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16. Abstract

The objective of this four-year research effort was to develop and test a methodology to estimate the economic impacts of median design. This report summarizes the activities and results for the entire four-year project. The primary task in the fourth year of the study was to collect post-construction data on the Texas Avenue corridor in College Station, Texas. The research team also collected customer survey information at five business types at the College Station corridor and performed interviews at several locations in Amarillo, Texas, where the raised median was removed. Final analyses on the entire eight-city data set from throughout Texas were performed in the final year of the study.

The results of this research effort will provide insight to planners, engineers, and researchers investigating the economic impacts of raised median projects. This information is expected to be especially useful in communicating potential economic impacts to business and property owners prior to construction.

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A METHODOLOGY FOR DETERMINING ECONOMIC IMPACTS OF RAISED MEDIANS: FINAL PROJECT RESULTS

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DISCLAIMER

The contents of this report reflect the views of the authors, who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the official views or policies of the Texas Department of Transportation (TxDOT).

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- Ms. Emily Stubbs, customer survey administration; and
- Ms. Jennifer Williams, customer survey administration.

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1.0 INTRODUCTION

The economic impacts of raised medians on adjacent businesses has been of primary interest to many transportation professionals as these treatments are increasingly used along urban and suburban arterials. Previous research has shown the benefits of raised medians on improved traffic operations and safety by separating opposing traffic flows and removing left-turning vehicles from the through lanes. Through access control, raised medians restrict left turns to mid-block and intersection median openings. Though the improved access control will likely improve the operations and arterial signal coordination, the economic impacts of restricting these left turns may be felt by owners of businesses and properties adjacent to the arterial. While rather extensive literature has been previously performed to quantify the costs and benefits of constructing raised medians with respect to initial costs and benefits to motorists in terms of reduced delay and increased safety, there is relatively limited research in estimating the economic impacts of median treatments.

Many state and local transportation agencies, including the Texas Department of Transportation (TxDOT), have recognized the need to provide answers to the public regarding the pre-, during-, and post-construction impacts of installing raised medians. The use of raised medians is increasing in urban areas. Transportation agencies and the public are interested in learning more about the economic impacts. TxDOT requires a methodology with which to determine if such concerns are warranted. With such a methodology, TxDOT will be better informed of the overall economic impact that a raised median may have on adjacent businesses and properties. After estimating what, if any, impacts may be expected, TxDOT can provide this information to the public to keep them informed of anticipated changes.

1.1 PROJECT OBJECTIVES

The objective of this project was to develop and test a methodology to estimate the economic impact of median design. This was performed by:

- identifying prior evaluations and practices in the literature related to the effects of median design, as well as identifying other relevant issues and concerns;
- developing a methodology for evaluating the economic impacts of median design; and
- evaluating economic impacts at several locations throughout Texas.

In the first year of this project, researchers developed and tested a methodology on one case study location in College Station, Texas. Data were collected before and during construction along this corridor where a raised median was being installed (*1*). In the second year of the project, the research team sought additional case study locations to test the methodology for estimating the economic impacts of median design. The second year of the research effort was used to identify and collect data at these additional case study locations. After investigating several potential case study locations, the research team selected 10 sites in the following cities: McKinney, Longview, Wichita Falls, Odessa, Houston, and Port Arthur (*2*). In the third year of the project, the data obtained in the second year were analyzed (*3*). In the fourth and final year of the research effort, post-construction data were collected along Texas Avenue. Customer surveys were administered along Texas Avenue, and personal interviews were conducted with business owners in Amarillo, Texas, at locations where raised medians were removed.

Currently, TxDOT does not have a method of estimating the economic impacts on adjacent businesses that result from the construction of a raised median. Developing such a methodology will allow TxDOT engineers and planners to estimate the potential impacts so that the information can be provided to the public, specifically to business owners. Several TxDOT roadway construction projects currently underway, or in the planning stages, would benefit from such a methodology and estimated impacts. In addition, TxDOT can use the methodology to estimate economic impacts of raised median installation projects in the future.

1.2 RESEARCH PROCEDURE

Throughout the project, researchers have completed seven major tasks to meet the project objectives. An extensive literature review was conducted to provide information on issues related to the effects of constructing different types of medians. Based upon the literature and by working with the project director, a survey instrument has been developed, revised, and administered to businesses and undeveloped landowners whose business is adjacent to a roadway in which a raised median has been, or is being, constructed. Two case studies evaluated locations where the raised median was removed and the roadway converted back to a two-way left-turn lane (TWLTL). The intent of the survey was to assess the effects before, during, and after construction (or removal) of the raised median and/or widening project. These surveys were only one portion of the methodology which is discussed in more detail in Chapter 2.0. Customer surveys were also developed and performed in College Station along Texas Avenue at five locations to compare customer opinions of the raised median installation with business owners/managers. It is anticipated that this methodology can be used by TxDOT to evaluate similar impacts for future projects as needed. The following sections of this chapter further explain each of the work tasks.

1.2.1 Conduct State-of-the-Practice Literature Review

Numerous research and case studies have evaluated the impacts of different median installations. Many of these studies have addressed the traffic-related impacts, such as the operational and safety issues, related to installing or removing different median types. From an economic impact perspective, there have been several case studies that evaluated the impacts on businesses of installing raised medians. Some of the main factors that these evaluations considered were business sales (if available), sales tax information, property values, land use, employment patterns, and parking availability.

Most of the case studies that addressed economic impacts of median design were site-specific, with the researchers unable to apply results to all situations. Some of the factors that appear to restrict findings to site-specific locations include local traffic conditions, the local economy, and

land use characteristics that may change over time. For a review of the previous literature, the reader is encouraged to obtain the research report for the first and second years of this project (*1*,*2*).

1.2.2 Identify Existing Methodologies for Estimating Economic Impacts

Two generally accepted practices for estimating the economic impacts of a raised median installation are a before-and-after evaluation and a post-facto evaluation. In the case of a median installation, the before-and-after technique simply involves collecting the same type of site data before and after the median is installed, with a time allowance to account for the initial effects of pre- and post-construction activity. The post-facto technique is used when the median has already been installed and an economic analysis is desired. The pre-construction data are obtained or reconstructed with available data and by surveying persons knowledgeable about the pre-construction period (e.g., business owners, county appraisal offices, and real estate representatives). The post-construction data are collected in the same manner for the post-facto technique as the before-and-after technique.

The analysis procedure for both techniques is generally similar, with the only major difference being the data collection process. With the post-facto technique, all available pre-, during-, and post-construction data are collected at one time (post-construction period), while the data for the before-and-after technique are collected at two different times, before and after the construction period. In two of the sites selected in the second year of the project, data were collected before construction had begun. These sites were Call Field Road in Wichita Falls and Long Point Road in Houston. For the other eight additional case studies identified in the second year of the project, researchers collected data after the construction was completed.

1.2.3 Develop Sample Survey Instruments

It was anticipated that from the task outlined in section 1.2.2 that existing methodologies from past case studies would include the development of a survey(s) to facilitate the gathering of information from business and landowners affected by a median installation. In the first year of

the project, researchers identified several surveying techniques. Three types of surveys were identified from past studies for possible use. The first survey was developed to assess the economic impact on businesses adjacent to the median project. For the case study in the first year along Texas Avenue, the survey questions focused on the real impacts during construction (as compared to pre-construction conditions) and perceived impacts after construction. In addition, the survey ascertained such factors as the number of customers, parking spaces, gross sales, employment patterns, and property values. A revision of this survey was used for data collection at the additional sites surveyed in the second year. An example of this revised survey instrument is shown in Appendix A for Texas Avenue in College Station.

The second survey was developed for assessing the economic impact on undeveloped land adjacent to streets where a raised median will be installed. The survey included several of the same perception-type questions as the one oriented toward business owners including property value changes. This survey was also used in the second year of the project at the additional case study locations. An example of an undeveloped land survey used along the Clay Road corridor in Houston is shown in Appendix B. The third survey developed was a survey of customers to determine their perceptions of how the median installation will influence their endorsement of businesses along the corridor after installation of the raised median. This survey is shown in Appendix C.

1.2.4 Administer Suggested Surveying Techniques

Participants in the survey included business owners/managers and undeveloped landowners adjacent to the corridors of interest. The research team first conducted a windshield survey to determine which businesses and land uses were present along the corridors in which the survey was to be administered. Business information (e.g., address and contact name) for each location was then obtained from the chamber of commerce, appropriate neighborhood/business groups, county appraisal district office, and/or telephone directories. Five of the 10 additional case studies identified in the second year were performed with personal interviews similar to Texas Avenue in the first year of the project. For these sites, the research team contacted all businesses by telephone to determine their interest in participating and arranged an interview at each of the

locations to administer the survey. Researchers sent mail-out surveys to business owners/managers and undeveloped landowners along the other five case study sites (or locations) of interest. For all the sites except in Amarillo, Texas, a letter of support of the research effort was sent, endorsed by the local chamber of commerce or neighborhood association, to encourage them to participate in the survey. Finally, reminder cards were sent to the five case studies where mail-out surveys were administered to encourage individuals to return the surveys. In the final year of the study, the research team performed the in-person interviews along Texas Avenue in College Station after the raised median installation was completed. The customer surveys were also performed. Data were also collected via personal interview at locations in Amarillo, Texas, where the raised medians were removed.

1.2.5 Develop Methodology for Estimating Economic Impacts

In the first year of the project, the researchers developed a methodology for estimating the economic impacts of a median design project. This methodology incorporated the experiences of the research team in administering the methodology on one study location in College Station, Texas. The steps to the methodology are shown in Chapter 2.0.

1.2.6 Identify Additional Corridors on Which to Test Methodology

After the methodology had been developed and tested on the one case study in College Station, Texas, the research team desired to test it on additional case study locations and obtain economic impact data on several corridors. In this task, the research team identified corridors in Texas cities, as well as other states as appropriate, on which the methodology could be tested. Corridors on which medians had been added at least three to five years in the past were desired as they would likely provide the best opportunities for collecting pre- and post-construction data. As mentioned in section 1.1, 10 additional case study locations were added. These include sites in the cities of Houston, Port Arthur, McKinney, Longview, Odessa, and Wichita Falls. The characteristics of these sites are summarized in Chapter 2.0.

1.2.7 Collect and Analyze Data from All Corridors

In the second year of the research effort, the research team collected all the data necessary to test the methodology at the 10 additional case study locations. This included surveying the businesses and collecting gross sales, property values, and employment trend data. The research team performed the data analysis in the third year on the data obtained in the second year. After completion of the data collection in the final year of this project, the research team performed data analysis on the complete data set from all corridors. Chapter 3.0 and subsequent appendices in this report provide these analyses.

1.2.8 Organization of Report

This report is organized into five chapters, as described below:

- Chapter 1.0, Introduction: Provides an introduction to the research topic and presents the research objectives and scope.
- Chapter 2.0, Methodology, Case Studies, and Data Collection: Provides information regarding the methodology used for the research effort, describes the case study locations, and describes the data collection and response rate information.
- Chapter 3.0, Analyses Results: Provides the analysis procedure and results of the data collected at the eight cities throughout Texas.
- Chapter 4.0, Discussion and Conclusions: Provides comments, discussion, and conclusions based upon the research project.
- Chapter 5.0, References: Provides a listing of the references used in this report.

2.0 METHODOLOGY, CASE STUDIES, AND DATA COLLECTION

2.1 INTRODUCTION

In the first year of this project, a methodology was developed and tested on one case study location in College Station, Texas. Data were collected before and during construction along this corridor where a raised median was being installed. In the second year of this project, the research team sought additional case study locations on which to test the methodology for estimating the economic impacts of median design. After investigating several potential case study locations, the research team selected 10 additional sites in the following cities throughout Texas: McKinney, Longview, Wichita Falls, Odessa, Houston, and Port Arthur. The research team collected all necessary data from the additional corridors in the second year. In the third year of the project, data analysis was performed on the additional case study locations identified in the second year. This report describes the findings and analysis of the complete data set after the completion of the post-construction interviews along Texas Avenue in College Station in the fourth year. Customer surveys were also performed at five locations in College Station in the fourth year of the study along with personal interviews at select locations in Amarillo, Texas, where raised medians were removed.

2.2 METHODOLOGY

The primary purpose of this research project was the development of a methodology to determine if there are any economic impacts on adjacent businesses when a raised median is installed. The research team developed a methodology and tested it on a case study in the first year of the project. After analyzing the procedures and results of that test, the research team revised the methodology and tested it on 10 case studies in the second year of the project. The current methodology, consisting of eight main steps, provides a logical structure by which the user can identify case studies and collect and analyze data. The steps of the methodology are:

1. identify sites (cities) with potential corridors;
2. identify corridor characteristics;
3. contact sources of information;
4. inventory businesses and establishments along the subject corridor;
5. obtain information about businesses;
6. prioritize businesses to be surveyed;
7. collect data by personal interviews; and
8. analyze and summarize data.

2.2.1 Identify Sites (Cities) with Potential Corridors

The first step in the methodology is the selection of sites from which economic impacts will be evaluated. The research team investigated all potential case study corridors to determine their applicability to this project. The process of investigating potential case study corridors included several steps. The first step of the site investigation process was to talk to individuals at local agencies (e.g., TxDOT, metropolitan planning organization [MPO], city) to obtain as much preliminary information as possible about each potential corridor. The information included the type of construction project, the construction time periods, the types of abutting development, and the amount of abutting undeveloped land. The research team used this information to rule out corridors that did not fit the parameters established in the methodology. For example, preferable corridors included those that had been constructed within the last six years or so and were primarily abutted by commercial property. The researchers looked for corridors with more retail development than residential development, office development, or undeveloped land. The vast majority of the corridors the research team investigated involved the installation of raised medians. However, the team also evaluated median removals, and two case studies are median removals.

2.2.2 Identify Corridor Characteristics

This step included identifying the corridor characteristics of a particular corridor based upon the characteristics desired as explained in section 2.2.1 above. Many corridors were investigated for inclusion in the project.

2.2.3 Contact Sources of Information

Contacting sources of information is also necessary for the successful estimation of the economic impacts. Several agencies and groups provided vital support in the data collection for this project. The team sought and obtained endorsement of the survey instrument and process from chambers of commerce in most of the case study cities. In Houston, chamber of commerce personnel recommended the research team contact neighborhood/business groups for research support and provided contacts. In larger cities such as Houston, neighborhood/business groups provide more support to the research since business owners are tied closer to these associations than to a chamber of commerce.

Generally, a researcher would contact the chamber of commerce and determine who the appropriate person was to write a letter (or sign a letter prepared by the research team explaining the research) addressed to business owners/managers or undeveloped landowners along the corridor. The research team viewed this step as crucial since it was hypothesized that the businesses would be more willing to participate in a survey if the chambers of commerce endorsed it. In all cases, the chambers of commerce were cooperative and all but one of them was able to provide the desired letters. None of the chambers of commerce refused to provide assistance.

Appraisal districts in some of the cities provided significant support in the data collection efforts. They allowed the researchers to use public computer terminals to obtain property value information. The amount and specific types of data available varied among districts. Some of the appraisal districts have more historical data available on their computers than others. In some cases, depending on the age of the project and the amount of historical data available, researchers were able to collect all of the desired data from computers in the appraisal district

offices. To ease the collection of the property value from the appraisal districts for some of the case study locations, the research team obtained compact discs from a private company that made this information available. Data were available in this form for larger metropolitan areas (e.g., Harris County). Appraisal districts were also often able to provide anecdotal information regarding land development trends or contact information for business owners.

2.2.4 Inventory Businesses and Establishments along the Subject Corridor

To get the most detailed information possible during site visits of potential corridors, the researchers performed windshield surveys of the corridors. In doing so, they recorded the names, addresses, and telephone numbers (when available) from store fronts. The researchers recorded this information by sketching maps of the corridors and noting specific details such as parcel location, site circulation, driveway locations, and median opening locations. This information was very useful for the development of stratifying variables for the analysis presented in Chapter 3.0. These variables were used to provide separate analyses for factors such as whether a business is a stand-alone business or located in a shopping center, whether a business is located on a corner lot with direct access, or whether a business is located mid-block or at a street intersection. The business inventory process also included photographing the corridors. Researchers took slides of the roadway cross-sections, as well as examples of adjacent businesses. The researchers used the slides as a record of specific attributes of the corridors. Some of the slides appear as figures in this report.

2.2.5 Obtain Information About Businesses

During this step of the methodology, data were collected from the appraisal districts regarding trends in property values. Data to quantify metrics such as percent change in employees, gross sales, and property values were also collected in this step. Data were collected for each city, county, and statewide for comparison to each particular corridor to identify differences in local and regional economic activity. Employee data were collected from the Texas Workforce Commission (TWC). Gross sales data were collected from the Texas Comptroller of Public Accounts, and property values were collected from the appraisal districts.

2.2.6 Prioritize Businesses to be Surveyed

Not all of the businesses identified in the site visits and windshield survey were surveyed in the project. Some business types such as churches or other non-commercial offices were not surveyed. This step of the methodology identifies all businesses that one desires to survey. One can also decide in this stage of the methodology whether a mail-out survey or in-person interview will be performed. In-person interviews were the primary means of data collection in this study, but the research team also performed some mail-out surveys.

2.2.7 Collect Data by Personal Interviews

This step of the methodology includes the actual interviews and data collection from each particular business. For this project, in-person interviews were formally scheduled with business owners/managers for each business. Collecting data by personal interviews is quite labor intensive, but it provides a much greater participation rate than mail-out surveys, as well as higher quality data. However, some mail-out surveys were performed at selected corridors in an effort to provide additional sample size without a significant added cost.

2.2.8 Analyze and Summarize Data

This step of the methodology includes summarizing and analyzing the information that is collected for the project. This includes investigating the key performance measures of interest (e.g., number of employees, property values, gross sales) for different business types and stratifying variables of interest.

2.3 CASE STUDY DESCRIPTIONS

The case studies investigated in the project include corridors with a variety of business mixes. Most of the corridors are in suburban type areas with shopping centers and strip retail development. One of the corridors, Grant Avenue in Odessa, is located in a central business district. The specific types of development on the individual corridors range from completely

retail to a mix of office, institutional, and retail. In addition, the cities included in the study are of a variety of population size. The populations range from approximately 25,000 in McKinney to approximately 1.7 million in the city of Houston. Table 2-1 summarizes several different characteristics of interest for each of the 11 sites.

2.3.1 Texas Avenue (College Station)

The first test corridor used in the first year of the study to test the survey instrument was the Texas Avenue corridor in College Station, Texas. In-person surveys were performed along a 1.5-mile segment from University Drive south to Harvey Mitchell Parkway (FM 2818) in 1997. The data were collected during the construction of the raised median in 1997 along the northern most segment of the corridor (University Drive to Dominik Drive). Data were also collected along the segment from Dominik Drive south to Harvey Mitchell Parkway though this section is not scheduled for bidding until the year 2001. Performing the survey along the entire corridor allowed for the testing of the methodology early in the project. In 2000, the fourth year of the study, in-person interviews were again performed after the completion of the raised median. Texas Avenue went from a four-lane arterial divided by a TWLTL to a six-lane arterial with a raised median. There were 59 potential businesses in the area of interest. In addition, the corridor was of interest to the research team as there was also a cross-street (Dominik Drive) which did not have a median opening. The development along the corridor is primarily commercial, with some churches and municipal buildings. Most of the commercial development is concentrated within shopping centers, but there are several freestanding businesses with individual curb-cuts and driveways. Commercial development is concentrated mostly on the east side of the street as the Texas A&M University campus is located on the west side. This part of the campus is comprised of a golf course and other undeveloped land. There is one main entrance to the campus within this segment of Texas Avenue.

Table 2-1. Characteristics of Case Study Locations.

Street Name	City and Population	Before Constr.	After Constr.	Study Limits	Length (miles)	Construction Years	Survey Type	Land Use	Number of Establishments
Texas Avenue	College Sta. 64,200	TWLTL	Raised Median	University Dr. to Dominik Dr.	1.5	1996 to 1998	Interview	Retail, University	59
South Post Oak Road	Houston 1,844,000	Undivided	Raised Median	I-610 to South Main Street	1.5	1988 to 1990	Interview	Retail, Industrial	155
Clay Road	Houston 1,844,000	Undivided	Raised Median	Hollister Rd. to Gessner Rd.	2.2	1994 to 1996	Mail-out	Retail, Industrial, Undeveloped	63
West Fuqua Road	Houston 1,844,000	Undivided	Raised Median	Hiram Clarke Rd. to Almeda Rd.	1.5	1987 to 1989	Mail-out	Retail, Undeveloped	68
Long Point Road	Houston 1,844,000	Undivided	Raised Median	Campbell Rd. to Hollister Rd.	0.7	Surveyed pre-constr.	Mail-out	Retail	41
Twin Cities Highway	Port Arthur 58,600	Raised Median	TWLTL	53rd Street to Griffing Park	2.0	1983 to 1985	Mail-out	Retail, Office	90
9th Avenue	Port Arthur 58,600	Undivided	Raised Median	Texas 365 to Lake Arthur Drive	1.5	1979 to 1980	Mail-out	Retail, Residential, Undeveloped	66
University Drive	McKinney 35,000	Undivided	Raised Median	U.S. 75 to Texas Highway 5	1.4	1991 to 1992	Interview	Retail, Residential	132
Loop 281	Longview 76,000	Flush Median	Raised Median	Spur 63 to Spur 502	0.6	1996	Interview	Retail	65
Call Field Road	Wichita Falls 98,200	Undivided	Raised Median	Kemp Blvd. to Lawrence Street	0.3	Surveyed pre-constr.	Interview	Retail	55
Grant Avenue	Odessa 95,400	Undivided	Raised Median	2nd Street to 8th Street	0.6	1992	Interview	Retail, Office	42
Various	Amarillo 168,000	Raised Median	Undivided or TWLTL	Varies	Varies	Varies (1989–1995)	Interview	Retail	118

Figures 2-1 through 2-4 show additional points of interest along the test corridor. Figure 2-1 shows a typical turn lane and landscaping of the median. Figure 2-2 shows median landscaping and adjacent shopping centers. University Drive is in the background. Figure 2-3 shows the signage and lack of a median opening for Dominik Drive motorists as they approach Texas Avenue. Figure 2-4 shows the raised median looking back to University Drive in the background.

2.3.2 South Post Oak Road (Houston, Texas)

One of the four locations selected in Houston, Texas was South Post Oak Road from the I-610 extension to South Main Street. The north end project limit includes direct connect access to I-610, the loop freeway around Houston. There were approximately 155 businesses along the corridor. This corridor was reconstructed from a four-lane undivided roadway to a six-lane facility with a raised median. The construction of the median was performed from 1988 to 1990 along the approximately 1.5-mile corridor. The site was selected since it contains substantial development in the form of several stand-alone businesses as well as strip development. In addition, there were some undeveloped land parcels along the corridor, and the effects upon undeveloped land was an interest of the sponsoring agency. This corridor is also unique in that the median locations are channelized to allow turning maneuvers in only one direction. The research team decided to perform in-person survey administration along this corridor since it was rather unique due to these several characteristics.

Photographs in Figures 2-5 through 2-8 illustrate interesting aspects of the street. Figure 2-5 is taken just south of the I-610 direct access ramp to South Post Oak Road. This photograph displays the channelized median which allows traffic to turn in only one direction. Note that the DO NOT ENTER traffic sign warns southbound drivers along South Post Oak Road not to enter the opening.

Figure 2-1. Median Treatment along Texas Avenue.

Figure 2-2. Typical Median Landscaping Treatment with University Drive in the Background.

Figure 2-3. Dominik Drive at Texas Avenue without a Median Opening After Construction.

Figure 2-4. Typical Landscaping and Median Openings along Texas Avenue.

Figure 2-5. Southbound South Post Oak Road at the Northern End of the Project Limit.

Figure 2-6. Southbound South Post Oak Road Illustrating Channelized Median.

Figure 2-7. Southbound South Post Oak Road with Strip Development and Median Landscaping.

Figure 2-8. Back-to-Back Channelized Median Openings along South Post Oak Road.

Figure 2-6 shows another illustration of the channelized median design. This photograph also shows the landscaping within the median. Figure 2-7 also shows the median landscaping and strip development typical for this corridor. Finally, Figure 2-8 illustrates two back-to-back channelized raised median openings. Also note the truck traffic that is rather significant along this corridor.

2.3.3 Clay Road (Houston, Texas)

Another location in Houston is the 2.3-mile segment of Clay Road from Hollister Road to Gessner Road. This east/west street was previously two relatively narrow lanes in each direction and was widened to include the installation of a raised median. This site was attractive to the research team since it was completed relatively recently, with construction from 1994 to 1996.

The corridor contains strip development and some stand-alone businesses. There are approximately 63 businesses along the Clay Road corridor. In addition, there are many undeveloped parcels along the Clay Road segment. The corridor is experiencing growth as large companies move into the area. The research team decided to perform the survey administration of this corridor with mail-out surveys. Figures 2-9 through 2-12 provide more detail of the corridor.

Figure 2-9 shows the eastern-most end of the east/west roadway case study. This figure also shows the design of the raised median and landscaping. Figure 2-10 shows the median design at a signalized intersection in a more developed location along the corridor. Figure 2-11 shows the raised median landscaping along the corridor, and Figure 2-12 illustrates another example of the median design at an intersection. These pictures also show the relatively large amount of undeveloped land along the corridor.

Figure 2-9. Eastbound Clay Road at Hollister Road.

Figure 2-10. Westbound Clay Road at Hollister Road.

Figure 2-11. Typical Median Landscaping along Clay Road.

Figure 2-12. Median Design at the Intersection of Clay Road and Gessner Road.

2.3.4 West Fuqua Road (Houston, Texas)

The West Fuqua corridor was used as a case study for the 1.5-mile length from Hiram Clarke Road to Almeda Road. Prior to the installation of the raised median, the traffic was undivided with one lane of traffic in each direction. The construction period lasted from 1987 to 1989 during which a raised median was added and the road was widened. Although this project was not within the ideal time-frame for age, the research team selected it for an additional site for a mail-out survey. The corridor contains significant amounts of undeveloped land as well as strip development and some stand-alone businesses—approximately 70 in all.

The pictures in Figures 2-13 through 2-15 show interesting aspects of the corridor. Figure 2-13 is taken looking eastbound on West Fuqua just east of Hiram Clarke Road. This photograph shows the landscaped median, roadway geometry, and adjacent land use. Figure 2-14 shows the staggered intersection of White Heather Road with West Fuqua Road. The intersection in the foreground illustrates an unsignalized portion and the respective median treatment, while in the background the signalized leg is shown. Figure 2-15 is taken along eastbound West Fuqua Road at Buffalo Speedway and again shows the median treatment and the roadway geometry along with the large amount of adjacent undeveloped land.

2.3.5 Long Point Road (Houston, Texas)

The fourth case study in Houston, Texas, is along Long Point Road from Campbell Road to Hollister Road. The land use along this 0.7-mile corridor is mainly strip development and some stand-alone commercial properties. There is no undeveloped property along the corridor. This corridor is undivided with two lanes in each direction. Widening of the roadway to allow for a raised median is being planned. There are approximately 40 businesses along the corridor. This site provided valuable insight into the economic impacts of a corridor in which there are near future plans for median installation.

Figure 2-13. Eastbound West Fuqua Road at Hiram Clarke Road.

Figure 2-14. White Heather Road Intersection Median Treatment.

Figure 2-15. Eastbound West Fuqua Road at Buffalo Speedway.

Figures 2-16 through 2-18 contain pictures that illustrate the site. Figure 2-16 is taken westbound along Long Point Road at the Hollister Road intersection. The photograph shows the roadway geometry at the intersection. Figure 2-17 is taken midway along the corridor at a curve along the roadway. One of the principal reasons behind the installation of the raised median was to improve safety along this horizontal curve segment. Figure 2-18 is taken eastbound at Campbell. Figures 2-16 and 2-18 are the east and west ends of the project, respectively.

Figure 2-16. Westbound Long Point Road at Hollister Road.

Figure 2-17. Eastbound Long Point Road Midway along Study Corridor.

Figure 2-18. Eastbound Long Point Road at Campbell Road.

2.3.6 Twin Cities Highway (Port Arthur, Texas)

Twin Cities Highway (Texas 347) is one of two sites selected for study in Port Arthur, Texas. The 2.0-mile route being studied was between 53rd Street/Hogaboom Road and Griffing Park Drive/25th Street. This location was of interest to the research team since the raised median was removed along this corridor from 1983 to 1985 and the two-way left-turn lane was put back in the street along this segment. Mail-out surveys were sent to approximately 90 business owners along the corridor which includes mostly strip mall and stand-alone businesses. The research team felt that this location would provide a unique opportunity to obtain economic impact data from a location in which the raised median was removed.

Figures 2-19 and 2-20 display some of the interesting features of this case study. Figure 2-19 shows the cross section of the existing site including the three lanes of traffic in each direction with the two-way left-turn lane. The photograph is taken north of Texas 73. Looking closely at the TWLTL, one can see the previous location of the raised median. This photograph shows where a turn bay was previously located when the raised median was in place. The significant development along this corridor is also illustrated in this figure. Figure 2-20 is taken southbound at 33rd Street. This photograph shows the adjacent land use along the corridor. The previous raised median location can also be seen in the existing TWLTL at the intersection.

