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16. Abstract This report presents the results of a structured survey in an area of Houston, Texas, that has been designated as a freeway corridor. The survey focuses on selected characteristics, attitudes and expectations of area residents with the primary objectives of (1) delineating key variables which predict resident's opinions of freeway construction, and (2) measuring potential socio-economic impacts of the proposed highway. The data are analyzed with regard to the following topics: characteristics of the respondents, neighborhood identification, awareness of freeway-related activities, anticipatory effect of the proposed freeway, and evaluation of transportation services. A capsulated summary of the findings depicts area residents as receptive to the freeway construction, with 70 percent favorable. Respondents who had 5-12 years of education, were male and/or Anglo were more likely to be in favor of the proposed facility than respondents who had either more or less education and were female or Mexican-American. Length of residence in the neighborhood and means of transportation were not significant predictors of freeway acceptance. It also was possible to isolate differential acceptance of the proposed highway by zonal location within the study site, which has implications for actual freeway location.			
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EVALUATION OF RESIDENTS' ATTITUDES AND EXPECTATIONS
OF A PLANNED FREEWAY

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PREFACE

The authors wish to express their sincere appreciation to those who have assisted or facilitated this study. Special acknowledgement is given to Mr. M.L. Yancey, Mr. P.L. Wilson, Mr. R.L. Lewis, and Mr. B.H. Balfour of the Texas Highway Department for their guidance and valuable assistance. Mr. C.H. McCann of the Federal Highway Administration also provided constructive assistance.

In addition, many staff members of the Texas Transportation Institute aided in implementing the study and project report. Dr. W.F. McFarland, Program Manager of Transportation Economics, Mr. H.G. Meuth, Assistant Research Economist, and especially Ms. K.A. Baltuskonis, typist of this manuscript, all provided valuable assistance.

This report is one of a series issued under Research Study 2-1-71-148, which has as an overall objective the analysis of social, economic, and environmental factors in the decision-making process of freeway introduction and freeway improvements. Research Report 148-1, Experiences and Opinions of Residents Along Elevated, Depressed, and On-Grade Freeway Sections in Houston, Texas, and Report 148-2, Attitudes, Opinions, and Expectations of Businessmen in a Planned Freeway Corridor, have been published as a part of Study 2-1-71-148.

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration. This report does not constitute a standard, a specification, or a regulation.

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SUMMARY OF FINDINGS

The findings summarized below represent an attempt to identify key variables in the acceptance of freeway introduction and in the non-user impact of freeway construction in an urban neighborhood. Knowledge of specific personal characteristics of respondents provided predictive determinants of receptiveness to freeway introduction. While 70 percent of the total resident sample were in favor of the proposed freeway, Anglos ranked higher in acceptance than did Mexican-Americans, and male respondents were more receptive than were female respondents. The educational level of those interviewed was the only measure of socioeconomic status which differentiated freeway favorability, with those in the "middle" educational range ranking higher in acceptance. Anglos and male respondents, especially, may accurately perceive that they can adapt to large-scale changes in their residential area. On the other hand, Mexican-Americans, respondents with lower educational levels, and females may feel that their possibilities for residential mobility or for using the freeway as a resource are more narrowly circumscribed.

Respondents in the northern portion of the Harrisburg area were more receptive to the freeway plan than those in the two southern zones. The Southeast and Southwest Zones had been proposed as the original freeway corridor, so that residents in these sections were more aware of personal consequences of freeway introduction.

Residential and transportation characteristics of the respondents were not predictive of strong attitudes concerning freeway construction in the area. Neither length of residence nor means of transportation, both of which had been anticipated as important indicators, were significantly related to differential freeway acceptance.

In evaluating the opinions of residents surveyed, an accounting scheme was constructed which specified four types of information gained about the planned freeway.

Attractions. In the survey of Harrisburg residents, 55 percent provided reasons that the proposed freeway could benefit them personally. Accessibility to jobs and other selected places was the most frequently described personal advantage of the extended highway system. Further, 93 percent of those interviewed planned to remain in the area if the freeway was five blocks from their residence, with 44 percent suggesting that the area within the next 10 years would become more desirable if the freeway were constructed.

Benefits ascribed to the area as a whole tended to be transportation-related, rather than environmental or socioeconomic advantages. The freeway was expected to provide better accessibility for area residents, and to relieve traffic congestion. In addition, medical service provision (ostensibly based on accessibility) was viewed as improving, as well as the general neighborhood appearance.

Disbenefits. While the majority favored freeway construction, those who opposed the proposal tended to consider noise and higher property taxes as potential personal disbenefits. In regard to disadvantages for the area as a whole, those opposing the freeway plans

anticipated that the actual construction would remove too many residential dwellings and would split the neighborhood. Those respondents suggesting that the greatest advantage of the area was that it was a quiet neighborhood tended to be less favorable to freeway plans. Further, many were aware that air pollution would adversely affect the area.

Specifications. The desires of residents in regard to freeway design were identified. Seventy percent of the respondents suggested a preference for service roads, if the freeway were five blocks from their homes. No real consensus as to design elevation emerged; similar proportions of respondents preferred the on-grade, elevated, and depressed designs.

For the spacing of on/off ramps and cross-overs, many residents had no opinion. The largest frequency of responses of those specifying the distances between these design features preferred spacing distances of six blocks or less.

Forms and Uses of Information. The length of time which had elapsed since residents first became aware of the planned construction had no significant impact on the degree of acceptance of these plans. Development of strong opinions, either pro or con, did not depend on knowledge of the highway extension for a relatively long period.

Primary information sources were isolated individuals, such as acquaintances. Newspapers were mentioned by one-fourth as the origin of information, and seven percent specified THD hearings or handouts. Respondents were relatively uninformed as to the involvement of public

or THD officials in the planning process. Ten percent had attended meetings with THD officials present. Furthermore, over two-thirds of the respondents were not aware that THD provided relocation assistance to residents who were displaced by freeway construction.

Almost one-third of the residents interviewed had spoken with neighbors in regard to the freeway proposal. If they depicted neighbors as being in agreement with highway plans, then they too were favorable (92 percent). When neighbors were perceived as being opposed, only 34 percent then stated that they personally were in favor of the proposal.

By including this accounting scheme in the report, stress is placed on those factors which precipitate acceptance or rejection of freeway construction. Preferences and expectations of residents were specified, as well as forms and usages of information sources. Further studies may attempt a refinement or reformulation of this type of accounting scheme.

Transportation and other public decision-makers have realized that urban highways are viewed by the public, not only as transportation improvements, but also as forces for change within communities and neighborhoods. In many respects, the attitudes and expectations of the sample of residents described in this report are similar to opinions in other urban sub-areas which have been designated for freeway construction. The findings presented were at a macro, neighborhood level, rather than a disaggregated individual level, so that these results should prove applicable to other highway projects and study sites.

IMPLEMENTATION STATEMENT

The results of this report provide some tentative conclusions and useful hypotheses in regard to the highway planning process. Knowledge of the attitudes and expectations of residents in urban neighborhoods where freeway facilities have been planned aids in predicting (1) the degree of acceptance of this large-scale change and (2) the extent and form of impact that the construction would precipitate.

The focus of the report is sociological in nature, with attitudinal data the primary predictors of social, and secondarily economic and environmental, impact. The viewpoints of area residents provide identifiable information that highway engineers could utilize as auxiliary data in determining the design, location, and overall plan for urban highway systems in residential areas.

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PURPOSE OF THE STUDY

The construction of a freeway in an urbanized area can represent a potent influence within the area. For this reason, urban highway programs must relate freeway plans to their potential impact on the residential and commercial interests within the area.

In Houston, the Harrisburg Corridor has been designated as the proposed location of the downtown extension of S.H. 225. As a part of an effort to measure non-user effects of freeway introduction into this area, two separate attitude surveys were undertaken. The first, a study of the attitudes of businessmen in the Harrisburg area, has been published (TTI-2-1-71-148-2). The second survey, concentrating on the opinions and expectations of area residents, is the subject of this report.

The specific objectives of the survey of residents were:

1. To determine the degree of residents' receptiveness to the proposed freeway.
2. To delineate residents' reasons for favoring or opposing freeway introduction.
3. To describe the characteristics of residents based on their acceptance of the proposed freeway.
4. To identify information sources and actions of residents in regard to freeway construction.
5. To determine some of the elements of freeway location and design for which residents have preferences.
6. To provide quantifiable means of measuring and predicting freeway impact in urban residential areas.

It has been shown in previous studies that the characteristics and expectations of residents can provide predictive information concerning their actual behavior should the freeway be constructed. The 305 heads-of-households interviewed were representative of the residential area as a whole (see Appendix A, "Sampling Procedures and Reliability"); thus, their interview statements should clarify the opinions of residents in the Harrisburg Area.

THE STUDY AREA

The area selected for study is essentially a residential community in which a freeway is currently being planned. As shown in Figure 1, both natural (Buffalo Bayou) and man-made (Missouri Pacific Railroad and Missouri-Kansas-Texas Railroad) features form the boundaries of this area, known as the Harrisburg Corridor.

This area is an older section of the city. Commercial establishments are numerous along the major streets serving the area, and many old residences have been removed to make way for the new structures that house these firms.

Over 10 years ago, City of Houston and Harris County officials began studying the feasibility of constructing a freeway through the area to connect State Highway 225 or the LaPorte Freeway with downtown Houston and to relieve traffic congestion on the Gulf Freeway. In 1963, Harris County officials published a study that showed a proposed route (Corridor A in Figure 2) between Harrisburg Boulevard and Canal Street in the southern half of the study area. This route became known as the "original" route. Several years passed before further action was taken. In 1969 county officials asked the Texas Highway Department (THD) to recommend alternative corridors for the proposed freeway. In March, 1970 THD held a public hearing and presented a map that showed three alternative corridors for the freeway (shown in Figure 2). One of the proposed corridors followed the "original" route, that is,

