Commuter Perceptions of Traffic Congestion During the Reconstruction of I-45 North Freeway in Houston

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The I-45 North Freeway in Houston is currently undergoing a major reconstruction process. As Phase 2 of the reconstruction project is initiated, it has become necessary to implement several traffic-constricting activities, which are likely to affect mobility in an adverse manner. This paper presents an assessment of how the public is perceiving the traffic conditions during the reconstruction activities. Data on commuter travel times, travel distances, travel modes, and primary travel routes before and during reconstruction periods are presented. A similar effort was undertaken in Pittsburgh, Pennsylvania, during the reconstruction of the I-376 Parkway East. When possible, comparisons between the Houston and Pittsburgh data are presented. In general, it appears that most North Freeway commuters perceive little or no change in traffic conditions during this phase of the reconstruction. On the average, they depart 1.2 min earlier for work or school, travel distances measuring only 0.02 mi longer, and report a 1.2-min increase in travel time. Parkway East commuters, on the other hand, departed 29 min earlier for work or school, traveled distances 3.31 mi longer, and reported that it took 4 min longer to reach their destinations during reconstruction. Mode shifts in both Houston and Pittsburgh were very small, suggesting that the majority of commuters in both cities were not sufficiently inconvenienced by the reconstruction activities to look for another means of travel to work or school.

Phase 2 of a major reconstruction effort is currently under way along a 7.75-mi segment of the I-45 North Freeway in Houston, Texas. During this phase of reconstruction, an additional freeway mainlane will be added, and the transitway constructed for authorized high-occupancy vehicles will be enlarged to its final design width. This additional capacity will result in increased vehicle throughput during peak travel periods and better overall operation during off-peak hours.

As Phase 2 of the North Freeway reconstruction project is initiated, it has become necessary to temporarily implement several traffic-constricting activities, including the narrowing of freeway mainlanes, the closure of freeway ramps, and the periodic closure of freeway mainlanes during off-peak periods. These construction-related activities are likely to affect mobility in an adverse manner along the freeway mainlanes and throughout the entire North Freeway corridor. Of particular concern are the delays that may be incurred during the morning peak period when commuters are traveling to work or school. In order to minimize these potential delays, a traffic control plan has been developed by the Metropolitan Transit Authority of Harris County (METRO) and the Texas State Department of Highways and Public Transportation (SDHPT).

Texas Transportation Institute (TTI) is currently monitoring traffic conditions and collecting detailed and comprehensive data to evaluate the need for (and success of) various traffic control strategies during the North Freeway reconstruction process. In addition to travel time measurements, vehicle volume counts, and other types of measured data, TTI is also engaged in the assessment of how the public is perceiving traffic congestion and the special traffic control efforts. This assessment is being accomplished through the periodic distribution of questionnaires to a panel of North Freeway corridor commuters who have agreed to participate in the ongoing traffic congestion survey.

These perception studies are being undertaken as a result of past experiences showing that the public's perception of a project is often different from that indicated by objective studies. It is important to determine exactly how a project is being perceived by the public. If commuters do not perceive a need for (or benefit from) a particular traffic control effort, they are not likely to support its implementation (or continuation, or both), regardless of what objective studies may tell them. Such public support may be necessary when similar projects are considered in the future.

The first of the recurring North Freeway corridor commuter surveys was performed in May 1985 before Phase 2 of the mainlane reconstruction began. A second commuter survey was performed in December 1985 after Phase 2 reconstruction began. The results of the second survey are summarized in this paper. Many of the questions used in the North Freeway corridor commuter surveys are similar to those used in commuter surveys conducted before and during the reconstruction of the Parkway East (I-376) in Pittsburgh, Pennsylvania. When possible, for comparative purposes, the Pittsburgh data are also presented.

The primary purpose of the second commuter surveys in both Houston and Pittsburgh was to measure changes in departure times for work or school, travel times, travel distances, travel routes, and travel modes that have occurred since the reconstruction activities and traffic control strategies began. Specific activities and strategies in the North Freeway and Parkway East corridors are described in the following discussion.