2.3.7 9th Avenue (Port Arthur, Texas)

This is the second location in Port Arthur, Texas, selected by the research team. The corridor is 1.5 miles from Texas 365 to Lake Arthur Drive, and it contains a mix of land uses including residential, undeveloped land, some strip development, shopping centers, and a few stand-alone businesses. In all, there are approximately 65 businesses along the corridor to which surveys were mailed. The roadway was previously a two-way undivided facility with one lane of traffic traveling in each direction. The raised median and an additional lane of traffic in each direction were added from 1979 to 1980 when the roadway was widened. Although the time frame of this median installation is much older than initially desired by the research team, the research team thought that it would be interesting to investigate the ability to obtain data for an installation of this age. The close proximity to the other Port Arthur location also made this site useful for the study.

Figure 2-19. Southbound Twin Cities Highway North of Texas 73.

Figure 2-20. Southbound Twin Cities Highway at 33rd Street.

Figures 2-21 and 2-22 provide illustrations of unique elements of this case study location. Figure 2-21 is taken southbound on 9th Avenue at Texas 365 (Port Neches Highway) at the northern end of the study corridor. This photograph shows the cross-sectional geometry of the facility including the landscaped median in the background. It is also clear that the southbound lanes were newly constructed during the raised median installation since they appear newer than the northbound lanes. The adjacent land uses including strip development can also be seen on both sides of the roadway. Figure 2-22 illustrates the median treatments at an intersection along the 9th Avenue corridor. Gas stations are shown on the southeast and southwest corners of the intersection.

2.3.8 University Drive (McKinney, Texas)

The University Drive (US Highway 380) corridor in McKinney is approximately 1.4 miles in length and has six travel lanes. McKinney, with a population of approximately 25,000, is located about 30 miles north of Dallas and is beginning to show suburban development trends. It is bounded by US Highway 75 (Central Expressway) on the west and Texas Highway 5 (McDonald Street) on the east. University Drive is a gateway to McKinney from US 75. This corridor is the desired age, since the median was completed in late 1992, making it between five and six years old at the time of the study. The raised median on University Drive is fairly basic in design with openings at most street intersections and some private driveway intersections. A variety of land uses exist along the corridor, including an area of relatively newer retail development, two areas of relatively older retail development, and an area transitioning from residential to retail/office development. The retail development at the western end of the corridor is relatively new and in the form of typical strip shopping centers that include two or three anchor businesses and many smaller specialty stores. Some of these centers also have free-standing outparcel businesses. The center portion of the corridor includes several older houses which have been transformed into various types of businesses. The eastern end of the corridor is comprised of relatively older retail development consisting of smaller strip centers. Researchers recorded 132 total establishments on this corridor.

Figure 2-21. Southbound 9th Avenue at Texas 365.

Figure 2-22. Southbound 9th Avenue at Turtle Creek Road.

Figures 2-23 through 2-25 show cross sections of University Drive as well as the various types of land development. Figure 23 is on the eastern end of the corridor and presents a typical view of the high density of driveways of the older retail developments. The central portion of the corridor and its area of transition from residential to commercial land uses are presented in Figure 2-24. Figure 2-25 illustrates the western end of the corridor and its modern shopping centers that have very few driveways.

Figure 2-23. Westbound University Drive near Church Street.

Figure 2-24. Eastbound University Drive near West Street.

Figure 2-25. Westbound University Drive near Graves Street.

2.3.9 Loop 281 (Longview, Texas)

The Loop 281 corridor in Longview is approximately 0.6 miles long and has six travel lanes. Longview is located in eastern Texas, approximately 125 miles east of Dallas, and has a population of about 75,000. There are a few nearby small towns and the small city of Marshall is 20 miles away.

The corridor is bounded on the west by Spur 63 (McCann Road) and on the east by Spur 502 (Judson Road). This segment of the road is abutted completely by retail development, including a regional mall, a few shopping centers, and several free-standing businesses. This corridor has a relatively low driveway density because of the predominant shopping center style development. The median, completed in late 1996, was relatively new at the time of this study. Although it was not in the time frame defined in the methodology, this corridor contains a good mix of retail establishments that fit the methodology's criteria. Therefore, the research team decided to include it in the study.

Loop 281 previously had a flush median on this segment that was similar in width to a TWLTL at the west end and significantly wider at the east end. One of the interviewees referred to the wider end as a No Man's Land where automobiles would enter, accelerate, and exit at various haphazard angles and speeds. The wider end of the median now has a left-turn lane adjacent to the travel lanes and pavestone covering the remainder of the area. Several of the businesses along this segment of Loop 281 are located in shopping centers that have additional access from side streets. Therefore, the research team used discretion when targeting businesses to be surveyed. The researchers identified approximately 65 businesses along this corridor.

Figures 2-26 through 2-28 show the various attributes of the median along the Loop 281 corridor, including the channelization of left-turn bays and the low-driveway density. The widest portion of the median, located at the western end of the corridor, is shown in Figure 2-26. Figure 2-27 provides a good illustration of the channelized left-turn bays and how the median gets narrower toward the western end of the corridor. Figure 2-28 shows an example of how previous left-turn access to and from an individual business was eliminated. There is a median opening just east of this location which provides access to this business, as well as an adjacent shopping center.

2.3.10 Call Field Road (Wichita Falls, Texas)

The Call Field Road corridor, located in Wichita Falls, is approximately 0.3 miles long. Wichita Falls is about 110 miles northwest of Fort Worth, near the Oklahoma border. This corridor is in an older area that has experienced some commercial redevelopment in recent years. The case study segment is almost completely retail, with the main exception being a television station. There are also two streets, Faith Street and Rhea Street, which have T-intersections with Call Field Road that are of interest, due to the businesses located on those streets. Faith Street and Rhea Street also provide additional access to shopping centers and individual businesses which face Call Field Road.

This corridor is one of two (Long Point Road in Houston is the other) on which the median was not yet constructed at the time of this study. Therefore, the research team collected data from these businesses that is based upon their expectations of future impacts.

Faith Street, which intersects Call Field Road near the east end of the corridor, contains one block of retail establishments immediately south of Call Field. For about one year prior to construction, and this study, left turns to and from Faith Street have been prohibited. This prohibition is effected with the posting of signs and, according to interviewees, active police enforcement. The raised median, once installed, will physically prevent these left-turn maneuvers.

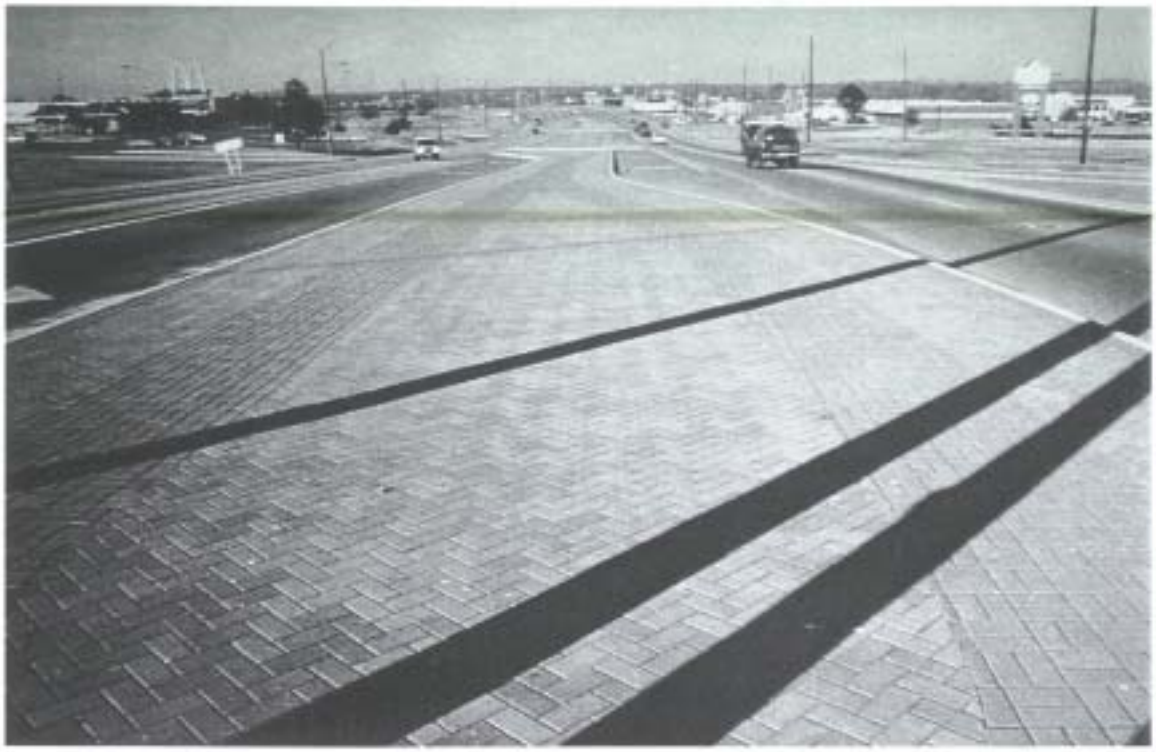

Figure 2-26. Westbound Loop 281 near Judson Road.

Figure 2-27. Westbound Loop 281 between Judson Road and Tuttle Road.

Figure 2-28. Facing South on Loop 281 West of Tuttle Road.

Rhea Road actually intersects Call Field Road near the west end of the corridor. This segment of Rhea Road provides secondary access to two shopping centers which abut Call Field Road. This intersection of Rhea Road and Call Field Road is signalized and will remain completely open to all turning maneuvers after the median is completed. There is also a commercial center, whose only access is from Rhea Road, that contains a mix of retail and service businesses. Due to their separation from Call Field Road, and the fact that all left turns will continue to be allowed at the intersection of Rhea Road and Call Field Road, those businesses were not included in the survey. Lawrence Street has a T-intersection with Call Field Road immediately west of the Rhea Road intersection. However, there are no businesses on Lawrence Street affected by the median project.

Figures 2-29 through 2-32 illustrate the Call Field Road corridor, including Faith Street, which intersects Call Field Road, before construction began. Figure 2-29 shows the eastern end of the corridor, looking west from Kemp Boulevard. The central portion of the corridor, which is characterized by a higher driveway density, is shown in Figure 2-30. Figure 2-31 presents the signalized intersections with Rhea Road and Lawrence Street. The Rhea Road intersection (from the south/left) is the segment of interest in this study. Figure 2-32 illustrates Faith Street, which has some retail development and primarily lay-down curb (continual open access to the parking lot), including the sign prohibiting left turns at Call Field Road.

2.3.11 Grant Avenue (Odessa, Texas)

The Grant Avenue (US Highway 385) study segment is unique in that it is located in the central business district of Odessa, which has a population of approximately 95,000. Grant Avenue (Andres Highway from a point beyond the north end of the case study) is a major north-south street through Odessa. The 0.6-mile corridor is bounded by 2nd Street (US Highway 80) on the south and 8th Street on the north. The corridor is comprised of a mix of retail and office development, including expansive municipal government and high-rise office buildings. The area has been undergoing a redevelopment process for the past few years, converting older buildings which had been vacant into offices and retail establishments. In fact, the median project was one element of an organized downtown revitalization effort. This corridor previously consisted of four undivided travel lanes and angle parking at the curbs. Installation of the median required that the parking be changed to a parallel configuration, since the project involved no additional right-of-way. As a part of the parking reconfiguration, pairs of parallel parking spaces were separated by eight-foot by eight-foot no parking areas. This feature facilitates easier parallel parking on the street, allowing more vehicles to pull into spaces head-first. The median segments are one block in length, with openings at all street intersections. The southern end of the corridor is comprised of a police station, courthouse, and parking areas. Immediately to the north is a concentration of attorney offices mixed with some retail businesses. The central portion of the corridor is comprised primarily of retail businesses, while the northern end is primarily office buildings.

Figure 2-29. Westbound Call Field Road at Kemp Boulevard.

Figure 2-30. Westbound Call Field between Faith Road and Rhea Road.

Figure 2-31. Westbound Call Field Road at Rhea Road.

Figure 2-32. Northbound Faith Road near Call Field Road.

Figures 2-33 and 2-34 show the mix of establishments on the Grant Avenue corridor. Figure 2-33 illustrates the Grant Avenue cross section and the abutting land uses along the northern two-thirds of the corridor. An example of the parallel parking configuration is presented in Figure 2-34.

2.3.12 Amarillo, Texas

Thirteen median removal sites in Amarillo, Texas, were also investigated to obtain perception information from business owners regarding the economic impacts of raised medians. These median removals included construction near several intersections on the west side of the city. The medians were being shortened in length from 50 to 200 feet to allow driveway location access to adjacent businesses. The raised median at these sites were not as wide as those that were built at the other case studies, but rather were traversable medians approximately two feet in width. Upon removal of the medians, the roadway would operate as undivided. Two of the sites were converted to a TWLTL after the removal. Figures 2-35 and 2-36 show these median treatments. Figure 2-35 shows the final location of the raised median at one site along Georgia Street south of Line Avenue in Amarillo where the raised median has been removed to allow access to an auto parts store. Figure 2-36 also shows how the raised median was removed to allow access for the pharmacy.

2.4 DATA COLLECTION

One of the initial considerations of the research team was the ability to obtain valuable data from the business owners (i.e., would business owners be willing to volunteer accurate data?). In addition, the research team desired to obtain data from as many respondents as possible. As a result, the team developed two survey instruments, one for interviews and one for mail-outs. Utilizing two types of survey instruments provided useful information with which to compare their effectiveness. Tables 2-2 and 2-3 present participation rates for the mail-out surveys and personal interviews, respectively.

Figure 2-33. Northbound Grant Avenue at 4th Street.

Figure 2-34. A Typical Parallel Parking Configuration along Grant Avenue.

Figure 2-35. Georgia Street South of Line Avenue.

Figure 2-36. Line Avenue East of Georgia Street.

Table 2-2. Participation Rates for Mail-Out Surveys.

Street Name	City and State	Number of Parcels		Total Number Sent	Returned Surveys		Participation Rates (Percent)		
		Businesses	Undeveloped Land		Businesses	Undeveloped Land	Businesses	Undeveloped Land	Total
Clay Road	Houston, Texas	61	11	72	8	1	13	9	13
Fuqua Road	Houston, Texas	62	28	90	2	4	3	14	7
Long Point Road	Houston, Texas	35	0	35	6	0	17	N/A	17
Twin Cities Highway	Port Arthur, Texas	90	0	90	5	0	6	N/A	6
9th Avenue	Port Arthur, Texas	68	23	91	5	3	7	13	9
Totals =		316	62	378	26	8	8	13	9

Table 2-3. Participation Rates for Personal Interviews.

Street Name	City and State	Total Number of Establishments Contacted[1]	Number of Business Participants	Participation Rates (Percent)
Texas Avenue (1997)	College Station, Texas	130	95	73
Texas Avenue (2000)	College Station, Texas	50	34	68
South Post Oak Road	Houston, Texas	50	19[2]	36
University Drive	McKinney, Texas	47	29	62
Loop 281	Longview, Texas	40	22	55
Call Field Road	Wichita Falls, Texas	27	17	63
Grant Avenue	Odessa, Texas	21	15	71
Various	Amarillo, Texas	67	22	33
Totals[3] =		302	158	55

[1]There were no undeveloped land parcels along any of the corridors except South Post Oak Road. This corridor had three such parcels, but two of them requested a mail-out survey, and one was not able to be contacted.

[2]Nine additional surveys not reflected here were received from the South Post Oak Road businesses. These were from individuals who had requested that they be sent a survey instead of performing a personal interview, or responses to surveys sent to many of the businesses along South Post Oak Road if there was difficulty contacting them.

[3]Does not include Texas Avenue (1997) data.

To aid in obtaining as much data as possible, given the time and financial constraints of the project, the research team sent mail-out surveys to businesses along five of the case study corridors. This process yielded additional data for the research from different study locations and provided an opportunity for evaluating different data collection techniques.

2.4.1 Mail-Out Surveys

The participation rates for the five mail-out surveys performed in the second year of the research effort are illustrated in Table 2-2. This table breaks down the participation rate by corridor and parcel type (e.g., business or undeveloped land). The participation rates ranged from 6 to 17 percent. Overall, the total participation rate for both businesses and undeveloped land was 9 percent. Surveys were sent to all businesses and undeveloped landowners identified along the corridor during the windshield survey and through the appraisal district data. Therefore, businesses that moved, did not want to participate, or were not likely to be affected by the median were not removed from the mailing list prior to sending the surveys. Since the mail-out surveys were relatively low cost, the time was not taken to remove these individuals from the

list. Further, it was possible that some of these establishments would provide additional information of interest. The result is that the participation rates are lower than they would have been had these businesses been removed from the original sample.

It should also be noted that the Spring Branch area is in the process of revitalizing the areas near the Clay Road and Long Point Road corridors in Houston. The Spring Branch Revitalization Association was conducting public hearings discussing the plans for the Long Point Road corridor and also discussing the economic developments and revitalization along Clay Road. The research team was able to attend one such meeting. It is likely that these ongoing and current efforts in this area supported the relatively higher participation rates of these corridors.

Finally, for a very small cost, the research team sent out reminder cards about three to four weeks after the mail-out surveys were originally sent. This reminder did seem to help in obtaining a response from some businesses and undeveloped landowners as a few more surveys were received. It also prompted several individuals to call the research team and thank them for the reminder. Usually these individuals would simply respond that they regretted to inform the researchers that they did not believe their information would be of value since their business had arrived so far after the completion of the raised median. However, this was still useful to the research team because these individuals could sometimes supply anecdotal information of use about the corridor, and it helped in keeping track of what businesses or undeveloped landowners had or had not participated.

2.4.2 Personal Interview Surveys

Table 2-3, previously presented, displays the participation rates for the personal interviews as well as the original test of the methodology in the first year of the project along Texas Avenue. The participation rates are generally much higher when performing personal interviews than mailing out the surveys. The participation rates range from 33 percent (Amarillo, Texas) to 73 percent (Texas Avenue in 1997). It is expected that the participation rates along the Amarillo, Texas, corridors are relatively low since a Chamber of Commerce support letter was not obtained.

2.4.3 Customer Surveys

The third survey that was developed for this project was the customer survey. These surveys were performed in the final year of the project for comparison to what the business owners themselves stated regarding the raised median. Five locations along the Texas Avenue corridor in College Station were used for these surveys after permission was granted from the business owners. Students handed out the one-page customer surveys for one day, over two to four hour periods at each site. The results of these surveys are described in Chapter 3.0 with the analyses.

3.0 ANALYSES RESULTS

3.1 INTRODUCTION

This chapter will present and describe the analyses results obtained from all the case study locations. Figure 3-1 illustrates the sequence of data analyses that were performed. There were primarily six components in the analyses as shown in each block of the figure. Supplemental data for each step are shown in the respective appendix listed in Figure 3-1. The sections that follow will describe each of these analyses steps in more detail as well as present the research results.

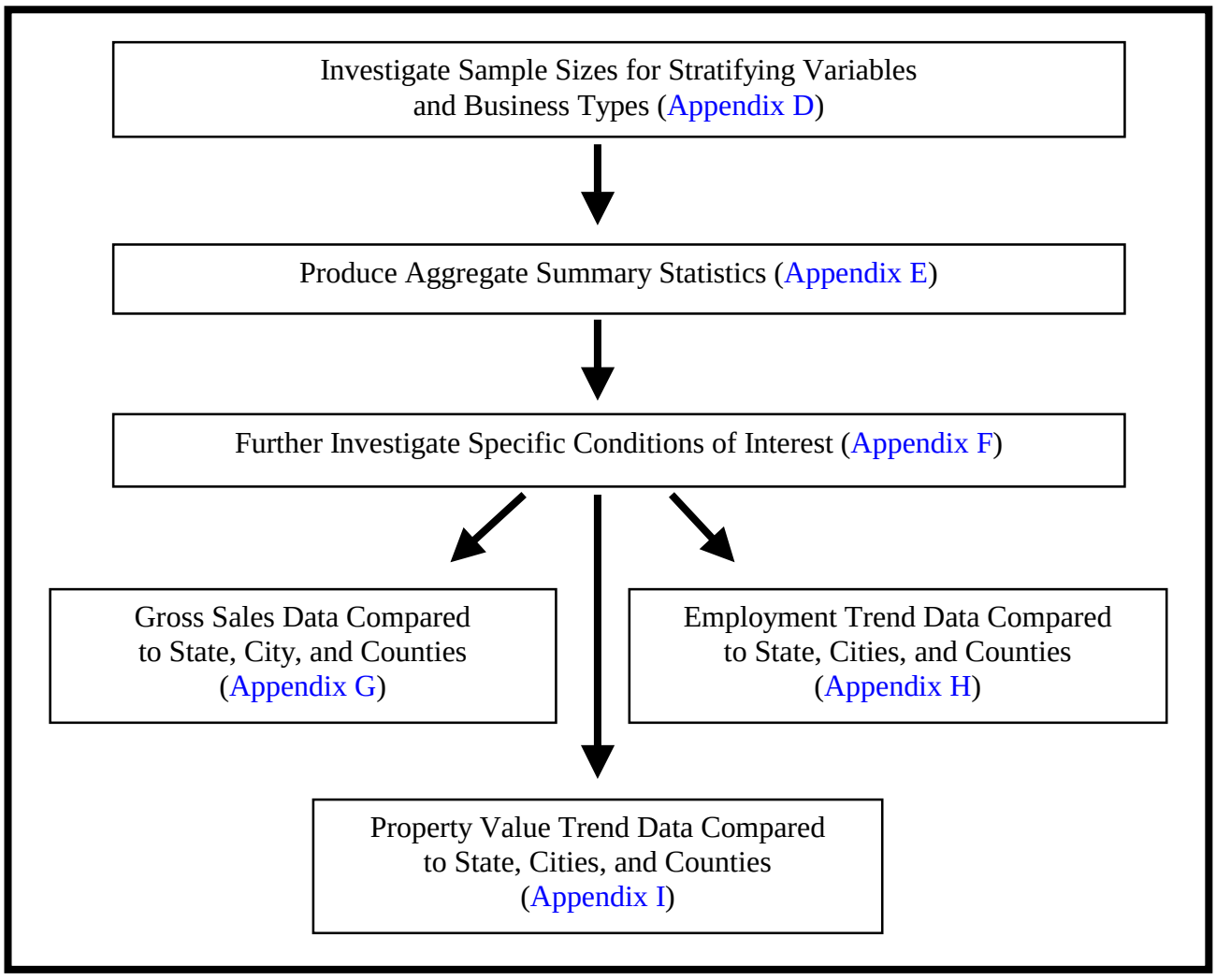

Figure 3-1. Data Analyses Procedure.

3.2 DATA REDUCTION AND QUALITY CONTROL

Ensuring that the data were recorded reliably and consistently from both the business surveys and customer surveys was of high importance to the research team. To ensure the reliability, one individual recorded the business survey results in an Excel spreadsheet. Two persons recorded the shorter and easier to code customer surveys into Excel. The analyses were then performed by reading the data into the statistical software SAS in which all data analyses were performed.

It should be noted that the data obtained in the first year of the project along Texas Avenue in College Station were not incorporated in the analyses that follow. This was because the survey instruments for the Texas Avenue study and the 10 additional case studies added in the second year and analyzed in the third year were inconsistent. This inconsistency resulted as the survey instrument was changed as the data collection methodology was enhanced. When appropriate, references are made to the results prior to the construction of the raised median in College Station along Texas Avenue from year one of this project. The results that follow include the data collected along the Texas Avenue corridor in the fourth year of the study as these data are compatible to the data collected at the additional 10 studies that were collected in the second year. As previously mentioned, the customer surveys were performed at five businesses in College Station in the fourth year of the study for comparison to the business surveys.

3.3 SAMPLE SIZES FOR STRATIFYING VARIABLES AND BUSINESS TYPES

The first step of the analysis was to obtain sample size information for the stratifying variables of interest. For the business surveys, these stratifying variables included the business type, when the business arrived along the corridor relative to the median installation, whether the business was at a mid-block or street intersection location, if the business was in a shopping center or was a stand-alone establishment, if the business was on a corner lot, and combinations of these stratifying variables.

The stratifying variable, when the business arrived along the corridor relative to the median installation, is termed business group throughout this report. The four business groups are as

defined in Figure 3-2. All the subsequent analysis is performed by breaking up the data into these business groups. For example, the results of those businesses in group one—those businesses present before, during, and after construction—can be compared with those businesses in group two, where the median has yet to be installed. Group one includes the sites in McKinney, Longview, Odessa, South Post Oak Road (Houston), West Fuqua Road (Houston), Clay Road (Houston), 9th Avenue (Port Arthur), and College Station. Group two includes the sites in Wichita Falls and Long Point Road (Houston) where the surveys were performed prior to construction of the raised median. Group three includes data from McKinney, Longview, Odessa, Clay Road (Houston), 9th Avenue (Port Arthur), and College Station. Finally, group four data were obtained from McKinney, Longview, Odessa, South Post Oak (Houston), Fuqua Road (Houston), Clay Road (Houston), 9th Avenue (Port Arthur), and College Station. Recall that Twin Cities Highway (Port Arthur) and the Amarillo locations are where the median removal was performed, and analyses on that corridor are discussed later in this chapter.

Table 3-1 illustrates the sample sizes by business group, and shows that there are 163 business surveys analyzed. The table presents the sample size information by case study corridor.

Of particular interest is the amount of sample for each business type. Table 3-2 presents the sample size breakdown for each type of business for the four business groups. Hair salons are the only business type not represented in the 76 observations available for business group one (before group). Table 3-3 presents the sample size information for each business type by case study location. Table 3-4 presents the sample size information for the customer surveys performed in College Station along Texas Avenue. There were a total of 452 customer surveys returned. Appendix D includes additional sample size information by stratifying variables of interest. The reader is encouraged to review Appendix D for additional sample size information including:

- shopping centers and stand-alone businesses by business group;
- personal interviews and mail-out surveys by business group;
- closest business access along the corridor by business group;
- business type by closest access location; and
- business type by building type.

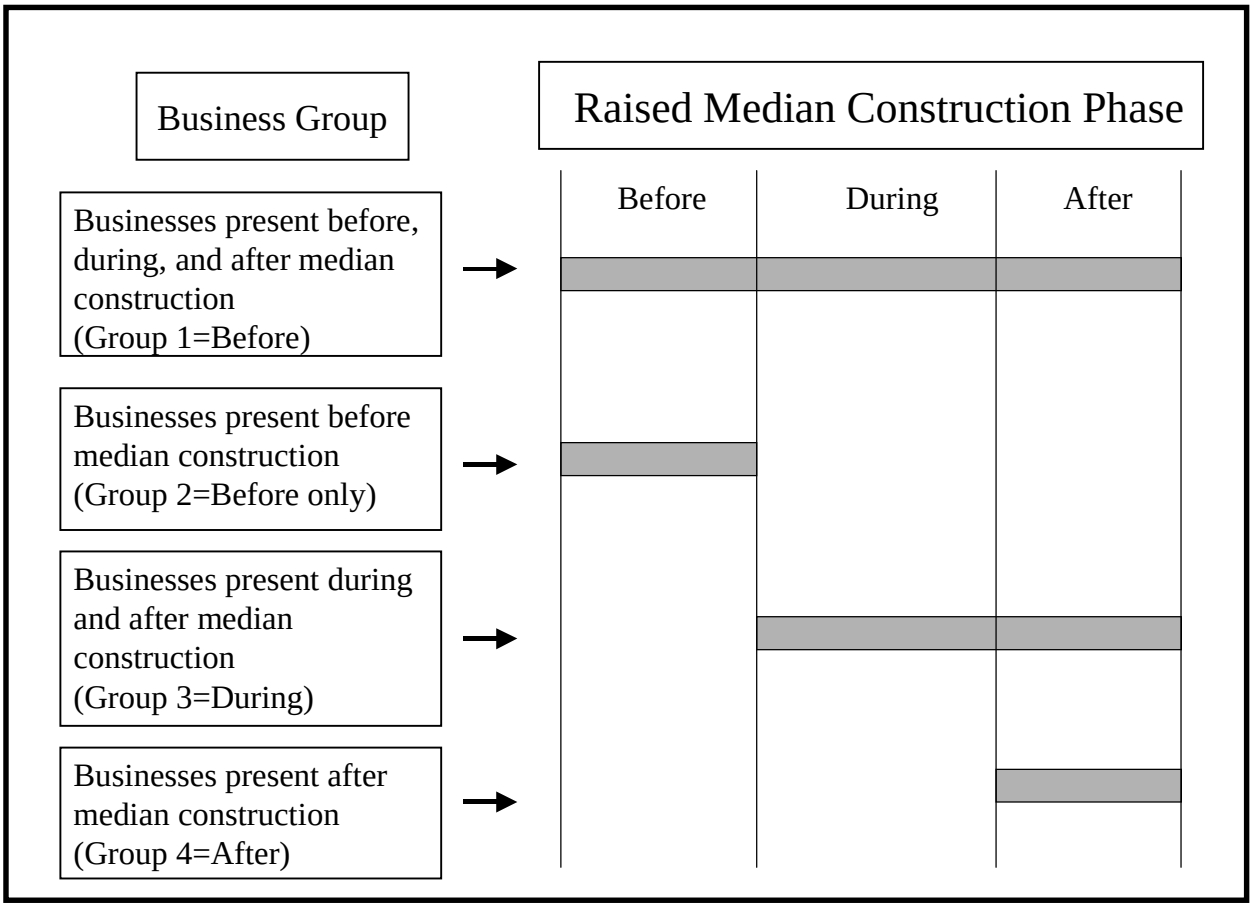

Figure 3-2. Business Groups as Defined by Raised Median Construction Phase.

