 1992 and May 1993.

Panelists were asked about the amount of additional travel time to and from work they would be willing to tolerate in order to expedite construction on NCE. The median value reported was almost 15 minutes, nearly one-half of the 30-minute average travel times to and from work reported by panelists in May 1993. Thus, motorists in the corridor appear quite willing to tolerate the inconveniences of construction in order to obtain the future benefits the reconstruction roadway will provide. Panelists see themselves most likely changing routes and departing earlier if congestion levels and travel times become excessive, but not changing to carpooling or transit travel. These anticipated behaviors are consistent with actual responses by motorists in other cities who have endured major freeway reconstruction in the past.



## **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.





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## SUMMARY

The results of the May 1993 survey of automobile panelists in the NCE corridor indicate that construction continued to have little impact upon motorist travel patterns and driving conditions. The following is a list of the specific findings from the survey:

- No statistically significant changes occurred in average total weekly tripmaking frequencies or weekly tripmaking frequencies on NCE. Likewise, NCE use as a percentage of total tripmaking activity was also unchanged.
- Median departure times for panelists' home-to-work and work-to-home trips were 10 to 15 minutes later in May 1993 than in October 1992. The changes were most noticeable for the original panelists.
- Average travel times to and from work did not change significantly between October 1992 and May 1993.
- On average, new panelists made more stops during their home-to-work trips in May 1993. Although not statistically significant, the number of stops reported by original panelists in May 1993 were also slightly greater than in October 1992. The amount of increase due to NCE construction and the amount attributable to seasonal differences between the two surveys could not be determined.
- The single-occupant automobile was the primary travel mode in May 1993, being used by 94 to 95 percent of the panelists. This value was slightly higher than the 91 to 93 percent single-occupant automobile usage reported in October 1992.
- Statistically, there were no changes in the relative utilization of the various roadways in the NCE corridor reported by panelists for their work trips in May 1993 as compared to October 1992.
- Panelists indicated that they would be willing to tolerate substantial increases in travel time in order to expedite NCE construction. A 50th-percentile panelist reportedly would accept nearly 15 minutes of additional delay as part of construction.
- Panelists as a group indicated that their most likely responses to excessive increases in NCE congestion due to construction would be to choose another route and to leave for work at an earlier time. Carpooling, changing work schedules, or changing jobs were seen as unlikely options by panelists.



## **INTRODUCTION**

This report is the seventh in a series documenting the biannual surveys of a "panel" of automobile drivers using the North Central Expressway (NCE) corridor in Dallas, TX. This panel was created in June 1990 immediately prior to the start of NCE reconstruction on the section between Woodall Rogers Freeway to the south and the Lyndon B. Johnson (I-635) Freeway to the north. Figure 1 illustrates the corridor. The purpose of a periodical survey of the panel is to obtain information firsthand on the actual and perceived traffic impacts of the reconstruction project as well as current public opinion regarding TxDOT's efforts to maintain as high a standard of traffic mobility during reconstruction as possible.

The initial panel was created via a mail-out survey to motorists identified as using the NCE corridor. This identification was accomplished through a license-plate study conducted along a screen line at Northwest Highway (Loop 12). The license-plate study yielded an initial panel of over 1800 members. Unfortunately, panel attrition was extremely high during its approximate two-and-one-half year lifespan, such that fewer than 400 members were continuing to participate by October 1992. Consequently, a second license-plate study was performed in October 1992 along a screen line roughly following the cross streets of Lemmon, Oak Lawn, Peak, and Haskell closer to the Dallas central business district (see Figure 1). From this second study, another 1253 motorists agreed to serve as panel members. Initial data were collected from these panel members in October 1992 regarding their basic travel patterns and were summarized in a recent report (1).

In keeping with the biannual schedule, panelists were again surveyed in May 1993. This report presents the results of that survey. As in the past, the findings demonstrate only minimal impact of NCE construction upon motorist travel patterns.

## **STUDY METHODOLOGY**

A two-part survey instrument was sent to both new (October 1992) and original (June 1990) panelists; the first part requested information on the panelist's recent overall tripmaking activity (i.e., the number of trips being made per week for various reasons),