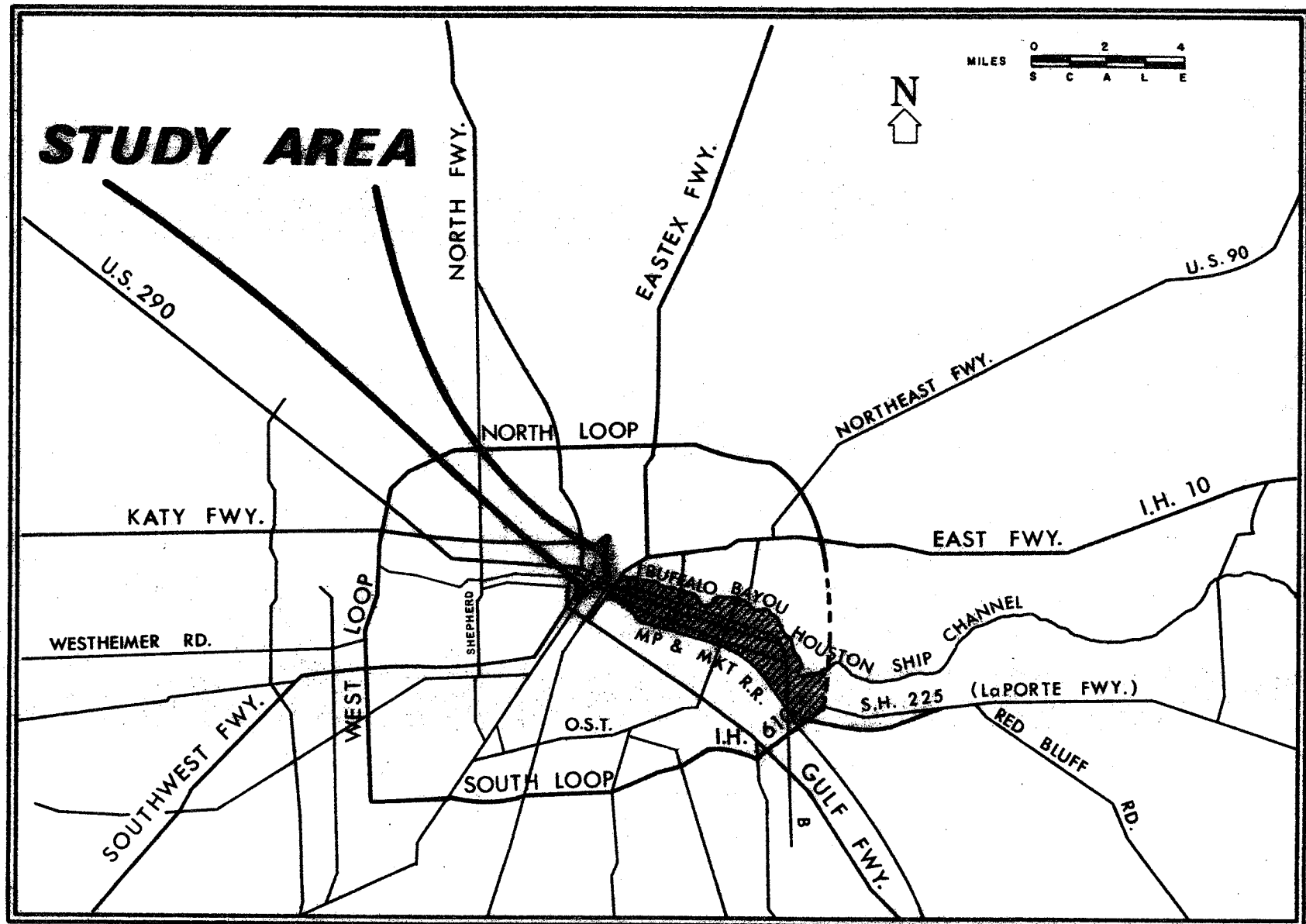


Figure 1. Map of Houston Depicting Location of Study Area

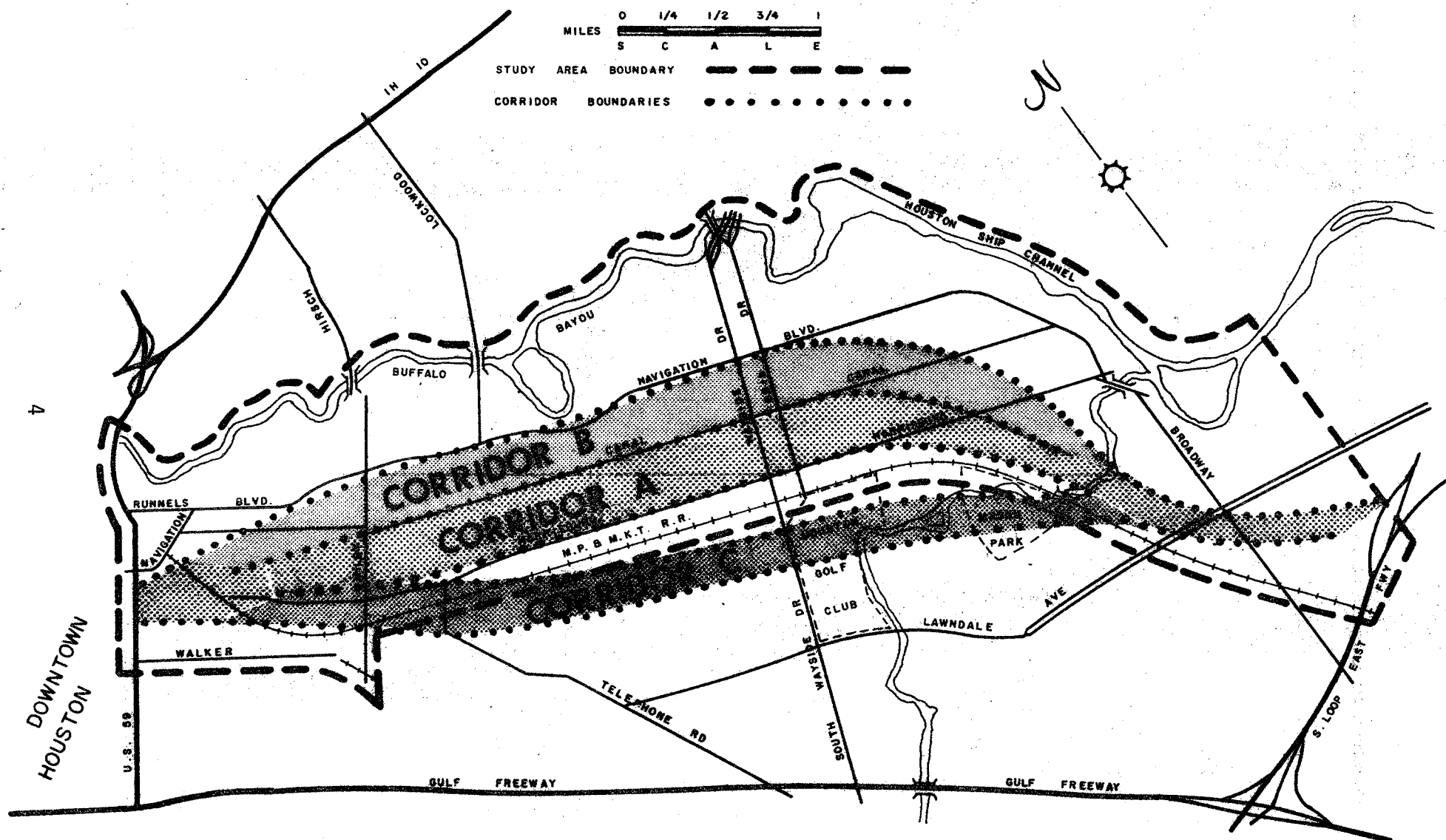


Figure 2. Map of Study Area Depicting the Locations of Alternative Sites of the Proposed Harrisburg Freeway

Corridor A. Another proposed route (Corridor B) was north of the original route between Canal Street and Navigation Boulevard. The third (Corridor C) was south of the original route and followed no particular streets; it has since been omitted as a possible corridor because of the parks, cemeteries and other public land uses in the path.

Shortly after the corridor public hearing, a group of local residents held a meeting protesting the construction of a freeway through the Harrisburg area. Officials of THD were invited to attend the meeting. In July, 1970 THD appointed an interdisciplinary team, composed of an economist, sociologist, and several THD engineers. THD asked this team to study the problem, determine if the freeway should be built and, if so, to recommend a route to follow. Some of the protesting residents suggested that a route following Buffalo Bayou might be acceptable. This team has held several public meetings with residents and businessmen of the area.

The study area boundaries, which define an area approximately one and a half miles wide and four to five miles long, were determined with the aid of the above mentioned Harrisburg Freeway Location and Design Team. Because Corridor C was ruled out as a possible route, the south boundary of the study area was set at the M.P. and M.K.T. Railroad (also called the G.H.&H. Railroad). Also, since Corridor A was considered long before any other and was revealed and discussed publicly, the study area was divided into zones, as shown in Figure 3. In this manner, the data collected from the residents could be divided by zones to detect

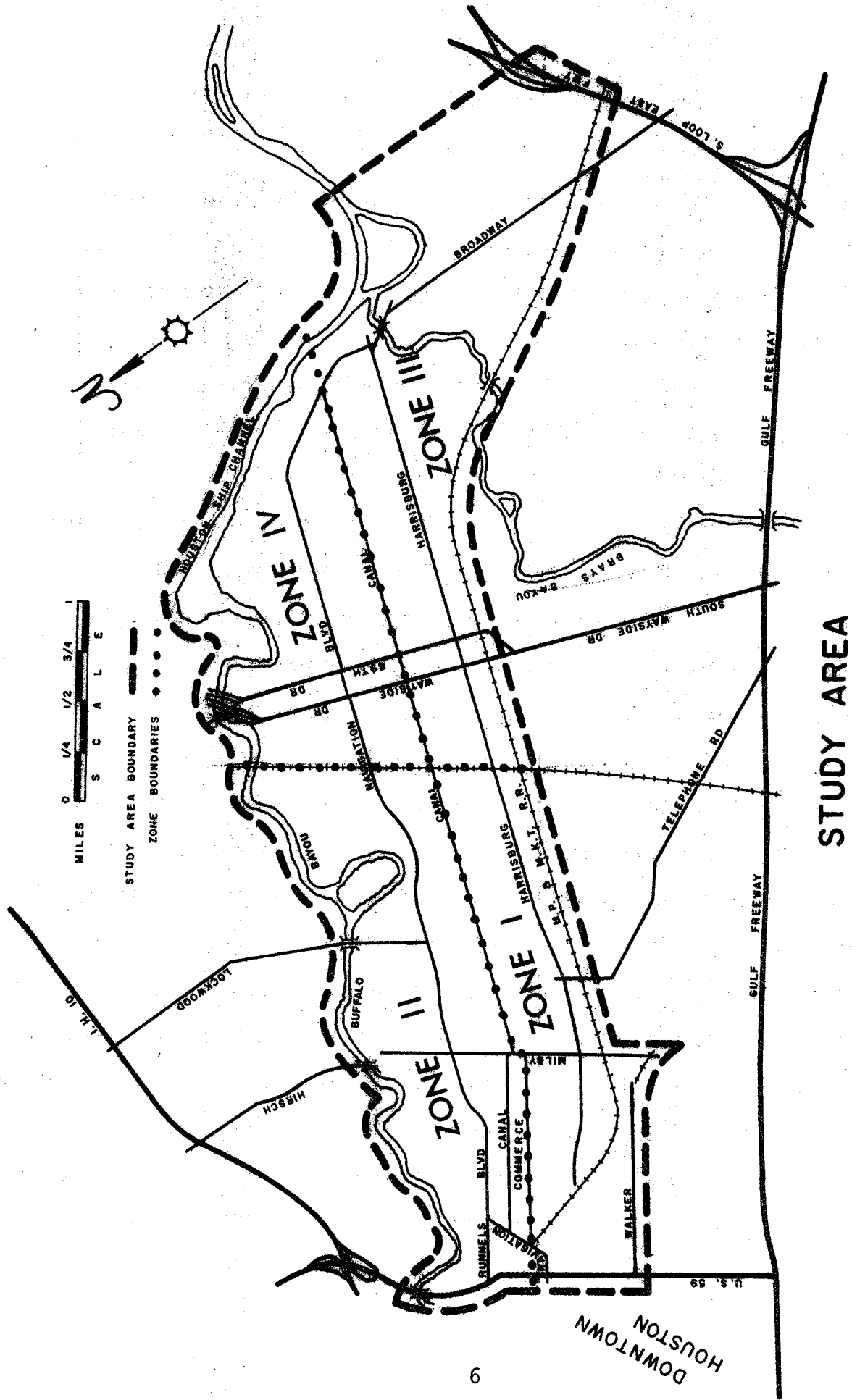


Figure 3. Map of Study Area Divided into Zones

sectional differences in actions, opinions, and preferences regarding the proposed freeway.