Table 3-1. Business Group Sample Sizes by Site.

Business Group	McKinney	Longview	Wichita Falls	Odessa	South Post Oak Road	Long Point Road	Fuqua Road	Clay Road	9th Ave.	Texas Ave.	Totals
1	10	18	0	8	13	0	1	3	0	23	76
2	0	0	17	0	0	6	0	0	0	0	23
3	3	2	0	1	0	0	0	2	1	8	17
4	12	2	0	5	17	0	1	3	4	3	47
Totals	25	22	17	14	30	6	2	8	5	34	163

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

Table 3-2. Sample Sizes for Business Type by Business Group.

Business Group	Durables Retail	Specialty Retail	Grocery	Gas Stations	Fast-Food Restaurant	Sit-Down Restaurant	Medical	Auto Repair	Hair Salon	Other Services	Other	Total
1	2	23	1	5	11	10	2	7	0	12	3	76
2	1	8	2	1	1	1	3	1	3	2	0	23
3	1	7	0	1	1	2	1	0	1	3	0	17
4	4	14	2	1	2	7	1	0	2	13	1	47
Totals	8	52	5	8	15	20	7	8	6	30	4	163

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

Table 3-3. Sample Sizes for Business Type by Site.

Site	Durables Retail	Specialty Retail	Grocery	Gas Stations	Fast-Food Restaurant	Sit-Down Restaurant	Medical	Auto Repair	Hair Salon	Other Services	Other	Totals
McKinney	1	4	2	2	7	6	0	0	1	2	0	25
Longview	2	14	0	0	2	4	0	0	0	0	0	22
Wichita Falls	1	8	1	1	1	0	1	0	2	2	0	17
Odessa	2	6	0	0	0	1	1	1	2	1	0	14
South Post Oak Rd.	1	8	0	1	0	1	2	3	0	10	4	30
Long Point Road	0	0	1	0	0	1	2	1	1	0	0	6
Fuqua Road	1	0	0	0	1	0	0	0	0	0	0	2
Clay Road	0	1	0	1	1	0	1	2	0	2	0	8
9th Avenue	0	0	1	0	0	0	0	0	0	4	0	5
Texas Avenue	0	11	0	3	3	7	0	1	0	9	0	34
Totals	8	52	5	8	15	20	7	8	6	30	4	163

Table 3-4. Customer Survey Overall Sample Size Information.

Business Type	Completed Surveys	Percentage of Total
First Sit-Down Restaurant	168	37.2
Second Sit-Down Restaurant	65	14.4
First Gas Station	56	12.4
Second Gas Station	56	12.4
Fast-Food Restaurant (inside)	65	14.4
Fast-Food Restaurant (drive thru)	42	4.3

3.4 STATISTICAL SIGNIFICANCE OF ANALYSES AND RESPONSE BIAS

The target population for the business surveys for all the corridors included all the businesses and establishments adjacent to the corridors in the project. Random sampling of such a small population would require mathematically involved statistics. However, for this project, it was possible to contact the entire population along the corridor. In spite of this, complete information for the whole population was not obtained because some business managers chose not to answer some or all of the questions. Whether the information obtained from those who chose to respond is representative of the whole population is open to speculation. Respondents themselves selected whether or not to respond to the survey and thus were not chosen at random. Therefore, statistical tests based on random sampling do not answer the question of whether the number of respondents was appropriate for inferences about the whole population. Furthermore, there is an inherent response bias in the collected data since not all businesses completed a survey. Even though the information may not fully represent the whole population, this was the most complete information that was available.

Customer surveys were performed over a two week period. The surveys were handed out by students for one day, over two to four hour periods at each site at five locations in College Station. As above, respondents themselves selected whether or not to respond to the survey and thus were not chosen at random. It is again open to speculation as to whether the information obtained from these surveys is representative of the whole population of customers at a given institution or a like business. However, the customer surveys provide an interesting comparison to the business owner survey results.

3.5 AGGREGATE SUMMARY STATISTICS

The next step in the analysis shown in Figure 3-1 was to produce aggregate statistics of the survey questions of interest. The questions that were investigated include changes in the following:

- passerby traffic;
- relative importance of access;

- raised median installation on regular customers;
- full- and part-time employees, property values, accidents, traffic volume, customers per day, gross sales, gross sales where the median was installed, and gross sales in the area;
- traffic congestion, traffic safety, property access, business opportunities, customer satisfaction, and delivery convenience; and
- extent of public involvement.

3.5.1. Impacts on Passerby Traffic

Changes in passerby traffic, or impulse buyers, are often of interest when considering the impacts of raised medians. The usual perception of business owners is that the raised median will restrict the amount of passerby traffic as motorists are required to take a more circuitous route to get to their business. Table 3-5 presents the change in passerby traffic for each business group. A small decrease (2.5 percent) is indicated for the passerby traffic for those businesses in group one that were present before, during, and after the raised median installation. Conversely, the perception of those individuals in group two that were present prior to the raised median installation expected an average of a five percent increase in passerby traffic. In addition, those business owners that arrived during the construction phase (group three) indicated a small decrease (2.2 percent) in passerby traffic. Finally, those individuals that arrived after the raised median installation (group four) indicated a perception that passerby traffic would have increased by 12.0 percent. Appendix E shows additional statistics for each of these business groups including the number of observations, minimum values, and maximum values.

Table 3-5. Percent Change and Sample Size for Passerby Traffic by Business Group.

Business Group	Sample Size	Percent Change Standard of Deviation
1	52	–2.5% 9.3
2	5	5.0% 11.2
3	9	–2.2% 6.7
4	6	12.0% 23.9

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

Additional analyses regarding passerby traffic for each business type and business group were also performed. Table F-1 of Appendix F presents this information. For many of the cells, sample sizes are relatively low or even missing. However, for the before group businesses (group one), it was observed that fast-food restaurants experienced a small increase in passerby traffic while all others reported no change in passerby traffic or a small decrease in passerby traffic. Gas stations indicated the largest decrease in passerby traffic at 17.5 percent.

More disaggregate analyses of passerby customer perceptions from business owners are also shown in Table F-2 of Appendix F. The reader is encouraged to review these results for stratifications of businesses that were present before, during, and after the installation of the raised median for additional information regarding passerby traffic. Findings of interest from Table F-2 include:

- Specialty retail, sit-down restaurants, and other services located in shopping centers and at the street intersection did not indicate any change in passerby customers.
- Increases in passerby traffic were indicated by specialty retail businesses located mid-block, both in shopping centers and stand-alone.

- Decreases in passerby traffic were provided for specialty retail, gas stations, and fast-food restaurants that were stand-alone located at a street intersection after the median installation.

Customers were also asked whether their particular trips to the businesses surveyed were passerby trips. Table 3-6 summarizes the results of these customer surveys. The percent of trips that were passerby are highest for gas stations and the fast-food restaurant drive thru. It should be noted that the first question of the survey asked whether the customer was familiar with the widening project along Texas Avenue in which a raised median was installed that eliminated the turn lane along Texas Avenue in front of the business. Further, the second question of the survey asked whether customers patronized the business prior to the raised median installation. This combination is included in the first column of Table 3-6 to provide comparison of the results of those individuals that frequented the business prior to the median installation to those that have become customers after the median installation. Note that while there are five total locations, six sets of data appear as separate surveys were performed at the fast-food restaurant for individuals inside the store and those going through the drive-thru.

3.5.2 Impacts on Importance of Access to Customers

Question eight of the survey shown in Appendix A asked business owners to rank accessibility to store with other factors including distance to travel, hours of operation, customer service, product quality, and product price in order of importance that customers use when selecting a business of their type. The results of this analysis by business group are shown in Table 3-7 for those businesses there before, during, and after the median installation (group one). In all cases, the accessibility to the store ranked third or lower. Generally, accessibility was ranked lower than the items of customer service, product quality, and product price—all elements that business owners/management themselves can directly influence. Once again, on the customer survey, a similar question was asked. These results are shown in Table 3-8 compared to the business owner's/manager's survey result. In all cases, the customers ranked accessibility to store with lower, or equal, value to the business owners. Accessibility is ranked as number two at one of the gas station locations after product price. The results in Table 3-8 are for customers that knew of the raised median project and patronized the business prior to the median installation.

Table 3-6. Passerby Results of Customer Surveys.

Patronize Prior to Raised Median?	Business Type	Total Sample Size	Percent Passerby Number Passerby
Yes	First Sit-Down Restaurant	75	16.0% 12
No	First Sit-Down Restaurant	24	20.8% 5
Yes	Second Sit-Down Restaurant	25	16.0% 4
No	Second Sit-Down Restaurant	7	14.3% 1
Yes	First Gas Station	17	64.7% 11
No	First Gas Station	9	66.7% 6
Yes	Second Gas Station	16	62.5% 10
No	Second Gas Station	6	83.3% 5
Yes	Fast-Food Restaurant (inside)	38	23.7% 9
No	Fast-Food Restaurant (inside)	8	37.5% 3
Yes	Fast-Food Restaurant (drive-thru)	23	21.7% 5
No	Fast-Food Restaurant (drive-thru)	5	60.0% 3

Table 3-7. Relative Importance Ranking of Accessibility to Store by Business Type.

Business Type	Sample Size	Ranked Items					
		Distance to Travel	Hours of Operation	Customer Service	Product Quality	Product Price	Accessibility to Store
Durables Retail	2	5	5	2	2	1	5
Specialty Retail	23	6	5	1	2	3	4
Grocery	1	1	6	2	3	4	5
Gas Station	5	6	5	1	4	2	3
Fast-Food Restaurant	10	5	6	2	1	4	3
Sit-Down Restaurant	10	5	6	1	2	3	4
Medical	2	4	3	2	1	2	4
Auto Repair	6	5	3	1	2	4	6
Other Services	10	6	4	1	2	3	5

Table 3-8. Relative Importance Ranking of Accessibility to Store from Customers and Business Owners.

Business Type	Service Type	Sample Size	Distance to Travel	Hours of Operation	Customer Service	Product Quality	Product Price	Accessibility to Store
Sit-Down Restaurant	Customers	58	4	5	3	1	2	6
	Business Owner	1	5	6	2	1	3	5
	Customers	23	4	5	3	1	2	4
	Business Owner	1	5	6	2	1	4	3
Gas Station	Customers	12	2	4	6	5	1	3
	Business Owner	1	6	4	1	5	2	3
	Customers	12	5	6	3	4	1	2
	Business Owner	1	3	5	2	6	4	1
Fast-Food Restaurant (inside)	Customers	28	3	6	4	1	2	5
	Business Owner	1	5	6	2	1	4	3
Fast-Food Restaurant (drive-thru)	Customers	19	4	6	3	1	2	5
	Business Owner	1	5	6	2	1	4	3

There was also interest in further evaluating the ranking of accessibility by various stratifying variables. Tables F-3 and F-4 with additional information regarding the ranking of accessibility can be found in Appendix F. Findings from these tables include:

- Accessibility to store ranked fourth or lower for all business types aggregated together (i.e., without consideration of stratifying variables). It is generally ranked behind some combination of customer service, product quality, and product price (Table F-3).
- Accessibility to store was broken down by the stratifying variables of interest when the sample size was greater than, or equal to, two (Table F-4). In all but three cases, accessibility ranked greater than, or equal to, third.
- Accessibility to store was ranked second for specialty retail stores that are stand-alone establishments, at mid-block locations (n=3); for grocery stores that are in shopping centers, at street intersections (n=2); and for sit-down restaurants that are stand-alone establishments, at street intersections (n=2).
- Sample sizes became rather small when all the stratifying variables were introduced.

3.5.3 Impacts on Regular Customers

Another question of particular interest on the survey was business owner perception of the impacts on regular customers due to the raised median installation. The results of the responses to this question are shown in Table 3-9 for each business group. The business owners that were along the corridor before, during, and after the construction of the raised median (group one) indicated a smaller percentage of their regular customers would be less likely to visit their business as a result of the raised median compared to those business owners that were interviewed prior to the raised median installation (14.3 percent compared to 19.1 percent).

Table 3-9. Percent and Frequency of Raised Median Installation Impacts on Regular Customers by Business Group.

Business Group	Less Likely	More Likely	Stay About the Same
1	14.3% 10	15.7% 11	70.0% 49
2	19.1% 4	14.3% 3	66.7% 14
3	12.5% 2	18.8% 3	68.8% 11
4	18.2% 6	24.2% 8	57.6% 19

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

Customers at the five study locations in College Station were also asked a similar question to relate to the responses at those particular businesses. The results are shown in Table 3-10. The majority of the customer survey responses match the business owner's/manager's selection at all five sites. The gas station business owners/managers interviewed seemed to be the most affected by the raised median installation. Questions number seven and eight of the customer survey (see Appendix C) refer to reasons for selecting less likely or more likely. The results of these questions are shown in Table 3-11. The primary reason for indicating less likely is due to access being more difficult. Interestingly, the primary reason for indicating most likely is that access is safer. In addition, customers were asked about their likeliness to visit the establishment during the construction phase of the median installation. At the gas stations, 71 percent indicated they were less likely to visit. About 50 percent of the sit-down restaurant and fast-food restaurant indoor patrons also indicated that they were less likely to visit. Finally, 70 percent of the drive-thru fast-food restaurant customers indicated that they were less likely to visit. The results indicate the potential impacts that the construction phase can have on these business types.

Table 3-10. Percent and Frequency of Responses from Customers and Business Owners Regarding Customers' Endorsement of Business.

Business Type	Survey Type	Less Likely to Visit	More Likely to Visit	Stay About the Same
Sit-Down Restaurant	Customers	19.7% 15	4.0% 3	76.3% 58
	Business Owner			✓
	Customers	8.0% 2	0.0% 0	92.0% 23
	Business Owner			✓
Gas Station	Customers	41.2% 7	5.9% 1	52.9% 9
	Business Owner			✓
	Customers	58.8% 10	0.0% 0	41.2% 7
	Business Owner	✓		
Fast-Food Restaurant (inside)	Customers	29.0% 11	2.6% 1	68.4% 26
	Business Owner			✓
Fast-Food Restaurant (drive-thru)	Customers	34.8% 8	0.0% 0	65.2% 15
	Business Owner			✓

Table 3-11. Reasons for Selecting Less Likely and More Likely in the Customer Surveys.

Visit Business Prior to Median?	Less Likely			More Likely		
	Access More Difficult	Takes Longer to Get Here	Other Stores More Convenient	Access More Convenient	Less Time to Get Here	Access More Safe
Yes	77.9% 35	0.0% 0	22.2% 10	0.0% 0	33.3% 4	58.3% 7
No	79.0% 15	5.3% 1	10.5% 2	0.0% 0	14.3% 1	42.9% 3

Note: Percentages may not add up to 100 as some respondents selected other for this question.

Analysis was then performed on the business surveys for the impacts on regular customers depending upon the many stratifying variables. These results are presented as Tables F-5 and F-6 in Appendix F. The total percentages shown in the right-most column in Table F-5 are represented in Table 3-9, and Table F-6 further breaks down the stratifying variables of interest. Highlights of these tables include:

- In most cases provided, the percentage of customers indicating more likely and stay about the same were the majority as indicated in the aggregate results of Table 3-9.
- Table F-5 shows the breakdown of specialty retail businesses by business group. This group had the largest sample size, and only 4.5 percent (1 of 17 surveyed) of business owners indicated customers were less likely to visit their business of the group one businesses. Those specialty retail business owners that were interviewed prior to the raised median installation (group one) indicated less likely 28.6 percent of the time (2 of 7 surveyed). Therefore, the perceptions appear to be harsher than the reality of those specialty retail businesses that were present before, during, and after the raised median construction. Sample size information for other businesses was rather low, although these data are also presented in Table F-5.
- Table F-6 includes analysis of the business surveys from Table F-5 in which sample sizes were relatively large. Statistics for select businesses such as specialty retail, fast-food restaurants, and sit-down restaurants for different stratifying variables (e.g., building type, location, whether the business is on a corner lot) are included. Sample sizes were reduced further when analyses were performed at this level; however, once again, a majority of the business owners indicate that regular customers are more likely and stay about the same for a majority of the conditions investigated.

3.5.4 Impacts on Number of Employees, Property Values, Accidents, and Traffic Volume

Impacts upon the number of employees, property values, accidents, and traffic volumes were also of interest. Results of these factors by business group are shown in Table 3-12. The during column in Table 3-12 indicates the impacts during construction relative to prior to the construction, and the after column indicates the impacts after construction relative to prior to the construction. For all the business groups, the number of full-time employees increases on average. Business group two—those interviewed prior to the raised median installation—indicate that they felt the number of full-time employees would decrease slightly during construction while it actually increased 8.6 percent for the group one business owners. The number of part-time employees decreased slightly after construction of the median. The perception of business owners was that property values increased 6.7 percent after the median installation (group one), but those business owners interviewed prior to the median installation

expected a 2.3 percent decrease. The business owners also indicated a perceived decrease of 10.2 percent in accidents along with a 31.5 percent increase in traffic volumes. Appendix E contains additional statistics related to these parameters including sample size, minimum values, and maximum values.

Table 3-13 presents the impacts on customers per day and gross sales for the four business groups. Gross sales where the median installed refers to question 17 of the survey in which business owners were asked what they believe was/is the impact of the raised median for all businesses along the corridor where the median was installed. Gross sales in the area refers to a similar question (question 18) that asked about gross sales for all other businesses in the area (not necessarily just the corridor) due to the raised median installation. One can quickly see that the construction phase did seem to impact customers per day and gross sales as evidenced by the values in the during columns. Perceptions seem to indicate a larger expected loss in gross sales during construction (18.6 percent) compared to the percent reduction of 11.6 percent by those businesses that were present before, during, and after the median installation. The decrease in gross sales after the median installation is relatively small. Appendix E provides additional data and statistics related to the information presented in Table 3-13 including sample size, minimum values, and maximum values. Additional information about gross sales is presented in a later section of this chapter.

Table 3-12. Percent Change, Standard Deviation, and Sample Sizes of Full- and Part-Time Employees, Property Values, Accidents, and Traffic Volumes by Business Group.

Business Group	Full-Time Employees		Part-Time Employees		Property Values		Accidents		Traffic Volume	
	During	After	During	After	During	After	During	After	During	After
1	8.6% 28.3 55	3.2% 20.0 57	–3.3% 19.7 53	–0.3% 12.2 55	1.5% 10.3 31	6.7% 15.8 38	5.5% 23.7 40	–10.2% 27.1 40	–12.5 21.1 38	31.5% 50.7 44
2	–0.3% 1.1 19	0.3% 7.8 18	–0.2% 0.9 18	–1.0% 4.9 17	–8.2% 22.5 14	–2.3% 11.8 13	–3.3% 23.0 18	–13.2% 33.5 14	–11.1% 25.0 19	7.9% 20.5 17
3	–6.3% 17.7 8	9.4% 26.5 8	–6.3% 17.7 8	0.0% 0.0 9	–5.8% 14.3 6	4.7% 7.7 7	–7.1% 18.9 7	–10.7% 28.3 7	–8.8% 27.5 8	28.8% 20.5 8
4	0.0% 0 3	7.1% 18.9 7	0.0% 0.0 3	6.3% 17.7 8	–15.6% 22.4 9	7.7% 12.9 11	0.0% 0.0 6	6.7% 18.6 12	–21.9% 23.9 8	37.7% 89.3 11

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

Note: The during column indicates impacts during construction relative to prior to construction, and the after column indicates impacts after construction relative to prior to construction.

Table 3-13. Percent Change, Standard Deviation, and Sample Sizes of Customers per Day, Gross Sales, Gross Sales along the Portion Where the Median Was (Will Be) Located, and Gross Sales in the Area.

Business Group	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in the Area	
	During	After	During	After	During	After	During	After
1	−14.9% 30.6 54	17.7% 101.0 55	−11.6% 24.7 53	−0.03% 1.5 61	−16.4% 18.5 37	8.5% 20.5 35	7.6% 17.5 25	1.2% 7.1 22
2	−9.5% 31.8 18	−5.9% 10.0 16	−18.6% 24.8 19	−0.8% 1.6 16	−14.2% 17.2 13	5.4% 22.9 14	11.8% 14.5 14	2.7% 6.0 13
3	−15.6% 22.9 8	−3.9% 22.6 9	−17.9% 23.8 7	0.0% 1.2 9	−12.95% 18.7 7	13.6% 20.6 7	0.7% 15.9 7	0.7% 18.8 7
4	0.0% 0.0 2	50.0% 105.6 8	0.0% – 1	0.3% 1.5 7	−20.4% 17.8 12	12.9% 18.1 12	9.5% 13.7 11	5.9% 13.8 11

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

Note: The during column indicates impacts during construction relative to prior to construction, and the after column indicates impacts after construction relative to prior to construction.

3.5.5 Impacts on Customers per Day, Gross Sales, and Property Values by Business Types

Table 3-14 provides results of analyses for group one businesses that have been present before, during, and after the median installation for customers per day, gross sales, property values, full-time employees, and part-time employees for different business types. One can see that the construction phase of the project appears to have a negative affect on many of the metrics of interest for many of the different business types. After construction of the raised median, gasoline stations, auto repair, and other services indicated a small negative affect on gross sales. These values are slightly lower for customers per day. Property values after construction are indicated as either rising or the same after the construction of the median, and there are only small changes in full- and part-time employees. It should be noted that these results are aggregate for all test sites. In addition, other conditions such as whether an establishment is on the corner of a lot, in a shopping center, or located mid-block or at a street intersection may also provide further insight.

Tables 3-11 through 3-13 provide aggregate results for each business group for the several economic impact measures of interest. Further analysis was performed that investigated these economic impact measures by stratifying variables of interest such as business type, nearest access location (e.g., mid-block or street intersection), building type (e.g., shopping center or stand-alone), and whether the business is located on an intersection corner. The results of these analyses are shown in Tables F-7 and F-8 in Appendix F. The interested reader is encouraged to refer to those tables for additional detail; however, some of the highlights of these analyses are summarized here:

- Full- and part-time employees generally remained the same or increased during and after the construction of the raised median for group one businesses. Gas station and fast-food restaurant business owners located at stand-alone locations at intersections indicated decreases during construction.
- Property values were found to increase for all locations after construction of the median except for specialty retail businesses located in shopping centers at street intersections and one medical establishment.

Table 3-14. Summary of Average Percent Change, Standard Deviation, and Sample Size for Responses from Businesses Present Before, During, and After Raised Median Installation (Group One Businesses).

Business Type	Total Sample Size	Percent Change in Responses of Interest									
		Customers per Day		Gross Sales		Property Values		Full-Time Employees		Part-Time Employees	
		During	After	During	After	During	After	During	After	During	After
Durables Retail	2	15.0% – 1	5.0% – 2	15.0% – 1	1.0% – 2	1.0% – 1	17.5% 3.5% 2	– – 0	0.0% – 1	0.0% – 1	0.0% – 1
Specialty Retail	23	–6.6% 14.0% 19	8.1% 12.8% 18	–5.6% 15.6% 19	0.4% 1.2% 21	–1.0% 3.2% 10	3.7% 17.9% 13	22.0% 41.0% 20	1.0% 11.4% 20	0.9% 14.1% 19	–5.3% 16.8% 19
Gas Station	5	–20.4% 68.1% 5	–17.6% 23.3% 5	–40.4% 24.8% 5	–2.4% 1.3% 5	16.7% 28.9% 5	20.0% 26.5% 5	2.6% 19.1% 5	–5.0% 11.2% 5	–20.0% 44.7% 5	0.0% 0.0% 5
Fast-Food Restaurant	11	–19.9% 37.0% 8	108.9% 237.6% 9	–8.6% 36.1% 7	0.4% 1.5% 7	–17.0% 12.6% 3	16.7% 8.8% 6	–3.7% 26.6% 6	30.8% 46.3% 6	–15.3% 30.0% 7	3.0% 13.3% 7
Sit-Down Restaurant	10	–6.1% 8.8% 7	2.6% 3.6% 7	–3.6% 10.6% 7	0.8% 0.4% 10	0.0% 0.0% 4	0.0% 0.0% 4	1.8% 5.0% 9	3.5% 8.2% 10	1.8% 5.0% 9	5.0% 10.5% 10
Auto Repair	7	–24.0% 25.1% 5	–5.0% 11.2% 5	–20.0% 24.5% 6	–0.5% 1.2% 6	3.3% 5.8% 3	3.3% 5.8% 3	0.0% 0.0% 5	0.0% 0.0% 5	0.0% 0.0% 4	0.0% 0.0% 4
Other Services	12	–32.5% 35.7% 8	–8.4% 9.3% 8	–17.5% 36.6% 6	–1.0% 1.7% 8	2.0% 4.5% 5	7.6% 10.8% 5	3.1% 5.9% 8	–4.4% 18.8% 8	0.0% 0.0% 7	1.4% 3.8% 7

Note: Each cell contains the average percent change (top), standard deviation (middle), and number of observations (bottom).

- Accidents were generally found to decrease after the median installation while traffic volumes generally were indicated as increasing.
- Although sample size information is rather limited, comparisons can also be made between some business types and business groups with the information provided in Table F-7.
- In general, customers per day, gross sales, gross sales where the median was installed, and gross sales in the area were indicated as increasing in Table F-8.
- Customers per day and gross sales information (Table F-8) often follow the trends of Table 3-14 as gross sales generally decreased slightly for gas stations, auto repair, and other services.
- The construction phase of the median installation appears to have provided decreases in customers per day and gross sales. In general, these metrics improved after the construction phase was completed.
- Table F-8 also includes data for all business groups though sample sizes were relatively small. The reader is encouraged to review this information for further comparisons of interest.

3.5.6 Impacts on Traffic Congestion, Traffic Safety, Property Values, Business Opportunities, Customer Satisfaction, and Delivery Convenience

Question 19 of the survey in Appendix A asked business owners whether the following were better, worse, or the same since the installation of the raised median: traffic congestion, traffic safety, property access, business opportunities, customer satisfaction, and delivery convenience. Table 3-15 shows the frequency and percentage of responses to this question for group one businesses. Gas station business owners/managers indicated worse for a majority of the responses for property access, business opportunities, customer satisfaction, and delivery convenience. A majority of sit-down restaurant business owners/managers also indicated that property access was worse.

Table 3-15. Percent and Frequency of Responses to Items of Interest for Select Business Types for Group One Businesses.

Item of Interest		Specialty Retail	Gas Station	Fast-Food Restaurant	Sit-Down Restaurant	Auto Repair
Traffic Congestion	Better	63.6% 14	40.0% 2	72.7% 8	60.0% 6	42.9% 3
	Worse	18.2% 4	20.0% 1	9.1% 1	10.0% 1	42.9% 3
	Same	18.2% 4	40.0% 2	18.2% 2	30.0% 3	14.3% 1
Traffic Safety	Better	81.8% 18	50.0% 2	81.8% 9	70.0% 7	42.9% 3
	Worse	13.6% 3	0.0% 0	9.1% 1	0.0% 0	28.6% 2
	Same	4.6% 1	50.0% 2	9.1% 1	30.0% 3	28.6% 2
Property Access	Better	36.4% 8	0.0% 0	36.4% 4	30.0% 3	42.9% 3
	Worse	27.3% 6	80.0% 4	27.3% 3	50.0% 5	42.9% 3
	Same	36.4% 8	20.0% 1	36.4% 4	20.0% 2	14.3% 1
Business Opportunities	Better	45.5% 10	20.0% 1	36.4% 4	40.0% 4	57.1% 4
	Worse	18.2% 4	80.0% 4	0.0% 0	20.0% 2	0.0% 0
	Same	36.4% 8	0.0% 0	63.6% 7	40.0% 4	42.9% 3
Customer Satisfaction	Better	45.5% 10	20.0% 1	45.5% 5	10.0% 1	28.6% 2
	Worse	4.6% 1	60.0% 3	9.1% 1	20.0% 2	0.0% 0
	Same	50.0% 11	20.0% 1	45.5% 5	70.0% 7	71.4% 5
Delivery Convenience	Better	27.3% 6	20.0% 1	27.3% 3	10.0% 1	28.5% 2
	Worse	13.6% 3	80.0% 4	18.2% 2	20.0% 2	14.3% 1
	Same	59.1% 13	0.0% 0	54.6% 6	70.0% 7	57.1% 4

Customer surveys also asked questions related to traffic congestion, traffic safety, property access, and customer satisfaction. A majority of the respondents to the customer surveys indicated access was worse after the raised median installation, and this majority ranged from 60 percent at one of the sit-down restaurants (25 total surveys) to 88 percent at one of the gasoline stations (17 total surveys). Except for the sit-down restaurant where 60 percent of the customers indicated access was worse, the business owners/managers themselves had indicated that they believed access was also worse. It was interesting to find that a majority of customers indicated that the raised median either made customer satisfaction better or that it remained about the same for the five businesses where customer surveys were performed (total number of surveys ranged at sites for this question from 16 to 73). At one of the gas stations, half of the customers indicated that customer satisfaction had increased (16 total surveys). In contrast, the business owners themselves indicated that customer satisfaction was worse at the two gas stations and one of the sit-down restaurants while it was the same at the other sit-down restaurant and the fast-food restaurant.

