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A MEDIAN STUDY IN SAN ANTONIO, TEXAS

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A Median Study in San Antonio, Texas

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The Texas Highway Department and various cities and towns in the state have been concerned with the necessity for and problems involved in improving highway routes along city streets. These routes usually serve as the main street in the smaller towns, or as major traffic arteries in the larger cities. As such, they are usually heavily developed with commercial businesses.

In order to move traffic along these routes more quickly, safely, and efficiently, the state and the city decided to construct a median barrier on some of these routes. With the construction of the median, additional problems were created. Businesses which had been accessible to total traffic flow from each direction were now accessible from only one direction. No mid-block left turns would be permitted. The motorists desiring 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.

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. Therefore, a joint committee of city and Highway Department officials was formed in September, 1958, to investigate and make recommendations on city-state median practices.

The committee decided 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 flow, eliminated delays, and increased safety; and how much, if any, they affected the retail sales volumes of adjacent businesses.

Therefore, three areas—Baytown, Pleasanton, and San Antonio—were selected to be subjected to a detailed analysis concerning both the traffic operation and the economic condition of businesses along these routes. The "before and after" approach was used in each of the three areas. This means that a complete picture was developed of the areas under the original set of operating conditions; then operating conditions were changed, and another picture was developed.

This report summarizes the findings in San Antonio, Texas, a city of some 588,000 population in 1960, and an estimated 641,500 in 1963. This city is a highway hub for South Texas with three Interstate routes (when completed) and six additional

State and U. S. highways serving the city and the South Texas area.

The study site is a section of South Loop 13, known as Southwest Military Drive, $1\frac{1}{2}$ miles in length, extending from South Flores to Commercial Street. During the "before" study, Southwest Military Drive was a two-lane roadway with paved shoulders. Due to the high volume of traffic, the shoulders were being used as additional traffic lanes. It was a heavily traveled street, especially during morning and evening peak hours. A large amount of traffic was generated by the military bases in Southeast and Southwest San Antonio.

For the "after" study period, the roadway had been reconstructed to provide three traffic lanes in each direction, separated by a 14-foot median with left turn lanes at each intersection.

Summary of Economic Analysis

The San Antonio businesses fared better throughout the "construction" period than firms in either the Baytown or Pleasanton studies. The construction of the median covered about two years, with the first year being devoted largely to utility relocation and the second to major construction. During the first year of the study, traffic flow and business activity was affected very little by the relocation of utilities. When the major construction program began, it was scheduled in such a manner that businesses were isolated from traffic for only short periods of time. However, some businesses were definitely hurt during the major construction period.

Some of the older firms had been using part of the right of way of the old street for customer parking. These businesses were reduced to limited parking space after the new facility was built. This created customer parking problems, and as a result, six of the businesses were forced to close during the last two years of the study period. In some cases the buildings were moved to other locations in San Antonio. Owners of others are planning to rebuild, but farther back from the street in order to provide sufficient space for customer parking. Three additional businesses in the study area closed in 1963. Their buildings were vacant at the end of the study.

The improved facility made the area more desirable for commercial development. A shopping center occupying a full block was built in 1963 and was fully occupied by 13 firms by early 1964. In addition to the shopping center, three more businesses were established in other segments of the area in 1962 and 1963.

The analysis of the economic influence of the median on adjacent businesses is based on gross sales data from cooperating firms along the route. Sales data for each period by type of business are shown in Table 1. Sales of the auto and mis-

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

Type of Business	Before Priced		During Period			After Period		
	Base Sales		Sales	Change from Base Period	Percent Change	Sales	Change from Base Period	Percent Change
	(Dollars)	(Dollars)	(Dollars)	(Percent)	(Dollars)	(Dollars)	(Percent)	
STUDY AREA								
Auto and Auto Parts	(8) ¹ 5,321,280 ²	(9) 5,961,049	+ 639,769	+12.0	(8) 6,423,726	+1,102,446	+20.7	
Service Stations	(4) 440,925	(4) 353,177	- 87,748	-19.9	(4) 346,066	- 94,859	-21.5	
Food Services	(6) 2,648,694 ²	(7) 1,509,159	-1,139,535	-43.0	(6) 2,037,243	- 611,451	-23.1	
Furniture Hdw. and App.	(5) 1,961,423 ²	(6) 1,874,588	- 86,835	- 4.4	(8) 1,837,883	- 123,540	- 6.3	
Personal Services	(6) 90,651	(6) 61,847	- 28,804	-31.8	(7) 64,925	- 25,726	-28.4	
Other Retail	(5) 579,974 ³	(7) 761,673	+ 181,699	+31.3	(8) 1,003,543	+ 423,569	+73.0	
TOTALS	(34) 11,042,947	(39) 10,521,493	- 521,454	- 4.7	(41) 11,713,386	+ 670,439	+ 6.1	
CONTROL AREA								
Auto and Auto Parts	(8) 5,813,514 ²	(8) 5,270,353	- 543,161	- 9.3	(8) 5,667,515	- 145,999	- 2.5	
Service Stations	(4) 412,821	(4) 393,433	- 19,388	- 4.7	(4) 395,935	- 16,886	- 4.1	
Food Services	(6) 2,629,013 ²	(6) 2,299,387	- 329,626	-12.5	(6) 2,220,833	- 408,180	-15.5	
Furniture Hdw. and App.	(5) 2,741,820 ²	(5) 2,493,323	- 248,497	- 9.1	(4) 2,313,755	- 428,065	-15.6	
Personal Services	(4) 108,305	(4) 95,027	- 13,278	-12.3	(4) 96,120	- 12,185	-11.3	
Other Retail	(4) 1,758,765 ³	(4) 1,603,812	- 154,953	- 8.8	(4) 1,719,385	- 39,380	- 2.2	
TOTALS	(31) 13,464,238	(31) 12,155,335	-1,308,903	- 9.7	(30) 12,413,543	-1,050,695	- 7.8	