The respondents represented a proportionate random sample from four 1970 census tracts -- 301, 310, 311, and 312 -- which were comparable to the four zones. From decennial census data available for these tracts, an attempt was made to sketch a broad picture of the area. Residents in 1970 were predominately Mexican-American, with Blacks representing less than three percent of the area's population. A decade earlier, many sections of the Harrisburg area had been primarily Anglo, so that a gradual ethnic transformation was occurring.

The age distribution of Harrisburg residents has also changed, with a larger number of persons under 16 and over 59 years of age. The proportion of residents in the "dependency" age categories therefore has increased. While the area had evidenced a slight decline in population to about 34,196 in 1970, most sections, nevertheless, maintained a densely settled population. In addition, almost 70 percent of the dwellings have been enumerated as single family units.

The residential stability of the Harrisburg area can be depicted as comparable to that of the larger metropolitan area, with over 40 percent of the residents having remained in the same dwelling for five years or longer. The condition of dwelling units also was roughly analogous to those in the Houston Standard Metropolitan Statistical Area (S.M.S.A.) as a whole. However, 80 to 90 percent of the dwellings (depending on census tract) were over 20 years old, whereas only 25 percent of residences in the larger metropolitan area had been constructed over 20 years ago.

Harrisburg, like other residential areas in close proximity to the central business district, ranks low on indicators of socioeconomic status. About 20 percent of the families had incomes below the poverty level in 1970, whereas less than 10 percent of the metropolitan population was in similar circumstances. Other socioeconomic indicators, such as owner values, gross rent, and years of school completed, all registered below-median levels when compared to the population of the larger S.M.S.A.

A broad sketch of the Harrisburg area depicts a community with older residences, but one which has dwellings that are fairly-well maintained, considering the socioeconomic level of the area. As a predominately Mexican-American community, there may be a symbolic isolation of the area from the rest of the city. Further, the very fact of examining an area with certain characteristics of housing, income, education, age and ethnicity is relevant for explaining the attitudes and expectations of its residents.

CHARACTERISTICS OF THE RESPONDENTS

One aim of a study designed to measure attitudes is the procurement of background data on the respondents which provide some means of explaining their predispositions. The general characteristics of the sample of residents interviewed furnishes an explanation for differential opinions in regard to acceptance of the proposed freeway.

Personal Characteristics

Of the overall sample, 70 percent favored the building of a freeway in the Harrisburg area, while 15 percent were opposed and 15 percent were undecided. This division of opinion was based on an aggregation of qualitative responses of "yes" or "probably yes" and "no" or "probably no" to the question: "Do you think that a freeway should be built in this area?"

In grouping the sample of residents by personal characteristics (see Table 1), several differences in degrees of receptiveness to the freeway proposal emerged. The ethnicity of respondents was a significant indicator of their opinions concerning the proposed construction, as shown in Table 2. Mexican-American residents were less favorable than Anglos, with 78 percent of the latter as compared to 66 percent of the Mexican-American sample approving the proposal. In addition, a greater percentage of Mexican-Americans were either "Indifferent" or responded "Don't Know" in regard to freeway plans. It is possible that the Mexican-American respondents were more uncertain about the effects of large-scale changes in their area. Those opposed tended to fear disruption of the neighborhood, and were concerned about moving to another location.

Twenty-four percent of the heads-of-households interviewed were female. While 75 percent of the males were amenable to the planned

Table 1. Selected Personal Characteristics
of the Respondents (N=305)

<u>Ethnicity</u>	<u>No.</u>	<u>Pct.</u>	<u>Household Income</u>	<u>No.</u>	<u>Pct.</u>
Anglo	108	35.4	<\$3,000	54	17.7
Mexican-American	197	64.6	\$3,000 - 4,999	43	14.1
		<u>100.0</u>	\$5,000 - 6,999	52	17.0
<u>Age Distribution</u>			\$7,000 - 8,999	57	18.7
<30	45	14.8	\$9,000 - 10,999	46	15.1
30-39	50	16.4	\$11,000+	36	11.8
40-49	58	19.0	No Response	17	5.6
50-59	63	20.7			<u>100.0</u>
60+	89	29.1			
		<u>100.0</u>	<u>Occupation</u>		
<u>Sex</u>			White Collar Worker	32	10.5
Male	233	76.4	Blue Collar Worker	180	59.0
Female	72	23.6	Not Applicable/ Not Full Time	93	30.5
		<u>100.0</u>			<u>100.0</u>
<u>Educational Level</u>			<u>Household Size</u>		
<5 yrs.	56	18.4	1 person	32	10.5
5-8 yrs.	121	39.6	2 persons	81	26.6
9-12 yrs.	106	34.8	3-4 persons	76	24.9
13+	22	7.2	5-6 persons	73	23.9
		<u>100.0</u>	7+	43	14.1
					<u>100.0</u>

Table 2. Ethnicity and Acceptance of Proposed Freeway

Ethnicity	Acceptance of Proposed Freeway			
	Favor	Against	Other ^a	Total
Anglo	84	17	7	108
Mexican-American	131	30	36	197
Total	215	47	43	305

$$\chi^2 = 8.15^{*b}$$

^aThe "Other" category in this and following tables refers to those who responded either "Don't Know" or "Makes No Difference".

^bThe asterisk in this table and those tables which follow denotes that the relationship between the two variables presented is significant at or beyond the .05 level.

freeway, only 57 percent of the female respondents shared this opinion. Male residents were more concerned with property values and less attentive to environmental concerns; the freeway was thus viewed by the male respondents as fostering economic benefits (see Table 3).

Acceptance of the planned freeway also varied by educational level of the respondents. Those in the "middle" educational levels were more favorable than either the respondents with less than five years of education or those in the upper educational level of 13 years or more of school completed (see Table 4). Other measures of socioeconomic status, such as income and occupation, were not important predictors of freeway favorability. Thus, differences in income levels and in blue-collar versus white-collar status did not significantly affect opinions about the desirability of a freeway in the Harrisburg area. Moreover, the number of household members who were employed and the extent to which family members maintained full-time employment did not alter the respondents' attitudes concerning the freeway proposal.

Geographical Location

The respondents in the two northern zones of the Harrisburg area -- Zones II and IV -- were more favorable toward the proposed freeway than those in the two southern zones (see Figure 4). The Southwest and Southeast Zones had been suggested as forming a possible freeway corridor at least ten years prior to the interview described in this report. Residents in the two southern zones therefore were more aware that the freeway might be constructed in the actual location of their dwellings. Ethnic differences between the northern and the southern zones did not explain this differential favorability in that a larger proportion

Table 3. Sex of Respondents and Acceptance of Proposed Freeway

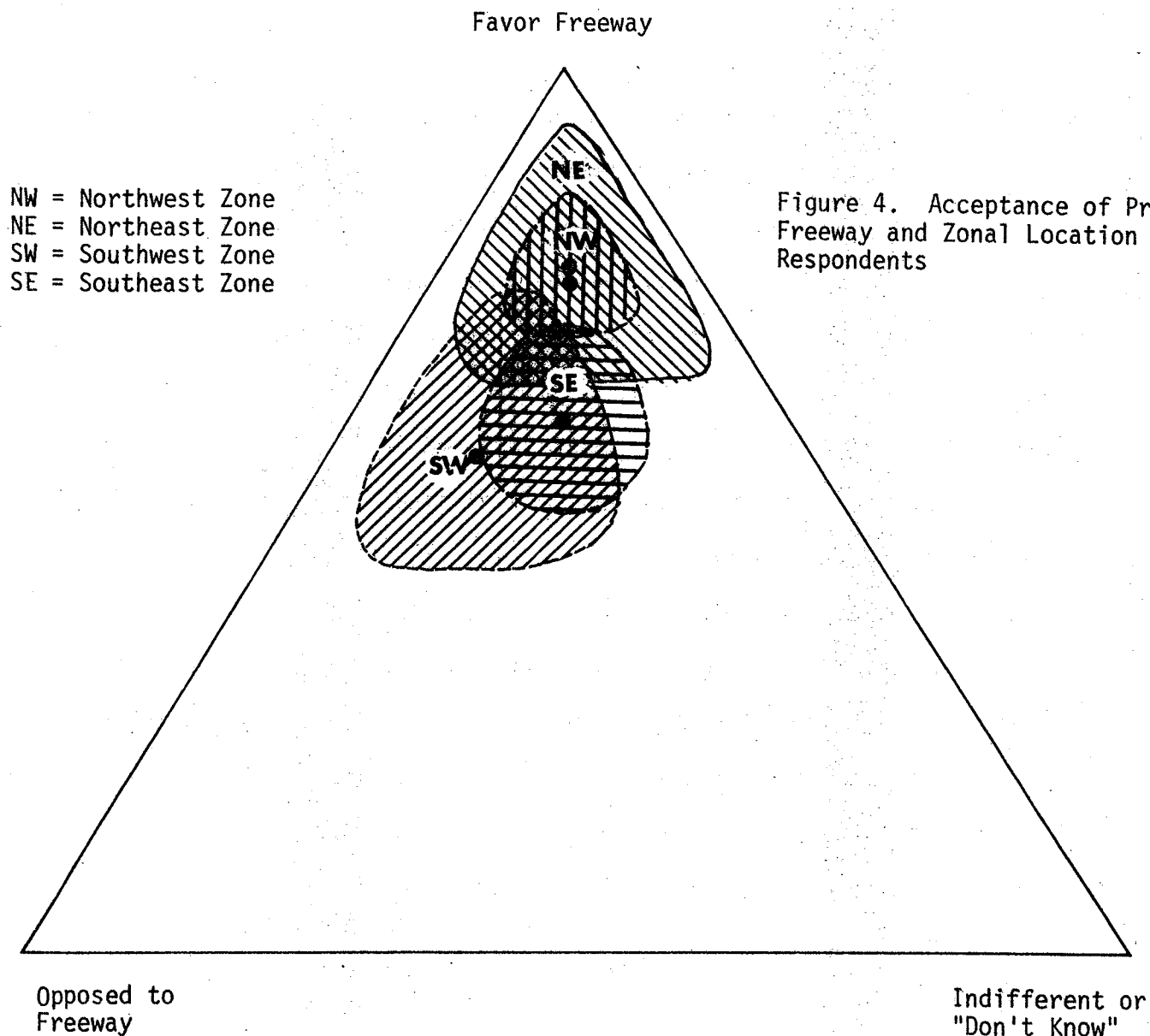
Sex of Respondent	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Male	174	32	27	233
Female	41	15	16	72
Total	215	47	43	305

$$\chi^2 = 8.66^*$$

Table 4. Education of Respondents and Acceptance of Proposed Freeway

Years of School Completed	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
<5 yrs.	31	9	16	56
5-8 yrs.	93	13	15	121
9-12 yrs.	77	19	10	106
13+ yrs.	14	6	2	22
Total	215	47	43	305

$$\chi^2 = 17.50^*$$



Note: The triangular figure above is the result of a three-dimensional 60° angle computer plotting procedure for depicting:

- (1) the strength of the respondents' attitude toward the proposed freeway [opinions are fairly strong and polarized away from the Indifferent and "Don't Know" categories];
- (2) the degree of acceptance by zonal location of the respondents [those in northern sectors are more favorable];
- (3) the degree of confidence which can be attributed to the four points plotted by width of circular parameters [the Northeastern and Southeastern sectors evidence less variability].