While Table 3-15 shows these potential impacts for group one businesses, Figure 3-3 through Figure 3-6 present the percentage of each of these potential impacts indicating better, the same, or worse for each business group, respectively. The biggest distinctions can be made between Figure 3-3, showing the impacts of businesses that were there before, during, and after the median installation (group one), and Figure 3-4, showing the indications of business owners from businesses prior to construction. It is interesting to note that the group one businesses in Figure 3-3 generally indicated worse at lower percentages than those group two businesses in Figure 3-4. In particular, property access is indicated as worse for group one businesses at 39.4 percent while higher at 55.6 percent for group two businesses. Similar results are also noticeable for business opportunities, customer satisfaction, and delivery convenience. The reverse is true for traffic congestion, though the percent difference between the two groups is not large (15.3 percent for group one and 14.3 percent for group two). It should be noted that traffic safety is indicated as worse for 8.5 percent of group one businesses while zero percent felt it would be worse prior to construction of the median.

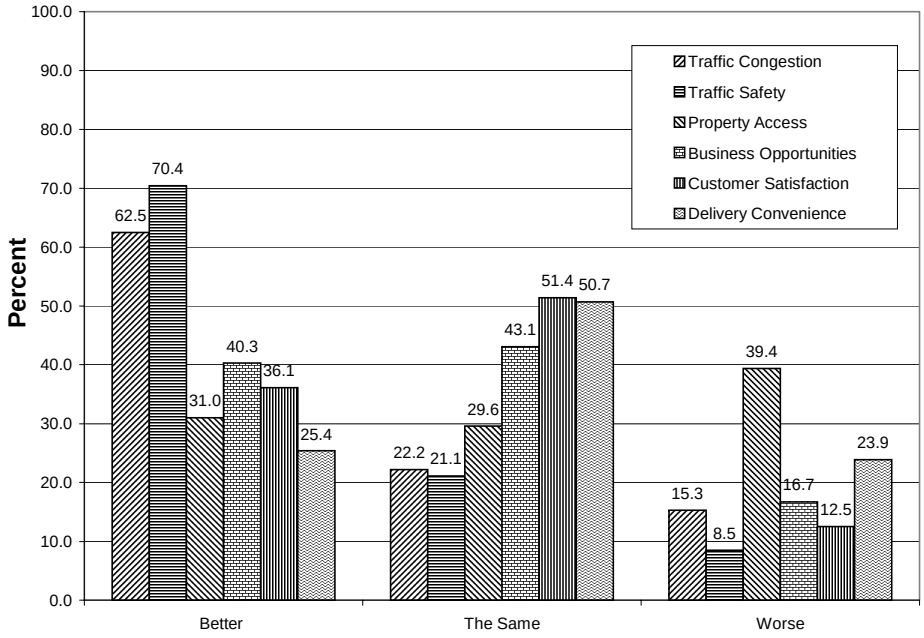

Figure 3-3. Raised Median Impacts of Interest for Group One Businesses.

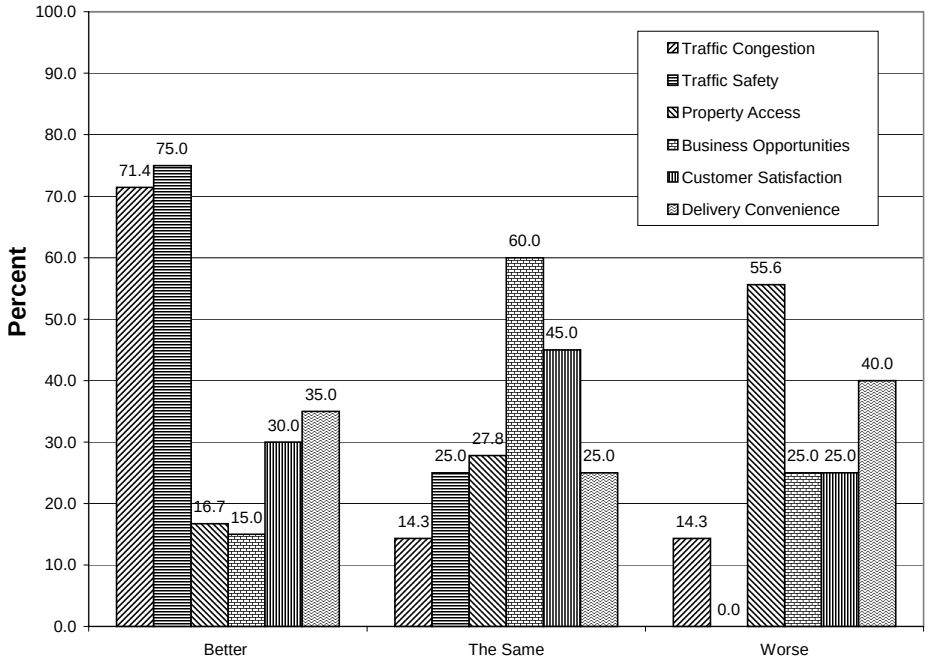

Figure 3-4. Raised Median Impacts of Interest for Group Two Businesses.

Figure 3-5 presents the data for those businesses that arrived during the construction phase. It is interesting to note that they indicate a similar percentage as group one businesses of property access at 29.4 percent as worse. Figure 3-6 presents the results of those businesses that were present after the median was installed. Appendix E presents additional statistics including the sample sizes and percentage of respondents indicating better, worse, or the same for the data presented in Figures 3-3 through 3-6.

Additional analyses were performed for traffic congestion, traffic safety, property access, business opportunities, customer satisfaction, and delivery convenience by business group and business type. These results are illustrated in Appendix F in Tables F-9 through F-11. Some of the more interesting points are made here regarding these results, and the reader is asked to review Appendix F for more details:

- Table F-9 indicates that generally those business owners that were present before, during, and after the raised median installation (group one businesses) indicated less severe negative impacts than those interviewed prior (group two) or during (group three) the construction of the median. This indicates that the general expectations of the negative impacts appear to be higher than the actual impacts perceived by the business owners.
- Table F-10 and Table F-11 provide further impacts information for traffic congestion, traffic safety, property access, business opportunities, customer satisfaction, and delivery convenience by the stratifying variables of interest. At this level of analysis, sample sizes become relatively limited, and the reader is encouraged to review this information for further detail and comparisons of specific conditions of interest to the reader.

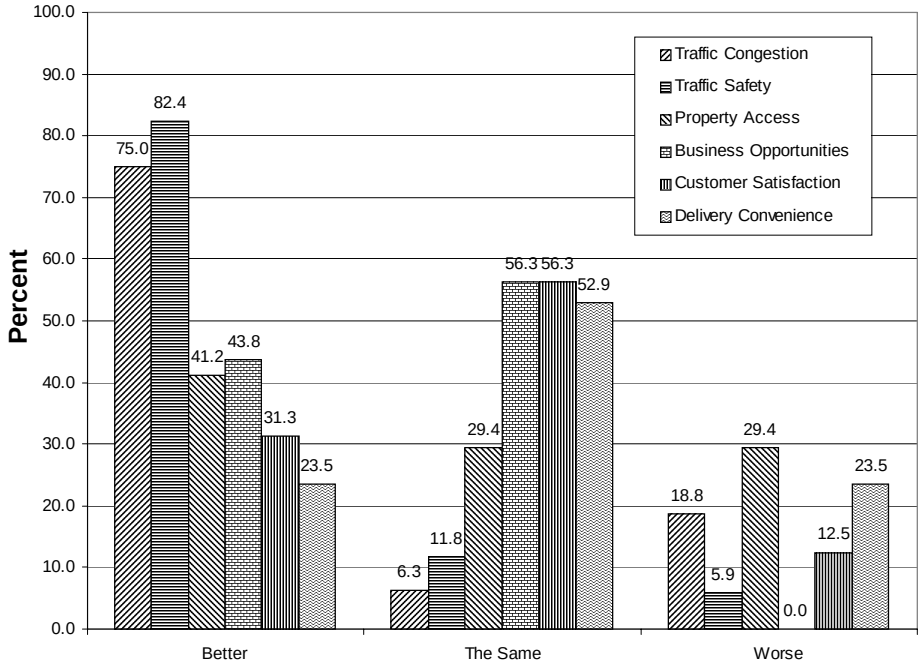

Figure 3-5. Raised Median Impacts of Interest for Group Three Businesses.

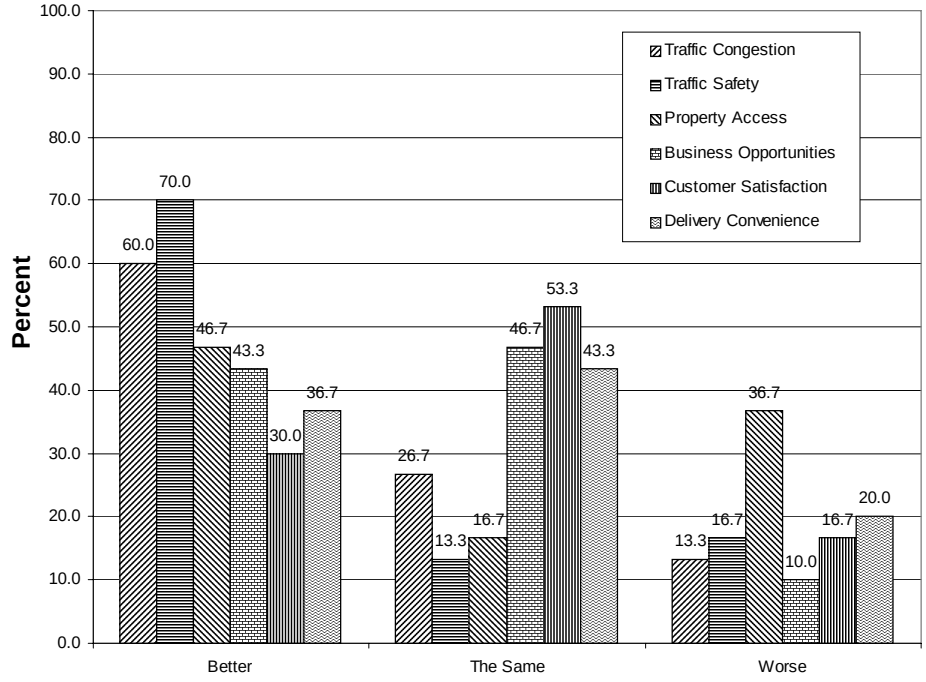

Figure 3-6. Raised Median Impacts of Interest for Group Four Businesses.

3.6 BUSINESS OWNERS' EXTENT OF PUBLIC INVOLVEMENT

The extent of public involvement during the raised median construction project was also of interest. Table 3-16 illustrates the extent of public involvement by business group. For each of the business groups, low was indicated for a majority of the surveys returned or interviews performed. Table F-12 in Appendix F provides additional detail regarding public involvement for group one and two business owners. Table F-12 provides similar results as shown in Table 3-16 although it is interesting to note that 40 percent of group one gas station owners (2 of 5) and one medical business owner indicated a high public involvement.

Table 3-16. Extent of Public Involvement by Business Group.

Business Group	High	Somewhat High	Moderate	Somewhat Low	Low
1	16.9% 11	4.6% 3	13.9% 9	3.1% 2	61.5% 40
2	20.0% 1	0.0% 0	0.0% 0	0.0% 0	80.0% 4
3	0.0% 0	0.0% 0	0.0% 0	0.0% 0	100.0% 13
4	0.0% 0	0.0% 0	4.4% 1	4.4% 1	91.3% 21

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

3.7 RAISED MEDIAN REMOVAL ANALYSIS

The research team also collected data along Twin Cities Highway in Port Arthur, Texas, and at select locations in Amarillo, Texas, where a raised median was removed. The removal in Port Arthur was performed from 1983 to 1985. The research team was interested in speaking to the business owners along the Twin Cities Highway corridor to determine the impacts upon their businesses as a result of the raised median being removed. Unfortunately, due to the age of the raised median removal, it was difficult to obtain adequate sample sizes of business owners along the corridor. Further, researchers questioned businesses in this corridor using a mail-out survey, which produced lower response rates than the in-person interviews as discussed earlier in this report.

The Twin Cities Highway corridor produced five returned business surveys. One of these survey respondents was present before, during, and after the median installation, yet did not complete a substantial portion of the survey since they were not sure about many of the questions. Three of the surveys were from individuals that arrived along the corridor after the raised median was installed. On one survey, the respondent simply wrote comments on the back. Obviously, it is difficult to draw anything conclusively from these surveys; however, it is interesting to note that one individual felt that the medians should be placed back in along the corridor as they believed that the raised medians would provide a safer corridor for motorists. Another interesting note was made by one business owner that stated the closing of a large anchor store in their shopping center impacted their business; however, the reason for the anchor store closing is uncertain.

Thirteen median removal sites were also investigated in Amarillo, Texas. Twenty-two personal interviews were performed to obtain perception data related to economic impacts. Table 3-17 illustrates the sample size information for the raised median removal projects in Amarillo. Thirteen business surveys were obtained for businesses present before, during, and after the median removal that occurred from 1989 to 1995 at the 22 sites. The following are highlights of the analyses performed on the Amarillo data for the group one businesses across all business types:

- There was a 3.7 percent increase in passer-by traffic (n=12).
- Accessibility to store was ranked 4th in importance by business owners behind customer service, product quality, and product price.
- Five business owners indicated their regular customers would be more likely to visit while seven business owners indicated their regular customers would stay about the same in terms of likeliness to visit their business after the raised median removal.
- Decreases during median removal were indicated for customers per day (15 percent), gross sales (0.4 percent), and property values (0.6 percent). No change was indicated in full- or part-time employees during construction.
- Increases after median removal were indicated for customers per day (10 percent) and gross sales (10 percent). No change in full- or part-time employees was indicated after construction, and a 7 percent decrease in accidents was indicated.
- Eighty-three percent of the business owners (n=10) indicated that access was better, and 16 percent (n=2) indicated that safety was worse. Seventy-five percent (n=9) indicated that customer satisfaction was better.

Table 3-17. Sample Size Information for Raised Median Removals in Amarillo.

Business Group	Durables Retail	Specialty Retail	Grocery	Gas Station	Bar	Other Services	Auto Repair	Other	Totals
1	0	6	1	2	0	1	1	2	13
3	0	0	0	2	1	2	0	0	5
4	1	1	0	1	0	0	1	0	4
Totals	1	7	1	5	1	3	2	2	22

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

- All business owners indicated low public involvement.
- There was a 3.9 percent increase per year in gross sales.
- Similar results were obtained when the analyses were stratified by business type though the sample sizes decreased substantially. Group three businesses (present during and after the median removal) and group four businesses (present after the median removal) also indicated similar results to those presented above.

3.8 UNDEVELOPED LAND SURVEY RESULTS

Appendix B presents the survey that was administered by mail to owners of undeveloped land along the corridors where undeveloped parcels exist. A total of eight undeveloped surveys were returned—three from 9th Avenue in Port Arthur, one from Clay Road (Houston), and four from Fuqua Road (Houston).

A sample of the undeveloped land survey is shown in Appendix B. There were several questions of interest asked in the undeveloped land surveys. Table 3-18 summarizes the responses to these questions for the before, during, and after undeveloped land groups. The table includes responses to the questions regarding whether the time to access the property changed due to the median installation, if it was more or less attractive, any effects on development possibilities, and also the extent of public involvement. Although sample sizes are rather limited, there is a general indication from the results that the raised median has enhanced the attractiveness of the undeveloped properties. The comments from those responses that indicate a change in the development effects often indicated that it was positive by providing better access and generally looking more attractive. Table 3-19 provides the responses of the undeveloped landowners when asked about traffic congestion, traffic safety, property access, customer satisfaction, and delivery convenience.

Table 3-18. Percent and Sample Size for Time to Access, Attractiveness, Development Affects, and Public Involvement for Undeveloped Land Surveys.

Business Group	Nearest Access	Time to Access				Attractiveness			Development Affects			Public Involvement				
		Increase	Decrease	No Change	Not sure	More	Less	Not sure	Yes	No	Not sure	High	Somewhat high	Moderate	Somewhat low	Low
1	Mid-block	0	0	50.0% 1	50.0% 1	50.0% 1	0	50.0% 1	0	50.0% 1	50.0% 1	0	0	0	0	100.0% 2
1	Street Int.	50.0% 1	0	50.0% 1	0	50.0% 1	50.0% 1	0	0	50.0% 1	50.0% 1	0	0	50.0% 1	0	50.0% 1
3	Not sure	0	0	100.0% 1	0	100.0% 1	0	0	100.0% 1	0	0	0	0	0	0	100.0% 1
4	Not sure	50.0% 1	0	50.0% 1	0	50.0% 1	0	50.0% 1	50.0% 1	0	50.0% 1	0	0	0	50.0% 1	0
4	Street Int.	0	0	100.0% 1	0	100.0% 1	0	0	100.0% 1	0	0	0	0	0	0	100.0% 1

Note: The percentages reported in this table do not always add up to 100 percent due to missing values for some questions.
Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

Table 3-19. Percent and Sample Size for Additional Raised Median Impacts of Interest for Undeveloped Land Surveys.

Business Group	Nearest Access	Traffic Congestion			Traffic Safety			Property Access			Business Opportunities			Customer Satisfaction			Delivery Convenience		
		Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same
1	Mid-block	50.0% 1	0	50.0% 1	100.0% 2	0	0	0	50.0% 1	50.0% 1	0	0	50.0% 1	0	0	50.0% 1	0	0	50.0% 1
1	Street Int.	0	50.0% 1	50.0% 1	0	0	100.0% 2	0	50.0% 1	50.0% 1	0	50.0% 1	50.0% 1	0	50.0% 1	50.0% 1	0	50.0% 1	50.0% 1
3	Not sure	100.0% 1	0	0	100.0% 1	0	0	100.0% 1	0	0	100.0% 1	0	0	0	0	100.0% 1	0	0	100.0% 1
4	Not sure	50.0% 1	0	0	100.0% 1	0	0	0	50.0% 1	0	50.0% 1	0	0	50.0% 1	0	0	0	0	50.0% 1
4	Street Int.	100.0% 1	0	0	100.0% 1	0	0	0	0	100.0% 1	0	0	100.0% 1	0	0	50.0% 1	0	0	100.0% 1

Note: The percentages reported in this table do not always add up to 100 percent due to missing values for some questions.
Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median had been installed.

3.9 ADDITIONAL GROSS SALES ANALYSIS

Appendix G of this report contains additional analysis that was performed to investigate trends in gross sales along the case study corridors compared to the state of Texas averages and the cities and counties of interest. Additional discussion is provided at the beginning of Appendix G that explains the data that are present in the tables shown in Appendix G. A couple points of interest from this data include:

- The construction years from 1988 to 1990 appear to have experienced decreasing gross sales along the South Post Oak Road corridor although the city and county did not experience declining gross sales during that time period. Gross sales increased along the corridor after the construction.
- A decrease in gross sales was indicated by business owners along Texas Avenue in College Station during the construction year 1997. Gross sales are indicated as increasing every year after the construction, and increases are also noted for the City of College Station and Brazos County.
- The year before the construction in 1992 along University Drive in McKinney, gross sales seemed to decrease; however, the city and county did not experience decreases during that time period.
- Decreasing gross sales were not experienced along the Longview corridor during the construction phase.
- The Odessa corridor respondents indicated increased gross sales during the construction year of 1992 although the city and county experienced decreasing sales.
- None of the corridors experienced decreasing gross sales after the construction phase except for McKinney, which experienced a small decrease in gross sales the year following construction.
- Sample sizes were relatively low for some corridors including Clay Road, Long Point Road and West Fuqua in Houston, and the Port Arthur corridors.

3.10 ADDITIONAL EMPLOYMENT DATA ANALYSIS

Appendix H contains additional analyses that were performed on the employment data collected along the corridors for the state of Texas and the cities and counties of interest. Discussion provided at the beginning of Appendix H explains in more detail the contents of the appendix. Important observations from this data include:

- There was an increase in the number of total employees along several of the corridors including Clay Road (Houston), Long Point Road (Houston), South Post Oak (Houston), University Drive (McKinney), Grant Avenue (Odessa), and Texas Avenue (College Station).
- Those corridors that did experience a decrease in the number of employees only experienced a decrease for one year and not over consecutive years. For those that did experience such a decrease, it did not occur during the construction phase along the corridor.
- Sample sizes were relatively low for West Fuqua Road (Houston) and the two Port Arthur corridors studied.

3.11 ADDITIONAL PROPERTY VALUE DATA ANALYSIS

Appendix I contains additional data regarding property values from data collected from the local appraisal districts for each corridor as well as data collected from the Texas Comptroller of Public Accounts for the cities and counties of interest for comparison to local trends. Discussion at the beginning of Appendix I describes the data in more detail. Highlights drawn from this information include the following:

- Site-specific results generally follow the city and county trends.
- Decreases during the construction phase are noted for many of the sites. This was also shown in Table 3-14 although the sample sizes for these two data sources are slightly different, and they include some different businesses.
- Though property values are occasionally indicated as negative, they are generally on the rise along all corridors. Business owner perceptions in Table 3-14 also indicate positive property values after median installation.

4.0 DISCUSSION AND CONCLUSIONS

As indicated throughout this report, it should be noted that sample sizes upon which researchers performed analyses were often rather small; however, many observations and interesting points may be drawn from this research effort. These observations are invaluable in laying the foundation for this type of research since limited work had been performed. The reader is referred to Chapters 1.0 and 2.0 for further detail regarding the survey administration and data collection. The reader is also encouraged to review Chapter 2.0 for additional information regarding the methodology that describes how to collect data for this type of study. This information and guidance is anticipated to be of significant value for those interested in performing similar studies in the future. Some of the key points are listed as follows.

- When asked to rank the factors that affect customers endorsing their businesses, business owners generally ranked accessibility to store fourth or lower below some combination of customer service, product quality, and product price. According to business owners, it appears that the most important elements used by customers to determine what businesses they will endorse are factors that may be controlled by the business owners themselves to some extent. In surveys of customers at five selected businesses along the Texas Avenue corridor in College Station, it was found that customers ranked accessibility to store with lower, or equal, value to the business owners.
- When combining all business types, it was found that 85.7 percent of business owners whose businesses were present before, during, and after the median installation felt that their regular customers would be more likely (15.7 percent) or stay about the same in likeliness (70.0 percent) to endorse their business. In contrast, those businesses that were interviewed prior to the installation of the raised median indicated this percentage slightly lower (i.e., indicated more regular customers less likely) at 80.9 percent. Therefore, for the case studies investigated in this project, the perceptions appear slightly more negative than what actually occurred along corridors where business owners were present before, during, and after the median installation. A similar question was posed to customers in College Station at the five selected businesses, and it was found that a majority of the customer survey responses

matched the business owner's/manager's opinions. Generally, customers did indicate they were less likely to visit the business during the construction of the raised median.

- A majority of customers indicated that while the raised median made access more difficult, they indicated that customer satisfaction was better or that it remained about the same for the five businesses where customer surveys were performed.
- There was almost always an increase in the number of total employees along several of the corridors. Those corridors that did experience a decrease in the number of employees only experienced a decrease for one year and not over consecutive years. This decrease often did not coincide with the construction years along the corridor. It was found that business owners were generally quite loyal to employees even during the construction phase.
- Property values were indicated as increasing 6.7 percent after the raised median installation by those business owners present before, during, and after the raised median installation (group one), while the perception of the group two businesses was that there would be a decrease of 2.3 percent.
- Business owners in Amarillo, Texas, that were present before, during, and after the median removal generally indicated an average increase in sales of 3.9 percent after the removal. A 3.7 percent increase in passer-by traffic (n=12) was noted, and accessibility to store was ranked 4th in importance by business owners behind customer service, product quality, and product price. This raised median was different than those at other locations. This median treatment was approximately two feet wide, and it was being removed 50 to 200 feet at signalized intersections to provide access to select businesses that were interviewed.
- The construction phase seemed to impact customers per day and gross sales. For all businesses, perceptions again seem to indicate a larger expected loss in the group two businesses that were interviewed prior to the construction of the raised median. These business owners indicated they expected an 18.6 percent reduction in gross sales, while those that were present before, during, and after the median installation (group one) indicated an 11.6 percent reduction as shown in Table 3-13. After the construction phase, a 17.7 percent increase in customers per day was indicated along with a decrease in gross sales of 0.03 percent for all businesses present before, during,

and after the median installation. Business types such as durables retail, specialty retail, fast-food restaurants, and sit-down restaurants indicated increasing customers per day, gross sales, and property values as shown in Table 3-14. Gas stations, auto repair, and other service businesses indicated decreasing customers per day and gross sales after the raised median was installed.

- The construction phase appears to have the most detrimental impacts on businesses. Suggestions to alleviate these impacts include: 1) ensuring adequate and highly visible access to businesses during construction, 2) reducing construction time, and 3) performing the construction in smaller roadway segments (phases) to the extent possible.
- Overall, public involvement participation was indicated as low for 61.5 percent of the business surveys.
- The in-person business surveys appear to provide more reliable data than the mail-out surveys, and these survey respondents appreciate the face-to-face opportunity to have their opinions heard. The average response rate for the in-person surveys was also much higher (55.0 percent) than the response rate for the mail-out surveys (9.0 percent).

One of the greatest challenges to TxDOT staff has been providing information to business and property owners regarding potential economic impacts of raised medians on businesses and properties. TxDOT staff will be able to use the results of this research to explain experiences on these corridors. It will be important for the staff to note that the results of this research will not guarantee any specific economic impacts on particular business or property types but may be used to anticipate general impacts. At a minimum, this information will allow TxDOT staff to discuss these issues with the public using appropriate research data, instead of having to say that they are unsure of what to expect. These results are also anticipated to be of help to other planners, engineers, and researchers investigating these issues or involved in similar median projects. The methodology explained in Chapter 2.0 is also expected to be of assistance for individuals performing similar work in the future.

5.0 REFERENCES

1. Eisele, W.L., W.F. Frawley, D.L. Picha, and M.T. Wildenthal. *A Methodology for Determining the Economic Impacts of Raised Medians: Initial Development.* Research Report 3904-1, Texas Transportation Institute, College Station, Texas. October 1997.
2. Eisele, W.L. and W.E. Frawley. *A Methodology for Determining Economic Impacts of Raised Medians: Data Collection for Additional Case Studies.* Research Report 3904-2, Texas Transportation Institute, College Station, Texas. October 1998.
3. Eisele, W.L. and W.E. Frawley. *A Methodology for Determining Economic Impacts of Raised Medians: Data Analysis on Additional Case Studies*. Research Report 3904-3, Texas Transportation Institute, College Station, Texas. October 1999.

APPENDIX A

Sample Business Impact Survey: Personal Interview for Texas Avenue

Date_____ **Texas Transportation Institute** **CONFIDENTIAL**
Texas A & M University System Code No._____
College Station, Texas

ECONOMIC IMPACT OF MEDIAN DESIGN ALONG TEXAS AVENUE
(BUSINESS IMPACT SURVEY)

College Station, Texas

Purpose of Survey

The Texas Transportation Institute (TTI) is studying the economic impact of raised median installation along Texas Avenue in College Station, Texas from University Drive to Dominik Drive for the Texas Department of Transportation (TxDOT). TxDOT requires the findings of an objective study to aid in planning median design projects that maximize positive impacts and minimize negative impacts during and after construction, especially on abutting businesses and undeveloped land. Please take the time to provide thoughtful responses to these survey questions. ALL ANSWERS TO THE FOLLOWING QUESTIONS WILL BE HELD CONFIDENTIAL. Your name or the name of your business will not be used in any way that would identify you.

Thank you very much for your time in filling out this important survey!

1. When did this business begin operations at this location?

   Month _____ Year _____

2. What is the primary type of business?

   Durables Retail___ Specialty Retail___ Grocery ___ Convenience Store
   Gas Station___ Conv/Gas Station___ Fast-food Restaurant___ Sit-down Restaurant____
   Bar/Tavern___ Hotel___ Medical___ Other Services
   Other____ describe:_____
   If both retail sales and service, please provide:
   Percent sales _____ Percent service_____

3. Please indicate the location of the nearest median opening that provides access to your business. In other words, how do your customers enter/exit your business—at a mid-block median opening or through a street intersection?

   Mid-Block____ Street Intersection____

4. What do you believe is the percentage of your customers who are passer-by customers and those who intend on stopping at your business? Passer-by customers are those customers that are not intending to stop at your particular business (i.e., impulse customers) as opposed to planned stops by customers that had intended on stopping at your business.

   Percent passer-by traffic____ Percent planned stop___

5. **Prior to the median installation**, what do you believe was the percentage of your customers who were passer-by customers and those that intended on stopping at your business?

   Percent passer-by traffic____ Percent planned stop___

6. What do you believe is the reason(s) for any difference, if any, in the percentages you reported in question 4 and question 5?

_____

_____

_____

7. Do you believe your regular customers have remained about the same, are more likely, or have been less likely to visit your business due to the raised median?

