PRELIMINARY STUDY OF THE ECONOMIC IMPACT OF A SECTION OF SAN ANTONIO'S LOOP 13 EXPRESSWAY

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Thanks are due also to a large number of other persons and groups who contributed to the study, including the businessmen and residents who provided information for the study.

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DEFINITION OF TERMS USED IN THIS REPORT

Some of the terms used in this report may not be completely self-explanatory. These are defined below:

Loop, Loop 13, Loop route - Refers to San Antonio's Loop 13, presently being constructed to expressway standards.

Old Road - Refers to that part of the Loop route that existed as Zercher Road and Northeast Military Drive prior to the construction program on Loop 13. It is the Loop route from U. S. 81 North to the east boundary of the City of Castle Hills. These roads have been or will be expanded to full expressway standards as a part of Loop 13.

New Road - Refers to that part of the Loop route extending from Northeast Military highway at the east boundary of the City of Castle Hills to U. S. 90 West. This entire section is a new highway, since no road existed along this route prior to Loop 13 expressway.

Study Area - The area selected for study was the Loop route beginning at the intersection of Loop 13 and U. S. 81 North and continuing westward to the intersection of Loop 13 and U. S. 90 West. The area studied was a band of properties one-half mile wide on either side of the right of way.

"Before Loop" - The period from January 1, 1950, through December 31, 1954. Data shown for this five-year period represent the situation immediately prior to the public announcement of and the beginning of construction of the expressway known as "new Loop 13."

"During Construction" - The period from January 1, 1955, through December 31, 1958. Data shown for this four-year period represent the situation during this part of the construction period. (Construction of the Loop began during the Spring of 1955 and it is only partially complete to date.)

Abutting Property or Loop Frontage - Property that touches the Loop 13 right of way.

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PART I — INTRODUCTION AND SUMMARY

A comprehensive study of the economic impact of one of San Antonio's Expressways was made in 1958 by the Texas Transportation Institute (Bulletin No. 11, "Economic Impacts of Expressways in San Antonio," William G. Adkins and Alton W. Tieken). This study dealt with the economic impact of sections of expressway routes located in the central part of the city.

To supplement that study, a study was undertaken to measure the economic impact of a section of San Antonio's Loop 13, a perimeter route that circles the city at an average distance of about eight miles from the downtown area. At the time of the study (in 1959), Loop 13 was in various stages of construction, but the section studied was open to traffic throughout its length from U. S. 81 North to U. S. 90 West. At some locations, traffic was carried on frontage roads whereas practically no construction had been started on the "old road" section.

Objectives of the Study

The original purposes of the Loop 13 study were (a) to ascertain changes in land values and in land use as a result of the Loop, (b) to determine the attitudes of residents and businessmen relative to the advantages and disadvantages of a Loop expressway, and (c) to determine the travel characteristics of those persons who reside in the vicinity of the Loop.

When the detailed research work was undertaken, it was soon learned that the guiding objectives could be only partially accomplished in that: (1) the expressway was still under construction in a part of the area selected for study, (2) all of the right of way had not been obtained for part of the route, and (3) only a part of the highway in the study area had been completed to full expressway standards. Difficulty was encountered in finding areas sufficiently comparable to the study area to serve as "control areas." Also, since the Loop was not yet completed, current data could not be interpreted as representing the "after Loop" period. Thus it was felt that the study was primarily a preliminary or "before" study, and that the lack of control areas would not be a serious omission at this stage. Control areas obviously will be needed in follow-up studies in attempts to isolate the effects of Loop 13.

In the reappraisal of the objectives of the study, it was decided that the best alternative would be a descriptive economic study of the selected section of Loop 13. The study would include an analysis of land prices and land use during a period of several years (1950-1954) prior to the start of construction of Loop 13, and for a four-year period (1955-1958) during which portions of Loop 13 within the study area were under construction. This analysis would allow the determination of any truly spectacular change in land prices and land use between these two periods. Some explanation of land prices and land use and possible hints as to future trends would be sought in a survey of the opinions and attitudes of residents and businessmen regarding Loop 13.