For a further display of contingency tables, see Ronald D. Snee, "Graphical Display of Two-Way Contingency Tables," in The American Statistician 28 (February, 1974): 9-12.

of Anglos resided in the two southern zones, and this group generally evidenced a greater acceptance than did Mexican-Americans.

When the four zones were collapsed into two areal units -- one section north of Canal Street and the other south of Canal Street -- the attitudinal differences between respondents were more pronounced. As shown in Table 5, 79 percent of those sampled north of Canal Street were in favor of the freeway construction, while 62 percent of those in the southern portion maintained this attitude. Opinions of respondents in the southern portion of the study area indicated that these residents would be less willing to reside near the freeway than the respondents in the northern portion. As presented in Table 6 below, only 25 percent of the residents south of Canal Street stated they would stay in their present home if it abutted the freeway, while 42 percent of those in the northern portion replied that they would remain. Similar percentage differences between respondents in the two areas can be noted in regard to their intentions about moving if the freeway were located two blocks away or five blocks away from their present residence. Interestingly, while those in the southern portion were more opposed to residing near the freeway, they also felt they could find another suitable residence more readily than did those in the two northern zones (see Table 7). No significant differences in attitudes toward the freeway were observed in comparing residents in the eastern portion of the area to those of the western portion. In general, residents' attitudes differed according to the alternative corridor locations, so that those differences in opinions which were

Table 5. Respondent's Address (North or South of Canal Street) and Acceptance of Freeway Location

Respondent's Location	Acceptance of Freeway Location			
	Favor	Against	Other	Total
North	116	14	16	146
South	99	33	27	159
Total	215	47	43	305

$$\chi^2 = 11.31^*$$

Table 6. North-South Location of Respondents and Mobility Actions in Regard to Proposed Freeway Site

Proposed Freeway Location:	Mobility Actions				Total
	Stay Here	Move Within Area	Move Out-side Area	Don't Know	
(1) Five Blocks from Residence					
a. Northern Location	142	2	1	1	146
b. Southern Location	143	2	4	10	159
					<u>305</u>
(2) Two Blocks from Residence					
a. Northern Location	132	6	6	2	146
b. Southern Location	108	10	22	19	159
					<u>305</u>
(3) Abutting					
a. Northern Location	61	38	36	11	146
b. Southern Location	39	43	49	28	159
					<u>305</u>

(1) Five Blocks from Residence: $\chi^2 = 8.63^*$

(2) Two Blocks from Residence: $\chi^2 = 25.80^*$

(3) Abutting: $\chi^2 = 14.02^*$

Table 7. North-South Location of Respondents and Attitude Concerning a Suitable Alternative Residence

Attitude About Suitable Alternative Residence	North-South Location		
	North of Canal St.	South of Canal St.	Total
Positive	49	51	100
Negative	70	54	124
Don't Know	27	54	81
Total	146	159	305

$$\chi^2 = 10.59^*$$

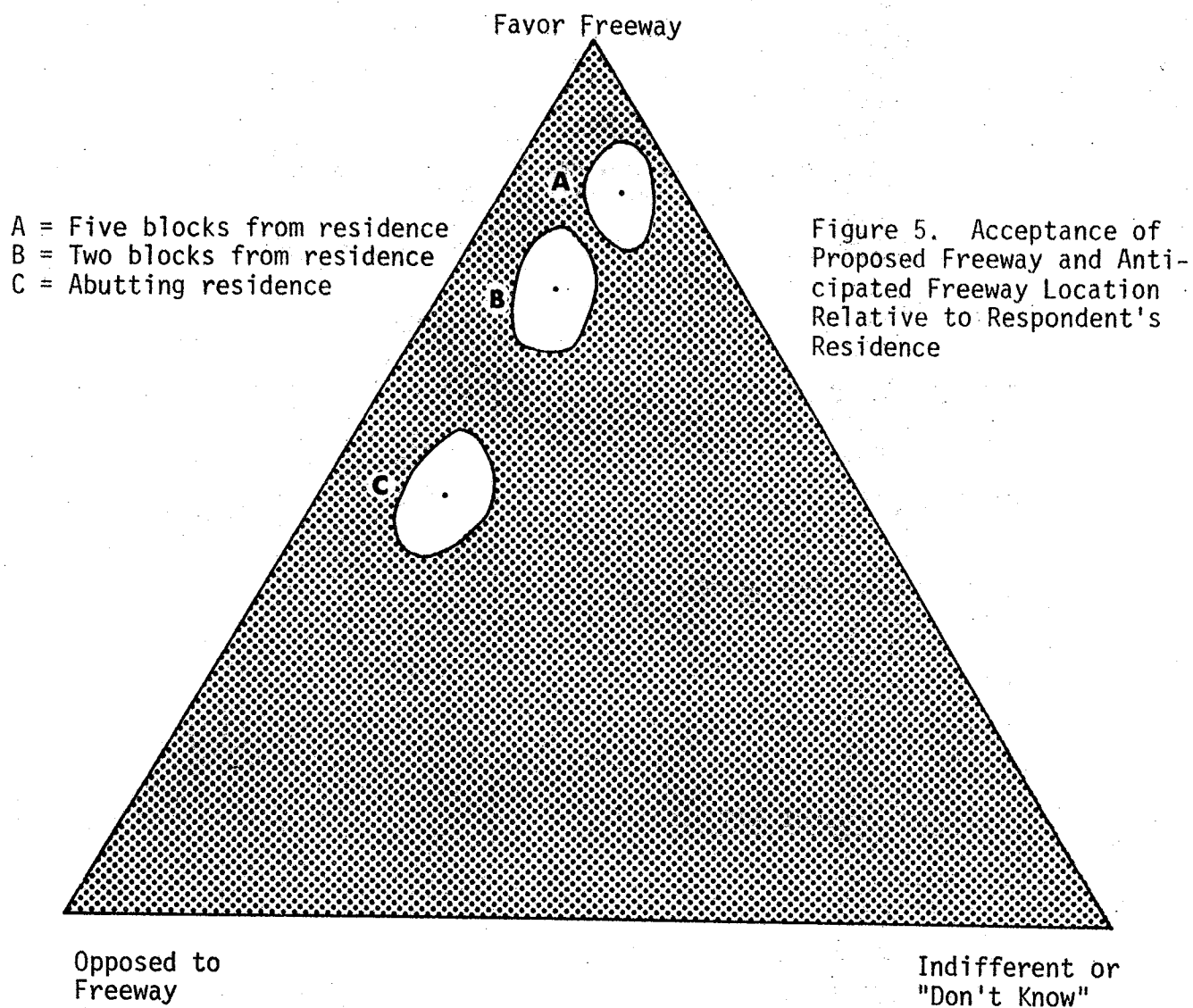
found paralleled the planned freeway sites. Figure 5 depicts the differential acceptance of freeway introduction based on proximity to the respondent's current residence.

Residential Characteristics

A large portion of the respondents, 120 out of 305, owned their residences and another 73 were in the process of buying their dwelling unit (see Table 8). It was anticipated that those who owned or who were buying their homes would feel more uncertainty with regard to the planned freeway than did the renters. However, no difference among these categories was evidenced in that 69 percent of those who owned, 71 percent of those buying, and 71 percent of those renting stated that the freeway should be built.

The size and condition of the dwellings were examined in regard to the degree of receptiveness to the planned freeway. Size of residence was measured by number of rooms and size of heated area. As with other socioeconomic indicators discussed earlier, these two measures did not differentiate attitudes toward the freeway. In addition, the general condition of the residences, as evaluated by the interviewer, had no bearing on the opinions provided by the sample in regard to the proposed construction.

Those planning to undertake major repairs or remodeling (30 percent of the sample) were significantly more favorable toward freeway introduction in the area than those who were not anticipating any such alterations. It is likely that those attempting to upgrade or maintain their residences view the freeway as adding to property values (see Table 9).



Note: For explanation of the meaning of the above figure refer to page 15, Figure 4.

Table 8. Selected Residential Characteristics of Respondents (N=305)

	<u>No.</u>	<u>Pct.</u>
<u>Household Tenure</u>		
Owned	120	39.4
Buying	73	23.9
Renting	112	36.7
		<u>100.0</u>
<u>Condition of Residence</u>		
Excellent	62	20.3
Good	148	48.6
Fair	79	25.9
Poor	16	5.2
		<u>100.0</u>
<u>Years at Present Address</u>		
< 1 yr.	41	13.4
1-4 yrs.	77	25.3
5-9 yrs.	55	18.0
10-19 yrs.	50	16.4
20+ yrs.	82	26.9
		<u>100.0</u>
<u>Years Resided in Neighborhood</u>		
< 1 yr.	13	4.3
1-4 yrs.	46	15.1
5-9 yrs.	36	11.8
10-19 yrs.	59	19.3
20+ yrs.	151	49.5
		<u>100.0</u>

Table 9. Major Repairs Planned by the Respondent and
Acceptance of Proposed Freeway

Major Repairs Planned	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Yes	73	9	8	90
No	122	35	33	190
Don't Know	20	3	2	25
Total	215	47	43	305

$$\chi^2 = 9.67^*$$

Length of residence, both in the same dwelling and within the same neighborhood, often has explanatory value in attempting to summarize the residents' acceptance or rejection of any large scale changes in their neighborhood. Thirty-one percent of the sample had lived in their dwellings less than one year and 56 percent had resided in the same house less than five years. On the other hand, 27 percent had lived in the same dwelling for 20 years or longer. This latter group was less willing to have the freeway built in their area than the sample as a whole, with 22 percent against such intervention, compared to 15 percent generally. These differences among those who had resided in their homes for a longer period compared to the newcomers were not significant, however.