Less likely____ More likely____ Stayed about the same_____

8. Please rank the following considerations in ascending order from "1" to "6" (with "1" being the most important) that consumers use when selecting a business of your type:

Distance to Travel	Hours of Operation	Customer Service	Product Quality	Product Price	Accessibility to Store
___	___	___	___	_____	_____

9. How many people are employed by your business? Please give the average annual number, including working owner and/or manager. Construction years are shown in **bold**.

	1991	1992	1993	1994	1995	**1996**	**1997**	**1998**	1999
Full-time	___	___	___	___	___	___	___	___	___
Part-time	___	___	___	___	___	___	___	___	___

For questions 10 through 18:

- Please give your best estimate of the percentage impact, up or down, on your business.
- If you do not think there was a large change during the construction or if there has not been a large change after the installation, please mark an "X" for "No Change."
- Please place an "X" for "Not Sure" if you are uncertain about what the effect was during construction or is now after the installation.

During and after the construction, has there been a change in:

10. Your number of customers per day?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

11. Your number of full-time employees?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

12. Your number of part-time employees?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

13. Your gross sales?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

14. Your property values?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

15. The number of accidents along the portion of Texas Avenue where the median was installed?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

16. The traffic volumes along the portion of Texas Avenue where the median was installed?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

17. Gross sales for all businesses along the portion of Texas Avenue where the median was installed?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

18. Gross sales for all other businesses in this area of College Station due to the installation of the raised median?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

19. Please indicate below, whether you feel the installation of the raised median has made the following items "Better", "Worse", or about "The Same" as before the median was installed.

		Better	Worse	The Same
a.	Traffic Congestion	_____	_____	_____
b.	Traffic Safety	_____	_____	_____
c.	Property Access	_____	_____	_____
d.	Business Opportunities	_____	_____	_____
e.	Customer Satisfaction	_____	_____	_____
f.	Delivery Convenience	_____	_____	_____

20. Please indicate with an "X" the appropriate range of annual gross sales for each year of this business. This information provides the researchers with a range by which to evaluate the trend in economic activity due to the raised median installation. Construction years are shown in **bold**.

	1991	1992	1993	1994	1995	**1996**	**1997**	**1998**	1999
Less than $100,000	____	____	____	____	____	____	____	____	____
$100,000 to $250,000	____	____	____	____	____	____	____	____	____
$250,000 to $500,000	____	____	____	____	____	____	____	____	____
$500,000 to $1,000,000	____	____	____	____	____	____	____	____	____
$1,000,000 to $1,500,000	____	____	____	____	____	____	____	____	____
$1,500,000 to $2,000,000	____	____	____	____	____	____	____	____	____
$2,000,000 to $2,500,000	____	____	____	____	____	____	____	____	____
$2,500,000 to $3,000,000	____	____	____	____	____	____	____	____	____
$3,000,000 to $3,500,000	____	____	____	____	____	____	____	____	____
$3,500,000 to $4,000,000	____	____	____	____	____	____	____	____	____
$4,000,000 to $4,500,000	____	____	____	____	____	____	____	____	____
$4,500,000 to $5,000,000	____	____	____	____	____	____	____	____	____
More than $5,000,000	____	____	____	____	____	____	____	____	____

21. Please indicate below the change in percentage of business sales activity that occurred at this business between the years shown. Construction years are in **bold**.

- Please give your best estimate of the percentage impact, up or down, on your business.
- If you do not think there was a change, please mark an "X" for "No Change."
- Please place an "X" for "Not Sure" if you are uncertain about what the change was.

	1991-1992	1992-1993	1993-1994	1994-1995	1995-**1996**	**1996-1997**	**1997-1998**	**1998**-1999
Percentage Increase	_____%	_____%	_____%	_____%	_____%	_____%	_____%	_____ %
No Change	_____	_____	_____	_____	_____	_____	_____	_____
Percentage Decrease	_____%	_____%	_____%	_____%	_____%	_____%	_____%	_____ %
Not Sure	_____	_____	_____	_____	_____	_____	_____	_____

22. What do you believe is the reason for the changes from year to year as you have indicated in question 21?

_____

_____

_____

_____

_____

_____

23. Please indicate the extent of your involvement in the public hearing and public meeting process for this median installation project by placing an "X" next to the appropriate category below.

High (attended several meetings) ____
Somewhat high involvement ____
Moderate involvement ____
Somewhat low involvement ____
Low involvement ____

24. Please use this space to discuss any additional thoughts you may have about the raised median installation along Texas Avenue.

_____

_____

_____

_____

_____

Once again, thank you very much for your time in completing this important survey!

25. Demeanor of person surveyed:

_____ Extremely positive
_____ Positive
_____ Neutral
_____ Negative
_____ Extremely negative

APPENDIX B

Sample Undeveloped Land Survey: Undeveloped Land for Clay Road

Texas Transportation Institute
Texas A & M University System
College Station, Texas

CONFIDENTIAL
Code No._____

ECONOMIC IMPACT OF MEDIAN DESIGN ALONG CLAY ROAD
(UNDEVELOPED LAND SURVEY)

Houston, Texas

Purpose of Survey

The Texas Transportation Institute (TTI) is studying the economic impact of raised median installation along Clay Road in Houston, Texas from Beltway 8 to Hempstead for the Texas Department of Transportation (TxDOT). TxDOT requires the findings of an objective study to aid in planning median design projects that maximize positive impacts and minimize negative impacts during and after construction, especially on abutting businesses and undeveloped land. ALL ANSWERS TO THE FOLLOWING QUESTIONS WILL BE HELD CONFIDENTIAL. Your name will not be used in any way that would identify you.

If you did not own your land along this corridor until after the installation of the raised median, your responses, to the best of your knowledge, are still of value to the research effort. If you have any questions about this survey or this research, please contact Bill Eisele at (409) 845-8550 or Bill Frawley at (817) 277-5503.

Thank you very much for your time in filling out this important survey! When you have completed the survey, please return it by mail in the postage paid envelope that is enclosed. Once again, thank you very much!

1. Do you own more than one parcel of undeveloped land on Clay Road where the median was installed?

   No____Yes____

   If yes, please specify the locations of all parcels of land that you own along this portion of Clay Road. Please complete this survey for each parcel of vacant land you own.

   _____

   _____

2. When did you purchase this property?

   Month _____ Year _____

3. What is the area (square footage or acreage) of the property you own?

   _____ Square feet or _____ Acres

4. What is the length of your property along Clay Road?

   _____ Feet

5. Did you lose some of your property due to the widening of Clay Road?

Yes _____ No _____

If yes, how much? _____ Square feet or _____ Acres Not sure _____

6. Do you believe that the installation of the raised median caused the time it takes to access your property to:

Increase _____ Decrease _____ No Change _____

7. Do you believe that your property is now more attractive or less attractive to potential buyers after the raised median has been installed?

More Attractive _____ Less Attractive _____

8. Do you believe that the addition of the raised median on Clay Road has affected the potential types of development on your property?

Yes _____ No _____

If yes, please explain:

_____

_____

_____

_____

_____

_____

9. Has your property's value per square foot or acre been affected by the installation of a raised median?

Yes _____ No _____

If yes, Up _____ Down _____ Percent Up or Down _____

10. Has your property's value per square foot or acre been affected by the roadway widening and/or loss of property?

Yes _____ No _____

If yes, Up _____ Down _____ Percent Up or Down _____

11. Please indicate the location of the nearest median opening that provides access to your land. In other words, how are future motorists likely going to enter/exit your land—at a mid-block median opening or through a street intersection?

Mid-Block____ Street Intersection____

For questions 12 through 15:

- Please give your best estimate of the percentage impact, up or down, on your land.
- If you do not think there was a large change during the construction or if there has not been a large change after the installation, please mark an "X" for "No Change."
- Please place an "X" for "Not Sure" if you are uncertain about what the effect was during construction or is now after the installation.

During and after the construction, has there been a change in:

12. The number of accidents along the portion of Clay Road where the median was installed?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

13. The traffic volumes along the portion of Clay Road where the median was installed?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

14. Gross sales for all businesses along the portion of Clay Road where the median was installed?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

15. Gross sales for all businesses in the area adjacent to the portion of Clay Road where the median was installed?

	During Construction (As compared to Before Construction)	After Installation (As compared to Before Construction)
Percent Increase	_____%	_____%
No Change	_____	_____
Percent Decrease	_____%	_____%
Not Sure	_____	_____

16. Please indicate below, whether you feel the installation of the raised median has made the following items "Better," "Worse," or about "The Same" as before the median was installed.

		Better	Worse	The Same
a.	Traffic Congestion	_____	_____	_____
b.	Traffic Safety	_____	_____	_____
c.	Property Access	_____	_____	_____
d.	Business Opportunities	_____	_____	_____
e.	Customer Satisfaction	_____	_____	_____
f.	Delivery Convenience	_____	_____	_____

17. Please indicate the extent of your involvement in the public hearing and public meeting process for this median installation project by placing an "X" next to the appropriate category below.

High (attended several meetings) ____
Somewhat high involvement ____
Moderate involvement ____
Somewhat low involvement ____
Low involvement ____

18. Please use this space to discuss any additional thoughts you may have about the raised median installation along Clay Road. There is additional space at the bottom of this page if necessary.

_____

_____

_____

_____

_____

_____

_____

Once again, thank you very much for your time in completing this important survey! Please mail this survey in the postage paid envelope that is enclosed to:

Texas Transportation Institute
Mobility Analysis Program
The Texas A&M University System
College Station, TX 77843-9988

APPENDIX C

Sample Customer Impact Survey for Texas Avenue

Site number:_____1_____

The Texas Transportation Institute at Texas A&M University is studying the economic impact of the roadway widening and raised median installation (elimination of the center turn lane) along Texas Avenue in College Station, Texas from University Drive to Dominik Drive for the Texas Department of Transportation. Please take the time to provide thoughtful responses to these survey questions. If you have any questions regarding this survey or the study please contact the research supervisor Bill Eisele at (979) 845-8550. Thank you very much for your time in filling out this survey!

1. Are you aware of the widening project in which a raised median was installed that eliminated the turn lane along Texas Avenue in front of this business?
   ____Yes ____No

2. Did you patronize this business prior to the construction of the raised median?
   ____Yes ____No

3. When leaving this business will you have to go the opposite way than you would like and make a U-turn (or series of right turns)?
   ____Yes ____No

4. Is this driving maneuver different than before the raised median was installed along the center of Texas Avenue in front of this business?
   ____Yes ____No

5. Did you make a special trip to visit this business or just stop here because it is convenient on the way to somewhere else?
   ____Special trip just to this business (or went out of way to stop here)
   ____Passing by / convenient

6. If you visited this business prior to the roadway widening and median installation, do you believe you are now more likely or less likely to visit this business or is it about the same?
   ____Less likely ____More likely _____Stayed about the same

7. If less likely in question 6, why?
   ____Access more difficult
   ____Takes longer to get here
   ____Other stores more convenient
   ____Other, please describe_____

8. If more likely in question 6, why?
   ____Access more convenient
   ____Less time to get here
   ____Access more safe
   ____Other, please describe_____

9. If you visited this business prior to the roadway widening and median installation, were you more likely or less likely to visit the business during the construction of the raised median?
   _____Less likely _____More likely _____Stayed about the same

10. Please rank the following considerations in increasing order from "1" to "6" (with "1" being the most important) that you use when selecting a business of this type:

Distance to Travel	Hours of Operation	Customer Service	Product Quality	Product Price	Accessibility to Store
_____	_____	_____	_____	_____	_____

11. Please indicate below whether you feel the installation of the raised median has made the following items "better," "worse," or about "the same" as before the median was installed.

		Better	Worse	The same
A.	Traffic congestion	_____	_____	_____
B.	Traffic safety	_____	_____	_____
C.	Property access	_____	_____	_____
D.	Customer satisfaction	_____	_____	_____

12. Do you have any other comments regarding the raised median?

Once again, thank you very much for your time in completing this important survey!

APPENDIX D

Additional Sample Size Information by Stratifying Variables of Interest

Table D-1. Sample Sizes of Shopping Centers and Stand-Alone Businesses by Business Group.

Business Group	Shopping Center	Stand-Alone	Totals
1	39	37	76
2	14	9	23
3	11	6	17
4	33	14	47
Totals	97	66	163

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table D-2. Sample Sizes of Personal Interviews and Mail-Out Surveys by Business Group.

Business Group	Personal Interview	Mail-Out	Totals
1	68	8	76
2	17	6	23
3	14	3	17
4	34	13	47
Totals	133	30	163

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table D-3. Sample Sizes of Closest Business Access along Corridor by Business Group.

Business Group	Mid-Block	Street Intersection	Unknown	Totals
1	35	37	1	73
2	7	12	3	22
3	6	11	0	17
4	19	26	0	45
Totals	67	86	4	157

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table D-4. Sample Sizes for Business Type by Closest Access Location.

Access Location	Durables Retail	Specialty Retail	Grocery	Gas Stations	Fast-Food Restaurant	Sit-Down Restaurant	Medical	Auto Repair	Hair Salon	Other Services	Other	Totals
Mid-Block	3	28	1	2	3	6	4	5	1	12	2	67
Street Int.	5	24	2	6	11	13	3	3	4	15	0	86
Unknown	0	0	1	0	1	1	0	0	1	0	0	4
Totals	8	52	4	8	15	20	7	8	6	27	2	157

Table D-5. Sample Sizes for Business Type by Building Type.

Access Location	Durables Retail	Specialty Retail	Grocery	Gas Stations	Fast-Food Restaurant	Sit-Down Restaurant	Medical	Auto Repair	Hair Salon	Other Services	Other	Totals
Shopping Center	4	38	5	0	3	8	7	2	4	22	4	97
Stand-Alone	4	14	0	8	12	12	0	6	2	8	0	66
Totals	8	52	5	8	15	20	7	8	6	30	4	163

APPENDIX E

Additional Detailed Data from Aggregate Summary Statistics

This appendix contains additional detailed data related to aggregate summary statistics as presented in Chapter 3.0. The data are discussed in four sections related to each business grouping as described in the report. These groupings are as follows:

Group One (Before): Businesses present before, during, and after median installation.
Group Two (Before only): Businesses present before median construction is to begin.
Group Three (During): Businesses present during and after median installation.
Group Four (After): Businesses present only after the median has been installed.

The additional data provided related to Tables 3-5, 3-12, and 3-13 include statistics for various variables of interest including sample sizes (N), average (mean), standard deviation, and minimum and maximum values. Additional data are provided in this appendix for Figures 3-3 through 3-6 including sample sizes and percentages of the sample specifying “better,” “worse,” or “the same.”

Table E-1. Select Statistics for Several Variables of Interest for Group One Businesses.

Variable of Interest	N	Mean	Standard Deviation	Minimum	Maximum
Passerby Traffic	52	–2.5	9.3	–45.0	10.0
Customers per Day (During)	54	–14.9	30.6	–90.0	100.0
Customers per Day (After)	55	17.7	101.0	–35.0	700.0
Full-Time Employees (D)	55	8.6	28.2	–50.0	100.0
Full-Time Employees (A)	57	3.2	20.0	–50.0	100.0
Part-Time Employees (D)	53	–3.2	19.7	–100.0	50.0
Part-Time Employees (A)	55	–0.3	12.2	–67.0	30.0
Gross Sales (D)	53	–11.6	24.7	–75.0	50.0
Gross Sales (A)	61	–0.03	1.4	–3.0	1.0
Property Values (D)	31	1.5	10.2	–15.0	50.0
Property Values (A)	38	6.9	15.8	–50.0	50.0
Accidents (D)	40	5.5	23.7	–50.0	100.0
Accidents (A)	40	–10.2	27.1	–75.0	30.0
Traffic Volumes (D)	38	–12.5	21.1	–65.0	50.0
Traffic Volumes (A)	44	31.4	50.7	0	250.0
Gross Sales Where Median Installed (D)	37	–16.3	18.5	–65.0	25.0
Gross Sales Where Median Installed (A)	35	8.5	20.5	–25.0	100.0
Gross Sales in Area Where Installed (D)	25	7.6	17.5	–25.0	65.0
Gross Sales in Area Where Installed (A)	22	1.2	7.1	–15.0	20.0

Table E-2. Traffic Congestion Statistics for Group One Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	45	62.50	45	62.50
Worse	11	15.28	56	77.78
The Same	16	22.22	72	100.00

Table E-3. Traffic Safety Statistics for Group One Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	50	70.42	50	70.42
Worse	6	8.45	56	78.87
The Same	15	21.13	71	100.00

Table E-4. Property Access Statistics for Group One Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	22	30.99	22	30.99
Worse	28	39.44	50	70.42
The Same	21	29.58	71	100.00

Table E-5. Business Opportunities Statistics for Group One Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	29	40.28	29	40.28
Worse	12	16.67	41	56.94
The Same	31	43.06	72	100.00

Table E-6. Customer Satisfaction Statistics for Group One Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	26	36.11	26	36.11
Worse	9	12.50	35	48.61
The Same	37	51.39	72	100.00

Table E-7. Delivery Convenience Statistics for Group One Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	18	25.35	18	25.35
Worse	17	23.94	35	49.30
The Same	36	50.70	71	100.00

Table E-8. Select Statistics for Several Variables of Interest for Group Two Businesses.

Variable of Interest	N	Mean	Standard Deviation	Minimum	Maximum
Passerby Traffic	5	5.0	11.2	0	25.0
Customers per Day (During)	18	–9.5	31.8	–70.0	80.0
Customers per Day (After)	16	–5.9	10.0	–25.0	0
Full-Time Employees (D)	19	–0.3	1.1	–5.0	0
Full-Time Employees (A)	18	0.3	7.8	–20.0	25.0
Part-Time Employees (D)	18	–0.2	0.9	–4.0	0
Part-Time Employees (A)	17	–1.0	4.9	–20.0	3.0
Gross Sales (D)	19	–18.6	24.8	–80.0	5.0
Gross Sales (A)	16	–0.8	1.6	–3.0	1.0
Property Values (D)	14	–8.2	22.5	–80.0	10.0
Property Values (A)	13	–2.3	11.8	–25.0	20.0
Accidents (D)	18	–3.3	23.0	–60.0	25.0
Accidents (A)	14	–13.2	33.5	–80.0	50.0
Traffic Volumes (D)	19	–11.1	25.0	–50.0	50.0
Traffic Volumes (A)	17	7.9	20.5	–15.0	80.0
Gross Sales where Median Installed (D)	13	–14.2	17.1	–50.0	0
Gross Sales where Median Installed (A)	14	5.4	22.9	–20.0	80.0
Gross Sales in Area Where Installed (D)	14	11.8	14.5	0	50.0
Gross Sales in Area Where Installed (A)	13	2.7	6.0	0	20.0

Table E-9. Traffic Congestion Statistics for Group Two Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	15	71.43	15	71.43
Worse	3	14.29	18	85.71
The Same	3	14.29	21	100.00

Table E-10. Traffic Safety Statistics for Group Two Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	15	75.0	15	75.0
The Same	5	25.0	20	100.00

Table E-11. Property Access Statistics for Group Two Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	3	16.67	3	16.67
Worse	10	55.56	13	72.22
The Same	5	27.78	18	100.00

Table E-12. Business Opportunities Statistics for Group Two Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	3	15.00	3	15.00
Worse	5	25.00	8	40.00
The Same	12	60.00	20	100.00

Table E-13. Customer Satisfaction Statistics for Group Two Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	6	30.00	6	30.00
Worse	5	25.00	11	55.00
The Same	9	45.00	20	100.00

Table E-14. Delivery Convenience Statistics for Group Two Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	7	35.00	7	35.00
Worse	8	40.00	15	75.00
The Same	5	25.00	20	100.00

Table E-15. Select Statistics for Several Variables of Interest for Group Three Businesses.

Variable of Interest	N	Mean	Standard Deviation	Minimum	Maximum
Passerby Traffic	9	–2.2	6.7	–20.0	0
Customers per Day (During)	8	–15.6	22.9	–50.0	0
Customers per Day (After)	9	–3.9	22.6	–60.0	25.0
Full-Time Employees (D)	8	–6.3	17.7	–50.0	0
Full-Time Employees (A)	8	9.4	26.5	0	75.0
Part-Time Employees (D)	8	–6.3	17.7	–50.0	0
Part-Time Employees (A)	9	0	0	0	0
Gross Sales (D)	7	–17.9	23.8	–50.0	0
Gross Sales (A)	9	0	1.2	–3.0	1.0
Property Values (D)	6	–5.8	14.3	–35.0	0
Property Values (A)	7	4.7	7.7	0	20.0
Accidents (D)	7	–7.1	18.9	–50.0	0
Accidents (A)	7	–10.7	28.3	–50.0	25.0
Traffic Volumes (D)	8	–8.8	27.5	–50.0	20.0
Traffic Volumes (A)	8	28.8	20.5	0	55.0
Gross Sales where Median Installed (D)	7	–12.9	18.7	–50.0	0
Gross Sales where Median Installed (A)	7	13.6	20.6	0	50.0
Gross Sales in Area Where Installed (D)	7	0.7	15.9	–25.0	30.0
Gross Sales in Area Where Installed (A)	7	0.7	18.8	–30.0	35.0

Table E-16. Traffic Congestion Statistics for Group Three Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	12	75.00	12	75.00
Worse	3	18.75	15	93.75
The Same	1	6.25	16	100.00

Table E-17. Traffic Safety Statistics for Group Three Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	14	82.35	14	82.35
Worse	1	5.88	15	88.24
The Same	2	11.76	17	100.00

Table E-18. Property Access Statistics for Group Three Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	7	41.18	7	41.18
Worse	5	29.41	12	70.59
The Same	5	29.41	17	100.00

Table E-19. Business Opportunities Statistics for Group Three Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	7	43.75	7	43.75
The Same	9	56.25	16	100.00

Table E-20. Customer Satisfaction Statistics for Group Three Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	5	31.25	5	31.25
Worse	2	12.50	7	43.75
The Same	9	56.25	16	100.00

Table E-21. Delivery Convenience Statistics for Group Three Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	4	23.53	4	23.53
Worse	4	23.53	8	47.06
The Same	9	52.94	17	100.00

Table E-22. Select Statistics for Several Variables of Interest for Group Four Businesses.

Variable of Interest	N	Mean	Standard Deviation	Minimum	Maximum
Passerby Traffic	6	12.0	23.9	–2.0	60.0
Customers per Day (During)	2	0	0	0	0
Customers per Day (After)	8	50.0	105.6	–30.0	300.0
Full-Time Employees (D)	3	0	0	0	0
Full-Time Employees (A)	7	7.1	18.9	0	50.0
Part-Time Employees (D)	3	0	0	0	0
Part-Time Employees (A)	8	6.3	17.7	0	50.0
Gross Sales (D)	1	0	.	0	0
Gross Sales (A)	7	0.3	1.5	–3.0	1.0
Property Values (D)	9	–15.6	22.4	–50.0	10.0
Property Values (A)	11	7.7	12.9	0	40.0
Accidents (D)	6	0	0	0	0
Accidents (A)	12	6.7	18.6	–20.0	50.0
Traffic Volumes (D)	8	–21.9	23.9	–50.0	0
Traffic Volumes (A)	11	37.7	89.3	–20.0	300.0
Gross Sales Where Median Installed (D)	12	–20.4	17.8	–50.0	0
Gross Sales Where Median Installed (A)	12	12.9	18.1	–10.0	45.0
Gross Sales in Area Where Installed (D)	11	9.5	13.7	0	35.0
Gross Sales in Area Where Installed (A)	11	5.9	13.8	–20.0	35.0

Table E-23. Traffic Congestion Statistics for Group Four Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	18	60.00	18	60.00
Worse	4	13.33	22	73.33
The Same	8	26.67	30	100.00

Table E-24. Traffic Safety Statistics for Group Four Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	21	70.00	21	70.00
Worse	5	16.67	26	86.67
The Same	4	13.33	30	100.00

Table E-25. Property Access Statistics for Group Four Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	14	46.67	14	46.67
Worse	11	36.67	25	83.33
The Same	5	16.67	30	100.00

Table E-26. Business Opportunities Statistics for Group Four Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	13	43.33	13	43.33
Worse	3	10.00	16	53.33
The Same	14	46.67	30	100.00

Table E-27. Customer Satisfaction Statistics for Group Four Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	9	30.00	9	30.00
Worse	5	16.67	14	46.67
The Same	16	53.33	30	100.00

Table E-28. Delivery Convenience Statistics for Group Four Businesses.

Value	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	11	36.67	11	36.67
Worse	6	20.00	17	56.67
The Same	13	43.33	30	100.00

APPENDIX F

Additional Detail for Analyses of Interest

Table F-1. Percent Change, Standard Deviation, and Sample Size of Passerby Traffic for Different Business Types and Business Groups.

Business Group	Durables Retail	Specialty Retail	Grocery	Gas Station	Fast-Food Restaurant	Sit-Down Restaurant	Medical	Auto Repair	Hair Salon	Other Services
1	0.04% – 1	–1.6% 8.0 19	0.0% – 1	–17.5% 19.4 4	1.2% 10.4 6	–1.3% 3.5 8	0.0% 0.0 2	–1.25% 2.5 4	—	–3.4% 8.4 7
2	—	—	—	—	—	25.0% – 1	0.0% 0.0 2	0.0% – 1	0.0% – 1	—
3	0.0% – 1	0.0% 0.0 2	—	–20.0% – 1	—	0.0% – 1	0.0% – 1	—	0.0% – 1	0.0% 0.0 2
4	0.0% 0.0 1	29.0% 43.8 2	10.0% – 1	—	—	—	0.0% – 1	—	—	4.0% – 1

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table F-2. Passerby Customer Information of Interest for Specific Stratifying Variables for Businesses Present Before, During, and After the Median Installation.

Business Type	Building Type	Location	On Corner Lot?	Sample Size	Percent Change Standard Deviation
Specialty Retail	Shopping Center	Mid-Block	No	8	0.6% 1.8
Specialty Retail	Shopping Center	Street Intersection	No	5	0.0% 0.0
Specialty Retail	Stand-Alone	Mid-Block	No	2	2.5% 3.5
Specialty Retail	Stand-Alone	Street Intersection	No	3	−13.3% 17.6
Gas Station	Stand-Alone	Street Intersection	No	2	−27.5% 24.7
Fast-Food Restaurant	Stand-Alone	Street Intersection	No	3	−4.3% 12.1
Sit-Down Restaurant	Shopping Center	Street Intersection	No	3	0.0% 0.0
Auto Repair	Stand-Alone	Mid-Block	No	2	−2.5% 3.5
Other Services	Shopping Center	Street Intersection	No	2	0.0% 0.0
Other Services	Stand-Alone	Mid-Block	No	2	−7.5% 17.7

Table F-3. Relative Importance of Accessibility to Store by Business Group.

Business Group	Sample Size	Distance to Travel	Hours of Operation	Customer Service	Product Quality	Product Price	Accessibility to Store
1	70	6	5	1	2	3	4
2	20	6	5	1	2	3	4
3	14	6	4	1	2	3	5
4	40	5	6	2	1	3	4

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table F-4. Relative Importance Ranking of Accessibility to Store for Select Stratifying Variables.

Business Group	Business Type	Building Type	Location	On Corner Lot?	Sample Size	Distance to Travel	Hours of Operation	Customer Service	Product Quality	Product Price	Accessibility to Store
1	Specialty Retail	Shopping Center	Mid-Block	No	9	5	6	1	2	3	4
1	Specialty Retail	Shopping Center	Street Intersection	No	7	6	5	3	1	1	4
1	Specialty Retail	Stand-Alone	Mid-Block	No	3	5	4	1	2	5	2
1	Specialty Retail	Stand-Alone	Street Intersection	No	3	5	5	1	2	3	4
1	Gas Station	Stand-Alone	Street Intersection	No	2	5	4	1	3	2	3
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	Yes	2	6	4	2	1	5	3
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	No	5	4	6	2	1	5	3
1	Sit-Down Restaurant	Shopping Center	Street Intersection	No	3	6	5	1	2	3	4
1	Sit-Down Restaurant	Stand-Alone	Mid-Block	No	3	5	6	1	2	3	4
1	Auto Repair	Stand-Alone	Mid-Block	No	2	4	3	2	1	3	5
1	Other Services	Shopping Center	Mid-Block	No	2	4	3	1	1	2	4
1	Other Services	Shopping Center	Street Intersection	Yes	2	5	2	3	2	1	4
1	Other Services	Shopping Center	Street Intersection	No	2	6	4	1	2	5	3
1	Other Services	Stand-Alone	Mid-Block	No	3	5	4	1	2	3	6
1	Specialty Retail	Shopping Center	Mid-Block	No	4	4	4	1	2	2	3
2	Specialty Retail	Stand-Alone	Street Intersection	Yes	2	6	4	2	1	3	5
2	Medical	Shopping Center	Street Intersection	No	2	6	2	4	5	1	3
3	Specialty Retail	Shopping Center	Mid-Block	No	3	6	5	1	3	2	4
4	Durables Retail	Stand-Alone	Street Intersection	No	3	6	4	3	1	2	5
4	Specialty Retail	Shopping Center	Mid-Block	No	6	6	5	2	3	1	4
4	Specialty Retail	Shopping Center	Street Intersection	No	3	6	4	1	2	3	5
4	Grocery	Shopping Center	Street Intersection	No	2	2	5	1	4	3	2
4	Sit-Down Restaurant	Shopping Center	Street Intersection	No	3	4	6	2	1	3	5
4	Sit-Down Restaurant	Stand-Alone	Street Intersection	No	2	4	4	3	1	4	2
4	Other Services	Shopping Center	Mid-Block	No	2	2	4	1	3	2	5
4	Other Services	Shopping Center	Street Intersection	No	4	5	5	2	1	3	4

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table F-5. Frequency and Sample Sizes for Impacts on Regular Customers from Business Owners for Each Business Type.