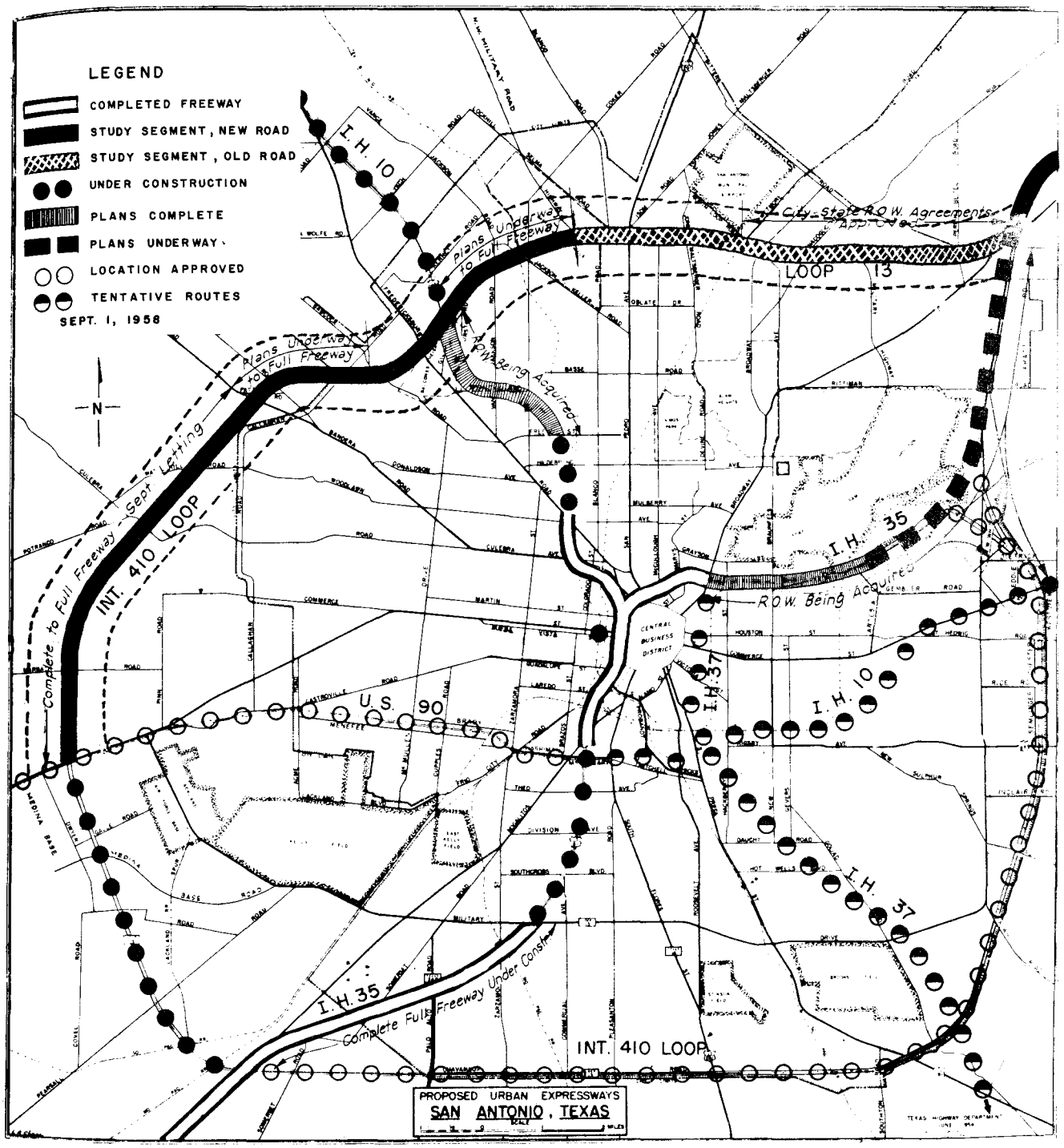
This preliminary report gives some indication as to what was happening in 1959 in area adjacent to the north portion of Loop 13 relative to land use, price changes, and people's attitudes. Should this particular study be continued several years after the Loop has been completed to full freeway standards, the data presented would provide a basis for making valid "before Loop 13", "during construction of Loop 13", and "after Loop 13" comparisons.