Likewise, there was a tendency among those residing within the general area or neighborhood for a relatively long period to be less receptive to freeway introduction than those who had lived in the area less than five years. As with residential stability, the differences in attitudes based on neighborhood tenure were not significant.

Transportation Characteristics of Respondents

Almost half of the heads-of-households sampled stated they owned at least one vehicle, while 33.8 percent of the respondents acknowledged ownership of two or more vehicles (see Table 10). Eighteen percent owned no automobile or truck. This latter group was least desirous of freeway construction in their area, but no significant difference between vehicle owners versus non-owners emerged.

In 14 percent of the households surveyed, there were no drivers

in the family, while in 39 percent of the residences, two drivers were named (Table 10). The number of those driving per household had no relationship to attitudes concerning the freeway.

The modes of transportation used by family members were varied, with 96 percent, as drivers or passengers, depending on the automobile. Fourteen percent also utilized trucks for transportation. Almost 50 percent of the family members have engaged city buses and eight percent have utilized school buses. The taxi was listed by 18 percent of the respondents as a mode of transportation for family members and walking by 58 percent of those in the sample. As can be noted, the use of one form of transportation was not exclusive of other facilities; residents in the area use the variety of transportation modes available to them. Further, the dependence on any one of these facilities did not reflect in differential acceptance of the freeway's extension within their area. Appendix B (pp.61-62) contains tables specifying the frequency of trips to selected places, as well as the means of transportation used.

Table 10. Selected Transportation Characteristics of Residents (N=305)

	<u>No.</u>	<u>Pct.</u>
<u>Private Vehicles Owned</u>		
1 Vehicle	147	48.2
2 Vehicles	81	26.6
3 or more	22	7.2
None	55	18.0
		<u>100.0</u>
<u>Drivers in Household</u>		
1 Driver	120	39.3
2 Drivers	115	37.8
3 or more	26	8.5
None	44	14.4
		<u>100.0</u>
<u>Transportation Mode Used by Family Members (Categories are Independent)</u>		
Automobile	292	95.7
Truck	42	13.8
City Bus	151	49.5
School Bus	26	8.5
Taxi	56	18.4
Walk	177	58.0
Others	7	2.3

IDENTIFICATION WITH NEIGHBORHOOD

The reasons residents provide for moving into an area, and for remaining in the area over an extended period, aid in providing an understanding of the social organization of the locale, as well as of facilities and amenities which may be present. Those residents sampled in the Harrisburg area responded that they had moved to the area because of convenience to work (25 percent), "good neighborhood" (19 percent), and proximity to relatives (10 percent), among other reasons.

Seventy-eight percent stated they were not planning to move within the next two years. Of the remainder, five percent replied they planned to move to another residence within the area, so that almost 85 percent planned to maintain a residence in the Harrisburg area. Those planning a move suggested that the major reason for the change was to obtain a larger residence.

In ranking respondents' replies to the question, "What is the greatest advantage of living in this neighborhood?", "convenience to work" (52 percent) and "good neighborhood" (14 percent) received the most mentions. In listing the greatest disadvantage, 44 percent replied there were no disadvantages and 14 percent mentioned "physical deterioration". As might be expected, those who felt that the greatest advantage of the area was convenience to work were more favorable to freeway introduction than those who thought the greatest advantage was that the neighborhood was quiet (see Table 11 and Figure 6).

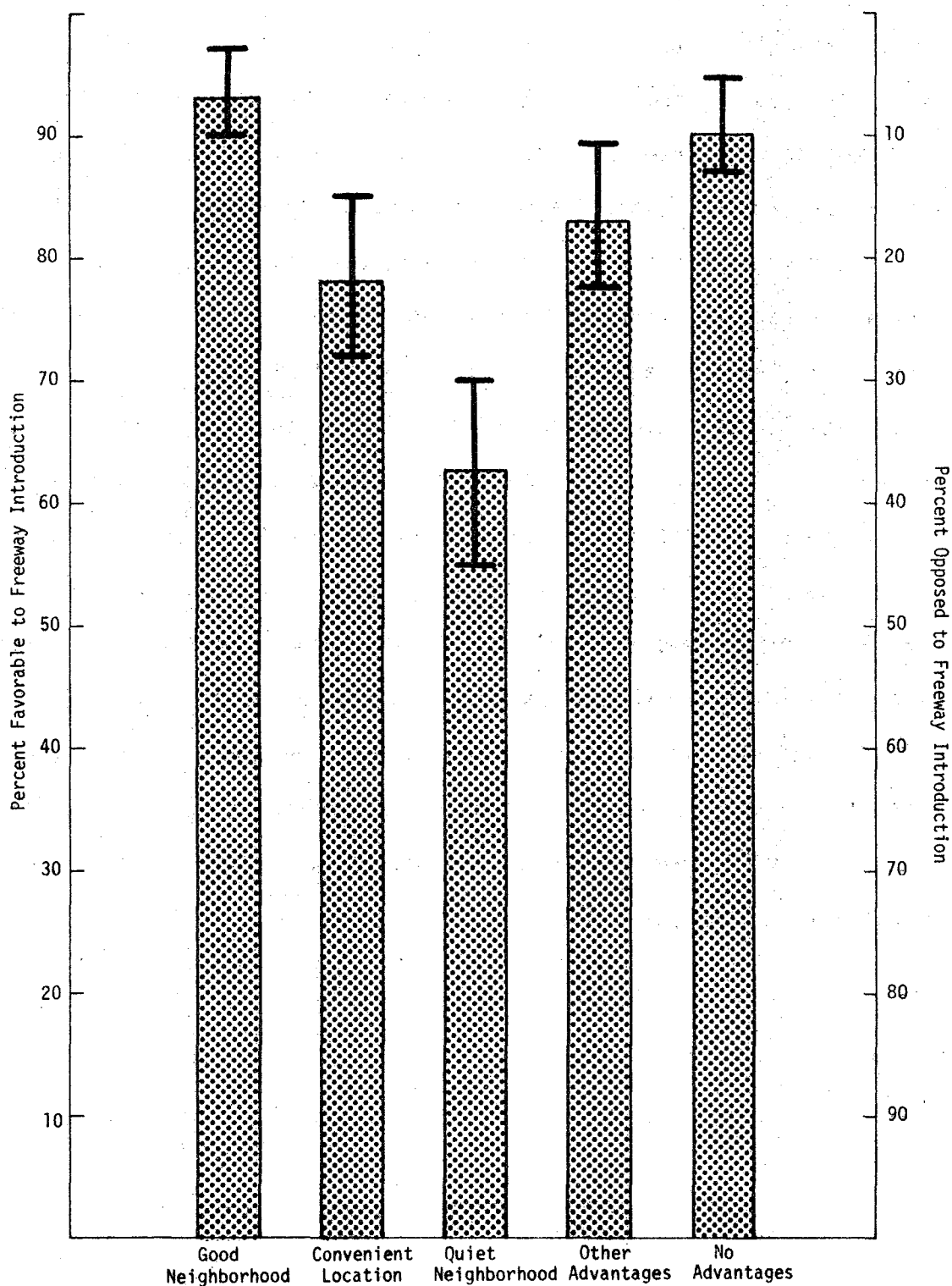
Previous research has shown that identification with a neighborhood and satisfaction with the area are often tied to the amount and intensity of neighboring with friends and relatives. Lower status individuals,

Table 11. Greatest Advantage in Residing in Neighborhood and Acceptance of Proposed Freeway

Greatest Advantage	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Good Neighborhood	30	2	10	42
Convenient to work, relatives, shopping	117	32	10	159
Quiet Neighborhood	5	3	3	11
None	27	3	10	40
Other	36	7	10	53
Total	215	47	43	305

$$\chi^2 = 24.75^*$$

Figure 6. Greatest Advantage of Residing in Neighborhood by Acceptance of Proposed Freeway



Note: The proportions and associated 99 percent confidence intervals per category are depicted to emphasize the differential acceptance of freeway construction.

especially minority members, are often more dependent on their neighborhood for social interaction than would be the case for residents in other urban subareas. In accord with these earlier studies, 38 percent of the respondents stated they had close relatives within walking distance, and 58 percent had close friends within walking distance. Of those with close relatives in the area, only 63 percent were in favor of the freeway proposal, whereas 80 percent of those without these familial ties were favorable to freeway construction (see Table 12).

Fifty-two percent reported visiting with close relatives at least once weekly, with 71 percent visiting at least one time a week with close friends. Approximately one-fourth of the respondents visited with close friends and with close relatives almost daily. Over 20 percent listed themselves or other family members as active in church activities. On the whole, however, formal organizations were less significant bases for social relationships than were informal neighborhood ties. As will be shown in the next section, these informal ties also provided the key source of information to the respondents concerning the planned highway facility.

Table 12. Close Relatives Residing in Area and Acceptance of Proposed Freeway

Close Relatives in Area	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Yes	110	33	31	174
No	105	14	12	131
Total	215	47	43	305

$$\chi^2 = 10.34^*$$

AWARENESS OF ACTIVITIES CONCERNING THE PROPOSED FREEWAY

The length of time that residents have been informed about the proposed freeway could potentially bring forth differences in the polarization of opinions. Those residents who were informed over a longer period might possess stronger attitudes than those who have just heard about the construction plans and who still may be relatively uninformed.

Twenty-five percent of the respondents explained that they had not been cognizant of the freeway plans, so that only 228 respondents are referred to in this section of the report. Twenty-two percent had been informed for less than one year and 27 percent had heard of the proposal for one or two years. In this survey, the length of time was not significantly related to differential acceptance of the freeway plans.

Of those aware of the proposal, sixty-four percent had received the information from isolated individuals, while one-fourth received their knowledge from newspapers. Only seven percent had learned of the proposal from either THD hearings (five percent) or THD handouts (two percent). The differences in attitudes toward the freeway were shown to vary by information source, as shown in Figure 4.

The respondents, on the whole, were uninformed as to the involvement of city officials and other institutionally-based officials who were making decisions about the planned freeway. Ten percent, however, replied that they had attended meetings with THD officials present. Any other form of involvement was negligible. Almost one-third stated that they had spoken with neighbors concerning the issue, so that informally, more than in formal meetings, the freeway proposal had been discussed. Respondents were queried as to their neighbors' attitudes about the planned

facility. Those who felt that their neighbors were favorable also tended to possess positive opinions about the highway extension in their area (see Table 13).

Of those respondents who felt that THD officials were considering the residents' interests, 86 percent were in favor of the freeway proposal. Of those who thought THD officials were not properly concerned with their personal interests, only 47 percent were in favor (see Table 14). Eighty-seven percent of those respondents who suggested that their elected officials were considering the residents' interests were in favor of the freeway, whereas only 45 percent were in favor of the proposal if they felt that these elected officials were not concerned (see Table 15).

Over two-thirds of the total sample were not aware that THD gives relocation assistance to residents that are displaced by freeways. Whether or not the respondent was informed in this regard appeared to have no significant impact on acceptance of freeway plans.