Business Group	Likeliness	Durables Retail	Specialty Retail	Grocery	Gas Station	Fast-Food Restaurant	Sit-Down Restaurant	Medical	Auto Repair	Hair Salon	Other Services	Other	Totals
1	Less Likely	0.0% 0	1.4% 1	0.0% 0	2.9% 2	2.9% 2	0.0% 0	0.0% 0	1.4% 1	0.0% 0	5.7% 4	0.0% 0	14.3% 0
	More Likely	0.0% 0	5.7% 4	0.0% 0	1.4% 1	5.7% 4	1.4% 1	0.0% 0	1.4% 1	0.0% 0	0.0% 0	0.0% 0	15.7% 11
	Stay About the Same	2.9% 2	24.3% 17	1.4% 1	2.9% 2	7.1% 5	12.9% 9	2.9% 2	7.1% 5	0.0% 0	8.6% 6	0.0% 0	70.0% 49
2	Less Likely	0.0% 0	9.5% 2	4.8% 1	0.0% 0	0.0% 0	4.8% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	19.1% 3
	More Likely	4.8% 1	4.8% 1	0.0% 0	4.8% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	14.3% 3
	Stay About the Same	0.0% 0	19.1% 4	0.0% 0	0.0% 0	4.8% 1	0.0% 0	14.3% 3	4.8% 1	14.3% 3	9.5% 2	0.0% 0	66.7% 14
3	Less Likely	0.0% 0	0.0% 0	0.0% 0	6.3% 1	0.0% 0	6.3% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	12.5% 2
	More Likely	0.0% 0	12.5% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	6.3% 1	0.0% 0	18.8% 3
	Stay About the Same	6.3% 1	25.0% 4	0.0% 0	0.0% 0	6.3% 1	6.3% 1	6.3% 1	0.0% 0	6.3% 1	12.5% 2	0.0% 0	68.8% 11
4	Less Likely	3.0% 1	6.1% 2	3.0% 1	0.0% 0	0.0% 0	6.1% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	18.2% 6
	More Likely	3.0% 1	6.1% 2	3.0% 1	0.0% 0	0.0% 0	3.0% 1	0.0% 0	0.0% 0	3.0% 1	6.1% 2	0.0% 0	24.2% 8
	Stay About the Same	3.0% 1	18.2% 6	0.0% 0	0.0% 0	3.0% 1	12.1% 4	3.0% 1	0.0% 0	3.0% 1	12.1% 4	3.0% 1	57.6% 19

Note: Cell percentages provided sum to rightmost column (see Table 3-9).

Table F-6. Frequency and Sample Sizes for Impacts on Regular Customers from Business Owners for Stratifying Variables of Interest.

Business Group	Business Type	Building Type	Location	On Corner Lot?	Likeliness		
					Less Likely	More Likely	Stay About the Same
1	Specialty Retail	Shopping Center	Mid-Block	No	0.0% 0	11.1% 1	88.9% 8
1	Specialty Retail	Shopping Center	Street Intersection	No	0.0% 0	33.3% 2	66.7% 4
1	Specialty Retail	Stand-Alone	Mid-Block	No	0.0% 0	0.0% 0	100.0% 3
1	Specialty Retail	Stand-Alone	Street Intersection	Yes	0.0% 0	0.0% 0	100.0% 1
1	Fast-Food Restaurant	Shopping Center	Street Intersection	No	0.0% 0	100.0% 1	0.0% 0
1	Fast-Food Restaurant	Stand-Alone	Mid-Block	No	0.0% 0	0.0% 0	100.0% 2
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	Yes	50.0% 1	50.0% 1	0.0% 0
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	No	20.0% 1	20.0% 1	60.0% 3
1	Sit-Down Restaurant	Shopping Center	Mid-Block	No	0.0% 0	0.0% 0	100.0% 1
1	Sit-Down Restaurant	Shopping Center	Street Intersection	No	0.0% 0	0.0% 0	100.0% 3
1	Sit-Down Restaurant	Stand-Alone	Mid-Block	Yes	0.0% 0	0.0% 0	100.0% 1
1	Sit-Down Restaurant	Stand-Alone	Mid-Block	No	33.3% 1	0.0% 0	66.7% 2
1	Sit-Down Restaurant	Stand-Alone	Street Intersection	No	0.0% 0	0.0% 0	100.0% 1
1	Sit-Down Restaurant	Stand-Alone	Street Intersection	No	0.0% 0	0.0% 0	100.0% 1
2	Specialty Retail	Shopping Center	Mid-Block	No	25.0% 1	25.0% 1	50.0% 2
3	Specialty Retail	Shopping Center	Mid-Block	No	0.0% 0	33.3% 1	66.7% 2
4	Specialty Retail	Shopping Center	Mid-Block	No	33.3% 1	66.7% 2	0.0% 0
4	Specialty Retail	Shopping Center	Street Intersection	No	0.0% 0	0.0% 0	100.0% 3

Table F-7. Percent Change, Standard Deviation, and Sample Size for Full-Time Employees, Part-Time Employees, Property Values, Accidents, and Traffic Volume for Stratifying Variables of Interest.

Business Group	Business Type	Building Type	Location	On Corner Lot?	Full-Time Employees		Part-Time Employees		Property Values		Accidents		Traffic Volume	
					During	After	During	After	During	After	During	After	During	After
1	Durables Retail	Shopping Center	Mid-Block	No	—	0.0% – 1	—	0.0% – 1	—	15.0% – 1	—	—	—	25.0% – 1
1	Durables Retail	Shopping Center	Street Intersection	No	—	—	—	—	20.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	–20.0% – 1	20.0% – 1
1	Specialty Retail	Shopping Center	Mid-Block	No	22.2% 44.1 9	–3.7% 11.0 9	–4.1% 11.7 8	–8.4% 23.7 8	–1.7% 4.1 6	8.6% 9.0 7	0.8% 4.9 6	–20.0% 38.6 7	1.7% 25.8 6	15.0% 19.4 7
1	Specialty Retail	Shopping Center	Street Intersection	No	33.3% 51.6 6	4.2% 10.2 6	8.3% 20.4 6	–5.5% 13.5 6	0.0% 0 4	–2.4% 27.4 5	20.0% 40.0 6	1.3% 21.0 4	–14.2% 20.1 6	23.0% 18.2 5
1	Specialty Retail	Stand-Alone	Mid-Block	No	20.0% 28.3 2	14.0% 19.8 2	0.0% 0 2	0.0% 0 2	—	—	0.0% 0 2	0.0% – 1	–30.0% – 1	250.0% – 1
1	Specialty Retail	Stand-Alone	Street Intersection	Yes	—	0.0% – 1	—	0.0% – 1	—	—	—	—	—	0.0% – 1
1	Specialty Retail	Stand-Alone	Street Intersection	No	0.0% 0.0 3	0.0% 0.0 2	0.0% 0.0 3	0.0% 0.0 2	—	0.0% – 1	50.0% – 1	–9.0% 15.6 2	0.0% 0.0 2	7.5% 10.6 2
1	Gas Station	Stand-Alone	Mid-Block	Yes	33.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	—
1	Gas Station	Stand-Alone	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	5.0% – 1	50.0% – 1	25.0% – 1	25.0% – 1	–50.0% – 1	100.0% – 1
1	Gas Station	Stand-Alone	Street Intersection	Yes	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	—	—	—
1	Gas Station	Stand-Alone	Street Intersection	No	–10.0% 14.1 2	–12.5% 17.7 2	–50.0% 70.7 2	0.0% – 1	0.0% – 1	10.0% – 1	–25.0% – 1	–25.0% – 1	–65.0% – 1	35.0% 49.5 2
1	Fast-Food Restaurant	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	–15.0% – 1	15.0% – 1	—	—	—	—
1	Fast-Food Restaurant	Stand-Alone	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	—
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	Yes	–50.0% – 1	80.0% – 1	–22.5% 38.9 2	8.0% 31.1 2	10.0% – 1	20.0% – 1	10.0% 14.1 2	–30.0% 28.3 2	–5.0% 35.4 2	35.0% 21.2 2
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	No	9.3% 20.6 3	35.0% 56.3 3	–20.7% 40.2 3	1.7% 2.9 3	—	21.7% 2.9 3	50.0% – 1	20.0% 0.0 2	–25.0% 7.1 2	66.7% 28.9 3

Table F-7. Percent Change, Standard Deviation, and Sample Size for Full-Time Employees, Part-Time Employees, Property Values, Accidents, and Traffic Volume for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Full-Time Employees		Part-Time Employees		Property Values		Accidents		Traffic Volume	
					During	After	During	After	During	After	During	After	During	After
1	Sit-Down Restaurant	Shopping Center	Mid--lock	No	15.0% – 1	25.0% – 1	15.0% – 1	25.0% – 1	—	—	0.0% – 1	0.0% – 1	0.0% – 1	15.0% – 1
1	Sit-Down Restaurant	Shopping Center	Street Intersection	No	0.0% – 3	0.0% – 3	0.0% – 3	0.0% – 3	0.0% – 3	0.0% – 3	15.7% 28.7 3	−50.0% 43.3 3	13.3% 15.3 3	5.0% 8.7 3
1	Sit-Down Restaurant	Stand-Alone	Mid-Block	Yes	—	0.0% – 1	—	0.0% – 1	—	0.0% – 1	—	0.0% – 1	—	—
1	Sit-Down Restaurant	Stand-Alone	Mid-Block	No	0.3% 0.6 3	3.3% 5.8 3	0.3% 0.6 3	8.3% 14.4 3	0.0% – 1	—	−50.0% – 1	−25.0% 35.4 2	−10.0% – 1	10.0% – 1
1	Sit-Down Restaurant	Stand-Alone	Street Intersection	Yes	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	2.0% – 1	−4.0% – 1	−10.0% – 1	0.0% – 1
1	Sit-Down Restaurant	Stand-Alone	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	−30.0% – 1	10.0% – 1
1	Medical	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	−10.0% – 1	−30.0% – 1	0.0% – 1	0.0% – 1	−15.0% – 1	0.0% – 1
1	Auto Repair	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—
1	Auto Repair	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	—	—	—	—	—	—	−20.0% – 1	50.0% – 1
1	Auto Repair	Stand-Alone	Mid-Block	No	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 1	0.0% – 1	1.5% 2.1 2	−1.0% 1.4 2	—	20.0% – 1
1	Auto Repair	Stand-Alone	Street Intersection	No	—	—	—	—	10.0% – 1	10.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	75.0% – 1
1	Auto Repair	Stand-Alone	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	—	—	—

Table F-7. Percent Change, Standard Deviation, and Sample Size for Full-Time Employees, Part-Time Employees, Property Values, Accidents, and Traffic Volume for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Full-Time Employees		Part-Time Employees		Property Values		Accidents		Traffic Volume	
					During	After	During	After	During	After	During	After	During	After
1	Other Services	Shopping Center	Mid-Block	No	5.0% 7.1 2	5.0% 7.1 2	0.0% – 1	0.0% – 1	0.0% – 1	23.0% – 1	0.0% – 1	0.0% – 1	—	0.0% – 1
1	Other Services	Shopping Center	Street Intersection	Yes	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 1	0.0% – 1	0.0% – 1
1	Other Services	Shopping Center	Street Intersection	No	7.5% 10.6 2	2.5% 3.5 2	0.0% – 2	5.0% 7.1 2	5.0% 7.1 2	7.5% 10.6 2	–15.0% 21.2 2	–15.0% 21.2 2	0.0% – 2	14.1% 10.0 2
1	Other Services	Stand-Alone	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	—	–50.0% – 1	200.0% – 1
1	Other Services	Stand-Alone	Street Intersection	Yes	0.0% – 1	–50.0% – 1	0.0% – 1	0.0% – 1	—	—	0.0% – 1	—	0.0% – 1	0.0% – 1
2	Durables Retail	Stand-Alone	Mid-Block	No	–5.0% – 1	0.0% – 1	–4.0% – 1	0.0% – 1	0.0% – 1	5.0% – 1	0.0% – 1	–10.0% – 1	0.0% – 1	5.0% – 1
2	Specialty Retail	Shopping Center	Mid-Block	No	0.0% – 4	1.3% 18.4 4	0.0% – 4	–5.0% 10.0 4	5.0% 7.1 2	0.0% 20.0 3	2.5% 5.0 4	8.5% 36.7 3	–21.3% 22.1 4	–5.0% 8.7 3
2	Specialty Retail	Shopping Center	Street Intersection	No	0.0% – 1	—	0.0% – 1	—	—	—	—	—	0.0% – 1	0.0% – 1
2	Specialty Retail	Stand-Alone	Street Intersection	Yes	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 1	–10.0% – 1	–30.0% 42.4 2	–40.0% 56.6 2	–7.5% 10.6 2	5.0% 7.1 2
2	Specialty Retail	Stand-Alone	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	–25.0% – 1	–25.0% – 1	15.0% – 1	–10.0% – 1	10.0% – 1	0.0% – 1
2	Gas Station	Stand-Alone	Street Intersection	Yes	—	0.0% – 1	—	0.0% – 1	—	—	0.0% – 1	–30.0% – 1	0.0% – 1	15.0% – 1
2	Fast-Food Restaurant	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	10.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
2	Sit-Down Restaurant	Shopping Center	Unknown	No	—	—	—	—	—	—	—	—	–50.0% – 1	—

Table F-7. Percent Change, Standard Deviation, and Sample Size for Full-Time Employees, Part-Time Employees, Property Values, Accidents, and Traffic Volume for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Full-Time Employees		Part-Time Employees		Property Values		Accidents		Traffic Volume	
					During	After	During	After	During	After	During	After	During	After
2	Medical	Shopping Center	Mid-Block	No	—	—	—	—	—	—	—	—	—	—
2	Medical	Shopping Center	Street Intersection	No	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	–25.% 49.5 2	–45.0% 49.5 2	–32.5% 24.7 2	47.5% 46.0 2
2	Auto Repair	Stand-Alone	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	–10.0% – 1	0.0% – 1	20.0% – 1	0.0% – 1
2	Hair Salon	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	3.0% – 1	–20.0% – 1	0.0% – 1	–15.0% – 1	—	5.0% – 1	0.0% – 1
2	Hair Salon	Stand-Alone	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	25.0% – 1	0.0% – 1	–35.0% – 1	0.0% – 1
2	Hair Salon	Stand-Alone	Unknown	No	0.0% – 1	0.0% – 1	—	—	—	—	25.0% – 1	10.0% – 1	50.0% – 1	25.0% – 1
3	Durables Retail	Shopping Center	Mid-Block	No	0.0% – 1	75.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	3.0% – 1	0.0% – 1	–50.0% – 1	–10.% – 1	10.0% – 1
3	Specialty Retail	Shopping Center	Mid-Block	Yes	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	0.0% – 1	0.0% – 1	0.0% – 1	25.0% – 1
3	Specialty Retail	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
3	Specialty Retail	Shopping Center	Street Intersection	No	—	—	—	0.0% – 1	—	10.0% – 1	—	—	20.0% – 1	20.0% – 1
3	Gas Station	Stand-Alone	Street Intersection	Yes	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	25.0% – 1	–50.0% – 1	50.0% – 1
3	Sit-Down Restaurant	Stand-Alone	Street Intersection	No	–50.0% – 1	0.0% – 1	–50.0% – 1	0.0% – 1	–35.0% – 1	20.0% – 1	0.0% – 1	0.0% – 1	–50.0% – 1	50.0% – 1
3	Medical	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	0.0% – 1	55.0% – 1
3	Hair Salon	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	–50.0% – 1	–50.0% – 1	—	—
3	Other Services	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	20.0% – 1	–20.0% – 1

Table F-7. Percent Change, Standard Deviation, and Sample Size for Full-Time Employees, Part-Time Employees, Property Values, Accidents, and Traffic Volume for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Full-Time Employees		Part-Time Employees		Property Values		Accidents		Traffic Volume	
					During	After	During	After	During	After	During	After	During	After
4	Durables Retail	Shopping Center	Street Intersection	No	—	—	—	—	10.0% – 1	20.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	25.0% – 1
4	Durables Retail	Stand-Alone	Street Intersection	No	—	—	—	—	0.0% – 1	0.0% – 1	—	—	0.0% – 1	0.0% – 1
4	Specialty Retail	Shopping Center	Mid-Block	No	—	—	—	—	0.0% – 1	0.0% – 1	0.0% – 2	0.0% – 2	—	—
4	Specialty Retail	Shopping Center	Street Intersection	Yes	—	0.0% – 1	—	0.0% – 1	–40.0% – 1	40.0% – 1	—	50.0% – 1	—	0.0% – 1
4	Specialty Retail	Shopping Center	Street Intersection	No	—	0.0% – 1	—	0.0% – 2	–50.0% – 1	5.0% 7.1 2	0.0% – 1	–1.7% 17.6 3	–50.0% 0.0 2	25.2% 3.3 3
4	Specialty Retail	Shopping Center	Street Intersection	No	—	0.0% – 1	—	0.0% – 2	–50.0% – 1	5.0% 7.1 2	0.0% – 1	–1.7% 17.6 3	–50.0% – 1	3.3% 25.2 3
4	Fast-Food Restaurant	Stand-Alone	Street Intersection	Yes	—	0.0% – 1	—	0.0% – 1	—	15.0% – 1	—	0.0% – 1	—	30.0% – 1
4	Medical	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
4	Hair Salon	Shopping Center	Mid-Block	Yes	—	—	—	—	—	0.0% – 1	—	35.0% – 1	—	—
4	Hair Salon	Shopping Center	Street Intersection	No	—	0.0% – 1	—	0.0% – 1	–20.0% – 1	—	—	0.0% – 1	–40.0% – 1	0.0% – 1
4	Other Services	Shopping Center	Mid-Block	No	0.0% – 2	0.0% – 1	0.0% – 2	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
4	Other Services	Shopping Center	Street Intersection	No	—	50.0% – 1	—	50.0% – 1	–40.0% – 1	0.0% – 1	—	—	–35.0% – 1	300.0% – 1

Table F-8. Percent Change, Standard Deviation, and Sample Size for Customers per Day, Gross Sales, Gross Sales Where the Median Was (Will Be) Installed, and Gross Sales in the Area for Stratifying Variables of Interest.

Business Group	Business Type	Building Type	Location	On Corner Lot?	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in Area	
					During	After	During	After	During	After	During	After
1	Durables Retail	Shopping Center	Mid-Block	No	—	5.0% – 1	0.0% – 1	1.0% – 1	–20.0% – 1	0.0% – 1	—	—
1	Durables Retail	Shopping Center	Street Intersection	No	15.0% – 1	5.0% – 1	15.0% – 1	0.0% – 1	–12.0% – 1	8.0% – 1	0.0% – 1	—
1	Specialty Retail	Shopping Center	Mid-Block	No	–3.6% 6.3 7	5.0% 6.5 7	0.0% 8.9 8	0.8% 0.4 9	–9.3% 8.9 7	5.0% 8.4 7	5.8% 9.2 6	–2.0% 4.5 5
1	Specialty Retail	Shopping Center	Street Intersection	No	12.5% 19.4 6	10.0% 13.8 6	–12.5% 19.4 6	0.2% 1.6 6	–23.0% 24.9 5	10.0% 9.4 5	14.0% 31.5 5	0.0% – 3
1	Specialty Retail	Stand-Alone	Mid-Block	No	–2.7% 21.9 3	21.0% 16.5 3	–9.7% 25.5 3	1.0% 0.0 1	–20.0% – 1	40.0% – 1	10.0% – 1	7.0% – 1
1	Specialty Retail	Stand-Alone	Street Intersection	Yes	—	—	—	0.0% – 1	—	—	—	—
1	Specialty Retail	Stand-Alone	Street Intersection	No	–6.0% 7.9 3	–6.5% 4.9 2	–1.5% 2.1 2	–1.5% 2.1 2	25.0% – 1	0.0% – 1	—	—
1	Gas Station	Stand-Alone	Mid-Block	Yes	–40.0% – 1	–10.0% – 1	–40.0% – 1	–3.0% – 1	—	—	—	—
1	Gas Station	Stand-Alone	Mid-Block	No	100.0% – 1	20.0% – 1	0.0% – 1	0.0% – 1	–50.0% – 1	100.0% – 1	0.0% – 1	0.0% – 1
1	Gas Station	Stand-Alone	Street Intersection	Yes	–67.0% – 1	–33.0% – 1	–67.0% – 1	–3.0% –1–	—	—	—	—
1	Gas Station	Stand-Alone	Street Intersection	No	–47.5% 3.54 2	–32.5% 3.54 2	–47.5% 3.54 2	–3.0% 0.0 2	–30.0% – 1	–20.0% – 1	30.0% – 1	20.0% – 1

Table F-8. Percent Change, Standard Deviation, and Sample Size for Customers per Day, Gross Sales, Gross Sales Where the Median Was (Will Be) Installed, and Gross Sales in the Area for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in Area	
					During	After	During	After	During	After	During	After
1	Fast-Food Restaurant	Shopping Center	Street Intersection	No	—	−2.0% – 1	—	—	−25.0% – 1	15.0% – 1	0.0% – 1	10.0% – 1
1	Fast-Food Restaurant	Stand-Alone	Mid-Block	No	−50.0% – 1	−25.0% – 1	−50.0% – 1	−3.0% – 1	−40.0% – 1	−15.0% – 1	—	—
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	Yes	−32.5% 24.7 2	2.5% 24.7 2	15.0% – 1	1.0% – 1	—	—	—	—
1	Fast-Food Restaurant	Stand-Alone	Street Intersection	No	−8.8% 42.3 5	200.4% 298.4 5	−5.0% 37.1 5	1.0% 0.0 5	−25.0% 8.7 3	23.3% 7.6 3	15.0% 7.1 2	−7.5% 10.6 2
1	Sit-Down Restaurant	Shopping Center	Mid-Block	No	—	—	8.0% – 1	1.0% – 1	—	—	—	—
1	Sit-Down Restaurant	Shopping Center	Street Intersection	No	−3.3% 5.8 3	0.0% 0.0 3	−1.5% 12.0 2	0.7% 0.6 3	0.0% 14.1 2	3.5% 4.7 2	3.0.0% – 1	0.0% – 1
1	Sit-Down Restaurant	Stand-Alone	Mid-Block	Yes	—	—	—	1.0% – 1	—	—	—	—
1	Sit-Down Restaurant	Stand-Alone	Mid-Block	No	1.0% 1.4 2	6.5% 2.1 2	1.0% 1.4 2	1.0% 0 3	1.0% – 1	1.0% – 1	1.0% – 1	1.0% – 1
1	Sit-Down Restaurant	Stand-Alone	Street Intersection	Yes	−15.0% – 1	5.0% – 1	−12.0% – 1	1.0% – 1	−10.0% – 1	1.0% – 1	−4.0% – 1	1.0% – 1
1	Sit-Down Restaurant	Stand-Alone	Street Intersection	No	−20.0% – 1	1.0% – 1	−20.0% – 1	1.0% – 1	−25.0% – 1	5.0% – 1	−25.0% – 1	1.0% – 1
1	Medical	Shopping Center	Street Intersection	No	−10.0% – 1	0.0% – 1	−10.0% – 1	0.0% – 1	−20.0% – 1	0.0% – 1	15.0% – 1	15.0% – 1

Table F-8. Percent Change, Standard Deviation, and Sample Size for Customers per Day, Gross Sales, Gross Sales Where the Median Was (Will Be) Installed, and Gross Sales in the Area for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in Area	
					During	After	During	After	During	After	During	After
1	Auto Repair	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—
1	Auto Repair	Shopping Center	Street Intersection	No	—	—	0.0% – 1	0.0% – 1	—	0.0% – 1	—	—
1	Auto Repair	Stand-Alone	Mid-Block	No	–40.0% 17.3 3	–8.3% 14.4 3	–40.0% 17.3 3	–1.0% 1.7 3	–35.0% 21.2 2	–25.0% – 1	—	—
1	Auto Repair	Stand-Alone	Street Intersection	No	—	—	—	—	0.0% – 1	15.0% – 1	0.0% – 1	0.0% – 1
1	Auto Repair	Stand-Alone	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	—
1	Other Services	Shopping Center	Mid-Block	No	–50.0% – 1	–12.0% – 1	20.0% – 1	–1.0% 2.8 2	–50.0% – 1	—	—	—
1	Other Services	Shopping Center	Street Intersection	Yes	–45.0% 63.6 2	0.0% 0.0 2	0.0% – 1	0.0% 0.0 2	0.0% – 1	0.0% 0.0 2	0.0% – 1	0.0% 0.0 2
1	Other Services	Shopping Center	Street Intersection	No	0.0% 0.0 2	0.0% 0.0 2	0.0% 0.0 2	0.0% 0.0 2	–10.0% – 1	15.0% – 1	—	—
1	Other Services	Stand-Alone	Mid-Block	No	–45.0% 42.4 2	–20.0% 0.0 2	–75.0% – 1	–3.0% – 1	—	—	—	—
1	Other Services	Stand-Alone	Street Intersection	Yes	–30.0% – 1	–15.0% – 1	–50.0% – 1	–3.0% – 1	—	—	—	—

Table F-8. Percent Change, Standard Deviation, and Sample Size for Customers per Day, Gross Sales, Gross Sales Where the Median Was (Will Be) Installed, and Gross Sales in the Area for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in Area	
					During	After	During	After	During	After	During	After
2	Durables Retail	Stand-Alone	Mid-Block	No	–10.0% – 1	0.0% – 1	–5.0% – 1	0.0% – 1	–5.0% – 1	0.0% – 1	5.0% – 1	0.0% – 1
2	Specialty Retail	Shopping Center	Mid-Block	No	–40.0% 29.4 4	–11.3% 13.1 4	–38.8% 29.5 4	–1.3% 2.1 4	–38.3% 20.2 3	0.0% 10 3	13.3% 12.6 3	3.3% 5.8 3
2	Specialty Retail	Shopping Center	Street Intersection	No	–8.0% – 1	–20.0% – 1	–8.0% – 1	–3.0% – 1	0.0% – 1	–20.0% – 1	20.0% – 1	20.0% – 1
2	Specialty Retail	Stand-Alone	Street Intersection	Yes	2.5% 31.8 2	0.0% – 1	–20.0% 0.0 2	0.0% – 1	–20.0% – 1	0.0% – 1	20.0% – 1	5.0% – 1
2	Specialty Retail	Stand-Alone	Street Intersection	No	—	–5.0% – 1	0.0% – 1	0.0% – 1	–15.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
2	Gas Station	Stand-Alone	Street Intersection	Yes	—	—	—	0.0% – 1	–10.0% – 1	15.0% – 1	10.0% – 1	0.0% – 1
2	Fast-Food Restaurant	Shopping Center	Street Intersection	No	5.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
2	Sit-Down Restaurant	Shopping Center	Unknown	No	–30.0% – 1	–25.0% – 1	–30.0% – 1	–3.0% – 1	—	—	—	—
2	Medical	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	—	—	—	—	—	—
2	Medical	Shopping Center	Street Intersection	No	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	0.0% – 2	40.0% 56.6 2	50.0% – 1	0.0% – 1
2	Auto Repair	Stand-Alone	Mid-Block	No	–20.0% – 1	0.0% – 1	–20.0% – 1	0.0% – 1	–10.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1

Table F-8. Percent Change, Standard Deviation, and Sample Size for Customers per Day, Gross Sales, Gross Sales Where the Median Was (Will Be) Installed, and Gross Sales in the Area for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in Area	
					During	After	During	After	During	After	During	After
2	Hair Salon	Stand-Alone	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	–10.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
2	Hair Salon	Stand-Alone	Unknown	No	—	—	—	—	—	—	—	—
2	Other Services	Shopping Center	Street Intersection	No	–30.0% – 1	—	–20.0% – 1	—	—	0.0% – 1	0.0% – 1	0.0% – 1
2	Other Services	Stand-Alone	Street Intersection	No	80.0% – 1	—	–80.0% – 1	—	—	—	—	—
3	Durables Retail	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	—	1.0% – 1	–5.0% – 1	10.0% – 1	0.0% – 1	—
3	Specialty Retail	Shopping Center	Mid-Block	Yes	–25.0% – 1	25.0% – 1	–25.0% – 1	1.0% – 1	–25.0% – 1	35.0% – 1	–25.0% – 1	35.0% – 1
3	Specialty Retail	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	—	—	—	0.0% – 1
3	Specialty Retail	Shopping Center	Street Intersection	No	—	0.0% – 1	—	1.0% – 1	–10.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
3	Gas Station	Stand-Alone	Street Intersection	Yes	–50.0% – 1	–60.0% – 1	–50.0% – 1	–3.0% – 1	—	—	—	—
3	Sit–Down Restaurant	Stand-Alone	Street Intersection	No	–50.0% – 1	0.0% – 1	–50.0% – 1	0.0% – 1	–50.0% – 1	50.0% – 1	30.0% – 1	–30.0% – 1
3	Medical	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1

Table F-8. Percent Change, Standard Deviation, and Sample Size for Customers per Day, Gross Sales, Gross Sales Where the Median Was (Will Be) Installed, and Gross Sales in the Area for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in Area	
					During	After	During	After	During	After	During	After
3	Hair Salon	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
3	Other Services	Shopping Center	Street Intersection	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
4	Durables Retail	Shopping Center	Street Intersection	No	—	—	—	—	–50.0% – 1	25.0% – 1	0.0% – 1	0.0% – 1
4	Durables Retail	Stand–Alone	Street Intersection	No	—	—	—	—	–10.0% – 1	15.0% – 1	0.0% – 1	10.0% – 1
4	Specialty Retail	Shopping Center	Mid–Block	No	—	—	—	—	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
4	Specialty Retail	Shopping Center	Street Intersection	Yes	—	30.0% – 1	—	1.0% – 1	–30.0% – 1	45.0% – 1	30.0% – 1	15.0% – 1
4	Specialty Retail	Shopping Center	Street Intersection	No	—	75.0% – 1	—	1.0% 0.0 2	–32.5% -10.6 2	7.5% 10.6 2	2.5% 3.5 2	0.0% – 2
4	Fast-Food Restaurant	Stand–Alone	Street Intersection	Yes	—	25.0% – 1	—	0.0% 0.0 1	–30.0% – 1	45.0% – 1	10.0% – 1	15.0% – 1
4	Medical	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1	0.0% – 1
4	Hair Salon	Shopping Center	Mid-Block	Yes	—	0.0% – 1	—	—	0.0% – 1	20.0% – 1	0.0% – 1	–20.% – 1
4	Hair Salon	Shopping Center	Street Intersection	No	—	–30.0% – 1	—	–35.0% – 1	0.0% – 1	35.0% – 1	35.0% – 1	35.0% – 1

Table F-8. Percent Change, Standard Deviation, and Sample Size for Customers per Day, Gross Sales, Gross Sales Where the Median Was (Will Be) Installed, and Gross Sales in the Area for Stratifying Variables of Interest (cont.).