History of Loop 13

The dream of a "Loop" to encircle San Antonio is so old that the identity of the original advocator is lost. The early beginnings of a loop were started, however, with the construction of Military Drive to connect the many military installations located at San Antonio between 1914 and 1946. The resulting strategic traffic facility connected Fort Sam Houston and Camp Bullis, which are located northeast and northwest, respectively, from downtown San Antonio. A similar Military Drive connected Brooks Air Force Base with the Kelly-Lackland Air Force Base Area which are located southeast and southwest, respectively, in relation to the downtown area.

The concept of Loop 13 became a partial reality in that provisions were eventually made whereby traffic could move from U. S. 281 (San Pedro Avenue), over Northeast Military Drive to the vicinity of U. S. 81 North, and southeast bordering Fort Sam Houston to the east, and over W. W. White Road to Brooks Air Force Base on the southeast. The Loop then coincided with the Military Drive to connect Brooks Air Force Base with the Kelly-Lackland Air Force Base Area to the southwest and with U. S. 90 West. The Loop was incomplete in that there was a gap of almost 14 miles from Northeast Military Drive, near U. S. 281 southwestward to U. S. 90.

The prospects of available matching funds from the System of Interstate and Defense Highways stimulated the concept of a "new" Loop 13. The initial stages of construction were begun in 1955 to close the gap between U. S. 90 West and U. S. 281. The new Loop 13 is to coincide with parts of Northeast Military Drive, but its perimeter has been extended slightly beyond the original loop route in the east sector. Also there is considerable



OUTLINE MAP SHOWING SAN ANTONIO'S
EXPRESSWAY SYSTEM IN VARIOUS STAGES, 1958

Study Area Indicated by Dashes

extension beyond the earlier Loop on the south and southwest route to U. S. 90. With all route locations approved, and construction underway, a full loop around San Antonio was assured and located by early 1958. Most of the section which was studied was finally approved as a portion of IH 410. The map on the following page shows the Loop route.

The Loop 13 Study Area

The study involves the north 20-mile section of Loop 13 from U. S. 81 N westward to U. S. 90 W. The expressway route in the section coincides with Zercher Road and the old Northeast Military Drive from U. S. 81 N to the east boundary of the City of Castle Hills. This segment, about 6 miles long, is designated as "old road". The westward extension of the route to Highway 90, a distance of about 14 miles, is designated as "new road".

A band of properties approximately one-half mile in width on each side of the expressway route for the 20-mile distance was selected as the study area.

The first construction on the Loop 13 project was begun in the study area in August, 1955, at U. S. 90 W and extended northward to Culebra Road, a distance of 4.11 miles. This initial construction was followed by five additional stages of construction as follows: Culebra Road to Bandera Road, 2.8 miles; Vance-Jackson Road to San Pedro Avenue, 2.08 miles; Fredricksburg Road to Vance-Jackson Road, 1.7 miles; Bandera Road to Fredricksburg Road, 3.25 miles and San Pedro Avenue to Skyway Boulevard, 1.73 miles. These stages were completed by July, 1958.

The total construction amounted to 15.67 miles during the time interval, with only a portion being complete with full frontage roads and throughways. Fill-in projects to bring the entire construction up to complete expressway (freeway) standards were underway at the time of the survey. Additional right of way was being acquired along Zercher Road and the Northeast Military Highway for the route from Bullit Street east to U. S. 81. The section of Loop 13 from Highway 81 N to Highway 90 W was opened to traffic as construction progressed.