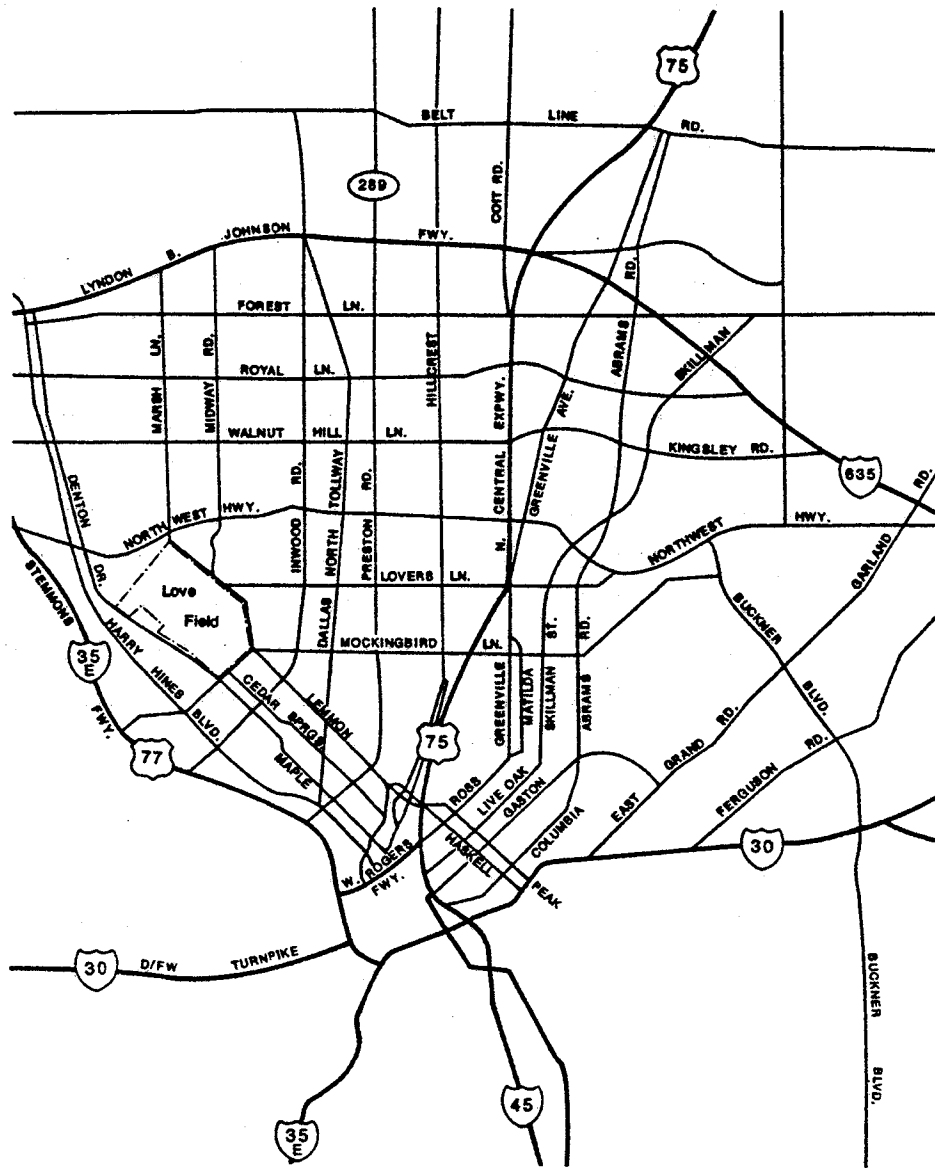


Figure 1. North Central Expressway Corridor in Dallas, TX



the number of trips per week made on the North Central Expressway, and perceptions as to whether they had changed the frequency of these trips. In this way, it is possible to observe how motorists' behavior and their perceptions of this behavior correlate. Also, because the same individuals are sampled in each follow-up survey, it is possible to observe how these behaviors and perceptions change over time. A copies of the survey instrument for the May 1993 survey is provided in Appendix A.

The second part of the automobile panel survey was devoted to home-to-work and work-to-home commuting perceptions and behaviors (i.e., peak period travel). In this part of the survey, panelists were questioned regarding their recent

- Departure times,
- Travel times,
- Number and types of intermediate stops on the way to and from work,
- Mode of travel (drive-alone, carpool, vanpool, transit, or other), and
- Use of other roadways in the corridor.

Panelists were also asked whether they believed their departure times and travel times had changed since October 1992 so that the correlation between their perceptions and actual changes in behavior could be examined.

The May 1993 survey also included two questions designed to explore panel sensitivity to the upcoming construction phases which will reduce peak period capacity on NCE. This capacity reduction will likely cause significant increases in travel time as well as substantial diversion to other roadways, modes of travel, and earlier departure times. At the bottom of the first page of the survey, panelists were asked how much additional travel time to and from work they would be willing to tolerate in order to allow Expressway construction to be completed as quickly as possible. In addition, they were queried as to their likelihood of diverting to other routes, modes, and departure times if congestion and travel times during this phase of construction become excessive.



## RESULTS

### Response Rate

A total of 1685 surveys were sent to panelists in May 1993 (1253 to panelists recruited in October 1992; 432 to the original panelists recruited in June 1990). Of these, 95 were returned undeliverable. A total of 942 of the remaining 1590 surveys distributed were returned for an effective return rate of 59.3 percent. This rate is consistent with those of previous surveys which have netted yielded return rates ranging between 57.5 and 83.5 percent (2-5).

A considerable difference in response was evident between the original and "new" panel groups, however, as illustrated in Table 1. Whereas a 72.5 percent response rate was obtained from the remaining original panel members, only 54.7 percent of the new panelists responded to the survey. Interestingly, the initial follow-up survey of the original panel performed in November 1990 also achieved a relatively low response rate (57.3 percent (2)). This rate then increased in subsequent surveys. Presumably, those panelists not having as great an interest in the surveys discontinue their participation after the first few surveys, leaving more active participants to continue to faithfully respond. The gradual shift to responses from more dedicated panelists has not influenced the values reported over time in the past, as very few significant changes in travel patterns have been documented. However, it will be necessary to keep this possible attrition influence in mind when assessing the results of subsequent surveys, since these active panel members may be more sensitized and vocal about any changes they make in travel patterns due to construction.

**TABLE 1. PANEL RESPONSE RATES**

Panel Group	Number Returned	Response Rate (%)
October 1992 (new)	646	54.7
June 1990 (original)	296	72.5
Total	942	59.3

## Total Tripmaking Characteristics

Table 2 presents the average number of trips per week reported by the new and original panelists for the May 1993 and the October 1992 surveys. None of the differences were found to be statistically significant, based on a test of means at a 0.05 level of significance. Values for the new panel in May 1993 are slightly higher than they were in October 1992, both in terms of absolute tripmaking frequencies and in the percentage of trips made on NCE. For the original panel, tripmaking frequencies and percentage utilization of NCE were slightly lower.

