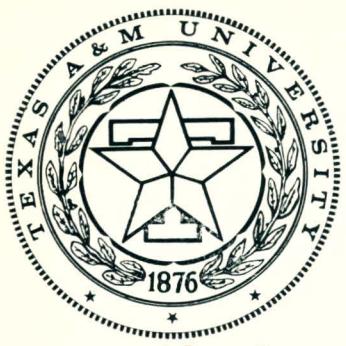


TEXAS
TRANSPORTATION
INSTITUTE

TEXAS
HIGHWAY
DEPARTMENT

COOPERATIVE
RESEARCH

A MEDIAN STUDY OF BAYTOWN, TEXAS

in cooperation with the
Department of Commerce
Bureau of Public Roads
and the Texas
Municipal League

PROGRESS REPORT
PROJECT 2-8-58-8 (HPS 1-27-I)
AUGUST 1963

A MEDIAN STUDY

IN BAYTOWN, TEXAS

By

C. V. Wootan and H. G. Meuth

A PROGRESS REPORT

on

A cooperative study between the Texas Highway Department,
the Texas Municipal League, and the
Texas Transportation Institute

The preparation of this report was partially sponsored by the
U. S. Bureau of Public Roads

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

FOREWORD

In September, 1958, a committee composed of members of the Texas Highway Department and the Texas Municipal League was formed to investigate and make recommendations on city-state median practices.

It was the intent of this committee to develop information on the effect that the addition of the median would have on a facility's ability to handle traffic more efficiently and safely and the effect that it would have on the local businesses. This information could then be used as a basis for evaluating future potential median sites to determine if a median-type facility should be installed.

The Texas Transportation Institute, as the official research agency of the Texas Highway Department, was asked to conduct the actual research program for the Committee. Three study sites, involving a heavily traveled route in a large city, a moderately traveled route in a medium sized city, and lightly traveled route in a small town, were selected for the analysis. This progress report is concerned only with the economic effects of the facility in the medium sized city of Baytown, Texas. A report covering both the economic and traffic effects of medians at the other locations will be released at the conclusion of the study.

A MEDIAN STUDY

IN BAYTOWN, TEXAS

Introduction

The Texas Highway Department and the various cities and towns of Texas have long been concerned with the necessity for and problems involved in improving highway routes along city streets. These routes are usually major traffic arteries in the larger cities and often serve as the Main Street in the smaller towns. As such they are usually heavily developed with commercial businesses throughout their length.

These combination highway routes and city streets are charged with fulfilling two diametrically opposed functions. In the smaller towns they must move the transient traffic through the town as quickly, safely and efficiently as possible and still serve as service streets to the businesses located on the adjacent land. In the larger cities they must perform these same functions and in addition carry the traffic moving between major sections of the city or between the suburban and central downtown areas. The difficulty in performing these functions concurrently has long been recognized.

Several procedures have been tried in an attempt to increase the efficiency with which this dual-purpose facility can be made to perform its functions. Among the more successful have been: speed zoning and signalization to regulate traffic flow; street widening or the creation of additional traffic lanes to increase the physical size of the facility; the creation of bypasses or alternate routes to remove through traffic; and finally the addition of a median barrier to increase traffic speed and decrease the number of accident exposure points. Median barriers are, of course, usually operated in conjunction with some type of traffic signalization and control.

With the advent of the median barrier, however, have come additional problems. Businesses which have been accessible to the total traffic flow from each direction were now directly accessible from only one direction. Motorists wishing to patronize businesses on the left side of the street were forced to go to the next median opening, turn around and return to the merchant. Merchants were naturally skeptical about the proportion of their customers who would go to the additional trouble of crossing the median to trade at their firms.

As a consequence, both the Texas Highway Department and the local city governments were frequently petitioned for the alteration or abolition of existing median improvements, and planned street improvement programs which included medians in their design were frequently resisted with vigor.

Since the Texas Highway Department was jointly concerned with the city each time a median was built, it was anxious to develop a solid foundation of facts from which the question of median installation and operation could be evaluated. It is not surprising, then, that in September, 1958, a joint City-Highway Department committee was formed to investigate and make recommendations on city-state median practices.

As the Committee reviewed the history of median operations, it found that medians have long been justified in the minds of their builders on the basis of their effectiveness in providing more efficient traffic movement and improving safety conditions. They have been opposed primarily on economic grounds. Local merchants feel that medians reduce their exposure to passing traffic and reduce their total sales volumes.

The committee felt, then, that its primary job was to determine through scientifically controlled research procedures just how the medians measured up to what was generally expected of them. That is, how much, if any, they increased traffic flow, eliminated delays, and increased safety, and how much, if any, they affected the retail sales volumes of adjacent businesses.

To do this, it was decided to select for study areas which were operating under nonmedian conditions but upon which medians were scheduled to be constructed in the immediate future. Each of these areas would then be subjected to a detailed analysis concerning both its record of traffic operation and the economic condition of its attendant businesses. The field work for this type of analysis would need to be initiated in time for a complete record of traffic and economic conditions to be developed prior to the beginning of construction. Additional analyses, covering the same type of data, would then be made at periodic time intervals after the new median had been built.

This research procedure is commonly known as the "Before and After" approach. Quite simply, its aim is to develop a complete picture of an area under its original set of operating conditions, let the operating conditions be changed, and then develop another picture. The research techniques carried on under this program are merely the mechanical workings of the researcher's analogous camera.

After the research approach was decided upon and the problems of financing solved, the first step was to select the appropriate areas for study. Funds and personnel were available to handle three separate study sites. These were selected on the basis of the size of city, the scheduling of median construction, the density of traffic, the type of commercial and residential development and the availability of the needed traffic and economic information.

The first area selected and the one covered in this report was in Baytown, Texas, a city of some 28,000 population located about 30 miles East of Houston. The study site itself was a section approximately two miles in length along State Highway 146 to the South of the Central Business District. This route was originally constructed several years ago to bypass the business district of Baytown, but as frequently happens, the town soon grew out to include the bypass section as one of its busiest streets. Over a period of years a large number of commercial establishments had been located along the route to serve both the local residents and the motoring public.

Traffic had increased to the point that approximately 10,000 vehicles used the facility each day and traffic congestion at peak hours had become an irritating problem. As a consequence the City of Baytown and the Texas Highway Department decided upon a street improvement program incorporating a median in the design of the new facility.

The median construction program in Baytown was scheduled to begin in December, 1958, and was expected to be completed by November 1 of the following year. The period November 1, 1957, through October 31, 1958, was selected as the "before" period to represent a time of normal operations under non-median conditions. The period November 1, 1958--October 31, 1959, represented the "construction" or "during" period and November 1, 1959 to October 31, 1960, the first year of normal operation with a median, the "after" period. Field work was begun in November, 1958 and was carried out in the November-May period in each year.

The research program was conducted in two phases: the economic phase and the traffic phase. The field work on these two phases was often conducted concurrently. However, they were treated separately in the analyses and only the results of the economic study will be reported here.