Research Procedures and Techniques

Sales prices were used to measure land values since they are believed to be the most simple and reliable indicator developed to date. There are, however, limitations in the use of sales prices that should be mentioned; namely, (1) difficulty in determining whether or not a particular transaction

is a bona fide sale, (2) problems of determining the actual price paid for the property, and (3) difficulty in determining the precise characteristics of properties which sell, including location.

It is recognized that land price changes reflect the influence of many factors other than road improvements. Inflation, direction of city growth, lateral roads, and subdivision development are among such factors. No attempt was made in this study to isolate or analyze individually the various factors in an attempt to determine the respective impact of each.

Real estate sales which occurred in the study area and location and descriptive data were determined with the help and cooperation of two title companies in San Antonio, the County Clerk's office of Bexar County and the City Tax office. Land price data were verified by inspecting real estate deeds filed in the records of Bexar County.

Virtually all real estate deeds expressed the price paid for property as "Ten dollars and other valuable considerations." In view of this, Federal Internal Revenue Stamps affixed to the instrument and, when applicable, the amount of assumed indebtedness, were used as the basis for determining the price of the particular property. Inasmuch as 55 cents in stamps is required for each $500, or fraction thereof of value exchanged, this price-determining method yields prices in round figures of $500. This tends to overstate the actual price paid; and percentage-wise, the overstatement of price is greater for low-priced than for higher-priced properties, but the bias had a very small effect on results in the Loop 13 study.

An analysis was made of 723 land sales that occurred in the study area during the 1950-58 period. The sales involved both acreages and unimproved and improved lots in subdivisions located within a one-half mile band on each side of the expressway route.

Sales data for the period from January 1, 1950, through December 31, 1954, were grouped and considered as sales for the "before Loop" period. The second grouping of data was for sales occurring during the period from January 1, 1955, through December 31, 1958. This latter period is referred to in the report as the "construction" period.

The January 1, 1955, date was selected as the dividing point between the two time periods because it was in late 1954 and early 1955 that the Loop 13 route was determined, and information on the route location became public knowledge. These two time periods provide the basis for the comparisons made in this report.

All sales data were converted to a per-acre basis for acreage sales and to a per-square-foot basis for lot sales. Simple averages, weighted averages, and average deviations were applied in analyzing the data. All of the 159 useable acreage sales that occurred during the two periods were analyzed and tabulated. An analysis was also made of 564 sales of improved and unimproved lots. All of these were located in the Castle Heights, Castle Hills, Ranchland Acres, and Country Gentlemen Estates subdivisions. The first three are in the City of Castle Hills, and Country Gentlemen Estates is in the City of Balcones Heights. The analysis of lot sales was confined to these four areas because they constituted the principal subdivisions platted prior to 1952 in the study area.

In the phase of the study dealing with the opinions of families living in the area, information was obtained by personal interview. More details on the method of this work are given in the section which presents the findings. Interviews made in the City of San Antonio were confined to the more recently developed subdivisions--Green Hill Village, Dellview, and Hillcrest.

It was desired to compare the opinions of those persons living on properties that abutted the Loop with those held by persons living a few blocks from the Loop. However, there were only a few residents whose properties abutted the Loop. Interviews were obtained with 34 families which could be contacted; also, interviews were obtained with 32 families living in comparable homes within two to four blocks of the Loop.

Since the right of way had not been obtained along a part of the Loop route, it was felt that interviews with owners of businesses whose properties were in the negotiation stage, might adversely affect such negotiations. Therefore, business interviews were confined to the "new road" segment of the Loop, the area where rights of way had been secured. A considerable amount of information was obtained in the 21 business interviews, but only that part pertaining to opinions regarding the Loop is included in this report. Other information was considered to be incomplete or premature. Business establishments were enumerated and classified according to the U. S. Department of Commerce's Standard Industrial Classification.