**TABLE 2. COMPARISON OF TOTAL TRIPMAKING ACTIVITY**

Type of Trip	Total Trips/Wk		NCE Trips/Wk		Percent of Total Trips on NCE	
	May 93	Oct 92	May 93	Oct 92	May 93	Oct 92
<b>New Panelists:</b>						
To/from work	5.4	5.5	2.3	1.9	43	35
Other work-related	1.8	1.8	0.6	0.7	33	39
To/from school or daycare	0.7	0.9	0.2	0.2	29	22
To/from social activity	2.7	2.6	0.9	0.7	33	27
To/from shopping	1.6	1.3	0.4	0.3	25	23
To/from personal business	<u>1.2</u>	<u>1.2</u>	<u>0.3</u>	<u>0.3</u>	<u>21</u>	<u>25</u>
<b>TOTAL</b>	<b>13.4</b>	<b>13.3</b>	<b>4.7</b>	<b>4.1</b>	<b>35</b>	<b>31</b>
<b>Original Panelists:</b>						
To/from work	4.8	5.5	2.1	2.7	44	49
Other work-related	1.4	1.5	0.6	0.6	43	40
To/from school or daycare	0.6	0.5	0.1	0.1	17	20
To/from social activity	2.2	2.1	0.4	0.7	32	33
To/from shopping	1.6	1.5	0.4	0.4	25	27
To/from personal business	<u>1.1</u>	<u>1.1</u>	<u>0.3</u>	<u>0.3</u>	<u>27</u>	<u>27</u>
<b>TOTAL</b>	<b>11.7</b>	<b>12.2</b>	<b>4.2</b>	<b>4.8</b>	<b>36</b>	<b>39</b>

In comparison to these actual tripmaking frequencies, panelist perceptions of the changes they have made in their weekly tripmaking activity are presented in Table 3. Relative to October 1992, 75 percent of new panelists and 77 percent of the original panelists felt they were continuing to make the same number of trips in May 1993. Only 10 to 13 percent of the panelists felt they were making fewer trips in May 1993 than in October 1992. Overall, panelist perceptions seem to be consistent with their self-reported behavior.

**TABLE 3. PERCEIVED CHANGES IN WEEKLY TRIPMAKING FREQUENCY**

Perceived Change	Percent of Responses	
	New Panel	Original Panel
Total Trips Per Week:		
Making more trips	15	10
Making same trips	75	77
Making fewer trips	10	13
Trips Per Week on NCE:		
Making more trips	10	12
Making same trips	57	60
Making fewer trips	33	28

Panelist perceptions concerning changes in their tripmaking frequency on NCE are also summarized in Table 3. Although most panelists believed they had not changed their use of NCE, a substantial percentage indicated that they were making fewer trips on the Expressway in May 1993 than they were in October 1992. Given that the averages for the overall panel were generally unchanged (Table 2), it was not apparent whether or not these panelists had actually reduced their use of NCE. Consequently, the tripmaking frequencies of these panelists on NCE were examined separately. As shown in Table 4, these particular individuals did report significantly lower trip rates on NCE in May 1993 in comparison to October 1992. For new panelists, the average trip rate on NCE was 35.5 percent lower in May 1993 than in October 1992; for original panelists, the May 1993 rate

was 23.1 percent lower. Therefore, the perceptions of these panelists were consistent with their actual behavior and indicate that a sizeable portion of the panel had actually reduced their utilization of NCE. However, it is not known whether these changes were due to the conditions encountered by panelists as they drove or a result of other factors (such as a change in where they wanted to shop or eat, for example).

**TABLE 4. AVERAGE WEEKLY TRIPMAKING RATES ON NCE FOR SUBJECTS WHO BELIEVED THEY WERE MAKING FEWER NCE TRIPS**

	October 1992		May 1993		Difference	
	New Panel	Original Panel	New Panel	Original Panel	New Panel	Original Panel
Trips/Day on North Central Expressway	3.1	2.6	2.0	2.0	-1.1 (-35%)	-0.6 (-23%)

### **Work Trip Characteristics**

#### Departure Times

Table 5 presents the median departure times to and from work reported by the new and original panelists in the October 1992 and May 1993 surveys. Departure times from work to home was slightly (10 to 15 minutes) later in May 1993 for both sets of panelists. In addition, the original panelists reported a slightly later departure time from home to work.

Panelists were asked directly whether they felt they were leaving home and work earlier, at the same time, or later in May 1993 than in October 1992. The results, shown in Table 6, indicate that most panelists perceive no change in their departure time patterns. Less than 10 percent of either panel believed they were leaving from work or home later than in October 1992. Consequently, the changes in median departure time

reported in Table 5 are more likely due to random fluctuations in the data rather than a systematic change in departure time by panelists.

**TABLE 5. MEDIAN DEPARTURE TIMES TO AND FROM WORK**

Panel Group	Home-to-Work Trips		Work-to-Home Trips	
	October 1992	May 1993	October 1992	May 1993
New Panelists	7:30 am	7:30 am	5:20 pm	5:30 pm
Original Panelists	7:20 am	7:30 am	5:00 pm	5:15 pm

**TABLE 6. PERCEIVED CHANGES IN DEPARTURE TIMES**

Perceived Change in Departure Time	Percent of Responses	
	New Panel	Original Panel
Home-to-Work Trip:		
Leaving Earlier	16	14
Leaving at the Same Time	76	79
Leaving Later	8	7
Work-to-Home Trip:		
Leaving Earlier	4	5
Leaving at the Same Time	88	86
Leaving Later	8	9

## Travel Times

Average travel times reported by panelists in October 1992 and May 1993 are presented in Table 7. The average travel time values for new panelists were slightly higher in May 1993, while the values for the original panelists were slightly lower. However, none of these differences were found to be statistically significant. Interestingly, average times for the new panelists were considerably shorter than the original panelists in 1992 (attributed to the different screen line locations used to identify panelists). However, travel times for the two groups were nearly identical in the May 1993 survey.