Concluding Observations on Business Activity

Some general observations concerning the effect of the construction of the median on businesses within the study area may be briefly stated as follows:

1. Adjacent businesses, both individually and as a group, were definitely hurt during the construction period. Many businesses were completely isolated for varying periods of time while the facility was being built with resulting severe losses in sales. Both business failures and decisions to relocate appear to stem directly from experiences during the the construction process.

2. Some of this loss was recovered during the first year of operation, but most old firms were still operating with a slightly lower level of sales than in the "before" period.

3. Of the four firms that went out of business during the entire study period, only one could actually be considered as an economic casualty. Of the remainder, one burned down and was replaced by a business of a different type, one lost the use of right-of-way parking that it had been using and was relocated just to the north of the study area but still along the median-type roadway of S.H. 146, and the other built a new building just to the north of the study area and 1/2 block off the facility.

4. The improvement of S.H. 146 appears to have created a number of attractive commercial sites within the study area. Several new businesses have already moved into the area and other businesses are known to be considering these locations as of 1962.

5. Total sales of all firms in the area were increased considerably above the base period. This was due largely to the establishment of new firms during the first year of operation under median conditions.

6. The monthly trend of sales for all firms in the last year was up even sharper than was reflected in annual sales.

7. No significant relationship was found to indicate that firms located at median openings fared better under median conditions than those without such openings. In fact, for this study, the opposite relationship was indicated.

Economic Analysis

The economic phase of the study was concerned with determining the influence of the median on local businesses. In this study only those businesses which fronted on the facility were considered as being in the influence zone of the median. The steps that were taken to insure that an accurate picture of their operation was obtained are as follows:

1. Initial Preparation

As a first step, a complete inventory was made of the study area. The name and address of each business were recorded and its location was plotted on a large scale map of the section. Each retail businessman was then written a personal letter explaining the study in detail and asking for his cooperation. He was also told that a member of the research staff would be by on a certain date to obtain specific sales information from him.

At the same time press releases were issued to the local newspapers, television and radio stations. Their cooperation was also sought later in publicizing the study through spot announcements and follow up feature stories. Civic leaders, such as the mayor, manager of the Chamber of Commerce, the presidents of local service clubs, and the chief of police, were also asked to help publicize the study and inform the local residents of its purposes.

2. Selection of Controls

In order to minimize the influence of external factors, such as an area wide boom or recession that would affect all businesses in the area, a group of control firms was selected to compare with the study firms. These external control firms were selected on a "one for one" basis and each control business was selected for its similarity to the business it was to control. It was also selected from a section of town that was judged to be least affected by the construction program. A service station, for example, would have as its companion control another service station handling the same brand of gasoline. This station would be of approximately the same size and would observe the same general operating procedures but would be located in another section of Baytown. The distribution of controls is shown in Figure 1.

After a control business had been selected, it was subjected to the same treatment as the study businesses. Its owner was contacted and his cooperation solicited. In cases where he would not cooperate or records were not available, a preselected alternate firm was chosen.

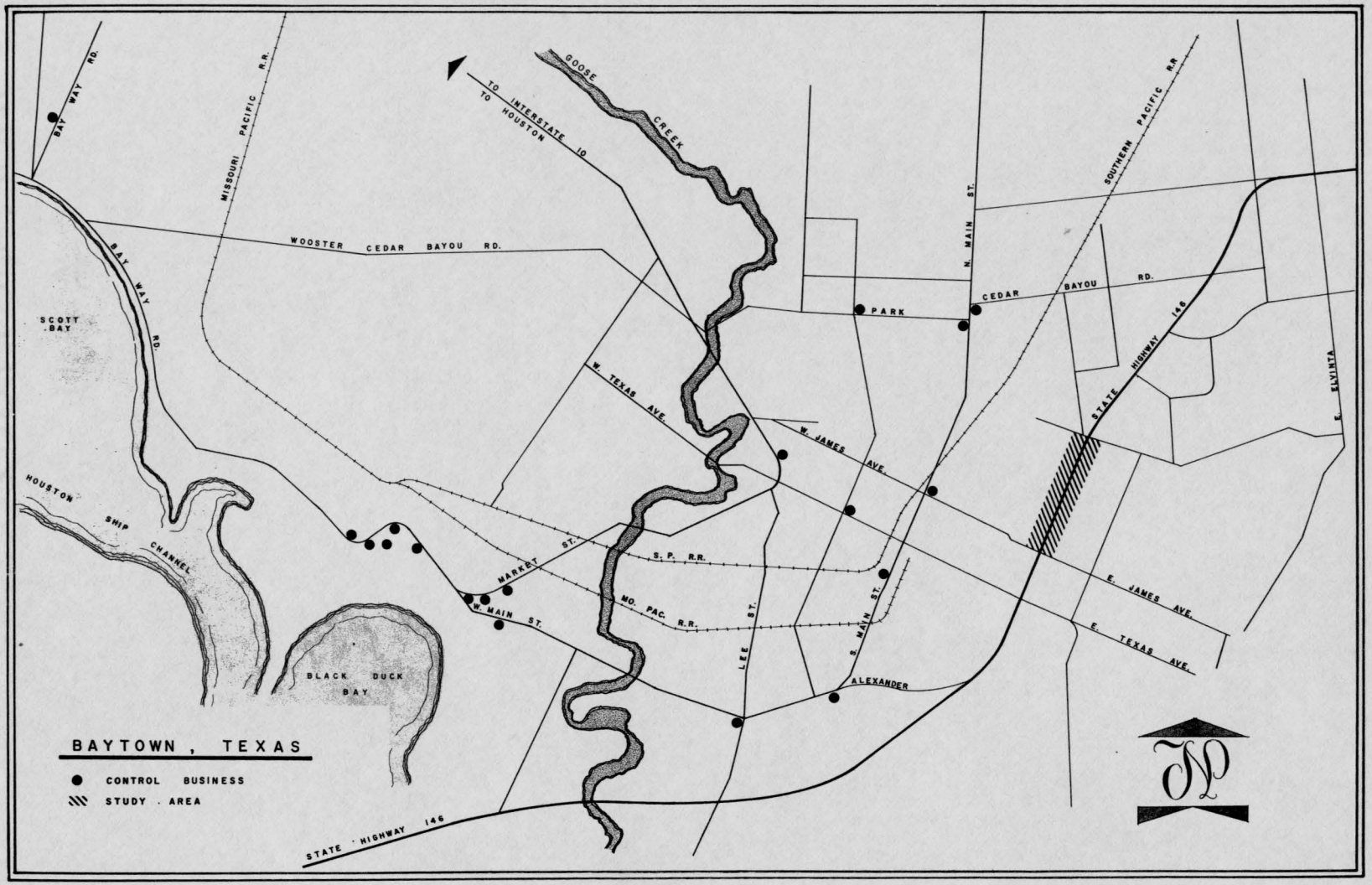

BAY WAY RD.
MISSOURI PACIFIC R.R.
TO INTERSTATE 10
TO HOUSTON
GOOSE CREEK
SOUTHERN PACIFIC R.R.
N. MAIN ST.
WOOSTER CEDAR BAYOU RD.
BAY WAY RD.
SCOTT BAY
PARK
CEDAR BAYOU RD.
STATE HIGHWAY 146
E. ELYSIA
W. TEXAS AVE.
W. JAMES AVE.
HOUSTON SHIP CHANNEL
MARKET ST.
S. P. R.R.
E. JAMES AVE.
W. MAIN ST.
MO. PAC. R.R.
LEE ST.
S. MAIN ST.
E. TEXAS AVE.
ALEXANDER
BLACK DUCK BAY
BAYTOWN, TEXAS
CONTROL BUSINESS
STUDY AREA
STATE HIGHWAY 146
N

FIGURE 1

3. Business Interviews

Each study and control area business owner or manager was personally interviewed by a member of the research staff. Considerable information concerning the business' operating history, its management practices, and the condition of its physical plant was obtained in these interviews. The main objective, however, was to get an accurate record of monthly retail sales volumes for the preceding 12-month period.