Land use in 1959 was determined primarily by a rather detailed inspection of the area. Several aerial photographs made in 1952, 1955, and 1957 were examined to determine earlier land-use patterns. The Planning Department of the City of San Antonio made available its map of the area showing the development along the route. These several sources of information provided the basis for conclusions as to present and potential changes in land use.

Summary of Findings

The major findings of the study are as follows:

1. It was apparent at the time of the study that the relative location of the land would be materially changed upon the completion of Loop 13. Some very excellent industrial, commercial, and residential sites would be created. However, during the construction period, little indication of the road's economic impact was discernible in factual data.

2. Prices of undeveloped acreages along the "old road" increased 65 percent between the two periods (1950-54 and 1955-58). This type of land along the new road location increased 42 percent between the periods. The greater percentage increase in the older area may be attributed to developments such as San Antonio's International Airport and the attraction of important lateral streets. This is an example of the mixed pattern of the findings.

3. Between the two time periods, sales prices of non-abutting undeveloped acreage along the "old road" segment increased 101 percent, while the sales prices of abutting acreage increased by 43 percent.

4. No road existed along the route of the "new road" segment prior to the construction of the Loop. The sales prices of non-abutting acreage in this area increased 46 percent between the two periods under study, as compared with the 101 percent increase for non-abutting acreage along the "old road," during the same time period. This is partially due to smoother terrain and better existing streets along the "old road."

5. Unimproved and improved residential lots increased in sale price by about the same percentage between the two time periods. Based on prices per square foot of land, vacant lots increased by 36 percent in value and improved lots increased by 35 percent.

6. Three of the four subdivisions studied showed fairly similar sales prices, while in the fourth, the general sales price level of both unimproved and improved lots was about twice that of the other three. The lower-priced vacant lots increased in sales price more than did the higher-priced vacant lots. On the other hand, the higher-priced lots with improvements increased more in price than did improved lower-priced lots.

7. As a group, the residents interviewed had a favorable attitude toward Loop 13. Residents whose property abutted a frontage road had a less favorable attitude than those who lived a few blocks from the facility. Construction dust and noise were irritating to those who resided adjacent to the Loop. There was a definite indication that when such temporary annoyances have subsided, this group will have a more favorable attitude toward the Loop.

8. The principal favorable comments concerned the accessibility to other parts of the City provided by the Loop. Unfavorable remarks which could be interpreted as permanent feelings concerned high-speed traffic on the Loop and the resulting hazard to children.

9. About one-third of the residents felt the expressway had caused or would cause the values of their homes to increase. About one-third thought the expressway had not and would not affect the values of their properties. The remainder did not know whether the Loop had affected or would affect property values.

10. Owners of businesses located in the study area generally had favorable attitudes toward the Loop. Since there was very little business development on the "new road" segment, most businesses studied were located a few blocks from the loop on cross streets. The limited access feature of the expressway was not a major business factor in the opinions of the businessmen interviewed. (Businessmen along the "old road" were not interviewed as some Loop right of way was yet to be acquired in this area.)

11. The number of residences and apartments in the "old road" segment increased ten percent from 1950 to 1955, and 16 percent from 1950 through 1958. Fifty-five percent of the abutting land in the segment was undeveloped in 1958.

12. The largest increase in number of residences occurred along a small part of the "new road" segment. In this area, the number of residences increased 225 percent from 1950 to 1955, and 500 percent from 1950 through 1958. Approximately 19 percent of the abutting land along the "new road" segment was improved in 1958.

13. Fifty-six of the 81 commercial and industrial establishments in the study area were located in the "old road" segment. These were predominantly retail trade and service establishments.

14. Areas which have the greatest potential for residential and commercial development lie near certain intersections with the Loop, as follows:

Interchanges with U. S. 87, U. S. 281, U. S. 81, and Bandera Road. The San Antonio International Airport Area and the area north of the Medina-Lackland Air Force Bases are likewise likely to attract more intensive land uses.