**TABLE 7. AVERAGE TRAVEL TIMES TO AND FROM WORK**

Panel Group	Home-to-Work Trips		Work-to-Home Trips	
	October 1992	May 1993	October 1992	May 1993
New Panelists	26.9 min	27.7 min	28.3 min	29.6 min
Original Panelists	29.0 min	27.6 min	32.5 min	30.5 min

Panelist perceptions as to how their travel times to and from work changed between October 1992 and May 1993 are presented in Table 8. Perceptions were generally consistent between the new and original panelists. Overall, 71 to 73 percent of the panel believed there was no change in their travel times between October 1992 and May 1993. Meanwhile, between 18 and 22 percent of the panel felt that travel times had increased, and a small (5 to 9 percent) portion of the panel believed that travel times had decreased.



**TABLE 8. PERCEIVED CHANGES IN TRAVEL TIMES**

Perceived Change in Travel Time	Percent of Responses	
	New Panel	Original Panel
Home-to-Work Trip:		
Shorter Trip	7	9
No Change	71	73
Longer Trip	22	18
Work-to-Home Trip:		
Shorter Trip	5	7
No Change	73	72
Longer Trip	22	21

The perceptions of the new panel appear to be consistent with the slightly higher travel time values reported, but the results of the original panel seem to contradict the slightly lower travel times that they reported. However, further analysis showed that those panelists perceiving longer travel times did actually report greater travel times on average in May 1993. As shown in Table 9, both new and original panelists who felt travel times were longer actually reported travel times in May 1993 that were an average of 3 minutes greater than in October 1992.

#### Intermediate Stops to and from Work

Panelists provided estimates of the frequency of stops they made to and from work. Averages of these estimates are presented in Table 10. Overall, neither new nor original panelists reported making significantly more or less stops during the home-to-work trip. On the trip home, new panelists reported significantly more stops in May 1993 as compared to October 1992. The biggest increases were for social and personal business reasons. Original panelists also reported making slightly more stops on the trip home in May 1993, although the change was not statistically significant. It is not known, however, whether the changes were a result of NCE construction or of seasonal changes.

**TABLE 9. AVERAGE TRAVEL TIMES FOR PANELISTS  
WHO BELIEVED TRAVEL TIMES WERE LONGER**

	October 1992		May 1993		Difference	
	New Panel	Original Panel	New Panel	Original Panel	New Panel	Original Panel
Home-to-Work Trip	31.2	31.5	34.4	33.8	+3.2 (+10%)	+2.3 (+7%)
Work-to-Home Trip	33.9	38.4	37.6	41.4	+3.7 (+11%)	+3.0 (+8%)

**TABLE 10. INTERMEDIATE STOPS MADE TO AND FROM WORK**

	October 1992		May 1993		Difference	
	New Panel	Original Panel	New Panel	Original Panel	New Panel	Original Panel
Home-to-Work Trip:						
School or daycare	0.53	0.43	0.54	0.37	+0.01	-0.06
Shopping	0.23	0.20	0.24	0.37	+0.01	+0.17
Social	0.35	0.20	0.29	0.22	-0.06	+0.02
Pers. Business	<u>0.50</u>	<u>0.35</u>	<u>0.50</u>	<u>0.33</u>	<u>0.00</u>	<u>-0.02</u>
TOTAL	1.61	1.18	1.57	1.29	-0.04	+0.11
Work-to-Home Trip:						
School or daycare	0.37	0.22	0.41	0.24	+0.04	+0.02
Shopping	0.88	0.81	0.98	0.71	+0.10	-0.10
Social	0.83	0.41	1.05	0.58	+0.22	+0.17
Pers. Business	<u>0.72</u>	<u>0.57</u>	<u>1.03</u>	<u>0.68</u>	<u>+0.31</u>	<u>+0.11</u>
TOTAL	2.80	2.01	3.47	2.21	+0.67*	+0.20

\* statistically significant at 0.05 level of significance

## Choice of Travel Mode

Table 11 summarizes panelist choices regarding travel modes used for work trips. As expected, the vast majority (94 to 95 percent) of the panelists in May 1993 drove alone in their automobiles, up slightly from the percentage determined for October 1992. These values do not of course necessarily reflect the corridor-wide mode choice distributions because panel identification focused strictly on automobile drivers. Nevertheless, the data does not suggest any shift away from single-occupant vehicles into carpools or other alternative travel modes between the two surveys.

**TABLE 11. WORK TRIP MODE CHOICE DISTRIBUTIONS**

	October 1992		May 1993	
	New Panel	Original Panel	New Panel	Original Panel
Drive Alone	93%	91%	94%	95%
Carpool	6%	5%	5%	3%
Other	1%	4%	1%	2%

## Roadway Utilization

Tables 12 and 13 illustrate panel utilization of the various North/South roadways in the NCE corridor for trips to and from work. The results indicate the NCE usage increased slightly for the new panelists between October 1992 and May 1993, whereas it decreased slightly for the original panelists. These slight changes were not found to be statistically significant, however. Other assorted small changes in utilization values were noted among the other roadways as well, although none of these were statistically significant either. In general, panelists route choices remained relatively constant over the six-month period between surveys.