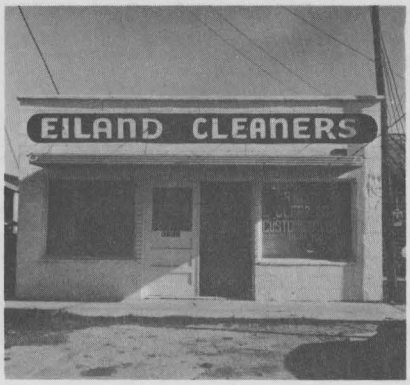
Since Texas had no system of sales taxes or State receipt taxes at the time this study was made, there was no way of determining gross business revenues from published records. Consequently, sales records were available from only one source--the business itself. This, of course, made it very necessary to get good cooperation from the firms that were interviewed. Fortunately, this was possible in Baytown as only two of the study area firms refused to cooperate in the study.

As the businesses were interviewed, they were classed into homogeneous groups. These groupings were developed to fit this study but were based on the Standard Industrial Classification Index of retail firms. Service stations, for example, were classed in a group by themselves as were motels and restaurants. For the purpose of this report these small groups were further combined, where necessary, to form six major classes of businesses. This was done in order that a comparative business analysis could be shown.

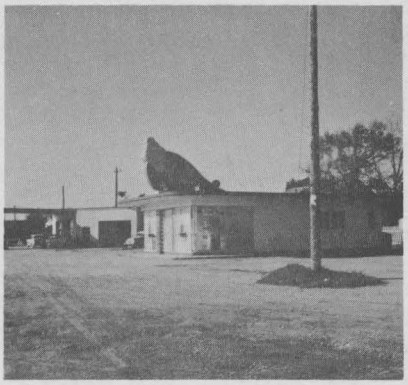
Business Analysis

A listing of all the firms located within the area that was selected for study, along with a record of their participation in this study is shown in Table 1. At the time the study was initiated, there were a total of 23 retail businesses located along S.H. 146 between James Avenue and Davis Road. All but two of these firms cooperated in the study by furnishing a record of their monthly gross sales volumes for the "before" period.

After construction was begun, however, one of the businesses was moved out of the area, one was destroyed by fire and one went out of business. Consequently, only 18 of the original firms were able to supply monthly sales data for the construction period. One additional firm moved out of the area during the "after" period to reduce the number of original firms supplying information to 17. During this same time, however, 5 new firms were established in the area. Four of these were in operation for a long enough period to furnish some monthly data for the "after" period.



RELOCATED TO NORTH 1/2 BLOCK OFF S.H. 146.



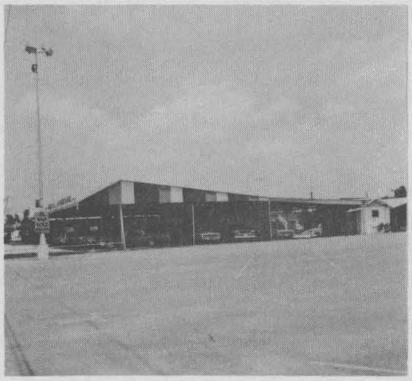
RELOCATED NORTH OF STUDY AREA ON S.H. 146

MOVED OUT OF AREA- BUILDING NOW OCCUPIED BY CLEANERS

BURNED DOWN - REPLACED BY NEW MOTEL

THESE FOUR FIRMS WENT OUT OF BUSINESS DURING THE STUDY.

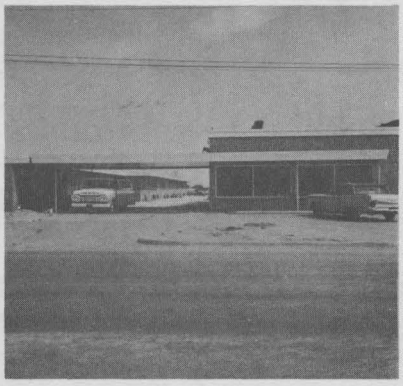
FIGURE 2



MOTOR COMPANY

GROCERY STORE

MOTOR COMPANY



MOTEL

FOUR OF THE NEW BUSINESSES THAT HAVE BEEN ESTABLISHED SINCE THE MEDIAN WAS BUILT.

FIGURE 3

TABLE 1

BUSINESSES BY TYPE AND RECORD OF PARTICIPATION IN THE BAYTOWN STUDY

	Business Number	Type Business	Period of Participation		
			Before	During	After
1/	1	Motel	x	x	x
	2	Food	x	x	x
2/	3	Miscellaneous	x		
3/	4	Service Station	x	x	x
	5	Food	x	x	x
4/	6	Personal Service	x		x
	7	Miscellaneous	x	x	x
5/	8	Food	x		
6/	9	Food			
6/	10	Miscellaneous			
7/	11	Service Station	x	x	x
	12	Automotive	x	x	x
	13	Automotive	x	x	x
	14	Personal Service	x	x	x
8/	15	Automotive			x
9/	16	Food			x
	17	Service Station	x	x	x
	18	Service Station	x	x	x
10/	19	Food	x		
11/	20	Food			
	21	Motel	x	x	x
	22	Food	x	x	x
	23	Automotive	x	x	x
12/	24	Automotive		x	x
	25	Service Station	x	x	x
	26	Food	x	x	x
13/	27	Food	x	x	x
9/	28	Motel			x
14/	29	Food			

1/ Changed owners in "before" period.
2/ Closed at end of "before" period--did not reopen.
3/ Station changed brands of product in "during" period.
4/ One firm moved--another firm of same type opened up in "after" period.
5/ Burned down in "during" period.
6/ Would not cooperate.
7/ Changed management in "during" period.
8/ Opened up as new business in "after" period.
9/ Opened as new business in "after" period (only in operation last 4 months).
10/ Moved from area at end of "before" period.
11/ Opened as new business last month of "after" period.
12/ Opened as new business in "during" period.
13/ Changed owners and name at end of "before" period.
14/ Opened as new business at end of "after" period (sales not included in study).