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PARKWAY EAST AND NORTH FREEWAY RECONSTRUCTION ACTIVITIES

Reconstruction activities along the Parkway East corridor in Pittsburgh were extensive and the freeway peak-period capacity was reduced by approximately two-thirds for 16 out of 20 months of the reconstruction process. Traffic was restricted to one lane in each direction for months at a time. Entrance ramps at both ends of the reconstruction zone were restricted to use by high-occupancy vehicles. It has been estimated that 80,000 trips were restricted each day during the Parkway East reconstruction (*1, 2*).

In Houston at least three lanes of the North Freeway mainlanes remain open during the peak period for the peak direction of flow. Freeway capacity has been reduced by the narrowing of lanes and the placement of concrete median barriers adjacent to right-hand travel lanes. Entrance and exit ramps are periodically closed, but their use has not been restricted. No construction has been taking place within the transitway itself and transitway use has not been restricted during peak travel periods. Vehicle volume levels along the North Freeway mainlanes fluctuate less than 3 percent for the inbound, morning peak direction of flow. Volumes for the outbound direction during the afternoon peak period have increased from 4 to 10 percent (*1*).

TRAFFIC CONTROL STRATEGIES IN HOUSTON AND PITTSBURGH

Traffic control strategies implemented during the reconstruction of the Parkway East consisted of several alternative methods of improving people-moving capabilities. These included a new commuter train service, a third-party vanpool program, high-occupancy-vehicle ramps, new park-and-ride facilities, new express bus service, and traffic operations improvements on major alternative routes.

Implementation of such strategies for the North Freeway corridor in Houston has not been as extensive as was the case for Parkway East in Pittsburgh. Static signs have been placed along the freeway to encourage increased use of the existing, extensive park-and-ride and vanpool programs. No additional park-and-ride lots have been constructed because there is available capacity within the four existing lots that serve the North Freeway corridor. Capacity improvements to frontage road approaches at four interchanges have been developed and submitted to METRO by TTI. These temporary improvements will be implemented only if the freeway mainlane capacity is severely reduced or access restricted. No strategies similar to those used in Pittsburgh have been implemented thus far in Houston (*1*).

RESULTS OF NORTH FREEWAY COMMUTER SURVEY

Survey questionnaires were mailed to a total of 960 North Freeway commuters (395 transit users, 186 vanpool drivers, and 379 automobile commuters). Response rates ranged from 34 percent for the automobile commuter group to 39 percent for the transit user group to 65 percent for the vanpool driver group. The overall response rate was approximately 42 percent.

For analytical purposes, the results of the commuter survey were disaggregated into the following five groups:

- Local bus riders,
- Express bus riders,
- Park-and-ride users,
- Vanpool drivers, and
- Automobile commuters.

The express bus riders, park-and-ride users, and vanpool drivers surveyed typically utilize the North Freeway transitway, whereas the local bus riders and automobile commuters surveyed utilize the North Freeway mainlanes and frontage roads.

Official Work or School Start Times

North Freeway commuters were asked to list their official work or school start time. Median official work or school start times by commuter group are as follows:

Commuter Group	*Median Work or School Start Time (a.m.)*
Local bus riders	8:00
Express bus riders	7:00
Park-and-ride users	7:30
Vanpool drivers	7:30
Automobile commuters	7:00

The median work or school start time of 7:00 a.m. for both the automobile commuters and express bus riders is 30 min earlier than the median time of 7:30 a.m. for the park-and-ride users and vanpool drivers and 1 hr earlier than the median time of 8:00 a.m. for the local bus riders.