**TABLE 12. ROADWAY UTILIZATION: HOME-TO-WORK TRIPS**

	Ave. Trips/Wk		% of Total Trips	
	October 1992	May 1993	October 1992	May 1993
<b>New Panelists:</b>				
NCE	1.8	2.1	35	40
Dallas N. Tollway	1.0	0.9	20	18
Skillman/Live Oak	0.6	0.7	12	13
Greenville/Ross	0.5	0.5	9	10
Abrams/Gaston	0.4	0.4	8	8
Hillcrest/Cole	0.4	0.3	8	6
Preston	<u>0.4</u>	<u>0.3</u>	<u>8</u>	<u>5</u>
<b>TOTAL</b>	<b>5.1</b>	<b>5.2</b>	<b>100</b>	<b>100</b>
<b>Original Panelists:</b>				
NCE	2.6	2.0	45	45
Dallas N. Tollway	0.6	0.7	12	15
Skillman/Live Oak	0.4	0.2	7	5
Greenville/Ross	0.4	0.4	8	8
Abrams/Gaston	0.4	0.4	7	8
Hillcrest/Cole	0.5	0.4	11	8
Preston	<u>0.5</u>	<u>0.5</u>	<u>10</u>	<u>11</u>
<b>TOTAL</b>	<b>5.1</b>	<b>4.6</b>	<b>100</b>	<b>100</b>

**TABLE 13. ROADWAY UTILIZATION: WORK-TO-HOME TRIPS**

	Ave. Trips/Wk		% of Total Trips	
	October 1992	May 1993	October 1992	May 1993
<b>New Panelists:</b>				
NCE	1.7	2.0	36	39
Dallas N. Tollway	0.9	0.9	19	17
Skillman/Live Oak	0.5	0.6	10	11
Greenville/Ross	0.4	0.6	9	11
Abrams/Gaston	0.5	0.4	9	8
Hillcrest/Cole	0.4	0.4	8	8
Preston	<u>0.4</u>	<u>0.3</u>	<u>9</u>	<u>6</u>
<b>TOTAL</b>	<b>4.8</b>	<b>5.1</b>	<b>100</b>	<b>100</b>
<b>Original Panelists:</b>				
NCE	2.3	2.0	46	43
Dallas N. Tollway	0.8	0.8	16	16
Skillman/Live Oak	0.4	0.2	7	5
Greenville/Ross	0.3	0.3	5	6
Abrams/Gaston	0.3	0.4	6	9
Hillcrest/Cole	0.5	0.4	11	10
Preston	<u>0.5</u>	<u>0.5</u>	<u>9</u>	<u>11</u>
<b>TOTAL</b>	<b>4.9</b>	<b>4.6</b>	<b>100</b>	<b>100</b>

## **Motorist Sensitivity to Degraded Traffic Conditions**

To date, motorists travelling the NCE have had to contend with temporary off-peak lane closures, temporary and permanent ramp closures, detours of the freeway mainlanes, frontage road detours, lane closures, etc. Although undoubtedly stressful and inconvenient, these activities have not generated significant amounts of additional congestion and delays (as shown through TTI's ongoing traffic monitoring program). However, construction will soon begin on sections of NCE closer to the Dallas CBD. In these sections, traffic control plans call for the long-term closure of freeway mainlanes, reducing available capacity on NCE during peak periods. It is during these phases of construction that traffic conditions in the corridor are expected to be substantially degraded.

In an effort to gain insight into motorist attitudes and possible behaviors concerning the likely deterioration of mobility in the corridor once these sections go under construction, panelists were asked two additional questions on the May 1993 survey form:

1. How much additional travel time to and from work would you be willing to tolerate in order to allow Expressway construction to be completed as quickly as possible?
2. Assuming travel times to and from work became excessive, how likely would you be to react by changing routes? by carpooling or riding the bus? by departing earlier? by changing your work schedule? by changing jobs?

Motorist sensitivity to construction-generated delays were evaluated in terms of the percentage of motorists who would tolerate a given amount of delay. A plot of the relationship between motorist tolerance and amount of delay is shown in Figure 2. Based on the responses obtained from the panelists, the typical motorist (approximated by the 50th-percentile response) would be willing to accept nearly 15 minutes of additional delay. This value is nearly one-half of the current average work trip travel times for panelists and suggests a strong willingness to endure additional travel time in order to have NCE construction completed.

Average rankings of the various possible responses to excessive delays provided in the second question are summarized in Table 14. Panelists were asked to give a value