Because of the changes in the number of firms operating in the study area during the 3 years of observation, it was very difficult to show an accurate picture of the influence of the median on their volumes through use of a single method of sales comparisons. The effect on individual firms or groups could be quite different from that reflected by the area as a whole, and losses or gains in the number of businesses could have an effect on the over-all volume of business by the entire group. For this reason the analysis was conducted and the comparisons are presented here in 3 different ways.

Table 2 shows what happened to the original group of businesses that were in the study area before construction of the median. This includes the sales of all those firms which went out of business during the 3 years but does not include sales of any of the new firms. It represents, then, only the sales records of the original 21 firms shown as a group. As such, it naturally shows the most severe decline in sales of any of the comparisons made. This decline was 16.5 percent between the "before" and "during" periods and 13.5 percent when extended to the "after" period. It should be remembered, however, that these comparisons include only 18 firms in the construction period and 17 firms in the "after" period.

Using the same method of comparison, the control businesses were considerably less affected during the study. Of the original 21 firms only 2 went out of business during the period; both early in the construction phase. Consequently, the sales of these firms were reduced by only 8 percent and 5 percent respectively in the two later periods.

Another way of comparing the business volumes of firms in the influence area is shown in Table 3. Here the comparison is made of only those firms which were operating in the area at both the beginning and the end of the study. The fact that they continued to operate throughout the period would indicate that they were probably the better established firms from the standpoint of both financing and management. This observation is borne out by the much smaller losses in sales experienced by these firms. During the construction period these firms lost less than 10 percent of their sales, and in the 12 months after the facility was completed their losses were reduced to 6.6 percent of the base period sales.

In a similar treatment of control area firms, losses amounted to 3.6 percent in the "during" period and 4 percent in the final year. This smaller loss was the result of the elimination from consideration of 2 firms which went out of business during the study.

The third method of comparison is shown in Table 4. Here the sales of all firms in operation within the study area are shown for each time period. This is probably the most logical comparison that can be made for the area as a whole.

TABLE 2

TOTAL SALES OF ALL FIRMS THAT WERE IN OPERATION AT THE BEGINNING OF THE STUDY 1/

STUDY AREA

Types of Business	Before Period (Base) Sales (Dollars)	During Period			After Period		
		Sales (Dollars)	Change From Base (Dollars)	Percent Change (Percent)	Sales (Dollars)	Change From Base (Dollars)	Percent Change (Percent)
Service Station	$ 511,630	$ 411,932	$ -99,698	-19.5%	$ 458,691	$ -52,939	-10.3%
Food Stores	1,408,044	1,224,145	-183,899	-13.1	1,216,574	-191,470	-13.6
Automotive	153,403	133,258	-20,145	-13.1	150,844	-2,559	- 1.7
Personal Services	54,562	52,163	-2,399	- 4.4	69,433	+14,871	+27.2
Motels	77,754	76,894	-860	- 1.1	70,654	- 7,100	- 9.1
Misc. Retail	71,540	2,400	-69,140	-96.6	2,500	-69,040	-96.5
Totals	$2,276,933	$1,900,792	$-376,141	-16.5	$1,968,696	$ 308,237	-13.5%

CONTROL AREA

Service Station	$ 527,784	$ 493,875	$- 33,909	- 6.4%	$ 507,419	$- 20,365	3.9%
Food Stores	1,359,181	1,236,356	-122,825	- 9.0	1,271,589	- 87,592	- 6.4
Automotive	150,384	138,938	- 11,446	- 7.6	139,553	- 10,831	- 7.2
Personal Services	85,775	76,546	- 9,229	-10.8	81,803	- 3,972	- 4.6
Motels	18,020	17,370	- 650	- 3.6	17,830	- 190	- 1.1
Misc. Retail	71,350	75,656	+ 306	+ .4	82,961	+ 11,611	+16.3
Totals	$2,212,494	$2,034,741	$-177,753	- 8.0%	$2,101,155	$-111,339	- 5.0%

1/ Includes firms that went out of business during the study but does not include sales of the new firms that located in the area after construction was completed.

TABLE 3

TOTAL SALES OF ALL FIRMS THAT WERE IN OPERATION AT BOTH THE BEGINNING AND ENDING OF STUDY PERIOD 1/

STUDY AREA

Types of Business	Before Period (Base) Sales (Dollars)	During Period			After Period		
		Sales (Dollars)	Change From Base (Dollars)	Percent Change (Percent)	Sales (Dollars)	Change From Base (Dollars)	Percent Change (Percent)
Service Stations	$ 511,630	$ 411,932	$- 99,698	-19.5%	$ 458,691	$- 52,939	-10.3%
Food Stores	1,308,780	1,224,145	- 84,635	- 6.5	1,216,574	- 92,206	- 7.0
Automotive	153,403	133,258	- 20,145	-13.1	150,844	- 2,559	- 1.7
Personal Services	54,562	52,163	- 2,399	- 4.4	69,433	+ 14,871	+27.3
Motels	77,754	76,894	- 860	- 1.1	70,654	- 7,100	- 9.1
Misc. Retail	2,400	2,400	---	---	2,500	+ 100	+ 4.2
Totals	$2,108,529	$1,900,792	$-207,737	- 9.9%	$1,968,696	$-139,833	- 6.6%

CONTROL AREA

Service Stations	$ 527,784	$ 493,875	$- 33,909	- 6.4%	$ 507,419	$- 20,365	- 3.9%
Food Stores	1,257,133	1,236,366	- 20,767	- 1.6	1,271,589	+ 14,456	+ 1.1
Automotive	150,384	138,938	- 11,446	- 7.6	139,553	- 10,831	- 7.2
Personal Services	85,775	76,546	- 9,229	-10.8	81,803	- 3,972	- 4.6
Motels	18,020	17,370	- 650	- 3.6	17,830	- 190	- 1.1
Misc. Retail	71,350	71,656	+ 306	+ .4	82,961	+ 11,611	+16.3
Totals	$2,110,446	$2,034,751	$- 75,695	- 3.6%	$2,101,155	$- 9,291	- 4.0%

1/ Does not include either firms that went out of business or new firms that located in the area after construction was completed.