Departure Times

As indicated by the following median departure times, the reconstruction activities appear to be having little effect on the time that most commuters leave home for work or school:

	Median Departure Time (a.m.)	
Commuter Group	*Before Reconstruction*	*During Reconstruction*
Local bus riders	6:54	6:50
Express bus riders	6:00	6:00
Park-and-ride users	6:24	6:20
Vanpool drivers	6:20	6:25
Automobile commuters	6:15	6:15

In fact, the majority of commuters from all five survey groups report no change in their departure times since the reconstruction began (Table 1). Furthermore, 15 percent of the local bus riders, 10 percent of the express bus riders, 20

TABLE 1 CHANGES IN DEPARTURE TIMES FOR WORK OR SCHOOL

Departure Time During Reconstruction Compared to Before Reconstruction	Local Bus Riders	Express Bus Riders	Park-and-Ride Users	Vanpool Drivers	Auto Commuters
30 or more minutes earlier	--	5%	2%	--	4%
25 minutes earlier	--	--	1%	--	--
20 minutes earlier	--	--	1%	1%	2%
15 minutes earlier	--	5%	9%	1%	9%
10 minutes earlier	--	--	4%	3%	6%
5 minutes earlier	15%	--	4%	2%	4%
Same	70%	80%	59%	82%	67%
5 minutes later	15%	--	1%	4%	1%
10 minutes later	--	5%	5%	2%	1%
15 minutes later	--	5%	9%	2%	2%
20 minutes later	--	--	--	1%	--
25 minutes later	--	--	1%	--	--
30 or more minutes later	--	--	4%	2%	4%
Summary: Depart earlier	15%	10%	21%	7%	25%
Depart at same time	70%	80%	59%	82%	67%
Depart later	15%	10%	20%	11%	8%

percent of the park-and-ride users, 11 percent of the vanpool drivers, and 8 percent of the automobile commuters report that they are leaving home 5 to 35 min later during the reconstruction. On the other hand, sizable percentages of park-and-ride users and automobile commuters (21 and 25 percent, respectively) state that they are leaving home 5 to 45 min earlier during reconstruction.

Travel Times

Median travel times from home to work or school by survey group are as follows. Again, only slight variations have been occurring during reconstruction.

	Median Travel Time (min)	
Commuter Group	*Before Reconstruction*	*During Reconstruction*
Local bus riders	30	40
Express bus riders	43	40
Park-and-ride users	45	45
Vanpool drivers	50	46
Automobile commuters	40	45

The majority of local bus riders, express bus riders, park-and-ride users, and vanpool drivers (76, 55, 56, and 67 percent, respectively) perceive that there has been no change in their travel times from home to work or school during reconstruction (Table 2). An additional 8 percent of the local bus riders, 30 percent of the express bus riders, 21 percent of the park-and-ride users, and 14 percent of the vanpool drivers indicate that travel times are actually 5 to 35 min shorter during reconstruction than before. Conversely, 16 percent of the local bus riders, 15 percent of the express bus riders, 23 percent of the park-and-ride users, and 19 percent of the vanpool drivers report longer travel times.

Responses from the automobile commuter group differ from those of the other four groups, however. Only 48 percent perceive no change and 10 percent perceive shorter travel times during reconstruction; 42 percent stated that travel times are 5 to 45 min longer.

Travel Distances

Median distances traveled from home to work or school ranged from 8 mi for the local bus riders to 30 mi for the vanpool drivers both before and during the reconstruction of the North Freeway.

	Median Travel Distance (mi)	
Commuter Group	*Before Reconstruction*	*During Reconstruction*
Local bus riders	8	8
Express bus riders	23	23

TABLE 2 CHANGES IN TRAVEL TIMES FROM HOME TO WORK OR SCHOOL

Travel Time During Reconstruction Compared to Before Reconstruction	Local Bus Riders	Express Bus Riders	Park-and-Ride Users	Vanpool Drivers	Auto Commuters
30 or more minutes shorter	--	--	1%	3%	--
25 minutes shorter	--	--	1%	1%	1%
20 minutes shorter	8%	10%	2%	--	--
15 minutes shorter	--	5%	6%	4%	1%
10 minutes shorter	--	5%	8%	4%	2%
5 minutes shorter	--	10%	3%	3%	6%
Same	76%	55%	56%	67%	48%
5 minutes longer	8%	--	6%	9%	12%
10 minutes longer	--	10%	8%	8%	3%
15 minutes longer	--	--	7%	1%	12%
20 minutes longer	8%	--	1%	--	11%
25 minutes longer	--	--	--	--	3%
30 or more minutes longer	--	5%	1%	--	1%
Summary: Travel time is shorter	8%	30%	21%	14%	10%
Travel time is the same	76%	55%	56%	67%	48%
Travel time is longer	16%	15%	23%	19%	42%