¹Numbers in parenthesis represent the number of firms in operation each year.

²1960 was used to represent base period for one firm beginning operation in 1959.

³1960 was used to represent base period for two firms beginning operation in 1959.

cellaneous retail groups increased sufficiently in the "after" period to more than offset the losses experienced by the other four groups of businesses along the route. As a consequence, the net change was an increase in over-all sales, even though three business types showed sharp declines.

Businessmen along the route feel that the new facility has increased the speed and flow of traffic, thereby making it more difficult for prospective customers to execute shopping turns. This problem is particularly acute during the rush hours, when traffic flow is heaviest. Since sales volumes are closely related to customer trips, the discouraging of turns affects business volume.

Of the three median studies, this area had the largest reduction in shopping U-turns in relation to total traffic volume along the route. Traffic along the route increased 14 percent between the hours of 7 a.m. to 7 p.m. after the completion of the new street, while the number of shopping turns decreased by 41 percent. There was a decrease in the number of both right and left shopping turns into businesses operating under median conditions.

As in Baytown and Pleasanton, the construction of the new street has improved the general appearance of the area and has created a better atmosphere for commercial development along the route.

Summary of Traffic Analysis

Traffic studies were conducted to investigate the character of traffic operation and to evaluate the level of service that existed in the study section during the "before" and "after" study periods.

Traffic volume data assembled at four different locations in the study section and on all cross streets showed considerable stability in volume conditions. The fact that there were essentially no changes in traffic volumes was believed to be due to the diversion of some of the through traffic from Loop 13. During the "before" study period, through traffic entering the San Antonio area from the north and east used Loop 13 as a bypass around the city. In the "after" study period, a section of IH 35 through San Antonio was opened to traffic, making a more desirable and direct route for much of the through traffic that had been using Loop 13.

Analyses of accidents occurring during the one-year periods immediately preceding and following construction of the new facility showed a 69% reduction in total accidents and a corresponding reduction in personal injury and accident costs. In the analysis of accidents by type, it was noted that significant decreases occurred in all types except the fixed object accident. There was a slight increase in this type. A substantial reduc-

tion in rear-end type accidents is attributable to the provision of added left turn lanes to remove slowing or waiting traffic from the through lanes. The reduction in head-on collisions from three to zero is directly attributable to the addition of the median. Decreases in sideswipe and right-angle type collisions, on the other hand, are due primarily to improvement of the facility rather than specifically to the introduction of a median.

Studies were conducted to investigate the extent to which improper maneuvers were occurring during the "before" and "after" study periods. These studies indicated that very few maneuvers on the facility could actually be classified as irregular. In comparison to the other two study areas, the greatest number of irregular maneuvers was observed in Pleasanton, the smallest town; however, a substantial but smaller number of irregular maneuvers were observed in Baytown, the intermediate sized city. Corresponding, traffic volumes were lower in Pleasanton (approximately 4,000 vpd) and Baytown (approximately 10,000 vpd) than in San Antonio (approximately 20,000 vpd).

Travel time studies were conducted to obtain a measure of the level of service provided by the facility during the "before" and "after" study periods. These investigations, which were conducted by the "average car method," showed considerable improvement in travel time and delay in the study section. Only in one control section was there a negative effect where travel time actually increased. This increase in travel time was partially attributable to signalization. The improvement in travel time therefore, cannot be attributed wholly to the introduction of the median. Providing added left-turn lanes played a major part in increasing the capacity of the facility and thus decreasing the congestion which caused delays and slower speeds during the "before" period.