TABLE 4

TOTAL SALES OF ALL FIRMS THAT WERE IN OPERATION DURING ANY ONE OF THE THREE STUDY PERIODS 1/

STUDY AREA

Types of Business	Before Period (Base) Sales (Dollars)	During Period Sales (Dollars)	During Period Change From Base (Dollars)	During Period Percent Change (Percent)	After Period Sales (Dollars)	After Period Change From Base (Dollars)	After Period Percent Change (Percent)
Service Stations	$ 511,630	$ 411,932	$- 99,698	-19.5%	$ 458,691	$- 52,939	-10.3%
Food Stores	1,408,044	1,224,145	-183,899	-13.1	1,471,869	+ 63,825	+ 4.5
Automotive	153,403	133,258	- 20,145	-13.1	556,057	+402,654	+262.5
Personal Services	54,562	52,163	- 2,399	- 4.4	69,433	+ 14,871	+27.3
Motels	77,754	76,894	- 860	- 1.1	76,256	- 1,498	- 1.9
Misc. Retail	71,540	2,400	- 69,140	-96.6	2,500	- 69,040	-96.5
Totals	$2,276,933	$1,900,792	$-376,141	-16.5	$2,634,806	$+357,873	+15.7%

CONTROL AREA

Types of Business	Before Period (Base) Sales (Dollars)	During Period Sales (Dollars)	During Period Change From Base (Dollars)	During Period Percent Change (Percent)	After Period Sales (Dollars)	After Period Change From Base (Dollars)	After Period Percent Change (Percent)
Service Stations	$ 527,784	$ 493,875	$- 33,909	- 6.4%	$ 507,419	$- 20,365	- 3.9%
Food Stores	1,359,181	1,236,356	-122,825	- 9.0	1,271,589	- 87,592	- 6.4
Automotive	150,384	138,938	- 11,446	- 7.6	139,553	- 10,831	- 7.2
Personal Services	85,775	76,546	- 9,229	-10.8	81,803	- 3,972	- 4.6
Motels	18,020	17,370	- 650	- 3.6	17,830	- 190	- 1.1
Misc. Retail	71,350	71,656	+ 306	+ .4	82,961	+ 11,611	+16.3
Totals	$2,212,494	$2,034,741	$-177,753	- 8.0%	$2,101,155	$-111,339	- 5.0%

1/ Includes sales of firms that went out of business and new firms that were established during the study period.

It is concerned with the annual retail sales within the study area rather than with either the "original" or "surviving" firms as specific groups. These are the figures that reflect gross incomes for tax bases for the area as a whole. As such, they should be most useful to governmental taxing and planning agencies.

This comparison shows that sales were down sharply in the construction period. This is, of course, influenced to some extent by the loss of 3 firms in that period. However, it is also a legitimate reflection of general business conditions while construction was underway. During the construction period the highway serving these businesses was torn up for a considerable period of time and several of the businesses were completely isolated for short periods. Consequently, total sales throughout the study area were off rather sharply while construction was underway.

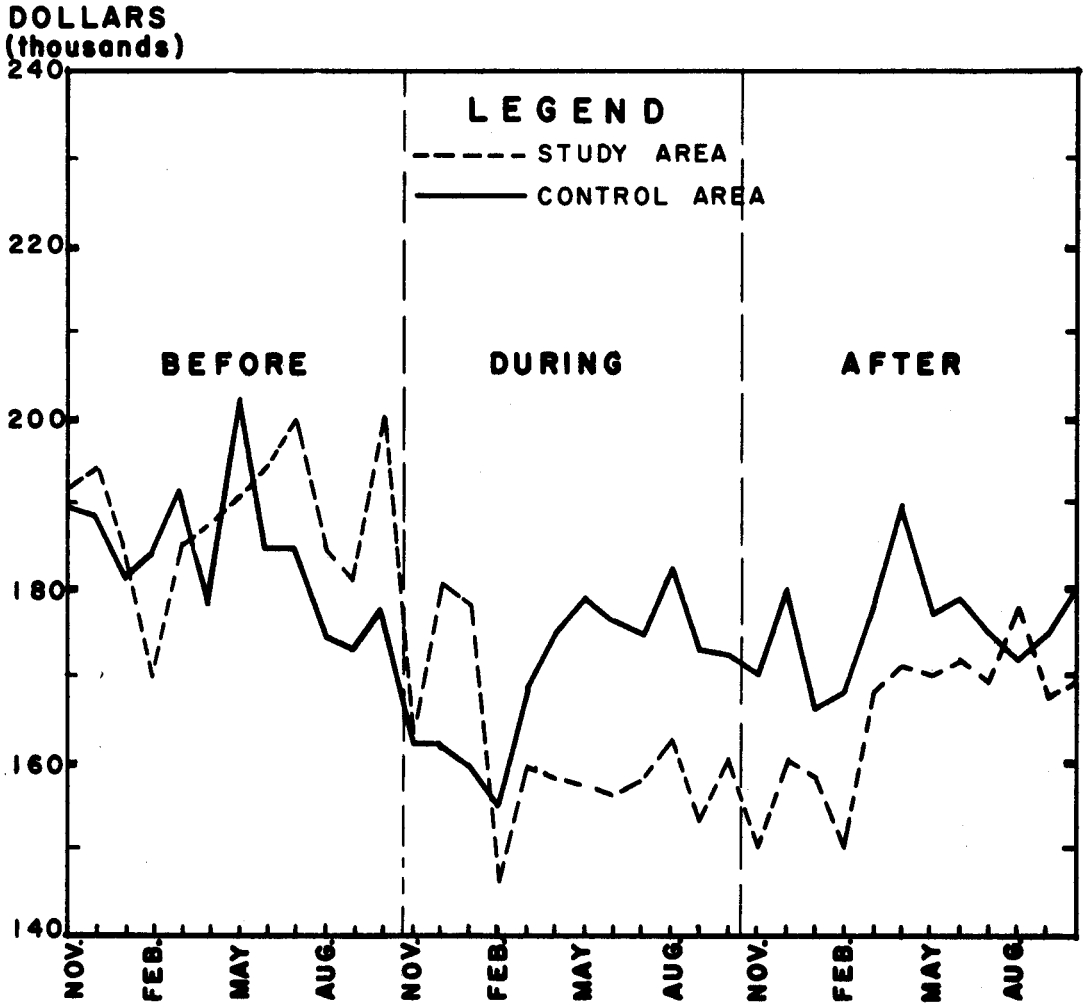
After the construction was completed the recovery in total study area sales was quite rapid. Total study area sales increased from about $1.9 million in the construction period to over $2.6 million in the first full year of operation. Here again, however, the cause of the increase was divided between generally small increases in the sales of established firms (as shown in Table 3) and the more impressive gains caused by tne new firms that located in the area after the improvements were completed. Together they caused the gross sales in the final period to show a 15.7 percent increase over that recorded prior to construction.

The effect of the construction program on monthly sales is shown graphically in Figures 4, 5, and 6. These figures show on a monthly basis the same information for all businesses that is presented by years for the different classes of business in Tables 2, 3, and 4.

The first two charts show the same general picture; that is, monthly sales of study area firms fluctuating in the same general area as the control firms in the "before" period with the sales of both in a general downward trend. Then, early in the construction period, the relatively greater losses in sales by the study area firms begins to become evident. By the time the construction is completed the monthly sales of firms in the study area are well below those in the controls.