	Median Travel Time (min)	
Commuter Group	*Before Reconstruction*	*During Reconstruction*
Park-and-ride users	22	22
Vanpool drivers	30	30
Automobile commuters	24	24

At least 92 percent of all commuters surveyed report that the distance they travel from home to work or school had not changed since the North Freeway reconstruction began (Table 3); very small percentages indicate that their travel distances are somewhat shorter. On the other hand, approximately 5 percent of the vanpool drivers and 6 percent of the automobile commuters report that their travel distances are from 1 to 13 mi longer.

Primary Travel Routes

Automobile commuters and vanpool drivers were also asked to describe their primary travel routes from home to work or school before and during the North Freeway reconstruction. Their responses are given in Table 4, which indicates that only a small percentage of vanpool drivers and automobile commuters have varied their primary travel routes since Phase 2 of the reconstruction activities began. Generally speaking, the North Freeway has been the most heavily traveled route both before and during reconstruction. However, during reconstruction, use of the North Freeway by the vanpool drivers has increased 2 percent and use of the freeway by the automobile commuters has decreased 7 percent. The slight increase in vanpool use of the North Freeway may be due to the presence of the transitway, whereas the decrease in automobile commuter use may be due to their perception of worsening traffic congestion. (Primary travel routes for the local, express, and park-and-ride bus services have remaincd unchanged since the reconstruction activities began.)

Primary Travel Modes

The primary travel modes to work or school both before and during reconstruction are presented in Table 5, which shows that 10 percent of the express bus riders, 5 percent of the park-and-ride users, 6 percent of the vanpool drivers, and 6 percent of the automobile commuters during reconstruction had used different modes of transportation to work or school before reconstruction. Another item of interest is the large percentage of automobile commuters who report that they carpool. Approximately 55 percent of the automobile commuters carpooled before reconstruction and 53 percent are carpooling during reconstruction.

TABLE 3 CHANGES IN TRAVEL DISTANCES FROM HOME TO WORK OR SCHOOL

Travel Distance During Reconstruction Compared to Before Reconstruction	Local Bus Riders	Express Bus Riders	Park-and-Ride Users	Vanpool Drivers	Auto Commuters
8 miles shorter	--	--	--	--	1%
6 miles shorter	--	--	1%	--	--
3 miles shorter	8%	--	--	--	--
2 miles shorter	--	--	--	2%	--
1 mile shorter	--	--	--	--	1%
Same	92%	100%	97%	92%	92%
1 mile longer	--	--	1%	--	--
2 miles longer	--	--	--	2%	1%
3 miles longer	--	--	--	1%	1%
4 miles longer	--	--	--	--	1%
5 miles longer	--	--	1%	1%	1%
8 miles longer	--	--	--	--	1%
10 or more miles longer	--	--	--	2%	1%
Summary: Travel distance is shorter	8%	0%	1%	2%	2%
Travel distance is the same	92%	100%	97%	93%	92%
Travel distance is longer	0%	0%	2%	5%	6%

TABLE 4 PRIMARY TRAVEL ROUTES FROM HOME TO WORK OR SCHOOL

	Vanpool Drivers		Auto Commuters	
Primary Travel Route	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction
N. Shepherd/N. Freeway	8%	7%	10%	10%
Airline	1%	---	---	2%
N. Freeway (mainlanes/AVL)	86%	88%	65%	58%
N. Freeway (frontage road)	---	1%	6%	6%
Hardy Road	1%	---	5%	5%
Eastex Freeway	1%	2%	---	1%
Crosstimbers/N. Freeway	---	---	1%	1%
Others	3%	2%	13%	17%

Information Concerning Reconstruction Activities

A final question asked of all five survey groups was "Do you think that the public has been kept adequately informed of the North Freeway reconstruction activities?" Their responses are given in Table 6. Between 23 and 40 percent of all commuters surveyed indicate "yes," whereas 25 to 41 percent respond "no" and 26 to 46 percent are unsure.