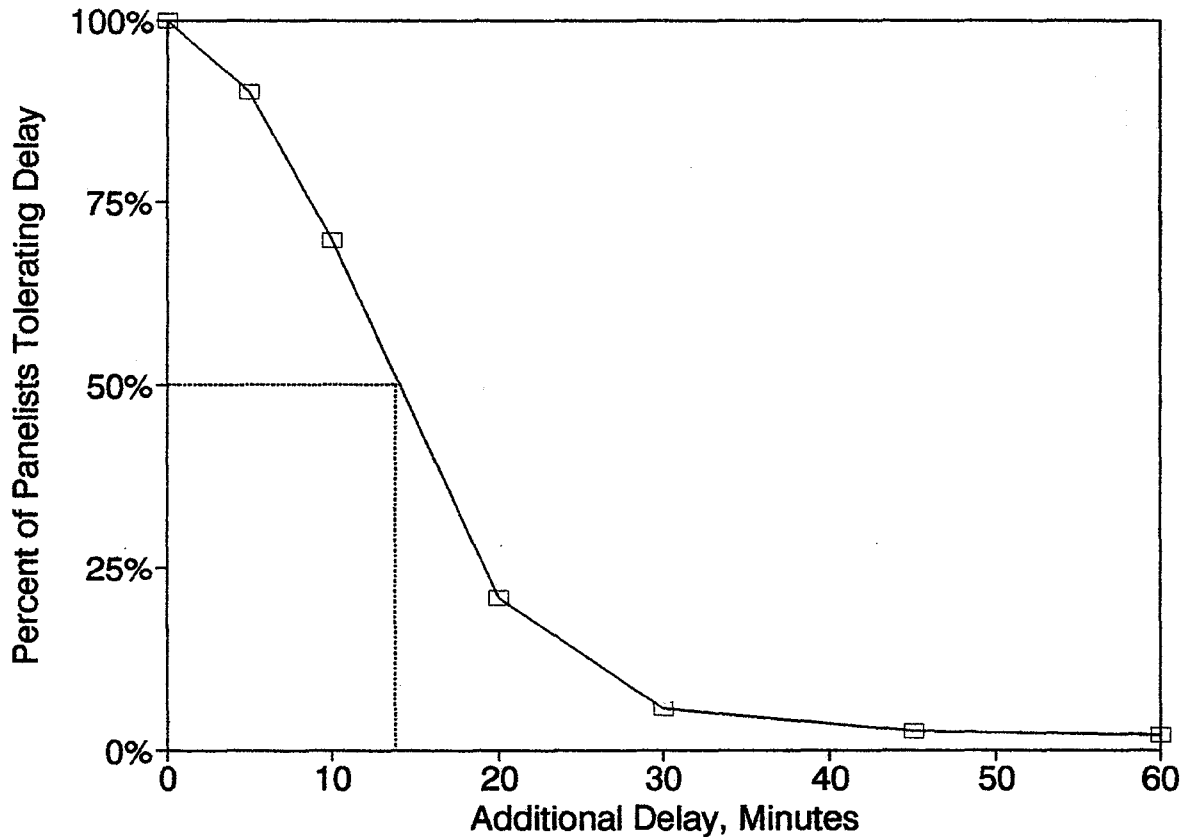


Figure 2. Potential Motorist Tolerance to Increased Delays During Construction.

of "1" to their most likely response, a "2" to the second most likely response, etc. Those alternatives not rated were then assigned a ranking of "6" (there were six alternatives given, including a "do nothing different" alternative). The average ranking of each alternative was computed and used to rate their likelihood of occurrence.

Table 14 illustrates that the most likely option reported by panelists was to change routes, followed by choosing an earlier departure time. The panelists' third most likely alternative was to "do nothing." Options such as changing work schedules, finding a carpool to share the ride (and frustration), or finding a different job were all ranked very low. The low scores for changing jobs or work schedules are understandable, as many employees do not have the luxury of setting their own work hours or where they want to work (for the same pay). The low score for the carpooling option was also expected. Attempts to encourage ridesharing during other major freeway reconstruction projects

nationwide have met with only limited success (2). For the most part, only those projects where travel time or financial incentives were made available to high-occupancy vehicles during construction achieved any type of shift away from single-occupant vehicle usage. It appears a similar incentive will be required if increased ridesharing is desired of Dallas motorists during construction.

**TABLE 14. RANKINGS OF POTENTIAL REACTIONS TO EXCESSIVE TRAVEL TIME DELAYS**

Possible Reaction	Ave. Rank Score
Change Routes	2.6
Leave Earlier	3.6
Do Nothing	4.9
Change Work Schedule	5.4
Carpool	5.5
Find a Different Job	5.8

**SUMMARY**

The results of the May 1993 survey of automobile panelists in the NCE corridor indicate that construction continued to have little impact upon motorist travel patterns and driving conditions. The following is a list of the specific findings from the survey:

- No statistically significant changes occurred in average total weekly tripmaking frequencies or weekly tripmaking frequencies on NCE. Likewise, NCE use as a percentage of total tripmaking activity was also unchanged. In general, panelists' perceptions of changes (or lack of changes) in their tripmaking activity were consistent with changes in their reported behavior.