Business Group	Business Type	Building Type	Location	On Corner Lot?	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in Area	
					During	After	During	After	During	After	During	After
4	Other Services	Shopping Center	Mid-Block	No	0.0% – 1	0.0% – 1	—	—	0.0% – 1	0.0% – 1	—	—
4	Other Services	Shopping Center	Street Intersection	No	—	300.0% – 1	—	1.0% – 1	–20.0% – 1	–10.0% – 1	25.0% – 1	10.0% – 1

Table F-9. Percent and Sample Size for Additional Raised Median Impacts of Interest by Business Type.

Business Type	Business Group	Traffic Congestion			Traffic Safety			Property Access			Business Opportunities			Customer Satisfaction			Delivery Convenience		
		Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same
Durables Retail	1	100.0% 2	—	—	100.0% 2	—	—	—	50.0% 1	50.0% 1	50.0% 1	—	50.0% 1	—	—	100.0% 2	—	—	100.0% 2
	2	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	—	—	100.0% 1	100.0% 1`	—	—
	3	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—
	4	33.3% 1	33.3% 1	33.3% 1	100.0% 3	—	—	33.3% 1	33.3% 1	33.3% 1	—	33.3% 1	66.7% 2	—	—	100.0% 3	33.3% 1	—	66.7% 1
Specialty Retail	1	63.6% 14	18.2% 4	18.2% 4	81.8% 18	13.6% 3	4.6% 1	36.4% 8	27.3% 6	36.4% 8	45.5% 10	18.2% 4	36.4% 8	45.5% 10	4.6% 1	50.0% 11	27.3% 6	13.6% 3	59.1% 13
	2	62.5% 5	25.0% 2	12.5% 1	50.0% 4	—	50.0% 4	—	85.7% 6	14.3% 1	—	37.5% 3	62.5% 5	25.0% 2	25.0% 2	50.0% 4	25.0% 2	50.0% 4	25.0% 2
	3	71.4% 5	28.6% 2	—	85.7% 6	—	14.3% 1	42.9% 3	42.9% 3	14.3% 1	42.9% 3	—	57.1% 4	42.9% 3	14.3% 1	42.9% 3	28.6% 2	28.6% 2	42.9% 3
	4	44.4% 4	22.2% 2	33.3% 3	55.6% 5	33.3% 3	11.1% 1	44.4% 4	33.3% 3	22.2% 2	55.6% 5	11.1% 1	33.3% 3	22.2% 2	11.1% 1	66.7% 6	11.1% 1	22.2% 2	66.7% 6
Grocery	1	100.0% 1	—	—	100.0% 1	—	—	—	—	—	—	—	100.0% 1	100.0% 1	—	—	—	—	100.0% 1
	2	—	100.0% 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	—	100.0% 1	—	100.0% 1	—	—	100.0% 1	—
Gas Station	1	40.0% 2	20.0% 1	40.0% 2	50.0% 2	—	50.0% 2	—	80.0% 4	20.0% 1	20.0% 1	80.0% 4	—	20.0% 1	60.0% 3	20.0% 1	20.0% 1	80.0% 4	—
	2	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—
	3	100.0% 1	—	—	100.0% 1	—	—	—	100.0% 1	—	—	—	100.0% 1	—	100.0% 1	—	—	100.0% 1	—
Fast-Food Restaurant	1	72.7% 8	9.1% 1	18.2% 2	81.8% 9	9.1% 1	9.1% 1	36.4% 4	27.3% 3	36.4% 4	36.4% 4	—	63.6% 7	45.5% 5	9.1% 1	45.5% 5	27.3% 3	18.2% 2	54.6% 6
	2	100.0% 1	—	—	100.0% 1	—	—	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1
	3	100.0% 1	—	—	100.0% 1	—	—	—	—	100.0% 1	100.0% 1	—	—	—	—	100.0% 1	—	—	100.0% 1
	4	100.0% 1	—	—	—	—	100.0% 1	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—
Sit-Down Restaurant	1	60.0% 6	10.0% 1	30.0% 3	70.0% 7	—	30.0% 3	30.0% 3	50.0% 5	20.0% 2	40.0% 4	20.0% 2	40.0% 4	10.0% 1	20.0% 2	70.0% 7	10.0% 1	20.0% 2	70.0% 7
	2	—	—	100.0% 1	—	—	100.0% 1	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—
	3	100.0% 2	—	—	100.0% 2	—	—	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	—	—	100.0% 2	—	—	100.0% 2
	4	40.% 2	—	60.0% 3	60.0% 3	20.0% 1	20.0% 1	40.0% 2	60.0% 3	—	20.0% 1	20.0% 1	60.0^ 3	20.0% 1	40.0% 2	40.0% 2	40.0% 2	20.0% 1	40.0% 2

Table F-9. Percent and Sample Size for Additional Raised Median Impacts of Interest by Business Type (cont.).

Business Type	Business Group	Traffic Congestion			Traffic Safety			Property Access			Business Opportunities			Customer Satisfaction			Delivery Convenience		
		Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better	Worse	Same
Medical	1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1
	2	100.0% 3	—	—	100.0% 3	—	—	33.3% 1	—	66.7% 2	33.3% 1	—	66.7% 1	66.7% 2	—	33.3% 1	100.0% 3	—	—
	3	—	100.0% 1	—	—	100.0% 1	—	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1
	4	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—
Auto Repair	1	42.9% 3	42.9% 3	14.3% 1	42.9% 3	28.6% 2	28.6% 2	42.9% 3	42.9% 3	14.3% 1	57.1% 4	—	42.9% 3	28.6% 2	—	71.4% 5	28.6% 2	14.3% 1	57.1% 4
	2	100.0% 1	—	—	100.0% 1	—	—	—	100.0% 1	—	—	—	100.0% 1	—	—	100.0% 1	—	100.0% 1	—
Other Services	1	63.6% 7	9.1% 1	27.3% 3	54.6% 6	—	45.5% 5	27.3% 3	54.6% 6	18.2% 2	36.4% 4	18.2% 2	45.5% 5	45.5% 5	18.2% 2	36.4% 5	30.0% 3	50.0% 5	20.0% 2
	2	—	—	100.0% 1	100.0% 1	—	—	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1
	3	100.0% 2	—	—	100.0% 3	—	—	66.7% 2	33.3% 1	—	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	33.3% 1	33.3% 1	33.3% 1
	4	100.0% 7	—	—	100.0% 7	—	—	57.1% 4	28.6% 2	14.3% 1	57.1% 4	—	42.9% 3	42.9% 3	14.3% 1	42.9% 3	57.1% 4	14.3% 1	28.6% 2
Other	1	100.0% 1	—	—	100.0% 1	—	—	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	100.0% 1	—	—
	4	100.0% 1	—	—	100.0% 1	—	—	—	100.0% 1	—	—	—	100.0% 1	—	—	100.0% 1	—	100.0% 1	—
Hair Salon	2	100.0% 3	—	—	100.0% 3	—	—	—	100.0% 2	—	—	33.3% 1	66.7% 2	33.3% 1	66.7% 2	—	—	66.7% 2	33.3% 1
	3	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1	—	—	100.0% 1
	4	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1

Table F-10. Percent and Sample Size for Additional Raised Median Impacts of Interest for Select Stratifying Variables.

Business Type	Business Group	Building Type	Location	On Corner Lot?	Traffic Congestion			Traffic Safety			Property Access		
					Better	Worse	Same	Better	Worse	Same	Better	Worse	Same
Specialty Retail	1	Shopping Center	Mid-Block	No	77.8% 7	11.1% 1	11.1% 1	77.8% 7	11.1% 1	11.1% 1	22.2% 2	22.2% 2	55.6% 5
Specialty Retail	1	Shopping Center	Street Intersection	No	66.7% 4	16.7% 1	16.7% 1	—	—	—	66.7% 4	16.7% 1	16.7% 1
Specialty Retail	1	Stand-Alone	Mid-Block	No	100.0% 3	—	—	100.0% 3	—	—	66.7% 7	—	33.3% 1
Specialty Retail	1	Stand-Alone	Street Intersection	No	—	66.7% 2	33.3% 1	66.7% 2	33.3% 1	—	—	66.7% 2	33.3% 1
Gas Station	1	Stand-Alone	Street Intersection	No	50.0% 1	50.0% 1	—	50.0% 1	—	50.0% 1	—	100.0% 2	—
Fast-Food Restaurant	1	Stand-Alone	Mid-Block	No	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	—	—	100.0% 2
Fast-Food Restaurant	1	Stand-Alone	Street Intersection	Yes	100.0% 2	—	—	100.0% 2	—	—	50.0% 1	50.0% 1	—
Fast-Food Restaurant	1	Stand-Alone	Street Intersection	No	80.0% 4	20.0% 1	—	80.0% 4	20.0% 1	—	20.0% 1	40.0% 2	40.0% 2
Sit-Down Restaurant	1	Shopping Center	Street Intersection	No	33.3% 1	33.3% 1	33.3% 1	66.7% 2	—	33.3% 1	66.7% 2	33.3% 1	—
Sit-Down Restaurant	1	Stand-Alone	Mid-Block	No	66.7% 2	—	33.3% 1	66.7% 2	—	33.3% 1	—	66.7% 2	33.3% 1
Auto Repair	1	Stand-Alone	Mid-Block	No	66.7% 2	—	33.3% 1	33.3% 1	—	66.7% 2	—	66.7% 2	33.3% 1
Other Services	1	Shopping Center	Mid-Block	No	66.7% 2	—	33.3% 1	66.7% 2	—	33.3% 1	—	66.7% 2	33.3% 1
Other Services	1	Shopping Center	Street Intersection	Yes	50.0% 1	—	50.0% 1	—	—	100.0% 2	—	50.0% 1	50.0% 1

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table F-10. Percent and Sample Size for Additional Raised Median Impacts of Interest for Select Stratifying Variables (cont.).

Business Type	Business Group	Building Type	Location	On Corner Lot?	Traffic Congestion			Traffic Safety			Property Access		
					Better	Worse	Same	Better	Worse	Same	Better	Worse	Same
Other Services	1	Shopping Center	Street Intersection	Yes	50.0% 1	—	50.0% 1	100.0% 2	—	—	50.0% 1	50.0% 1	—
Other Services	1	Stand-Alone	Mid-Block	No	100.0% 3	—	—	66.7% 2	—	33.3% 1	66.7% 2	33.3% 1	—
Specialty Retail	2	Shopping Center	Mid-Block	No	50.0% 2	50.0% 2	—	25.0% 1	—	75.0% 3	—	75.0% 3	25.0% 1
Specialty Retail	2	Stand-Alone	Street Intersection	Yes	100.0% 2	—	—	100.0% 2	—	—	—	100.0% 1	—
Medical	2	Shopping Center	Street Intersection	No	100.0% 2	—	—	100.0% 2	—	—	—	—	100.0% 2
Specialty Retail	3	Shopping Center	Mid-Block	No	66.7% 2	33.3% 1	—	100.0% 3	—	—	66.7% 2	33.3% 1	—
Other Services	3	Stand-Alone	Street Intersection	No	100.0% 2	—	—	100.0% 2	—	—	100.0% 2	—	—
Durables Retail	4	Stand-Alone	Street Intersection	No	50.0% 1	50.0% 1	—	100.0% 2	—	—	50.0% 1	50.0% 1	—
Specialty Retail	4	Shopping Center	Mid-Block	No	33.3% 1	33.3% 1	33.3% 1	33.3% 1	33.3% 1	33.3% 1	33.3% 1	33.3% 1	33.3% 1
Specialty Retail	4	Shopping Center	Street Intersection	No	33.3% 1	33.3% 1	33.3% 1	66.7% 2	33.3% 1	—	66.7% 2	—	33.3% 1
Sit–Down Restaurant	4	Stand-Alone	Street Intersection	No	—	—	100.0% 2	—	50.0% 1	50.0% 1	50.0% 1	50.0% 1	—
Other Services	4	Shopping Center	Mid-Block	No	100.0% 4	—	—	100.0% 4	—	—	75.0% 3	25.0% 1	—
Other Services	4	Shopping Center	Street Intersection	No	100.0% 2	—	—	100.0% 2	—	—	—	50.0% 1	50.0% 1

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table F-11. Percent and Sample Size for Further Additional Raised Median Impacts of Interest for Select Stratifying Variables.

Business Type	Business Group	Building Type	Location	On Corner Lot?	Business Opportunities			Customer Satisfaction			Delivery Convenience		
					Better	Worse	Same	Better	Worse	Same	Better	Worse	Same
Specialty Retail	1	Shopping Center	Mid-Block	No	33.3% 3	—	66.7% 6	44.4% 4	—	55.6% 5	11.1% 1	—	88.9% 8
Specialty Retail	1	Shopping Center	Street Intersection	No	50.0% 3	16.7% 1	33.3% 2	50.0% 3	—	50.0% 3	33.3% 3	16.7% 1	50.0% 3
Specialty Retail	1	Stand-Alone	Mid-Block	No	100.0% 3	—	—	100.0% 3	—	—	100.0% 3	—	—
Specialty Retail	1	Stand-Alone	Street Intersection	No	33.3% 1	66.7% 2	—	—	33.3% 1	66.7% 2	—	33.3% 1	66.7% 2
Gas Station	1	Stand-Alone	Street Intersection	No	—	100.0% 2	—	—	50.0% 1	50.0% 1	—	100.0% 2	—
Fast-Food Restaurant	1	Stand-Alone	Mid-Block	No	50.0% 1	—	50.0% 1	—	—	100.0% 2	—	—	100.0% 2
Fast-Food Restaurant	1	Stand-Alone	Street Intersection	Yes	50.0% 1	—	50.0% 1	50.0% 1	50.0% 1	—	50.0% 1	—	50.0% 1
Fast-Food Restaurant	1	Stand-Alone	Street Intersection	No	20.0% 1	—	80.0% 4	60.0% 3	—	40.0% 2	20.0% 1	40.0% 2	40.0% 2
Sit-Down Restaurant	1	Shopping Center	Street Intersection	No	33.3% 1	—	66.7% 2	—	33.3% 1	66.7% 2	—	—	100.0% 3
Sit-Down Restaurant	1	Stand-Alone	Mid-Block	No	33.3% 1	33.3% 1	33.3% 1	33.3% 1	—	66.7% 2	—	—	100.0% 3
Auto Repair	1	Stand-Alone	Mid-Block	No	33.3% 1	—	66.7% 2	33.3% 1	—	66.7% 2	33.3% 1	—	66.7% 2
Other Services	1	Shopping Center	Mid-Block	No	33.3% 1	33.3% 1	33.3% 1	33.3% 1	33.3% 1	33.3% 1	50.0% 1	50.0% 1	50.0% 1
Other Services	1	Shopping Center	Street Intersection	Yes	—	—	100.0% 2	50.0% 1	—	50.0% 1	—	50.0% 1	50.0% 1

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table F-11. Percent and Sample Size for Further Additional Raised Median Impacts of Interest for Select Stratifying Variables (cont.).

Business Type	Business Group	Building Type	Location	On Corner Lot?	Business Opportunities			Customer Satisfaction			Delivery Convenience		
					Better	Worse	Same	Better	Worse	Same	Better	Worse	Same
Other Services	1	Shopping Center	Street Intersection	No	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	50.0% 1	—
Other Services	1	Stand-Alone	Mid-Block	No	66.7% 2	33.3% 1	—	66.7% 2	—	33.3% 1	33.3% 1	33.3% 1	33.3% 1
Specialty Retail	2	Shopping Center	Mid-Block	No	—	25.0% 1	75.0% 3	50.0% 2	25.0% 1	25.0% 1	25.0% 1	25.0% 1	50.0% 2
Specialty Retail	2	Stand-Alone	Street Intersection	Yes	—	—	100.0% 2	—	—	100.0% 2	50.0% 1	50.0% 1	—
Medical	2	Shopping Center	Street Intersection	No	—	—	100.0% 2	50.0% 1	—	50.0% 1	100.0% 2	—	—
Specialty Retail	3	Shopping Center	Mid-Block	No	66.7% 2	—	33.3% 1	66.7% 2	—	33.3% 1	66.7% 2	33.3% 1	—
Other Services	3	Stand-Alone	Street Intersection	No	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1	50.0% 1	—	50.0% 1
Durables Retail	4	Stand-Alone	Street Intersection	No	—	50.0% 1	50.0% 1	—	—	100.0% 2	50.0% 1	—	50.0% 1
Specialty Retail	4	Shopping Center	Mid-Block	No	33.3% 1	33.3% 1	33.3% 1	—	—	100.0% 3	—	33.3% 1	66.7% 2
Specialty Retail	4	Shopping Center	Street Intersection	No	100.0% 3	—	—	33.3% 1	—	66.7% 2	—	33.3% 1	66.7% 2
Sit-Down Restaurant	4	Stand-Alone	Street Intersection	No	—	—	100.0% 2	—	50.0% 1	50.0% 1	50.0% 1	—	50.0%
Other Services	4	Shopping Center	Mid-Block	No	50.0% 2	—	50.0% 2	50.0% 2	—	50.0% 2	75.0% 3	25.0% 1	—
Other Services	4	Shopping Center	Street Intersection	No	50.0% 1	—	50.0% 1	—	50.0% 1	50.0% 1	—	—	100.0% 2

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before median construction; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Table F-12. Percent and Sample Size for Indications of Public Involvement for Group One and Two Business Owners.

Business Group	Group One Businesses (Before)					Group Two Businesses (Before Only)				
	High	Somewhat High	Moderate	Somewhat Low	Low	High	Somewhat High	Moderate	Somewhat Low	Low
Durables Retail	0.0% 0	50.0% 1	0.0% 0	0.0% 0	50.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Specialty Retail	4.8% 1	9.5% 2	19.1% 4	9.5% 2	57.1% 12	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Grocery	0.0% 0	0.0% 0	0.0% 0	0.0% 0	100.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Gas Station	40.0% 2	0.0% 0	20.0% 1	0.0% 0	40.0% 2	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Fast-Food Restaurant	12.5% 1	0.0% 0	0.0% 0	0.0% 0	87.5% 7	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Sit-Down Restaurant	33.3% 3	0.0% 0	11.1% 1	0.0% 0	55.6% 5	0.0% 0	0.0% 0	0.0% 0	0.0% 0	100.0% 1
Medical	100.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	100.0% 2
Auto Repair	0.0% 0	0.0% 0	28.6% 2	0.0% 0	71.4% 2	0.0% 0	100.0% 2	0.0% 0	0.0% 0	0.0% 0
Hair Salon	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0	100.0% 1
Other Services	30.0% 3	0.0% 0	10.0% 1	0.0% 0	60.0% 6	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Other	0.0% 0	0.0% 0	0.0% 0	0.0% 0	100.0% 1	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0
Totals	16.9% 11	4.6% 3	13.9% 9	3.1% 2	61.5% 40	0.0% 0	0.0% 0	0.0% 0	0.0% 0	0.0% 0

APPENDIX G

Gross Sales Percent Change Data

This appendix contains the gross sales percent change data obtained from questions 20 and 21 of the survey for businesses shown in Appendix A. It also contains the gross sales percent change values for the state of Texas and the case study cities, and counties of interest. The construction years for each median project are also provided in the tables for reference. For survey question 20, respondents were asked to provide the range of gross sales for each year. The data for this question were analyzed by providing subsequent numbers to each range every year (i.e., less than $100,000 = 1, $100,000 to $250,000 = 2, and so on). In the tables that follow, the data from these questions are indicated as from gross sales range. The four statistics provided for these questions are the percent change (Δ%), mean ($\bar{x}$), standard deviation (SD), and number of observations (n). The mean and standard deviation are based upon the value of the range given (e.g., 1, 2, 3, etc.). To obtain a measure for the general business trend, both the number of businesses and the value of the gross sales range was used in the calculation of the percent change. Therefore, these percent changes and related statistics are weighted by the number of observations as well as the mean value of the gross sales range. Throughout the table, the percent change value provided in a given year's column is the percent difference between the previous year and the year designated in the column. Data for some years along some corridors were not provided and are designated as "—."

For question 21, respondents were asked to indicate the change in gross sales from year to year. These results are provided for each corridor in the tables that follow as provided percent changes. The data were analyzed for all respondents (indicated as all surveys) and for all the respondents whose businesses were located along the corridor before, during, and after construction (indicated as before construction). Note that all the study corridors except Texas Avenue in College Station contain data for questions 20 and 21 through 1997 which was the most recent data available when researchers performed surveys along these corridors.

Data in the tables that follow also contain gross sales percent changes from year to year for retail trade for the state of Texas, cities, and counties for comparison to the values obtained from the survey questions number 20 and 21. The values for the state of Texas, cities, and counties of interest were obtained from the Texas Comptroller of Public Accounts. These reports can be obtained from the Internet at http://www.window.state.tx.us for years after 1985. Additional

data were obtained through written requests with the Comptroller's office. The county and city data obtained from the Comptroller's office were adjusted with Consumer Price Indexes (CPI) to the year 1999. The fourth quarter 1999 retail data were not available at the time this report was produced. These data were estimated by escalating the third quarter 1999 data the same amount as the percent change between the 1998 third and fourth quarters. The CPI values were obtained from the Bureau of Labor Statistics at http://www.bls.gov/cpi/. Data obtained from the surveys themselves were not adjusted. For question 20, the data were not adjusted since the responses were given for a rather large range, and adjustments would not significantly alter the results. Adjustment of the values in question 21 was not relevant since the respondents provided direct percent change values rather than dollar amounts.

Table G-1. Percent Change in Gross Sales for the State of Texas.

Year	Percent Change in Sales
1979	–1.4
1980	4.5
1981	3.9
1982	–5.4
1983	0.7
1984	2.9
1985	1.6
1986	–6.0
1987	–2.8
1988	0.9
1989	1.5
1990	3.3
1991	–0.1
1992	5.4
1993	6.4
1994	6.5
1995	4.6
1996	5.7
1997	5.4
1998	2.8
1999	5.7

Table G-2. Gross Sales Percent Change Data.

Houston, Texas																		
Location			**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
City of Houston			5.2	–7.3	–11.5	–3.2	0.9	0.7	8.3	–4.2	2.8	–3.5	6.3	3.4	10.5	8.9	–1.4	–0.8
Harris County			5.0	–5.7	–9.4	–2.8	1.9	1.0	3.0	–2.7	–3.7	1.3	3.7	7.0	2.8	5.6	11.4	1.9
Post Oak Road (Houston, Texas): Construction years = 1988 to 1990																		
All Surveys	From Gross Sales	Δ%	0	0	10.0	8.0	0	0	29.6	20.0	12.5	11.1	42.9	25.7	10.3	18.5	—	—
		$\bar{x}$	2.3	2.3	2.0	1.8	1.8	1.8	2.0	2.1	2.1	2.1	2.5	2.9	2.6	2.9		
		SD	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.8	0.9	1.1	1.2	1.2	12.5	1.7		
		Range	4	4	5	6	6	6	7	8	9	10	12	13	16	17		
All Surveys	Provided Percent Changes	Δ%	5.0	5.0	5.0	5.0	–10.0	–36.7	–28.3	5.0	8.3	7.5	11.0	10.8	12.5	17.5	—	—
		SD	7.1	7.1	7.1	7.1	14.1	33.3	18.9	7.1	7.6	6.5	12.4	6.6	8.8	15.1		
		n	2	2	2	2	2	3	3	2	3	4	5	6	6	8		
Before Const.	From Gross Sales	Δ%	0	0	8.7	8.0	0	0	11.1	0	0	0	0	51.7	0	0	—	—
		$\bar{x}$	2.3	2.3	2.0	1.8	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.6	2.6	2.6		
		SD	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0		
		Range	4	4	5	6	6	6	6	6	6	6	6	7	7	7		
Before Const.	Provided Percent Changes	Δ%	5	5	5	5	–10.0	36.7	–28.3	5.0	8.3	8.3	8.3	8.3	10.0	10.0	—	—
		SD	7.1	7.1	7.1	7.1	14.1	33.3	18.9	7.1	7.6	7.6	7.6	7.6	10.0	10.0		
		n	2	2	2	2	2	3	3	2	3	3	3	3	3	3		
Clay Road (Houston, Texas): Construction years = 1994 to 1996																		
All Surveys	From Gross Sales	Δ%	—	—	—	—	—	—	0	0	170	13.6	30.3	17.8	5.3	25.0	—	—
		$\bar{x}$							1.5	1.5	2.7	3.3	4.3	3.8	4.0	4.0		
		SD							0.7	0.7	2.1	3.2	4.9	4.9	5.4	5.1		
		Range							2	2	3	3	3	4	4	5		
All Surveys	Provided Percent Changes	Δ%	—	—	—	—	—	—	0	0	0	0	0	0	0	0	—	—
		SD							–	–	–	–	–	0	0	0		
		N							1	1	1	1	1	2	2	2		
Before Const.	From Gross Sales	Δ%	—	—	—	—	—	—	0	0	170	22.2	30.3	9.3	6.4	6.0	—	—
		$\bar{x}$							1.5	1.5	2.7	3.3	4.3	4.7	5.0	5.3		
		SD							0.7	0.7	2.1	3.2	4.9	5.5	6.1	6.7		
		N							2	2	3	3	3	3	3	3		
Before Const.	Provided Percent Changes	Δ%	—	—	—	—	—	—	0	0	0	0	0	0	0	0	—	—
		SD							–	–	–	–	–	–	–	–		
		n							1	1	1	1	1	1	1	1		

Table G-2. Gross Sales Percent Change Data (cont.).

Long Point Road (Houston, Texas): Surveyed prior to construction																		
Location			**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
All Surveys	From Gross Sales	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	—	—	—	0 1.0 – 1	0 1.0 – 1	200.0 1.0 0 3	33.3 1.0 0 4	—	—
All Surveys	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	—	—	0 – 0	0 – 0	0 – 0	4.5 6.4 2	—	—
Before Const.	From Gross Sales	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	—	—	—	0 1.0 – 1	0 1.0 – 1	200.0 1.0 0 3	33.3 1.0 0 4	—	—
Before Const.	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	—	—	0 – 0	0 – 0	0 – 0	4.5 6.4 2	—	—
West Fuqua Road (Houston, Texas): Construction years = 1987 to 1989																		
All Surveys	From Gross Sales	Δ% $\bar{x}$ SD n	—	—	—	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	150.0 2.5 0.7 2	0 2.5 0.7 2	0 2.5 0.7 2	0 2.5 0.7 2	—	—
Before Const.	From Gross Sales	Δ% $\bar{x}$ SD n	—	—	—	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	0 2.0 – 1	—	—

Table G-2. Gross Sales Percent Change Data (cont.).