SUMMARY OF TRAVEL CHARACTERISTICS

Local Bus Riders

On the basis of the results of the second commuter survey, local bus riders typically left home at 6:54 a.m. before reconstruction and are leaving at 6:50 during reconstruction in order to get to work or school by 8:00 a.m. The local bus

TABLE 5 PRIMARY TRAVEL MODES TO WORK OR SCHOOL

Primary Travel Mode	Express Bus Riders		Park-and-Ride Users		Vanpool Drivers		Auto Commuters	
	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction
Drive Alone	---	---	1%	---	2%	---	39%	47%
Carpool With Family	---	---	---	---	1%	---	6%	7%
Carpool With Others	10%	---	1%	---	1%	---	49%	46%
Vanpool	---	---	3%	---	94%	100%	4%	---
Bus	90%	100%	95%	100%	2%	---	2%	---

Note: 100% of the local bus riders reported that they commuted by bus both before and during reconstruction.

TABLE 6 IS PUBLIC KEPT ADEQUATELY INFORMED OF RECONSTRUCTION ACTIVITIES?

Adequate Information on Reconstruction Activities	Local Bus Riders	Express Bus Riders	Park-and-Ride Users	Vanpool Drivers	Auto Commuters
Yes	23%	40%	32%	38%	33%
No	31%	25%	35%	34%	41%
Not Sure	46%	35%	33%	28%	26%

riders traveled a distance of 8 mi in 30 min before reconstruction and 8 mi in 40 min (10 min slower) during reconstruction, indicating overall travel speeds of approximately 16 mph before reconstruction and 12 mph during reconstruction. None of the local bus riders have changed modes since the reconstruction began.

Express Bus Riders

Express bus riders typically left home at 6:00 a.m. both before and during reconstruction in order to get to work or school by 7:00 a.m. They reportedly traveled 23 mi in 43 min before reconstruction and 23 mi in 40 min during reconstruction. This indicates they averaged 32 mph before reconstruction and almost 35 mph during reconstruction. About 10 percent of the express bus riders had previously carpooled before reconstruction.

Park-and-Ride Users

Park-and-ride users typically left home at 6:24 a.m. before reconstruction and 6:20 a.m. (4 min earlier) during reconstruction in order to arrive at work or school by 7:30 a.m. They typically traveled a distance of 22 mi in 45 min both before and during reconstruction, indicating an overall travel speed of 29 mph. About 3 percent of the park-and-ride users had previously vanpooled before reconstruction; 1 percent drove alone and 1 percent carpooled with others than family members.

Vanpool Drivers

Vanpool drivers normally left home at 6:20 a.m. before reconstruction and 6:25 a.m. (5 min later) during reconstruction in order to arrive at work locations by 7:30 a.m.

They reportedly traveled 30 mi in 50 min before reconstruction and 30 mi in 46 min (4 min faster) during reconstruction. Thus they appear to have averaged 36 mph before reconstruction and 39 mph during reconstruction. Approximately 2 percent of the vanpool drivers were previously bus riders, 2 percent drove alone, and 2 percent carpooled with family or others before reconstruction.

Automobile Commuters

Automobile commuters surveyed reported earlier departure and work start times than the other four survey groups. In general, automobile commuters left home at 6:15 a.m. both before and during reconstruction in order to arrive at work by 7:00 a.m. They traveled a median distance of 22 mi both before and during reconstruction. Travel time of 45 min during reconstruction is 5 min slower than before reconstruction. Thus, they averaged 33 mph before reconstruction, but only 29 mph during reconstruction. Approximately 4 percent of the automobile commuters had previously vanpooled before reconstruction and 2 percent had made the trip by bus.