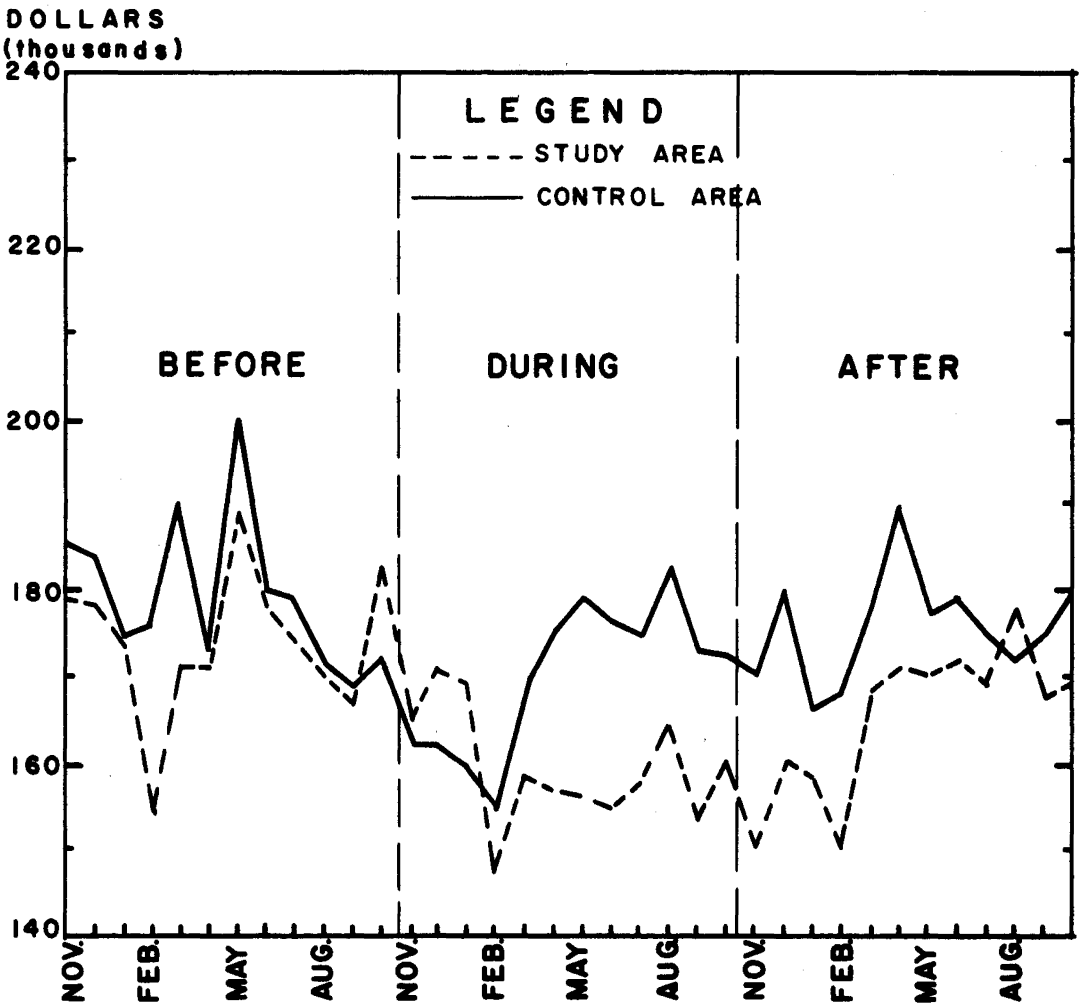
After the construction was completed, monthly sales of study area firms began to recover some of the sales they had lost while construction was underway. By the end of the first full year of operation with a median, study and control firms were again operating at about the same general level. However, sales for the year as a whole were still below their base period levels.

When the new firms were included in the analysis, as shown in Figure 6, the picture was changed considerably in the "after" period. As each new firm opened, its sales volume was added to those firms already in operation. This caused total sales to increase at an increasing rate throughout most of the



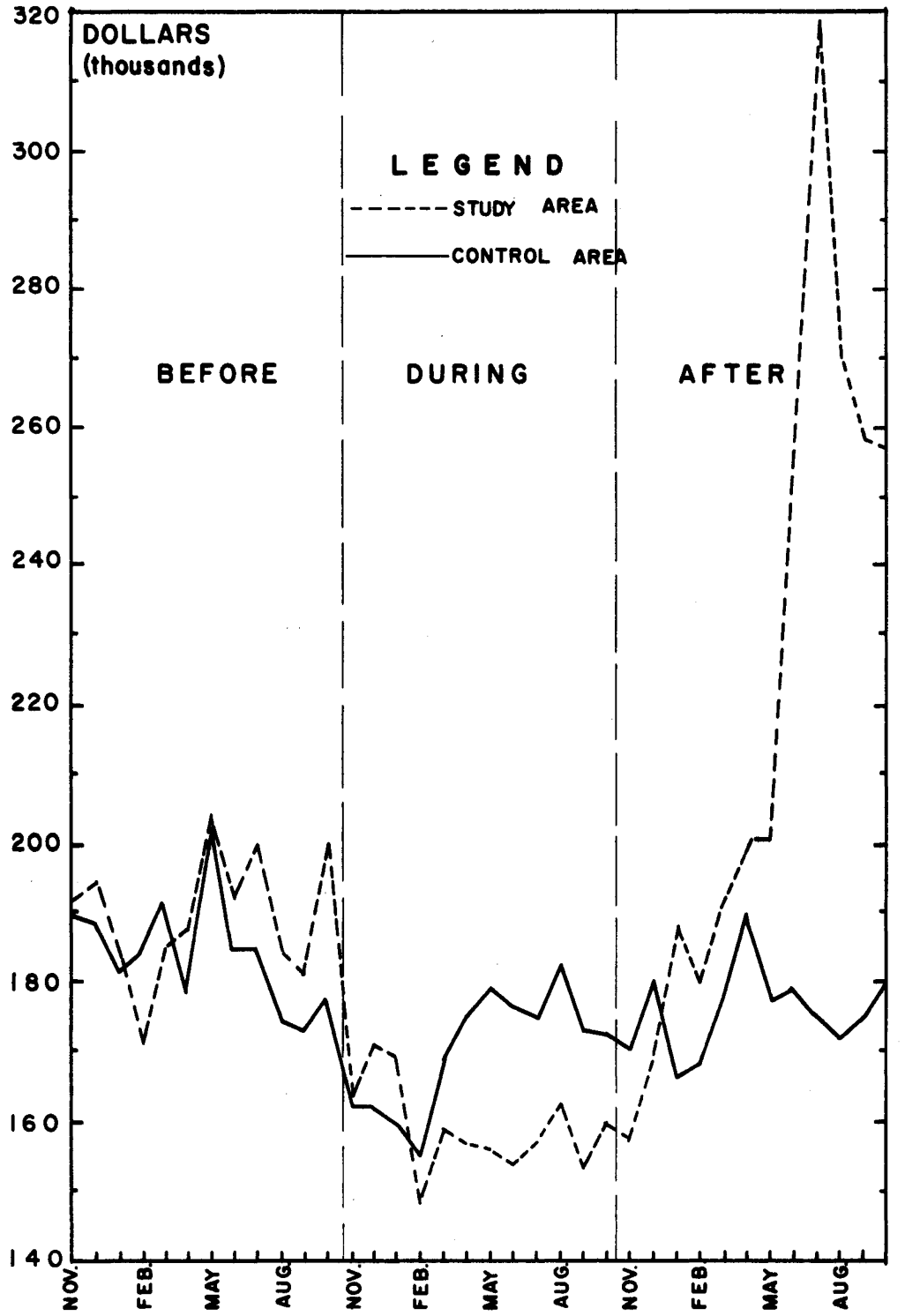
MONTHLY SALES OF ALL STUDY AND CONTROL AREA FIRMS THAT WERE IN BUSINESS AT THE BEGINNING OF THE STUDY PERIOD.