PART II

CHANGES IN REAL PROPERTY VALUES MEASURED IN TERMS OF REAL ESTATE SALES PRICES 1950-54 VS. 1955-58

Sales of undeveloped acreages and lot sales were analyzed separately because obviously two very different kinds of land are represented. Acreages generally have not had large sums of money invested in them in the form of capital improvements. Subdivisions, on the other hand, have experienced the addition of streets, utilities, and possibly other improvements of considerable value.

Insofar as could be determined, only bona fide sales were considered. Many sales or transfer instruments recorded in deed records were not included. In some cases no revenue stamps were affixed to the deed before it was filed. In others, information was incomplete or title passed to a member of the family or to a corporation or company owned by the seller. All such sales were omitted from the study.

Changes in Value of Acreages

A total of 159 bona fide acreage sales occurred in the study area during the 1950-58 period. Half the sales involved land within a half-mile on either side of the "new road" route and half in an area of the same width along the "old road" route. Slightly less than two-thirds of all acreage sales were transacted during the "before Loop" period. (See Table 1).

Table 1

NUMBER OF ACREAGE SALES ANALYZED

	Number of Sales Analyzed	
	Along Old Road	Along New Road
Sales occurred during:		
Before Loop period (1950 thru 1954)	49	49
Construction period (1955 thru 1958)	30	31
Totals	79	80

Acreage Price Changes Along "Old Road" and "New Road" — Along both the old and new segments of the expressway route, sizeable increases in per-acre price for acreage within the half-mile study band took place between the "before Loop" period (1950-1954) and the "construction" period (1955-1958). Along the "old road" the increase was 65 percent between the two periods, while along the "new road" the acreage value showed an increase of 42 percent (Table 2).

A total of 49 acreage sales occurred along the "old road" during the "before Loop" period. The average acreage transferred in these sales was approximately 33 acres; the price per acre ranged from a low of $400 to a high of $5000, with a weighted average of $1176 per acre. Thirty (30) sales occurred in this part of the study area during the 1955-1958 construction period. Tracts which were sold averaged approximately 30 acres. The price per acre ranged from $932 to $5000, with a weighted average of $1937, an increase of 65 percent over the first-period average.

Similarly, along the "new road," forty-nine (49) acreage sales that occurred during the "before Loop" period were studied. The average sale was of approximately 31 acres; the price per acre ranged from a low of $215 to a high of $3653, with a weighted average of $655 per acre. There were thirty-one (31) sales in the "new road" area during the "construction" period. The average sale involved approximately 43 acres. Price per acre ranged from $200 to $2187, with a weighted average of $927 per acre. The average price during the latter period was 42 percent larger than the "before Loop" price.

The greater increase along the old road segment of the Loop is probably due to the higher degree of development in that area. In addition to the greater number of streets already existing in the older area, the airport and several other commercial establishments were important stimuli to quicken land use and establish higher land values.

Acreage Price Changes of Abutting and Non-abutting Properties — Information was obtained as to the location of each piece of property sold in its relation to Loop 13. Sales data for properties along the "old road" area reveal that acreage property along roads or streets other than the Loop right of way showed a higher percentage increase in value between the two time periods than did similar property abutting the Loop (Table 3). A similar comparison for prices along the "new road" was not obtained.

There is more commercial and residential development a few blocks from the Loop than on abutting properties. This, coupled with important lateral roads, explains to some extent the greater increase in the price of non-abutting acreages.