COMPARISON OF HOUSTON AND PITTSBURGH SURVEY DATA

Median departure times from home to work or school both before and during reconstruction for the North Freeway corridor commuters (all modes) in Houston and the Parkway East corridor commuters (all modes) are given in Table 7. Median trip travel times and distances for both survey groups are given in Tables 8 and 9, respectively. Generally speaking, North Freeway corridor commuters leave home earlier, travel longer distances, and take more time to reach work or school locations than Parkway East corridor commuters (both before and during reconstruction periods).

Average Changes: Before and During Reconstruction

Looking at the average changes that took place in Pittsburgh and Houston reveals the following:

- Parkway East commuters departed for work or school 29 min earlier during reconstruction, whereas North Freeway commuters depart only 1.2 min earlier.
- Parkway East commuters traveled distances 3.31 mi longer during reconstruction, whereas North Freeway commuters travel distances only 0.02 mi longer.
- Parkway East commuters reported that it took 4 min longer to travel to work or school during reconstruction, whereas North Freeway commuters reported that it takes only 1.2 min longer.

Modal Split Data: Before and During Reconstruction

Modal split data for the North Freeway corridor commuters and the Parkway East commuters are given in Table 10, which indicates that vanpoolers make up a much larger percentage of the commuter group in Houston than in Pittsburgh. This is to be expected, because vanpooling has long been a popular travel mode in Houston, whereas vanpooling programs were just being initiated in Pittsburgh.

Table 10 also indicates very small modal shifts in Houston and Pittsburgh during the reconstruction activities. This would suggest that the majority of commuters in both cities were not sufficiently inconvenienced by the reconstruction activities to look for other means of travel to work or school.

TABLE 7 DEPARTURE TIMES FOR WORK OR SCHOOL BEFORE AND DURING RECONSTRUCTION PERIODS IN HOUSTON AND PITTSBURGH

	North Freeway - Houston		Parkway East - Pittsburgh	
Departure Time from Home	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction
Before 6:00 a.m.	15%	16%	6%	8%
6:00 - 6:30 a.m.	53%	51%	10%	13%
6:31 - 7:00 a.m.	19%	19%	45%	44%
7:01 - 7:30 a.m.	11%	12%	38%	33%
7:31 - 8:00 a.m.	1%	1%	1%	2%
After 8:00 a.m.	1%	1%	---	---
Average Change: During-Before	1 minute earlier		29 minutes earlier	

Source: December 1985 Houston North Freeway corridor commuter surveys and Reference 2.

TABLE 8 COMPARISON OF WORK AND SCHOOL TRIP TRAVEL TIMES BEFORE AND DURING RECONSTRUCTION PERIODS IN HOUSTON AND PITTSBURGH

Trip Time Distribution	North Freeway - Houston		Parkway East - Pittsburgh	
	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction
1-10 minutes	2%	1%	2%	1%
11-20 minutes	5%	5%	24%	10%
21-30 minutes	14%	13%	28%	24%
21-40 minutes	23%	23%	17%	23%
41-50 minutes	34%	33%	28%	23%
>50 minutes	22%	25%	11%	20%
Average change: During-Before	1.2 minutes longer		4 minutes longer	

Source: December 1985 Houston North Freeway Corridor commuter surveys and Reference 2.

TABLE 9 COMPARISON OF WORK AND SCHOOL TRIP TRAVEL DISTANCES BEFORE AND DURING RECONSTRUCTION PERIODS IN HOUSTON AND PITTSBURGH

Trip Distance Distribution	North Freeway - Houston		Parkway East - Pittsburgh	
	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction
1-5 miles	4%	3%	6%	5%
6-10 miles	5%	6%	32%	29%
11-15 miles	9%	8%	20%	30%
16-20 miles	12%	13%	20%	20%
21-25 miles	36%	36%	11%	11%
>25 miles	34%	34%	4%	5%
Average change: During-Before	0.2 miles longer		3.31 miles longer	

Source: December 1985 Houston North Freeway corridor commuter surveys and Reference 2.