Table 13. Knowledge of Neighbors' Opinions and Acceptance of Proposed Freeway

Neighbors Opinion of Freeway	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Favor	33	1	2	36
Opposed	14	23	4	41
Divided	19	2	1	22
Indifferent	3	1	0	4
Don't Know	24	1	5	30
No Discussion of Issue	68	11	16	95
Total	161	39	28	228

$$\chi^2 = 63.09^*$$

Table 14. Respondent's Interests Considered by THD Officials
and Acceptance of Proposed Freeway

Respondent's Interest Considered	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Yes	68	5	6	79
No	16	15	3	34
Don't Know	77	19	19	115
Total	161	39	28	228

$$\chi^2 = 28.88^*$$

Table 15. Respondent's Interests Considered by Public Officials and Acceptance of Proposed Freeway

Respondent's Interests Considered	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Yes	65	5	5	75
No	15	14	4	33
Don't Know	81	20	19	120
Total	161	39	28	228

$$\chi^2 = 26.18^*$$

ANTICIPATORY EFFECTS OF THE PROPOSED FREEWAY

The opinions which residents develop concerning freeway introduction in their area are based on the varied forms of information available to them, as well as their own predispositions. Past experience also can have a pronounced effect on attitude formation.

Anticipated Effects on Respondents

The effects which residents anticipate will be precipitated by the freeway are crucial for an understanding of the acceptance of the planned corridor. In response to the very broad question, "Do you think that a freeway should be built in this area?", 70 percent replied affirmatively, as noted earlier. Of that number, 171 respondents suggested that the freeway would relieve traffic congestion and 74 replied that accessibility would be increased. On the whole, those in favor of freeway construction visualized transportation-related benefits rather than benefits to property values, neighborhood appearance, or neighborhood development.

Of the 30 percent who were not amenable to the freeway proposal, only 15 percent (57 respondents) were actually against such plans. Of this group, 16 suggested that the freeway would remove too many houses and 15 thought it would split the neighborhood, while the remainder proffered other varied reasons.

Approximately one-half, or 156 of the respondents, were able to provide reasons that the freeway could benefit them personally. Again, these positive responses primarily revolved around the personal importance of accessibility to jobs and to other places. Twenty-five respondents of the total sample stated that, regardless of specific location, the freeway

would harm them personally if placed in the Harrisburg area. Of these, thirteen respondents gave noise as the primary personal disbenefit, and six feared higher property taxes. The listing of personal benefits, as well as of personal disbenefits, were both highly predictive of freeway acceptance (see tables 16 and 17).

In further questioning concerning the potential effects of the freeway on respondents, their mobility decisions were ascertained. If, hypothetically, the freeway were located five blocks from the respondent's residence, 285 or 93 percent replied that they would remain at their present residence. Seventy-nine percent determined they would stay if the freeway were as close as two blocks away. If their home were adjacent to the freeway, only 100 (33 percent) replied they would remain in their present dwellings. Forty-one percent felt they could not find a suitable place to relocate if their residences were taken by the freeway's right-of-way. Twenty-six percent stated they did not know whether they could find suitable replacement housing, and one-third replied affirmatively in regard to obtaining a suitable replacement.

Two questions were addressed to owners only, asking them to assume that their homes would not be taken in the process of freeway introduction. The first, "Have you already decided to do something with your residence because of the proposed freeway?", was answered affirmatively by only 10 respondents, whereas the remaining 153 owners suggested they had not made any such decisions. When asked what they would do with their residence if the freeway is built within ten years, 16 percent of the owners stated they would sell their home, while 67 percent planned to keep it for a home, and four percent planned to retain the dwelling for rent property.

Table 16. Freeway's Major Benefit for Respondent and Acceptance of Proposed Freeway

Freeway's Major Personal Benefit	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Increase Property Values	6	0	1	7
Increase Job Access	36	2	3	41
Increase Access to Other Places	72	6	8	86
Depends on It's Location	7	0	2	9
Others	21	1	0	22
None	56	34	19	109
Don't Know	17	4	10	31
Total	215	47	43	305

$$\chi^2 = 56.04^*$$

Table 17: Freeway's Major Disbenefit for Respondent and Acceptance of Proposed Freeway

Freeway's Main Personal Disbenefit	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Decrease Property Values	2	1	0	3
Higher Property Taxes	2	2	2	6
Annoyed by Noise	4	8	1	13
Increased Air Pollution	1	1	1	3
Depends on It's Location	43	18	11	72
Others	4	5	3	12
None	158	11	23	192
Total	214	46	41	301 ^a

$$\chi^2 = 59.01^*$$

^aFour respondents did not furnish a response with regard to the freeway's main personal disbenefit.

Opinions About Freeway Design

Once it has been determined that a new freeway should be built, the problems of location within a corridor and freeway design are of prime interest. To the extent that the project may be expected to generate disbenefits to a particular segment of the population, adjustments in location and design are possible to reduce some of the disadvantages. For example, continuous service or frontage roads may make the freeway more accessible to neighborhood residents. Such accessibility may wholly or partially compensate area residents who were unfavorably impacted by the freeway. To be sure, it is extremely difficult to quantify precisely the gains or losses attributable to adjustments in location and design. It is feasible, however, to adjust the direction of the gains and losses by including the desires of the impacted citizenry in the freeway's design and location. Thus, residents' ideas regarding frontage roads, grade levels and intersection spacing should be helpful in increasing the overall benefits to the community.

Seventy-percent of the respondents stated that service roads would be desirable if their home were within five blocks of the freeway. Eleven percent wanted no service roads near their homes, and 19 percent had no explicit preference. After being shown pictures of freeways with different grades - levels, 28 percent preferred the elevated grade-level, 23 percent the on-grade design and 22 percent the depressed grade. Twenty-seven percent had no preference. It appeared that there was no real consensus in regard to level of grade, while the vast majority favored the inclusion of service roads in the overall freeway design (see Table 18).

Table 18. Freeway Design Factors Considered by Respondents (N=305)

<u>Service Roads</u>	<u>Percent</u>
Design with service roads	69.9
Design without service roads	10.8
Makes no difference	8.5
Don't know	10.8
	<u>100.0</u>
<u>Level of Grade</u>	
Elevated	28.5
On-grade	22.6
Depressed	22.0
Makes no difference	15.4
Don't know	11.5
	<u>100.0</u>
<u>Distance Between Ramps</u>	
(Pairs of on/off ramps)	
Every 2 or 3 blocks	8.9
Every 4 or 5 blocks	31.1
Over 6 blocks	33.8
Makes no difference	10.8
Don't know	15.4
	<u>100.0</u>
<u>Distance Between Crossovers</u>	
Every 2 or 3 blocks	11.5
Every 4 or 5 blocks	38.3
Over 6 blocks	27.9
Makes no difference	6.9
Don't know	15.4
	<u>100.0</u>

Respondents in many instances tended to consider on/off ramps as equivalent to cross-overs. As shown in Table 18, distances over six blocks were preferred over other distance-categories for on/off ramps. A second preference was the four to five block distance for such ramps. The same two categories were chosen by the majority of respondents for the distances between crossovers with the largest category (38 percent) proposing a design incorporating four to five block distances.

Anticipated Effects of Freeway on Area

Respondents' perceptions of the potentially desirable, as well as the deleterious effects of the proposed freeway on the Harrisburg area were obtained. In response to the question, "Do you think it will be more or less desirable to live in this area the next ten years with the freeway?", 44 percent replied "more desirable", while 27 percent suggested the area would be less desirable in the coming decade. As might be anticipated, those feeling that the area would be improved by the freeway also thought the freeway should be built (see Table 19). Likewise, in a second, but related, question those indicating that the freeway would make the area a less desirable place in the next ten years tended to oppose the freeway plans.

A list of sixteen possible effects of freeway introduction in the area was supplied to each respondent. The opinions provided as to the freeway's impact on each of these items was found to significantly differentiate acceptance of the freeway in all sixteen cases. While presentation of the sixteen χ^2 tables is found in Appendix B (pp.63-70), a brief summary of the benefits and disadvantages of freeway introduction in regard to the items is summarized on the following page.

Table 19. Area Desirability with Freeway and Acceptance of Proposed Freeway

Area Desirable with Freeway	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
More	119	3	11	133
Less	39	31	12	82
Same	35	3	3	41
Don't Know	22	10	7	49
Total	215	47	43	305

$$\chi^2 = 82.21^*$$

Table 20. Anticipatory Effects of Freeway Introduction on Sixteen Area Facilities or Characteristics (N=305)

Item	Improved	Made Worse	About Same	Don't Know	Total
	(Percent)				
1. Local area travel	<u>59.4*</u>	9.8	18.0	12.8	100.0
2. Travel to other parts of city	<u>89.8</u>	1.0	4.6	4.6	100.0
3. Accidents (motor vehicle)	<u>38.4</u>	21.6	19.0	21.0	100.0
4. Air pollution (motor vehicle)	11.8	<u>42.7</u>	33.4	12.1	100.0
5. Noise	4.9	<u>66.6</u>	25.2	3.3	100.0
6. Drainage	<u>41.0</u>	6.2	29.5	23.3	100.0
7. Crime	<u>15.4</u>	9.5	<u>50.2</u>	24.9	100.0
8. Fire protection	<u>49.1</u>	3.3	<u>37.4</u>	10.2	100.0
9. Police protection	<u>63.0</u>	1.0	26.5	9.5	100.0
10. Medical (including ambulance) service	<u>75.4</u>	0.7	18.7	5.2	100.0
11. School organizations and convenience	20.7	13.8	<u>49.8</u>	15.7	100.0
12. General appearance	<u>66.2</u>	10.8	<u>14.1</u>	8.9	100.0
13. Employment opportunity	<u>59.0</u>	2.3	23.0	15.7	100.0
14. Religious organizations and convenience	16.7	10.8	<u>59.7</u>	12.8	100.0
15. Community togetherness	9.2	13.1	<u>57.4</u>	20.3	100.0
16. Historical character	4.3	7.9	<u>55.7</u>	32.1	100.0

*Underlined values denote highest proportion of anticipatory effects per area facility.

As noted, eighty-nine percent felt that travel to other parts of the city would be improved. Medical services and general appearance of area were also highly ranked (as measured by the proportion of respondents suggesting that these items would be improved). Noise and air pollution were the two conditions which many respondents anticipated might worsen.

In regard to the question of changing land use, 47 percent felt that there would be fewer single family residences, and 61 percent visualized the multiplication of apartment houses. At least half of the respondents anticipated retail and service businesses to increase, as well as industry and general land values. Less than half (40 percent) suggested that home values would increase. One striking result of these anticipated changes in land use was that, in all instances, a positive response to each of these factors was closely tied to favorability in regard to freeway construction. Thus, the heads-of-households interviewed appeared to feel that an increase in businesses and property values (such as retail businesses and land values) would be precipitated by freeway introduction. The χ^2 tables for these seven land use and land value items are included in Appendix B (pp. 71-74).