Table 2

SUMMARY DATA ON ACREAGE SALES IN THE
LOOP 13 STUDY AREA

Comparison of Data for "Before Loop" and "Construction" Periods
Along Both the "Old Road" and "New Road"

	Old Road	New Road
Before Period (1950-54)		
Number of sales studied	49 sales	49 sales
Average number of acres per sale	33 acres	31 acres
Lowest price per acre	$ 400	$ 125
Highest price per acre	$ 5000	$ 3653
Average price per acre	$ 1176	$ 655
Construction Period (1955-58)		
Number of sales studied	30 sales	31 sales
Average number of acres per sale	30 acres	43 acres
Lowest price per acre	$ 932	$ 200
Highest price per acre	$ 5000	$ 2187
Average price per acre	$ 1937	$ 927
Percentage Increase In		
Price per acre between before and construction period	65% increase	42% increase

PRICE PER ACRE FOR ACREAGE IN SAN ANTONIO'S LOOP 13 STUDY AREA

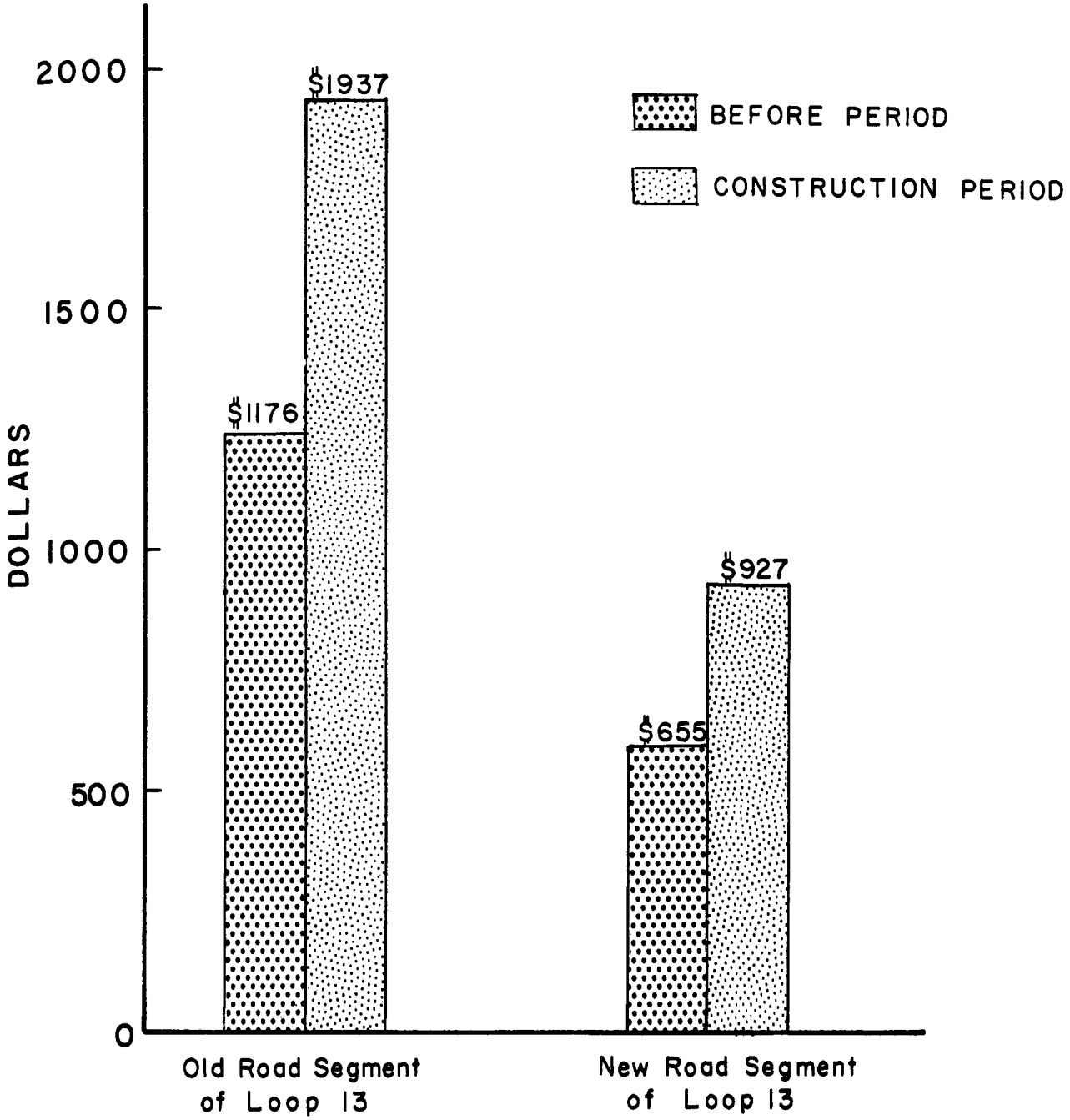


Table 3

ANALYSIS OF ACREAGE SALES ALONG "OLD ROAD"