FIGURE 4



MONTHLY SALES OF ALL STUDY AND CONTROL AREA FIRMS THAT WERE IN BUSINESS AT BOTH THE BEGINNING AND END OF THE STUDY PERIOD

FIGURE 5



MONTHLY SALES OF ALL STUDY AND CONTROL AREA FIRMS THAT WERE IN OPERATION DURING ANY ONE OF THE STUDY PERIODS.

FIGURE 6

final year. As a consequence, average monthly sales of all study area firms in the last 3 months of the "after" period were approximately 50 percent higher than for the same months in the "before" period. This would seem to indicate that if the study were extended for an additional year the increase in gross study area sales would be considerably greater than the 15.7 percent shown in Table 4.

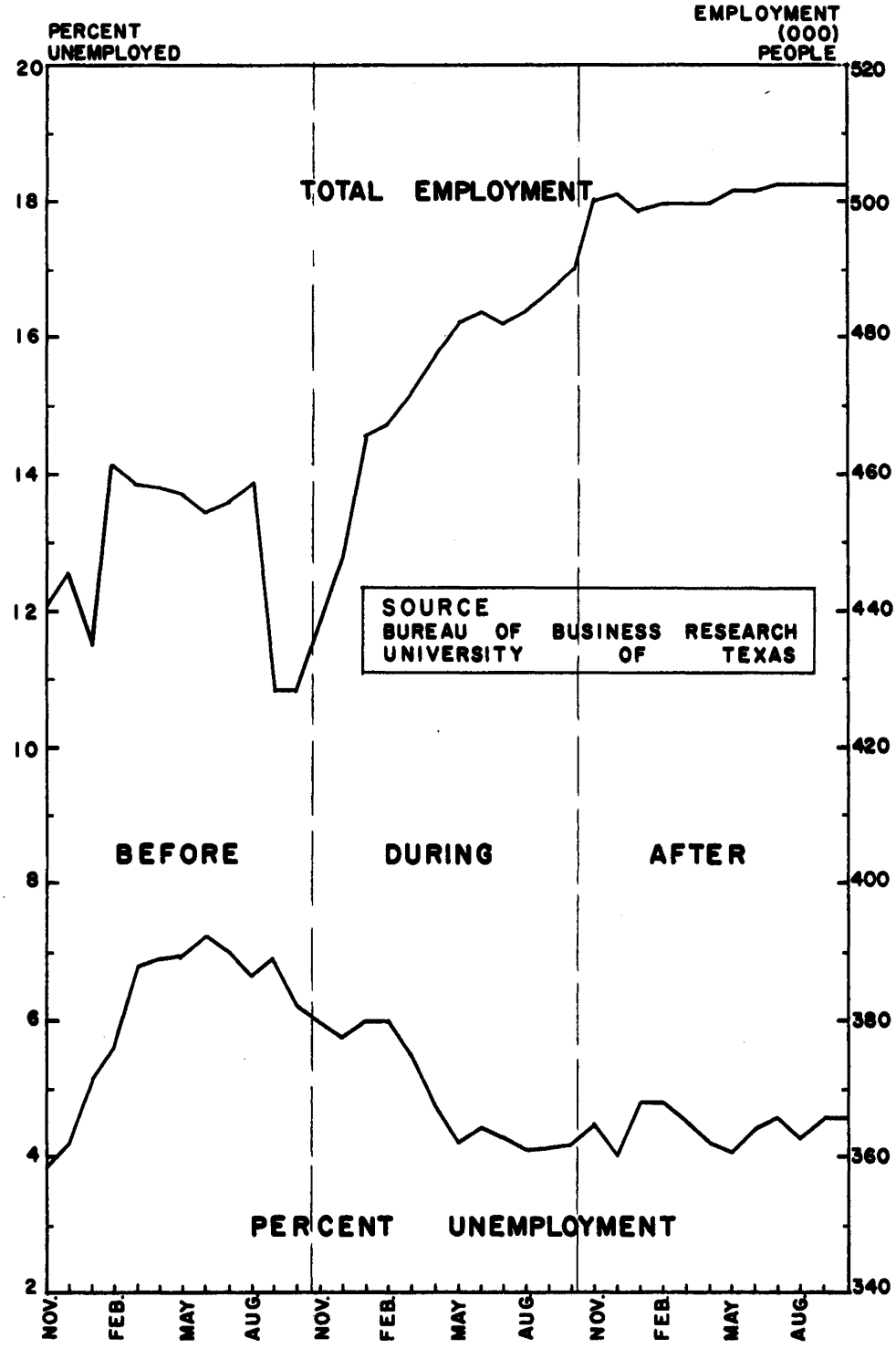
The general decline of both study and control area sales throughout the "before" period may be at least partially explained by the general economic conditions affecting Baytown during that time. Business activity dropped off sharply in early 1958 all over the United States. The business decline in Baytown was probably aggravated by the reduction in activity by the petroleum industry. Baytown's economy is rather closely geared to the oil-petro chemical industries and a cut-back in their operations is rapidly reflected in the economic activity of Baytown businesses.

An indication of the general level of economic activity in the Baytown area is shown in Figures 7 and 8. Figure 7 is concerned with employment (and unemployment) in the Baytown area and Figure 8 is a record of month-end bank deposits. The general upward trend of total employment, which is revealed in the first chart is the condition that would be normally expected in an expanding area such as the Gulf Coast. The fact that this growth was interrupted in the late summer and fall of 1958, and that total employment was actually reduced by a significant amount for a few months, is an indication of the severity of the economic decline. This is substantiated by the high and increasing percentage of unemployment in 1958 which was subsequently reduced to more "normal" levels in late 1959 and 1960.

Bank deposits, which are considered as a somewhat less reliable indicator of economic activity, declined sharply in early 1958 as a result of less income and continued spending. They built up again during the year as people postponed spending in the face of the recession that was then being recognized. Then, as confidence was restored by the increased hirings of area firms and the general economic recovery of the nation as a whole, spending again reduced bank deposits by the fall of 1959. It is perhaps not unreasonable to speculate that the decline in retail sales by both study and control firms in the "during" period was accentuated by the hesitancy of Baytown residents to spend money during the latter phase of the 1958 recession and the early stage of the subsequent recovery.