EVALUATION OF TRANSPORTATION SERVICES

Because of the likelihood that the freeway will be introduced within the Harrisburg area, the transportation needs of these residents were ascertained. Slightly over half of the respondents delineated "convenience" as the most important factor in choosing a means of transportation. A second feature was "time", with the "cost" factor being mentioned as the primary consideration by less than two percent of those sampled.

Several transportation services were mentioned by respondents which would relieve their specific needs. Providing more freeways was suggested by 24 percent, and 24 percent also mentioned the need to improve arterial streets. Other services listed as helping meet the respondents' transportation needs were the improvement of residential streets and of the local bus service.

In response to the question of amounts of public funding which were presently being spent on transportation services, many of those sampled felt that more funds should be spent for such provisions (see Table 21). In addition, a large percentage had no opinion in regard to public funding of transportation services.

As a final part of the evaluation of transportation services, the respondents were asked to appraise the services available to them currently. Table 22 provides a self-explanatory presentation of this assessment. Arterial streets, freeways at non-rush periods, and the local bus system were evaluated higher than other services. No one service received an evaluation of "very good" or "good" by more than half of the respondents.

Table 21. Opinions Concerning Changes in Amounts of Public Funds Spent on Transportation Services in Houston (N=305)

Service	Much More	More	Same Level as Now	Public Funds		Don't Know	Total
				Less	Much Less		
(Percent)							
Residential streets	9.2	<u>57.4^a</u>	17.7	1.6	0.0	14.1	100.0
Arterial Streets	6.6	<u>50.1</u>	28.5	0.7	0.0	14.1	100.0
Freeways	3.9	<u>38.3</u>	36.4	5.6	1.0	14.8	100.0
Local bus service	3.6	28.9	32.8	0.0	0.0	<u>34.7</u>	100.0
Freeway bus operations	2.3	23.0	24.9	1.0	0.0	<u>48.3</u>	100.0
Rapid rail transit ^b	5.9	23.0	25.2	0.0	0.0	<u>45.9</u>	100.0

^aUnderlined values denote highest proportion per service category.

^bThe changes in regard to public funds spent on rapid rail transit was posited as a hypothetical question.

Table 22. Respondents' Assessment of Transportation Services Available to Them (N=305)

Service	Evaluation						Total
	Very Good	Good	So So	Not So Good	Not Good at All	Don't Know	
			(Percent)				
Taxi	2.3	23.0	13.8	10.5	5.2	<u>45.2*</u>	100.0
Freeways (rush)	0.3	14.8	3.9	18.0	<u>49.2</u>	13.8	100.0
Air	5.2	16.4	2.3	2.0	1.0	<u>73.1</u>	100.0
Intercity bus	2.0	26.9	5.2	2.6	0.7	<u>62.6</u>	100.0
Local bus	1.6	<u>27.3</u>	21.6	12.5	12.1	24.9	100.0
Train	0.3	5.6	2.0	0.7	2.6	<u>88.8</u>	100.0
Freeways (non-rush)	30.2	<u>50.9</u>	3.9	1.6	0.0	13.4	100.0
Arterial streets	1.6	<u>42.4</u>	29.2	14.4	2.6	9.8	100.0

*Underlined values denote highest proportion per transportation category.

SUMMARY AND IMPLICATIONS FOR FREEWAY IMPACT

At this point, it is possible to bind together the findings concerning the attitudes and expectations of Harrisburg area respondents. A multi-indicator approach was utilized to measure the degree of receptiveness to the planned freeway. Thus, crucial characteristics of the residents were examined in regard to differential attitudes. Identification with the neighborhood and awareness of activities regarding the proposed facility were measured to obtain a broader understanding of the pre-dispositions of area residents. Relevant factors in regard to perceived benefits or disadvantages of the planned highway extension also were identified.

Residents' Characteristics and Receptiveness to the Freeway

Knowledge of specific characteristics of respondents provided predictive determinants of receptiveness to freeway introduction. While 70 percent of the total resident sample were in favor of the proposed freeway, Anglos ranked higher in acceptance than did Mexican-Americans, and male respondents were more receptive than were female respondents. The educational level of those interviewed was the only measure of socioeconomic status which differentiated freeway favorability, with those in the "middle" educational range ranking higher in acceptance. Anglos and male respondents, especially, may accurately perceive that they can adapt to large-scale changes in their residential area. On the other hand, Mexican-Americans, respondents with lower educational levels, and females may feel that their possibilities for residential mobility or for using the freeway as a resource are more narrowly circumscribed.

Respondents in the northern portion of the Harrisburg area were more receptive to the freeway plan than those in the two southern zones. As has been noted earlier, the Southeast and Southwest Zones had been proposed as the original freeway corridor, so that residents in these sections were more aware of personal consequences of freeway introduction.

Residential and transportation characteristics of the respondents were not predictive of strong attitudes concerning freeway construction in the area. Neither length of residence nor means of transportation, both of which had been anticipated as important indicators, were significantly related to differential freeway acceptance. Residents planning major repairs or remodeling were receptive to freeway introduction. It is likely that those attempting to upgrade or maintain their residences view the freeway as adding to property values.

Accounting Scheme for Receptiveness to Freeway

Many of the difficulties in evaluating residents attitudes and expectations in regard to highway construction lie in the complexities and interrelationships of these predispositions. Further, opinions concerning the freeway proposal may not actually crystallize until relocation or construction has been undertaken. A third type of attitudinal mechanism revolves around the difficulty of tying together opinions with actions. Those respondents strongly favoring or inflexibly opposing the freeway may never take any direct action to either support or hinder freeway plans. While these considerations often confound predictive indicators of favorability to freeway proposals, a systematic means of gauging residents feelings and reactions is an on-going goal of social and environmental impact studies.

To complete the evaluation of opinions of residents surveyed in the Harrisburg area, an accounting scheme has been derived which specifies four types of information gained about the planned freeway. By including the following scheme in the report, stress is placed on those factors which "trigger" acceptance of highway proposals by area residents. The elements of the accounting scheme are outlined below:

- A. Attractions: Features of the planned facility that made the proposal more desirable than having no freeway construction.
- B. Disbenefits: Unsatisfactory features of the planned facility which led to negative expectations or opinions.
- C. Specifications: Attributes of the proposed freeway which would be desirable for personal or community purposes.
- D. Information Sources and Actions: Means by which the proposed facility was brought to the respondent's attention and actual action undertaken in regard to the freeway plan.

Attractions. In the survey of Harrisburg residents, 55 percent provided reasons that the proposed freeway could benefit them personally. Accessibility to jobs and other selected places was the most frequently described personal advantage of the extended highway system. In addition, 93 percent of those interviewed planned to remain in the area if the freeway was five blocks from their residence, with 44 percent suggesting that the area within the next 10 years would become more desirable if the freeway were constructed.

Benefits ascribed to the area as a whole tended to be transportation-related, rather than environmental or socioeconomic advantages. The freeway was expected to provide better accessibility for area residents, and to relieve traffic congestion. In addition, medical service provision (ostensibly based on accessibility) was viewed as improving, as well as the general neighborhood appearance.

Disbenefits. While the majority favored freeway construction, those who opposed the proposal tended to consider noise and higher property taxes as potential personal disbenefits. Also, a large proportion of respondents (74 percent in the southern portion and 58 percent in the northern section) planned to move if the freeway abutted their residence.

In regard to disadvantages for the area as a whole, those opposing the freeway plans anticipated that the actual construction would remove too many residential dwellings and would split the neighborhood. Those respondents suggesting that the greatest advantage of the area was that it was a quiet neighborhood tended to be less favorable to freeway plans. Further, many were aware that air pollution would adversely affect the area.

Specifications. The desires of residents in regard to freeway design were identified. Seventy percent of the respondents suggested a preference for service roads, if the freeway were five blocks from their homes. No real consensus as to design elevation emerged; similar proportions of respondents preferred the on-grade, elevated, and depressed designs.

For the spacing of on/off ramps and cross-overs, many residents had no opinion. The largest frequency of responses of those specifying the distances between these design features, preferred spacing distances of six blocks or less.

Forms and Uses of Information. The length of time which had elapsed since residents first became aware of the planned construction had no significant impact on the degree of acceptance of the plans. Development of strong opinions, either pro or con, did not depend on knowledge of the highway extension for a relatively long period.

Primary information sources were isolated individuals, such as acquaintances. Newspapers were mentioned as an origin of information, and seven percent specified THD hearings or handouts. Respondents were relatively uninformed as to the involvement of public or THD officials in the planning process. Ten percent had attended meetings with THD officials present. Further, over two-thirds of the respondents were not aware that THD provided relocation assistance to residents who were displaced by freeway construction.

Almost one-third of the residents interviewed had spoken with neighbors in regard to the freeway proposal. If they depicted neighbors as being in agreement with highway plans, then they too were favorable (92 percent). When neighbors were perceived as being opposed, only 34 percent then stated that they personally were in favor of the proposal.

This general accounting scheme presented above focuses on four basic elements which are primary predictors of freeway impact. Preferences and expectations of residents were specified, as well as forms and usages of information sources. Further studies may attempt a refinement or reformulation of this type of accounting scheme. Ideally, researchers involved in predicting freeway impact should attempt to determine the coverage (or proportion adhering to a specific attitude) and the intensity (or relative importance)

of the attitude or expectation under examination. In this manner, pre-construction indicators of residential impact can be further quantified, and the differential importance of predictive impact variables can be determined.

There is a great deal of interest in the
subject of the new book, and it is
very much to be regretted that the
author has not been able to publish it.

APPENDICES

APPENDIX A. SAMPLING PROCEDURES AND RELIABILITY

Census tracts, selected because they encompassed the three proposed corridors, were used as the areal basis for sampling. Since each tract varied slightly along socioeconomic, ethnic, and other dimensions, it was necessary to obtain a sample proportionate to the population size in each of the tracts. A random probability sample of one out of one-hundred residents in each tract was then delineated. A systematic scheme was utilized to replace any respondents in the original sample when alternates were necessary. An alternate was chosen, for example, if the respondent could not be interviewed after at least two attempts or if the residence itself was part of a larger multi-unit structure.

The final sample of residents was intended to represent a proportionate population sample from four 1970 census tracts in the Harrisburg area.

Table A-1. Population and Sample Size by Census Tract

<u>Census Tract</u>	<u>Pop.</u>	<u>Sample Size</u>	<u>Ratio of Sample to Total Population</u>	<u>Proportion of Sample</u>
301	10,545	80	0.8%	26%
310	6,322	43	0.7%	14%
311	9,356	94	1.0%	31%
312	7,973	88	1.1%	29%
				<u>100.0%</u>

The data were collected using field interviews and a pre-tested questionnaire. Interviewers were staff members of the Texas Transportation Institute. The questionnaire utilized multiple choice questions and was administered in 1971-1972 as a structured, personal interview with each of the 305 Harrisburg respondents. A copy of the questionnaire can be obtained from the Texas Transportation Institute.