College Station, Texas																	
Location			**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
City of College Station										5.2	8.0	5.7	6.1	0.4	8.8	0.4	5.6	5.3
Brazos County			—	—	—	—	—	—	—	1.1	6.3	5.4	7.3	0.4	6.4	1.9	4.3	5.3
Texas Avenue (College Station, Texas): Construction years = 1996 to 1998																		
All Surveys	From Gross Sales	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	—	0 4.1 2.3 10	2.4 4.2 2.3 10	9.5 2.8 2.3 12	23.9 4.1 2.1 14	21.1 4.1 1.8 17	17.4 4.3 2.0 19	13.6 4.4 2.5 21	17.4 4.2 2.7 26
	Range																	
All Surveys	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	0.0 10.1 8	8.1 9.4 8	4.6 7.2 8	6.5 8.4 11	5.8 20.0 12	–5.7 24.8 14	3.3 17.9 16	12.7 14.7 21
Before Const.	From Gross Sales	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	—	0.0 4.2 2.4 9	2.6 4.3 2.4 9	10.3 3.9 2.4 11	23.3 4.1 2.1 13	22.6 4.1 1.8 16	–1.5 4.0 1.9 16	6.3 4.3 2.0 16	11.8 4.5 2.2 17
	Range																	
Before Const.	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	8.6 8.4 7	7.1 9.7 7	4.6 7.7 7	6.6 8.8 10	5.9 21.0 11	–6.9 25.4 13	4.0 19.5 13	16.1 11.3 15

Table G-2. Gross Sales Percent Change Data (cont.).

Location			1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
McKinney, Texas																		
City of McKinney			—	—	–17.8	–21.2	–6.5	0.3	2.2	2.0	24.1	13.9	10.8	8.7	6.8	32.4	23.2	19.8
Collin County			—	—	2.3	2.0	–1.4	6.3	2.1	6.4	19.5	1.4	13.6	1.5	12.1	7.2	12.8	17.3
University Drive (McKinney, Texas): Construction year = 1992																		
All Surveys	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	0 13.0 – 1	15.4 7.5 7.8 2	46.7 5.5 5.1 4	36.8 4.3 3.9 7	–4.3 4.8 4.1 6	6.9 4.4 3.9 7	4.5 4.6 3.8 7	60.2 4.3 4.2 12	28.5 3.9 3.6 17	8.9 3.8 3.5 19	10.5 3.8 3.3 21	—	—
All Surveys	Provided Percent Changes	Δ% SD n	—	—	—	—	—	7.0 12.1 3	4.0 6.9 3	29.3 49.7 4	25.5 50.5 4	32.3 47.5 6	24.0 38.3 6	18.8 26.1 13	18.7 24.6 19	18.6 26.1 20	—	—
Before Const.	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	0 13.0 – 1	15.4 7.5 7.8 2	46.7 5.5 5.1 4	36.8 4.3 3.9 7	–4.3 4.8 4.1 6	0 4.8 4.1 6	–2.1 4.7 4.2 6	0 4.7 4.2 6	14.2 4.6 3.8 7	6.8 4.2 3.8 8	15.1 4.4 3.4 9	—	—
Before Const.	Provided Percent Changes	Δ% SD n	—	—	—	—	—	7.0 12.1 3	4.0 6.9 3	29.3 49.7 4	25.5 50.5 4	19.8 55.0 4	27.3 48.7 4	24.4 42.6 5	21.9 35.6 7	15.0 17.1 7	—	—
Longview, Texas																		
City of Longview			—	—	–4.9	–3.3	0.2	–3.4	3.5	–2.6	6.1	0.3	3.7	6.4	12.1	–6.1	–5.0	5.6
Gregg County			—	—	–9.4	–4.5	0.6	–2.8	3.9	–3.2	5.0	4.7	5.6	6.9	5.2	–1.7	–3.6	3.2
Loop 281 (Longview, Texas): Construction year = 1996																		
All Surveys	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	29.4 4.4 2.3 5	46.4 4.6 2.0 7	23.0 4.4 2.3 9	6.6 4.2 2.1 11	12.6 4.0 2.1 13	27.5 3.9 1.9 17	8.6 4.0 1.9 18	—	—
All Surveys	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	5.4 9.9 5	9.5 7.7 6	10.5 9.3 8	6.9 9.6 10	95 8.1 13	17.1 13.1 14	15.9 15.1 17	—	—
Before Const.	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	29.4 4.4 2.3 5	46.4 4.6 2.0 7	23.0 4.4 2.3 9	16.7 4.2 2.1 11	12.6 4.0 2.1 13	21.2 4.2 1.9 15	2.4 4.3 1.9 15	—	—
Before Const.	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	5.4 9.9 5	9.5 7.7 6	10.5 9.3 8	6.9 9.6 10	9.5 8.1 13	17.1 13.1 14	12.7 12.4 15	—	—

Table G-2. Gross Sales Percent Change Data (cont.).

Location			1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Wichita Falls, Texas																		
City of Wichita Falls			—	—	–13.1	–5.0	–1.2	0.7	–3.9	–2.5	4.8	5.6	7.5	2.9	–0.7	–3.3	–2.4	2.1
Wichita County			—	—	–12.5	–5.8	–2.2	2.5	–3.0	–1.9	6.1	5.1	7.2	2.8	–.05	–2.9	–2.3	1.7
Call Field Road (Wichita Falls, Texas): Surveyed prior to construction																		
All Surveys	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	—	—	—	10.0 2.8 3.3 12	10.3 2.8 3.2 13	14.3 3.2 3.2 13	0 3.2 3.2 13	—	—
All Surveys	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	—	—	11.5 9.7 8	12.9 10.0 10	13.9 10.2 11	14.3 9.3 12	—	—
Before Const.	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	—	—	—	10 2.8 3.3 12	10.3 2.8 3.2 13	14.3 3.2 3.2 13	0 3.2 3.2 13	—	—
Before Const.	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	—	—	11.5 9.7 8	12.9 10.0 10	13.9 10.2 11	14.3 9.3 12	—	—
Odessa, Texas																		
City of Odessa			—	—	–18.8	–1.0	2.4	–9.2	11.1	–5.2	–3.1	–2.8	1.4	–3.2	7.1	2.1	1.5	–9.4
Ector County			—	—	–20.0	–0.6	1.2	–7.3	5.6	–6.4	–7.2	6.3	1.0	–2.1	1.1	8.2	–1.2	–8.2
Grant Avenue (Odessa, Texas): Construction year = 1992																		
All Surveys	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	13.6 2.3 1.5 4	17.4 1.8 1.3 6	29.6 2.0 1.2 7	5.0 2.1 1.2 7	14.3 2.1 1.2 8	9.5 2.3 1.4 8	0 2.3 1.4 8	2.7 2.1 1.5 9	10.6 1.9 1.4 11	0 1.9 1.4 11	0 1.9 1.4 11	—	—
All Surveys	Provided Percent Changes	Δ% SD n	—	—	0 0 3	1.3 2.5 4	2.6 3.7 5	2.6 3.4 7	2.6 3.4 7	2.6 3.4 7	2.8 3.2 8	0.8 4.3 9	0.8 4.3 9	–0.3 5.3 10	2.0 6.6 11	28.1 85.9 12	—	—
Before Const.	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	13.6 2.3 1.5 4	17.4 1.8 1.3 6	29.6 2.0 1.2 7	7.1 2.1 1.2 7	12.0 2.1 1.2 8	9.5 2.3 1.4 8	0 2.3 1.4 8	0 2.3 1.5 8	0 2.3 1.5 8	0 2.3 1.5 8	0 2.3 1.5 8	—	—
Before Const.	Provided Percent Changes	Δ% SD n	—	—	0 0 3	1.7 2.9 3	3.3 3.9 4	3.0 3.5 6	3.0 3.5 6	3.0 3.5 6	3.1 3.2 7	0.9 4.6 8	0.9 4.6 8	0.9 4.6 8	2.1 4.1 8	4.0 6.0 8	—	—

Table G-2. Gross Sales Percent Change Data (cont.).

Port Arthur, Texas																	
Location			**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
City of Port Arthur			–7.0	–5.8	–6.9	2.1	–8.7	5.2	–1.4	–7.4	–3.1	–7.6	5.8	–9.0	–1.8	0.8	4.4	3.8
Jefferson County			–1.2	–7.4	–1.3	–0.8	–3.9	–2.5	2.3	–3.1	–1.0	–2.6	5.0	0.3	1.0	1.8	4.0	4.8
9^{th} Avenue (Port Arthur, Texas): Construction years = 1979 to 1980																		
All Surveys	From Gross Sales Range	Δ% $\bar{x}$ SD n	—	—	—	—	—	—	—	—	—	0 13 – 1	0 13 – 1	45.4 6.3 6.1 3	6.3 6.7 5.7 3	0 6.7 5.7 3	—	—
All Surveys	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	—	—	—	—	17.5 3.5 2	25.0 7.1 2	—	—
Twin Cities Highway (Port Arthur, Texas): Construction years = 1983 to 1985																		
All Surveys	Provided Percent Changes	Δ% SD n	—	—	—	—	—	—	—	—	—	—	—	—	—	–90.0 – 1	—	—

APPENDIX H

Employment Trend Data

This appendix contains information regarding percent change in employees for the state of Texas and the case study cities and counties of interest. The data for the state of Texas, cities, and counties were obtained from the Texas Workforce Commission (TWC). Data for the state and cities are available for the most recent decade only. Data may be obtained from the TWC Internet page at http://www.twc.state.tx.us/lmi/lfs/lfshome.html. Additional data for the counties of interest were obtained from written requests to the TWC. Data were not available for the fourth quarter of 1999. These data were estimated by using the percent change between the third and fourth quarters of 1998.

The values in the state of Texas and city rows in the table that follows represent the percent change from year to year in the average annual total number of employees. There are two numbers in each cell for the county data. The top number of each county data cell represents the percent change from year to year of the total number of employees for retail trade and services categories. The bottom number represents the percent change from year to year of the total number of employees. Researchers used the fourth quarter from each year for the county data.

Question 9 of the business survey, shown in Appendix A, requests the number of part- and full-time employees by year. The sum for all survey respondents is shown in the table that follows for comparison with the state of Texas, city, and county. In each cell of the rows of data for the case study corridors of interest there are also two numbers. The top number indicates the sum of the number of part- and full-time employees for each year. The bottom number indicates the percent change from year to year. The total number of surveys is also noted in the table as well as the construction year of the median project of interest.

Table H-1. Employment Trend Data.

Location	Const. Year	No. of Surveys	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
State of Texas			—	—	—	—	—	—	—	0.8	1.7	3.4	3.9	4.2	3.5	4.7	3.8	2.2
Houston, Texas																		
City of Houston			—	—	—	—	—	—	—	1.4	0.5	0.9	2.4	1.8	0.6	2.0	4.0	.09
Harris County			11.7 5.5	0.6 –2.8	–4.3 –8.0	4.5 1.8	5.2 5.1	6.3 5.3	6.8 5.5	–1.9 –0.8	2.0 –0.7	2.7 2.0	3.3 2.7	4.3 2.7	2.9 3.4	5.0 5.1	5.3 4.7	0.9 0.3
Clay Road	1994 to 1996	8	—	—	—	—	—	5	5 0.0	6 20.0	20 233.3	25 25.0	28 12.0	38 35.8	43 13.2	197 358.1	—	—
Long Point Road	Upcoming	4	—	—	—	—	—	—	—	—	—	5	5 0.0	5 0.0	20 300.0	23 15.0	—	—
West Fuqua Rd.	1987 to 1989	1	—	—	—	—	—	—	—	—	—	—	7	4 –42.9	4 0.0	4 0.0	—	—
South Post Oak Road	1988 to 1990	24	54 0.0	56 3.7	56 0.0	59 5.4	59 0.0	59 0.0	59 0.0	68 15.3	74 8.8	75 1.4	75 0.0	79 5.3	115 45.6	142.2 3.5	—	—
Longview, Texas																		
City of Longview			—	—	—	—	—	—	—	1.7	1.5	0.8	3.4	1.3	0.5	1.5	1.2	–0.9
Gregg County			—	—	—	—	—	—	—	—	4.1 2.6	7.7 2.8	3.9 4.4	3.4 3.5	4.3 5.1	5.9 4.1	2.0 0.9	0.2 –1.4
Loop 281	1996	20	—	—	—	—	—	—	15	123 720.0	132 7.3	143 8.3	236 65.0	246 4.2	434 76.4	426 –1.8	—	—
McKinney, Texas																		
City of McKinney			—	—	—	—	—	—	—	2.2	3.7	6.3	8.5	7.2	7.3	8.9	7.6	2.9
Collin County			—	—	—	21.1 13.6	11.7 9.4	9.4 9.2	8.1 6.5	5.7 5.4	7.0 4.3	9.4 9.9	6.4 8.3	17.0 14.5	6.9 9.9	7.5 7.2	5.9 5.8	10.8 10.0
University Drive	1992	22	—	—	—	—	2	17 750.0	62 265.0	66 6.5	83 25.8	123 48.2	256 108.1	370 44.5	377 1.9	409 8.5	—	—

Table H-1. Employment Trend Data (cont.).

Location	Const. Year	No. of Surveys	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
City of Odessa																
City of Odessa			—	—	—	—	—	2.9	–0.4	0.5	1.7	0.7	0.5	2.6	3.4	–7.8
Ector County			—	—	4.5 –1.1	5.7 –0.4	6.4 7.5	–1.7 –0.8	–1.6 –5.1	6.6 5.1	1.4 0.1	4.3 1.4	0.5 2.6	6.3 4.9	1.1 3.2	–3.9 –9.5
Grant Avenue	1992	13	20	20 0.0	22 10.0	24 9.1	24 0.0	27 12.5	28 3.7	34 21.4	39 14.7	45 15.4	46 2.2	47 2.2	—	—
Wichita Falls, Texas																
City of Wichita Falls			—	—	—	—	—	–1.1	0.4	3.2	2.7	3.1	1.1	0.1	–0.2	–1.5
Wichita County			—	—	—	—	—	—	—	—	2.2 1.8	4.3 3.1	1.5 0.9	3.0 3.2	–0.1 0.6	–0.9 –2.3
Call Field Road	1999	16	—	—	—	—	—	—	—	80	86 7.5	97 12.8	96 –1.0	202 110.4	—	—
College Station, Texas																
City of College Station			—	—	—	—	—	3.3	3.5	3.9	3.4	0.04	0.5	2.6	4.9	2.4
Brazos County			—	—	—	—	—	—	1.2 2.7	7.8 5.9	1.9 3.1	53.9 32.7	–29.8 57.9	5.5 6.8	4.4 6.1	2.1 0.6
Texas Avenue	1996 to 1998	34	—	—	—	—	—	341	349 2.3	353 1.1	372 5.4	476 28.0	546 14.7	757 38.6	794 4.9	1003 26.3

Table H-1. Employment Trend Data (cont.).

Location	Const. Year	No. of Surveys	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Port Arthur, Texas														
City of Port Arthur														
Jefferson County			8.3 –0.3	5.1 8.6	5.5 3.8	6.0 13.2	9.3 5.9	–0.7 –1.0	–5.7 –7.4	–2.7 –9.2	0.6 –2.9	0.6 –2.6	–3.6 –6.3	1.3 –2.9
Twin Cities Highway	1983 to 1985	3	—	—	—	—	2	2 0.0	2 0.0	2 0.0	2 0.0	2 0.0	3 50.0	3 0.0
9th Avenue	1979 to 1980	5	—	—	—	—	—	1	1 0.0	1 0.0	1 0.0	1 0.0	1 0.0	1 0.0

Location	Const. Year	No. of Surveys	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Port Arthur, Texas															
City of Port Arthur			—	—	—	—	5.3	0.3	–2.0	–0.4	0.1	–1.7	1.3	1.3	–1.5
Jefferson County			2.9 0.2	3.7 3.5	3.0 1.6	4.3 5.8	2.7 4.8	4.4 –1.3	0.4 –1.4	3.2 0.6	–0.3 –0.1	1.9 1.5	4.1 5.9	0.8 5.8	–3.6 10.0
Twin Cities Highway	1983 to 1985	3	3 0.0	4 33.3	4 0.0	10 150.0	10 0.0	11 10.0	10 –9.1	13 30.0	15 15.4	16 6.7	21 31.3	—	—
9th Avenue	1979 to 1980	5	1 0.0	1 0.0	1 0.0	1 0.0	1 0.0	56 5,500.0	84 50.0	87 3.6	101 16.1	104 3.0	109 4.8	—	—

APPENDIX I

Property Value Trend Data

This appendix contains property value trend data for each corridor. These data were collected from the local appraisal district for each corridor. Data were collected and tabulated for each business parcel that was present throughout all the years indicated in Table I-1. Data for each city and county where the corridor is located were collected from the Property Tax Division of the Texas Comptroller of Public Accounts. Data for the city and county are provided in dollars and the percent change from year to year is indicated. These values are adjusted with the Consumer Price Index (CPI) as described in Appendix G for gross sales. Adjustments are made to the latest year of data available for the site of interest (e.g., 1997 for Houston).

Table I-1. Property Value Percent Change Data.

Houston, Texas																			
Location			**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1989**	**1999**
City of Houston																			
Total Appraised Vacant Land Values		Total Value (billions)	3.784	N/A	3.439	3.100	3.161	2.902	2.300	2.278	2.025	1.905	1.746	1.841	1.563	1.616	1.490		
		% Change		N/A	N/A	–9.8	2.0	–8.2	–20.7	–1.0	–11.1	–6.0	–8.3	5.5	–15.1	3.4	–7.8		
Total Appraised Commercial Property Value		Total Value (billions)	32.099	N/A	36.697	36.004	31.747	30.760	26.046	24.833	23.907	22.658	21.532	21.853	18.795	19.950	19.330		
		% Change		N/A	N/A	–1.9	–11.8	–3.1	–15.3	–4.7	–3.7	–5.2	–5.0	0.2	–12.9	6.1	–3.1		
Harris County																			
Total Appraised Vacant Land Values		Total Value (billions)	11.473	7.906	6.632	7.381	7.148	4.876	3/088	4.082	3.354	3.108	2.835	2.964	2.84	2.648	2.640		
		% Change		–31.1	–16.1	11.3	–3.2	–31.8	–18.4	2.7	–17.9	–7.3	–8.8	4.6	–4.2	–6.8	–0.3		
Total Appraised Commercial Property Value		Total Value (billions)	27.644	60.993	54.741	62.422	55.589	50.971	48.628	42.732	43.312	42.097	41.169	41.354	40.762	39.840	40.554		
		% Change		120.6	–10.3	14.0	–10.9	–8.3	–4.6	–12.1	1.4	–2.8	–2.2	0.4	–1.4	–2.3	1.8		
South Post Oak Road (Houston, Texas): Construction Years = 1988 to 1990																			
	Number of Businesses																		
Land Value	38	Total Value (millions)											4.414	4.108	3.926	3.814	3.834		
	38	Total Value (per square foot)											2.08	1.94	1.85	1.8	1.81		
		% Change												–6.9	–4.4	–2.9	0.5		
Land and Improvement Value	37	Total Value (millions)											12.454	11.833	11.789	11.536	11.759		
	37	Total Value (per square foot)											6.16	5.85	5.83	5.70	5.81		
		% Change												5.0	–0.4	–2.1	1.9		
Clay Road (Houston, Texas): Construction Years = 1994 to 1996																			
	Number of Businesses																		
Land Value	30	Total Value (millions)											16.325	14.053	11.76	10.066	9.887		
	30	Total Value (per square foot)											1.13	0.97	0.81	0.70	0.68		
		% Change												–13.9	–16.3	–14.4	–1.8		
Land and Improvement Value	21	Total Value (millions)											16.924	16.131	16.007	13.207	14.694		
	21	Total Value (per square foot)											4.59	4.37	4.34	3.58	3.98		
		% Change												–4.7	–0.8	–17.5	11.2		

Table I-1. Property Value Percent Change Data (cont.).

Long Point Road (Houston, Texas): Construction Year Upcoming																			
	Number of Businesses																		
Land Value	16	Total Value (millions)											3.440	3.353	3.057	2.965	3.048		
	16	Total Value (per square foot)											3.73	3.64	3.32	3.22	3.31		
		% Change												–2.5	–8.8	–3.0	2.8		
Land and Improvement Value	16	Total Value (millions)											42.463	41.402	34.958	22.06	22.122		
	16	Total Value (per square foot)											46.05	–2.5	37.91	23.93	23.99		
		% Change													–15.6	–36.9	0.3		
West Fuqua Road (Houston, Texas): Construction Years = 1987 to 1989																			
	Number of Businesses																		
Land Value	52	Total Value (millions)											4.281	4.177	4.104	4.050	3.911		
	52	Total Value (per square foot)											1.00	0.98	0.96	0.95	0.91		
		% Change												–2.4	–1.8	–1.3	–3.4		
Land and Improvement Value	39	Total Value (millions)											11.432	10.680	11.204	10.785	11.078		
	39	Total Value (per square foot)											5.65	5.27	5.53	5.33	5.47		
		% Change												–6.6	4.9	–3.7	2.7		

Table I-1. Property Value Percent Change Data (cont.).

College Station, Texas																		
Location			**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**
City of College Station																			
Total Appraised Vacant Land Values		Total Value (millions)	77.296	66.212	73.328	68.326	64.331	59.876	53.474	48.878	44.165	44.769	44.630	48.132	41.807	38.325	45.121	43.568	
		% Change	18.4	–14.3	10.7	–6.8	–5.8	–6.9	–10.7	–8.6	–9.6	1.4	–0.3	7.8	–13.1	–8.3	17.7	–3.4	
Total Appraised Commercial Property Value		Total Value (millions)	277.077	377.174	404.576	388.216	388.094	368.152	322.338	343.831	354.897	327.381	383.383	404.714	400.543	405.000	430.854	474.518	
		% Change		212.1	212.1	–4.0	0.0	–5.1	–12.4	6.7	3.2	–2.1	10.4	5.6	–1.0	1.1	6.4	10.1	
Brazos County																			
Total Appraised Vacant Land Values		Total Value (millions)	152.707	172.328	179.261	164.272	151.901	138.753	125.590	112.759	103.154	97.816	95.306	98.398	92.078	88.584	93.065	101.730	
		% Change	33.7	12.9	4.0	–8.4	–7.5	–8.7	–9.5	10.2	–8.5	–5.2	–2.6	3.2	–6.4	–3.8	5.1	9.3	
Total Appraised Commercial Property Value		Total Value (millions)	639.242	664.645	919.931	870.221	834.098	772.318	701.974	704.330	722.032	691.990	736.954	759.991	759.887	812.439	850.151	921.752	
		% Change		35.3	6.4	–5.4	–4.2	–7.4	–9.1	0.3	2.5	–4.2	6.5	3.1	0.0	6.9	4.6	8.4	
Texas Avenue (College Station, Texas): Construction Years = 1996 to 1998																			
	Number of Businesses																		
Land Value	38	Total Value (millions)												4.891	4.749	4.632	4.548	5.828	5.904
	38	Total Value (per square foot)												3.41	3.31	3.23	3.17	4.07	4.12
		% Change													–2.9	–2.4	–1.8	28.1	1.3
Land and Improvement Value	38	Total Value (millions)												24.371	23.842	22.054	22.772	24.470	24.498
	38	Total Value (per square foot)												17.00	16.63	15.38	15.88	17.07	17.09
		% Change													–2.2	–7.5	3.3	7.5	0.1

Table I-1. Property Value Percent Change Data (cont.).

Longview, Texas																			
Location			**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1989**	**1999**
City of Longview																			
Total Appraised Vacant Land Values		Total Value (millions)									70.352	67.582	72.958	63.547	61.750	58.602	57.840		
		% Change									N/A	–3.9	8.0	–12.9	–2.8	–5.1	–1.3		
Total Appraised Commercial Property Value		Total Value (millions)									721.020	642.100	543.704	586.580	554.697	564.604	569.415		
		% Change									N/A	–10.9	0.2	–12.0	–2.1	1.8	0.9		
Gregg County																			
Total Appraised Vacant Land Values		Total Value (millions)									99.142	94.382	98.937	87.643	85,576	81.747	80.752		
		% Change									N/A	–4.8	4.8	–11.4	–2.4	–4.5	–1.2		
Total Appraised Commercial Property Value		Total Value (millions)									875.619	782.707	781.900	703.310	686.770	700.919	704.175		
		% Change									N/A	10.6	–0.1	–10.1	–2.4	2.1	0.5		
Loop 281 (Longview, Texas): Construction Year = 1996																			
	Number of Businesses																		
Land Value	20	Total Value (millions)												14.369	13.999	13.863	13.727	14.426	
		% Change													–2.6	–1.0	–1	5.1	
Land and Improvement Value	20	Total Value (millions)												38.652	40.320	46.859	46.098	48.979	
		% Change													4.3	16.2	–1.6	6.2	

Table I-1. Property Value Percent Change Data (cont.).

Wichita Falls, Texas																		
Location			**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1989**	**1999**
City of Wichita Falls																			
Total Appraised Vacant Land Values		Total Value (millions)											37.028	35.931	38.123	38.323			
		% Change												–3.0	6.1	0.5			
Total Appraised Commercial Property Value		Total Value (millions)											521.753	511.518	514.058	522.571			
		% Change												–2.0	0.5	1.7			
Wichita County																			
Total Appraised Vacant Land Values		Total Value (millions)											46.203	45.188	47.099	47.048			
		% Change												–2.2	4.2	–0.1			
Total Appraised Commercial Property Value		Total Value (millions)											697.162	650.694	676.084	689.633			
		% Change												–6.7	3.9	2.0			
Call Field Road (Wichita Falls, Texas): Surveyed Prior to Construction																			
	Number of Businesses																		
Land and Improvement Value	26	Total Value (millions)												21.727	21.311	20.552	18.717		
		% Change													–1.9	–3.6	–0.89		

Table I-1. Property Value Percent Change Data (cont.).

Odessa, Texas																			
Location			**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1989**	**1999**
City of Odessa																			
Total Appraised Vacant Land Values		Total Value (millions)					117.405	89.645	81.608	72.801	70.810	64.608	63.418	45.156	42.901	35.824	33.648		
		% Change						–23.6	–9	–10.8	–2.7	–8.8	–1.8	–28.8	–5.0	–16.5	–6.1		
Total Appraised Commercial Property Value		Total Value (millions)					582.306	534.578	487.788	447.718	417.791	401.673	390.979	383.437	373.268	358.767	347.192		
		% Change						–8.2	–8.8	–8.2	–8.7	–3.9	–2.7	–1.9	–2.7	–3.9	–3.2		
Ector County																			
Total Appraised Vacant Land Values		Total Value (millions)					195.725	155.54	141.234	126.815	115.140	105.367	104.472	85.095	79.506	72.958	69.914		
		% Change						–20.5	–9.2	–10.2	–9.2	–8.5	–0.8	–18.5	–6.6	–8.2	–4.6		
Total Appraised Commercial Property Value		Total Value (millions)					1056.496	760.521	886.874	847.906	838.555	799.301	748.325	738.710	718.713	689.534	477.808		
		% Change						–28.0	16.6	–4.4	–1.1	–4.7	–6.4	–1.4	–2.6	–4.1	–30.7		
Grant Avenue (Odessa, Texas): Construction Year = 1992																			
	Number of Businesses																		
Land Value	52	Total Value (millions)											2.505					3.039	
		% Change[1]																21.3	
Land and Improvement Value	52	Total Value (millions)											11.368					13.637	
		% Change[1]																20.0	

[1]Data for Odessa were only available for 1993 and 1998. Therefore, percent change values are for the change between 1993 and 1998.

Table I-1. Property Value Percent Change Data (cont.).

Port Arthur, Texas																			
Location			**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1989**	**1999**
City of Port Arthur																			
Total Appraised Vacant Land Values		Total Value (millions)	30.564	31.999	33.343	34.093	42.566	35.634	35.050	N/A	37.087	25.376	24.421	23.575	22.231	22.230	21.235		
		% Change		4.7	4.2	2.2	24.9	–16.3	–1.6	N/A	N/A	–31.6	–3.8	–3.5	–5.7	0.0	–4.5		
Total Appraised Commercial Property Value		Total Value (millions)	447.879	417.469	428.141	386.418	368.507	346.703	319.176	N/A	286.767	267.227	257/079	249.003	239.495	237.634	238.767		
		% Change		–6.8	2.6	–9.7	–4.6	–5.9	–7.9	N/A	N/A	–6.8	–3.8	–3.1	–3.8	–0.8	0.5		
Jefferson County																			
Total Appraised Vacant Land Values		Total Value (millions)	206.647	198.750	195.011	189.621	206.363	197.284	189.536	177.047	175.354	154.053	153.746	147.085	141.048	136.036	131.514		
		% Change		–3.8	–1.9	–2.8	8.8	–4.4	–3.9	–6.6	–1.0	–12.1	–0.2	–4.3	–4.1	–3.6	–3.3		
Total Appraised Commercial Property Value		Total Value (millions)	6995.863	7009.225	6940.548	6639.857	6265.284	6090.131	5949.712	5753.548	5911.701	6226.174	6463.993	6258.652	6429.688	6266.024	6059.155		
		% Change		0.2	–1.0	–4.3	–5.6	–2.8	–2.3	–3.3	2.7	5.3	3.8	–3.2	2.7	–2.5	–3.3		
Twin Cities Highway (Port Arthur, Texas): Construction Years = 1983 to 1985																			
	Number of Businesses																		
Land Value	38	Total Value (millions)													5.020	4.872	4.762		
	38	Total Value (per square foot)													1.57	1.53	1.49		
		% Change														–3.0	–2.2		
Land and Improvement Value	38	Total Value (millions)													5.078	4.928	4.817		
	38	Total Value (per square foot)													1.58	1.53	1.50		
		% Change														–3.0	–2.2		