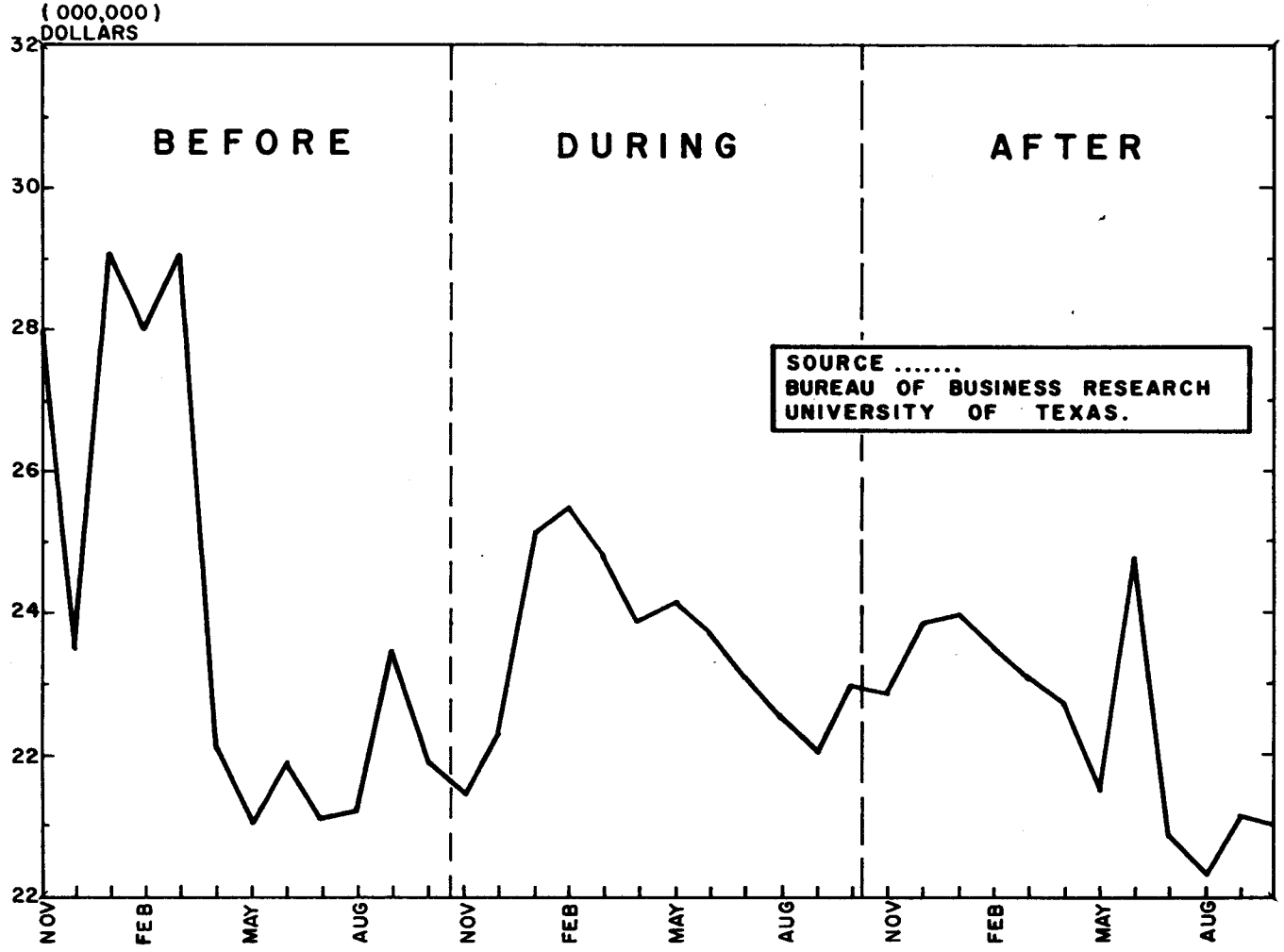
Relationship to Median Openings

One of the prime points of contention in the acceptance of a median-type design by adjacent businesses is the location of median openings with regard to each business. It is generally accepted by businessmen that a site at a median opening is much preferred over one without a median opening. The average businessman would like to have a median opening immediately in front



BAYTOWN AREA MONTHLY EMPLOYMENT
NOVEMBER 1957 — OCTOBER 1960

FIGURE 7



BAYTOWN END OF MONTH BANK DEPOSITS

NOVEMBER, 1957— OCTOBER, 1960

FIGURE 8

of his business. He feels that this would give him a continued accessibility to opposite stream traffic and would reduce the adverse effect of the median on his sales volumes.

As a part of this study it was decided to test the validity of this belief in as far as the data would permit. Each firm was classified as being located either at or away from a median opening. All firms which could be approached by a legal left turn were considered as being located at a median opening. Those that could not be entered by a legal left turn were placed in the non-opening group.

The relatively small number of firms included in this study prevented an analysis by individual classes of firms. However, the comparison for all firms as a group is shown in Table 5. Individual firm names or business types have been omitted in order to protect the identity of cooperating firms.

Of the 18 firms which were in operation at both the beginning and end of the study period, 10 were located at median openings and 8 were located away from the median crossing. This is admittedly a very small number from which to draw concrete conclusions. It is interesting, however, to compare the different effects on the two groups of firms. Of the two groups, those located at the median openings fared no better than those without openings. In fact their sales were ten percent below their base levels after a full year's operation with a median. The other group, those located away from the median openings, managed to show a 17 percent increase in sales over the same period of time. This difference is significant not because of what it shows, but because of what it fails to show. The anticipated better performance by firms at median openings failed to materialize.

This difference cannot be explained by the composition of the two groups since the different types and classes of businesses are fairly well distributed between them. Group I has 5 of its 10 firms classed in the "traffic serving" category while Group II has 4 of its 8 firms in this grouping. There is also little difference in the proportion of firms that gained or lost business during the study period.

It would appear, then, that in this instance at least, there was no advantage to a firm to be located near a median opening. The variations in sales of firms both with and without median openings strongly supports the theory that individual management--and managements' reaction to changing conditions--exerts a much stronger influence on sales than does location.

TABLE 5

THE EFFECT OF FIRM LOCATION WITH RESPECT TO MEDIAN OPENINGS ON SALES VOLUMES AS SHOWN BY INDEX NUMBERS (Nov. 1957 -- Oct. 1958=100)

Firm No.	Business Orientation	Before (Number)	During (Number)	After (Number)
GROUP I - FIRMS LOCATED AT MEDIAN OPENINGS				
1	Traffic	100	97	62
2	Nontraffic	100	168	482
3	Traffic	100	79	101
4	Nontraffic	100	133	143
5	Nontraffic	100	91	107
6	Traffic	100	79	91
7	Traffic	100	84	84
8	Nontraffic	100	91	91
9	Traffic	100	48	56
10	Nontraffic	100	99	111
TOTAL		100	89	90
GROUP II - FIRMS NOT LOCATED AT MEDIAN OPENINGS				
11	Traffic	100	149	144
12	Traffic	100	68	73
13	Traffic	100	83	74
14	Traffic	100	83	96
15	Nontraffic	100	82	88
16	Nontraffic	100	140	247
17	Nontraffic	100	135	161
18	Nontraffic	100	100	104
TOTAL		100	98	117