Two statistical tests are useful in analyzing the survey sample data. One of them, the χ^2 test, is used in the text. The χ^2 test¹ is applied to testing the comparability of actual and expected frequencies in two-way classifications, that is, in testing the hypothesis that there is no relationship between the two classifications. When computed χ^2 values exceed the χ^2 value for a chosen probability level, the hypothesis of independence is rejected. Such cases offer opportunities for positing theoretical relationships between the two classified entities.

The second statistical technique, inference, uses the normal distribution to determine confidence intervals for the parameter P, the proportion of the population having a certain attribute. The 95 percent confidence interval is defined as:

$$p - 1.96\sigma < P < p + 1.96\sigma, \text{ where}$$

$$\sigma = \sqrt{\sum \left(\frac{N_h}{N} \right)^2 \frac{p_h(1-p_h)}{n_h}}, \text{ and}$$

N = the size of the population (or 34,196 in this study)

N_h = total number of persons per census tract

p_h = the proportion of the sample per tract having a certain attribute

n_h = number of persons sampled per census tract

¹The calculations of χ^2 were made using the procedure recommended in Jerome Li, Statistical Inference I, (Ann Arbor, Michigan: Edwards Brother, Inc.) 1964, and William G. Cochran, Sampling Techniques (New York: John Wiley and Sons), 1963, pp. 88-95.

While no inferences about the population (or parameter P) are made in the text of this report, the interested reader can easily apply the confidence interval technique to any of the sample results that are presented.

APPENDIX B: SUPPLEMENTAL TABLES

Table B-1. Means of Transportation to Selected Places

	Auto, Driver	Auto, Rider	Bus	Taxi	Walk	Other	Not Applicable	Total
Grocery Store (Percent)	223 73.1	23 7.5	3 1.0	1 0.3	50 16.4	2 0.7	3 1.0	305 100.0
Bank	189 62.0	9 3.0	16 5.2	1 0.3	7 2.3	3 1.0	80 26.2	305 100.0
Church	181 59.3	27 8.9	2 0.7	1 0.3	42 13.8	0 0.0	52 17.0	305 100.0
Doctor	210 68.9	25 8.2	19 6.2	4 1.3	15 4.9	0 0.0	32 10.5	305 100.0
Employment	183 60.0	22 7.2	8 2.6	0 0.0	10 3.3	1 0.3	81 26.6	305 100.0
Movie Theater	123 40.4	8 2.6	15 4.9	0 0.0	3 1.0	0 0.0	156 51.1	305 100.0
Public Park	145 47.5	7 2.3	4 1.3	0 0.0	21 6.9	2 0.7	126 41.3	305 100.0

Table B-2. Frequency of Trips to Selected Places

	Daily	Weekly	Monthly	Yearly	Don't Know	Not Applicable	Total
Grocery Store (Percent)	94 30.8	204 66.9	4 1.3	0 0.0	0 0.0	3 1.0	305 100.0
Bank	2 0.7	80 26.2	124 40.7	15 4.9	3 1.0	81 26.5	305 100.0
Church	11 3.6	207 67.8	27 8.9	7 2.3	0 0.0	53 17.4	305 100.0
Doctor	2 0.7	12 3.9	152 49.8	105 34.4	3 1.0	31 10.2	305 100.0
Employment	222 72.8	1 0.3	2 0.7	0 0.0	0 0.0	80 26.2	305 100.0
Movie	0 0.0	41 13.4	82 26.9	23 7.5	4 1.3	155 50.9	305 100.0
Public Park	5 1.6	31 10.1	71 23.3	71 23.3	0 0.0	127 41.7	305 100.0

Table B-3. Acceptance of Proposed Freeway and Anticipated Effect on Local Travel

Local Travel	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	144	16	21	181
Worsened	13	16	1	30
Same	39	8	8	55
Don't Know	19	7	13	39
Total	215	47	43	305

$$\chi^2 = 54.64^*$$

Table B-4. Acceptance of Proposed Freeway and Anticipated Effect on Travel to Other Parts of the City

Travel to Other Parts of City	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	205	32	37	274
Worsened	1	2	0	3
Same	3	9	2	14
Don't Know	6	4	4	14
Total	215	47	43	305

$$\chi^2 = 41.05^*$$

Table B-5. Acceptance of Proposed Freeway and Anticipated Effect on Motor Vehicle Accidents

Motor Vehicle Accidents	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Increased	100	10	7	117
Decreased	37	18	11	66
Same	44	8	6	58
Don't Know	34	11	19	64
Total	215	47	43	305

$$\chi^2 = 35.87^*$$

Table B-6. Acceptance of Proposed Freeway and Anticipated Effect on Air Pollution

Air Pollution	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	31	0	5	36
Worsened	84	29	17	130
Same	80	12	10	102
Don't Know	20	6	11	37
Total	215	47	43	305

$$\chi^2 = 22.51^*$$

Table B-7. Acceptance of Proposed Freeway and
Anticipated Effect on Noise Levels

Noise Levels	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	11	2	2	15
Worsened	135	39	29	203
Same	64	5	8	77
Don't Know	5	1	4	10
Total	215	47	43	305

$$\chi^2 = 14.44^*$$

Table B-8. Acceptance of Proposed Freeway and
Anticipated Effect on Drainage

Drainage	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	100	10	15	125
Worsened	9	5	5	19
Same	68	15	7	90
Don't Know	38	17	16	71
Total	215	47	43	305

$$\chi^2 = 24.18^*$$

Table B-9. Acceptance of Proposed Freeway and Anticipated Effect on Area Crime

Area Crime	Acceptance of Proposed Freeway			Total
	Favor	Against	Other	
Improved	38	5	4	47
Worsened	15	10	4	29
Same	107	23	23	153
Don't Know	55	9	12	76
Total	215	47	43	305

$$\chi^2 = 11.68$$

Table B-10. Acceptance of Proposed Freeway and Anticipated Effect on Fire Protection

Fire Protection	Acceptance of Proposed Freeway			Total
	Favor	Against	Other	
Improved	120	13	17	150
Worsened	5	4	1	10
Same	73	25	16	114
Don't Know	17	5	9	31
Total	215	47	43	305

$$\chi^2 = 21.61^*$$

Table B-11. Acceptance of Proposed Freeway and Anticipated Effect on Police Protection

Police Protection	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	146	23	23	192
Worsened	1	2	0	3
Same	50	19	12	81
Don't Know	18	3	8	29
Total	215	47	43	305

$$\chi^2 = 17.87^*$$

Table B-12. Acceptance of Proposed Freeway and Anticipated Effect on Area Medical Service

Area Medical Services	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	174	28	28	230
Worsened	1	1	0	2
Same	33	17	7	57
Don't Know	7	1	8	16
Total	215	47	43	305

$$\chi^2 = 31.21^*$$

Table B-13. Acceptance of Proposed Freeway and Anticipated Effect on School Organizations and Convenience

Schools	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	47	4	12	63
Worsened	19	18	5	42
Same	123	16	13	152
Don't Know	26	9	13	48
Total	215	47	43	305

$$\chi^2 = 44.99^*$$

Table B-14. Acceptance of Proposed Freeway and Anticipated Effect on General Appearance of Area

General Appearance of Area	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	161	16	25	202
Worsened	9	21	3	33
Same	28	7	8	43
Don't Know	17	3	7	27
Total	215	47	43	305

$$\chi^2 = 73.38^*$$

Table B-15. Acceptance of Proposed Freeway and Anticipated Effect on Employment Opportunity

Employment Opportunity	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	145	16	19	180
Worsened	1	5	1	7
Same	44	16	10	70
Don't Know	25	10	13	48
Total	215	47	43	305

$$\chi^2 = 38.61^*$$

Table B-16. Acceptance of Proposed Freeway and Anticipated Effect on Area Religious Organizations and Convenience

Religious Organizations and Convenience	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	38	3	10	51
Worsened	14	16	3	33
Same	136	23	23	182
Don't Know	27	5	7	39
Total	215	47	43	305

$$\chi^2 = 34.15^*$$

Table B-17. Acceptance of Proposed Freeway and Anticipated Effect on Community Togetherness

Community Togetherness	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	20	0	8	28
Worsened	18	19	3	40
Same	137	18	20	175
Don't Know	40	10	12	62
Total	215	47	43	305

$$\chi^2 = 47.06^*$$

Table B-18. Acceptance of Proposed Freeway and Anticipated Effect on Historical Character of Area

Historical Character	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Improved	8	0	5	13
Worsened	9	13	2	24
Same	136	15	19	170
Don't Know	62	19	17	98
Total	215	47	43	305

$$\chi^2 = 45.75^*$$

Table B-19. Acceptance of Proposed Freeway and Expected Change in Number of Single Family Residences

Direction of Land Use Change	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
More Residences	20	0	6	26
Fewer Residences	99	29	14	142
Same Amount	55	8	4	67
Don't Know	41	10	19	70
Total	215	47	43	305

$$\chi^2 = 24.64^*$$

Table B-20. Acceptance of Proposed Freeway and Expected Change in Number of Multi-Family Dwellings

Direction of Land Use Change	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
More Apartments	138	23	24	185
Fewer Apartments	2	5	2	9
Same Amount	36	10	3	49
Don't Know	39	9	14	62
Total	215	47	43	305

$$\chi^2 = 21.25^*$$

Table B-21. Acceptance of Proposed Freeway and Expected Change in Number of Retail Businesses

Direction of Land Use Change	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
More Retail Businesses	139	15	21	175
Fewer Retail Businesses	18	11	2	31
Same Amount	39	7	5	51
Don't Know	19	14	15	48
Total	215	47	43	305

$$\chi^2 = 41.35^*$$

Table B-22. Acceptance of Proposed Freeway and Expected Change in Number of Service Businesses

Direction of Land Use Change	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
More Service Businesses	123	11	17	151
Fewer Service Businesses	15	12	3	30
Same Amount	46	8	6	60
Don't Know	31	16	17	64
Total	215	47	43	305

$$\chi^2 = 40.32^*$$

Table B-23. Acceptance of Proposed Freeway and Expected Change in Number of Industrial Businesses

Direction of Land Use Change	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
More Industrial Businesses	146	24	19	189
Fewer Industrial Businesses	5	2	1	8
Same Amount	43	12	9	64
Don't Know	21	9	14	44
Total	215	47	43	305

$$\chi^2 = 19.21^*$$

Table B-24. Acceptance of Proposed Freeway and Expected Change in General Land Values

Direction of Land Use Change	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Higher Land Values	150	14	18	182
Lower Land Values	7	13	0	20
Same Amount	17	6	3	26
Don't Know	41	14	22	77
Total	215	47	43	305

$$\chi^2 = 67.58^*$$

Table B-25. Acceptance of Proposed Freeway and Expected Change in Home Values

Direction of Land Use Change	Acceptance of Proposed Freeway			
	Favor	Against	Other	Total
Higher Home Values	103	7	13	123
Lower Home Values	19	15	3	37
Same Amount	40	12	5	57
Don't Know	53	13	22	88
Total	215	47	43	305

$$\chi^2 = 40.80^*$$