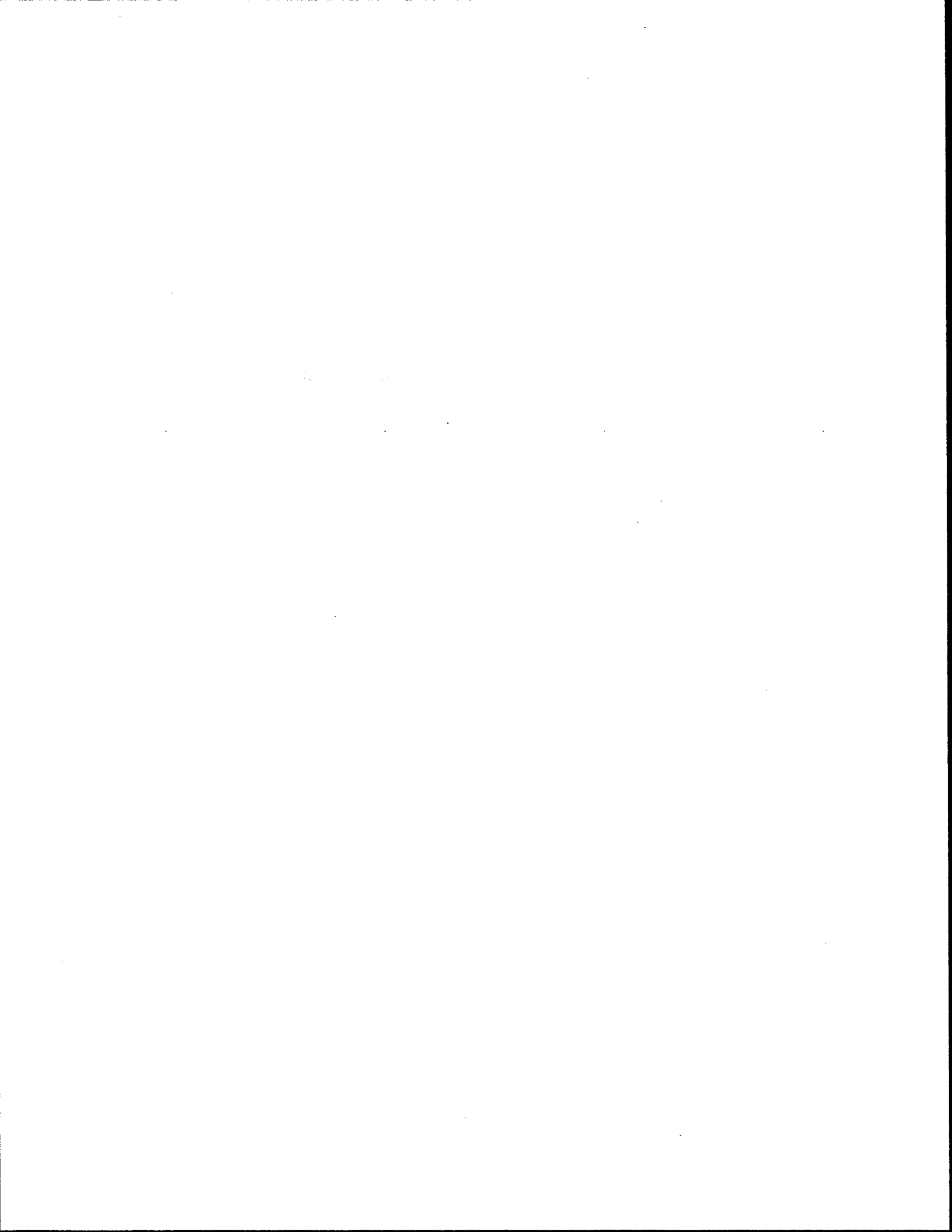


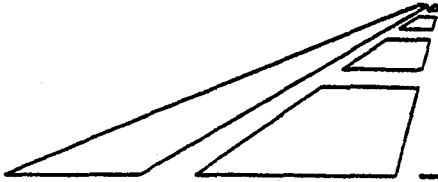
- Median departure times for panelists' home-to-work and work-to-home trips were 10 to 15 minutes later in May 1993 than in October 1992. The changes were most noticeable for the original panelists. However, the majority of both new and original panelists felt that they had not made any changes in departure times either to or from work.
- Average travel times to and from work did not change significantly between October 1992 and May 1993. Although most of both groups of panelists believed there had been no change in the work trip travel times, between 18 and 22 percent felt that travel times had increased in May 1993 relative to October 1992.
- On average, new panelists made more stops during their home-to-work trips in May 1993. Although not statistically significant, the number of stops reported by original panelists in May 1993 were also slightly greater than in October 1992. The amount of increase due to NCE construction and the amount attributable to seasonal differences between the two surveys could not be determined.
- The single-occupant automobile was the primary travel mode in May 1993, being used by 94 to 95 percent of the panelists. This value was slightly higher than the 91 to 93 percent single-occupant automobile usage reported in October 1992.
- Statistically, there were no changes in the relative utilization of the various roadways in the NCE corridor reported by panelists for their work trips in May 1993 as compared to October 1992. The NCE was still the most highly-utilized roadway of panelists, with the Dallas North Tollway a distant second.
- Panelists indicated that they would be willing to tolerate substantial increases in travel time in order to expedite NCE construction. A 50th-percentile panelist reportedly would accept nearly 15 minutes of additional delay as part of construction, nearly one-half of the existing 30-minute average work trip travel time.
- Panelists as a group indicated that their most likely responses to excessive increases in NCE congestion due to construction would be to choose another route and to leave for work at an earlier time. Carpooling, changing work schedules, or changing jobs were seen as unlikely options by panelists.

## REFERENCES

1. Ullman, G.L. and R.A. Krammes. U.S. 75 North Central Expressway Reconstruction: Lemmon/Oak Lawn/Peak Screen Line Automobile User Panel, October 1992 Survey Results. Research Report TX-93/1940-5. Texas Transportation Institute, College Station, TX. May 1993.
2. Ullman, G.L. and R.A. Krammes. U.S. 75 North Central Expressway Reconstruction: Northwest Highway Screen Line Automobile and Transit User Panels, November 1990 Survey Results. Research Report TX-92/984-3. Texas Transportation Institute, College Station, TX. May 1991.
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.
4. Ullman, G.L. and R.A. Krammes. U.S. 75 North Central Expressway Reconstruction: Northwest Highway Screen Line Automobile and Transit User Panels, October 1991 Survey Results. Research Report TX-92/1940-2. Texas Transportation Institute, College Station, TX. May 1992.
5. Ullman, G.L., K.M. Collins, and R.A. Krammes. U.S. 75 North Central Expressway Reconstruction: Northwest Highway Screen Line Automobile and Transit User Panels, May 1992 Survey Results. Research Report TX-92/1940-3. Texas Transportation Institute, College Station, TX. December 1992.