TABLE 10 MODAL SPLIT FOR COMMUTERS SURVEYED BEFORE AND DURING RECONSTRUCTION IN HOUSTON AND PITTSBURGH

Primary Travel Mode	North Freeway - Houston		Parkway East - Pittsburgh	
	Before Reconstruction	During Reconstruction	Before Reconstruction	During Reconstruction
Drove Alone	13%	15%	37%	34%
Carpooled with Family	2%	2%	9%	9%
Carpooled with Others	17%	15%	19%	20%
Vanpooled	30%	30%	3%	5%
Transit	38%	38%	31%	31%
Other	---	---	1%	1%

Source: December 1985 Houston North Freeway corridor commuter surveys and Reference 2.

(The small modal shifts that occurred in Pittsburgh were particularly disappointing considering the new commuter rail, park-and-ride service, express bus service, and vanpool programs that were implemented as traffic control strategies.)

COMPARISON OF SURVEY RESULTS WITH FIELD MEASUREMENTS

The commuter surveys in Houston and Pittsburgh were undertaken to identify and measure changes in travel behavior during the reconstruction periods. In addition to these surveys, a variety of field measurements were also performed along the North Freeway and Parkway East corridors. Comparisons between the survey responses and field measurements were possible in several areas. In general, there was a high degree of consistency between the field measurements and the commuter survey responses in both Houston and Pittsburgh.

Departure Time Changes

In Houston the majority of commuters report no change in their departure times from home to work or school since the reconstruction began. Vehicle volume counts along the North Freeway corridor indicate that there has been no shift in the time that the a.m. peak period occurs (*1*).

Survey responses in Pittsburgh indicated that there was a general shift toward earlier departure times during reconstruction activities. Volume counts within the Parkway East corridor indicated that the peak travel period shifted approximately 30 min earlier during the reconstruction period, which is consistent with average change in reported departure times (*2*).

Travel Time Changes

The majority of North Freeway corridor commuters in Houston perceive that there has been little or no change in their travel times from home to work or school during reconstruction. The average change in a.m. travel time as reported by all modes was 1.2 min longer during reconstruction. Results of travel time and delay studies along the North Freeway indicate that during reconstruction, the average travel times in the a.m. peak decreased by 0.1, 1.9, and 0.9 min, respectively, for trips beginning at 6:30, 7:30, and 8:30 a.m. (*1*).

In Pittsburgh survey responses from the Parkway East commuter panel indicated an increase of about 5 min for work or school trips during the reconstruction period; trip time measurements indicated an average travel time increase of about 6 min for the morning peak (*2*).

Primary Travel Route Changes

Only a very small percentage of the North Freeway commuters in Houston report to have varied their primary travel routes since the reconstruction began. Generally speaking, the North Freeway has been the most heavily traveled route both before and during reconstruction. Volume levels recorded along the freeway mainlanes have changed by less than 3 percent for the inbound flow. No increase in transitway use has been observed (*1*).

Volume levels during reconstruction of the Parkway East in Pittsburgh decreased by slightly more than half. Survey responses from the commuter panel indicate that 40 percent of the work trips formerly using the Parkway East diverted to other routes (*2*).

CONCLUSION

From the results of the Houston survey, it appears that most commuters have perceived no change in traffic conditions along the North Freeway during reconstruction. In fact, 70 percent report that they leave home at the same time, 94 percent travel the same distance, and 57 percent report no change in the length of time it takes to travel to work or school. An additional 12 percent leave home later, 5 percent travel shorter distances, and 28 percent take less time to get to work or school during reconstruction. This would indicate that the majority of commuters perceive that (so far) they have not been significantly affected by this phase of the reconstruction process. Indeed, several commuters commented that, considering the magnitude of the project, disruption to traffic has been minimal. However, as construction sequences begin to directly affect the freeway mainlanes, additional delay could occur, travel patterns may be altered, and additional traffic control strategies may be warranted.

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