**APPENDIX A: MAY 1993 SURVEY FORMS**





TEXAS TRANSPORTATION INSTITUTE

CORRIDOR OPERATIONS  
ANALYSIS PROGRAM

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

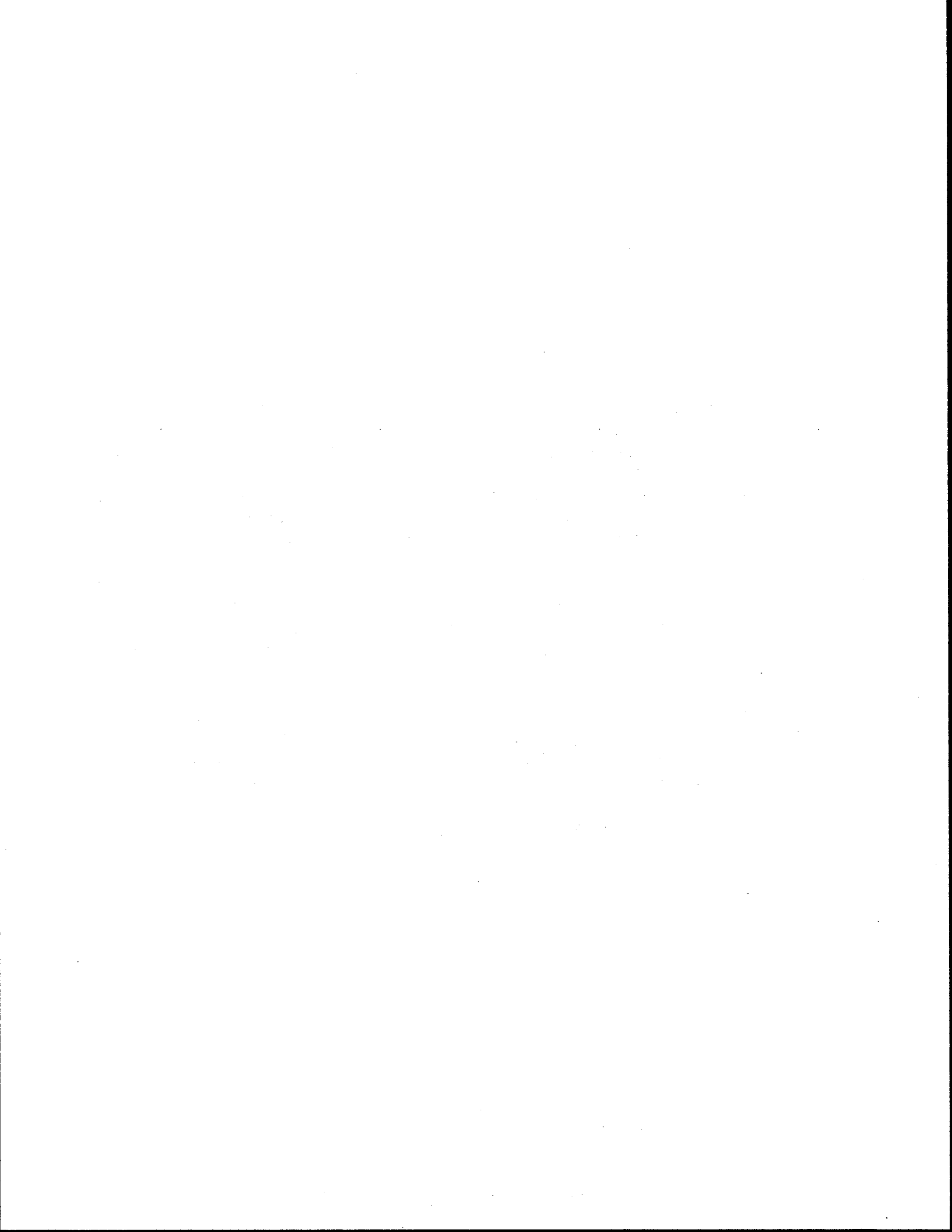
May 19, 1993

Dear Motorist:

Thank you for returning the survey last October regarding travel conditions and patterns in the North Central Expressway corridor. We have presented the findings of that survey to the Texas Department of Transportation and other transportation agencies in Dallas. They are relying on that and other information to decide how to best accommodate motorist's travel needs throughout construction. Your input is very important, because you and the other members of the panel know best how travel conditions are being affected by the lengthy but necessary construction project.

We have prepared a follow-up survey to again assess your travel patterns in the North Dallas area. It asks many of the same questions as before, so that we can see if your travel has changed over time. The survey consists of two parts: the first requests general information about all of your tripmaking, while the second requests more specific information about your trips to and from work.

Please take a few moments, fill out the survey, and return it in the postage-paid envelope provided. Those of you who indicated that you do not work outside of your home need only complete part 1 of the survey. The information will remain confidential, only summaries of the data will be released. If you do not wish to participate in additional travel surveys in the future, please let us know on the back of the survey forms. Thank you for your participation in this effort.





May 1993

### PART 2: NORTH CENTRAL EXPRESSWAY WORK TRIP SURVEY

1. Have you changed work locations since October 1992?  yes  no
2. When do you typically leave your home to go to work? \_\_\_\_\_ AM or PM (circle one)  
 Have this changed since October 1992?  
 Yes, I leave \_\_\_\_\_ minutes earlier now.  
 Yes, I leave \_\_\_\_\_ minutes later now.  
 No, I have not changed my departure time.

3. How much time does your trip from home to work typically take you? \_\_\_\_\_ minutes  
 Has this time changed since October 1992?  
 Yes, it is \_\_\_\_\_ minutes longer now.  
 Yes, it is \_\_\_\_\_ minutes shorter now.  
 No, it has not changed.

4. When do you typically leave your work to go home? \_\_\_\_\_ AM or PM (circle one)  
 Have this changed since October 1992?  
 Yes, I leave \_\_\_\_\_ minutes earlier now.  
 Yes, I leave \_\_\_\_\_ minutes later now.  
 No, I have not changed my departure time.

5. How long does your trip from work to home typically take you? \_\_\_\_\_ minutes  
 Has this time changed since October 1992?  
 Yes, it is \_\_\_\_\_ minutes longer now.  
 Yes, it is \_\_\_\_\_ minutes shorter now.  
 No, it has not changed.

6. How many times per week <sup>do</sup> you make each of the following types of stops on the way to and from work?

	<u>From home to work</u>	<u>From work to home</u>
school/child daycare	_____	_____
shopping	_____	_____
personal business	_____	_____
social/recreation/eat a meal	_____	_____

7. How do you typically make your trips between home and work? (check one)  
 drove alone  carpool/vanpool (with \_\_\_\_\_ people)  bus  other

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

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