Land With Loop Frontage Vs. Land Without Loop Frontage

	Loop Frontage	Without Loop Frontage
Before Period (1950-54)		
Number of sales studied	19 sales	30 sales
Average number of acres per sale	46 acres	25 acres
Lowest price per acre	$ 657	$ 400
Highest price per acre	$ 4200	$ 5000
Average price per acre	$ 1224	$ 1120
Construction Period (1955-58)		
Number of sales studied	18 sales	12 sales
Average number of acres per sale	32 acres	28 acres
Lowest price per acre	$ 932	$ 1208
Highest price per acre	$ 5000	$ 5000
Average price per acre	$ 1756	$ 2251
Percentage Increase In		
Price per acre between before and construction periods	43% increase	101% increase

There may have been some hesitancy to buy land along the old road, in view of the fact that at least a part of such land would be acquired for right of way. Another possibility is that selectivity resulted in the purchase of better-than-average lots away from Loop 13 and poorer-than-average abutting acreages.

Nineteen (19) sales of property abutting the "old road" which occurred during the "before Loop" period were analyzed. The average size of the tracts which sold was about 46 acres. The price per acre ranged from a low of $657 to a high of $4200, with an area-weighted average of $1224 per acre. Eighteen (18) sales of acreages with Loop frontage which occurred in the "during construction" period were studied. The average size of the tracts was about 32 acres. The price per acre ranged from a low of $932 to a high of $5000, with a weighted average of $1756 per acre. Thus, between the "before Loop" and "construction" periods, acreage that abutted the "old road" portion of the Loop rose in price by about 43 percent.

Similarly, an analysis was made for 30 acreage sales that occurred in the "before Loop" period in the area of the "old road." The properties did not have Loop frontage. These tracts were of an average size of about 25 acres. The range in price per acre was from a low of $400 to a high of $5000. The weighted average was $1120 per acre.

The twelve (12) sales of non-abutting property which occurred in the same locality during the "construction" period averaged about 28 acres each and ranged in price from a low of $1208 per acre to a high of $5000 per acre; the weighted average price per acre was $2251. This relatively small number of acreage sales indicated non-abutting acreages along the "old road" experienced an average increase of 101 percent between the two time periods, compared with a 43 percent increase for abutting property.

A comparison of the prices paid for acreage within the study area in the "new road" vicinity indicates that acreage prices increased an average of 42 percent between the "before Loop" and the "construction" periods. Since there were no Loop frontage properties before the Loop right of way was purchased, only limited comparisons were made. These are shown in Table 4. Table 5 summarizes the price data on acreages by time periods and by location.

Table 4

ANALYSIS OF ACREAGE SALES ALONG "NEW ROAD"

Land With Loop Frontage Vs. Land Without Loop Frontage

	Loop Frontage	Without Loop Frontage
Before Period (1950-54)		
Number of sales studied	-0-	49 sales
Average number of acres per sale	—	31 acres
Lowest price per acre	—	$ 125
Highest price per acre	—	$ 3653
Average price per acre	—	$ 655
Construction Period (1955-58)		
Number of sales studied	6 sales	25 sales
Average number of acres per sale	35 acres	45 acres
Lowest price per acre	$ 200	$ 335
Highest price per acre	$ 1398	$ 2187
Average price per acre	$ 758	$ 957
Percentage Increase In		
Price per acre between before and construction periods	—	46% increase

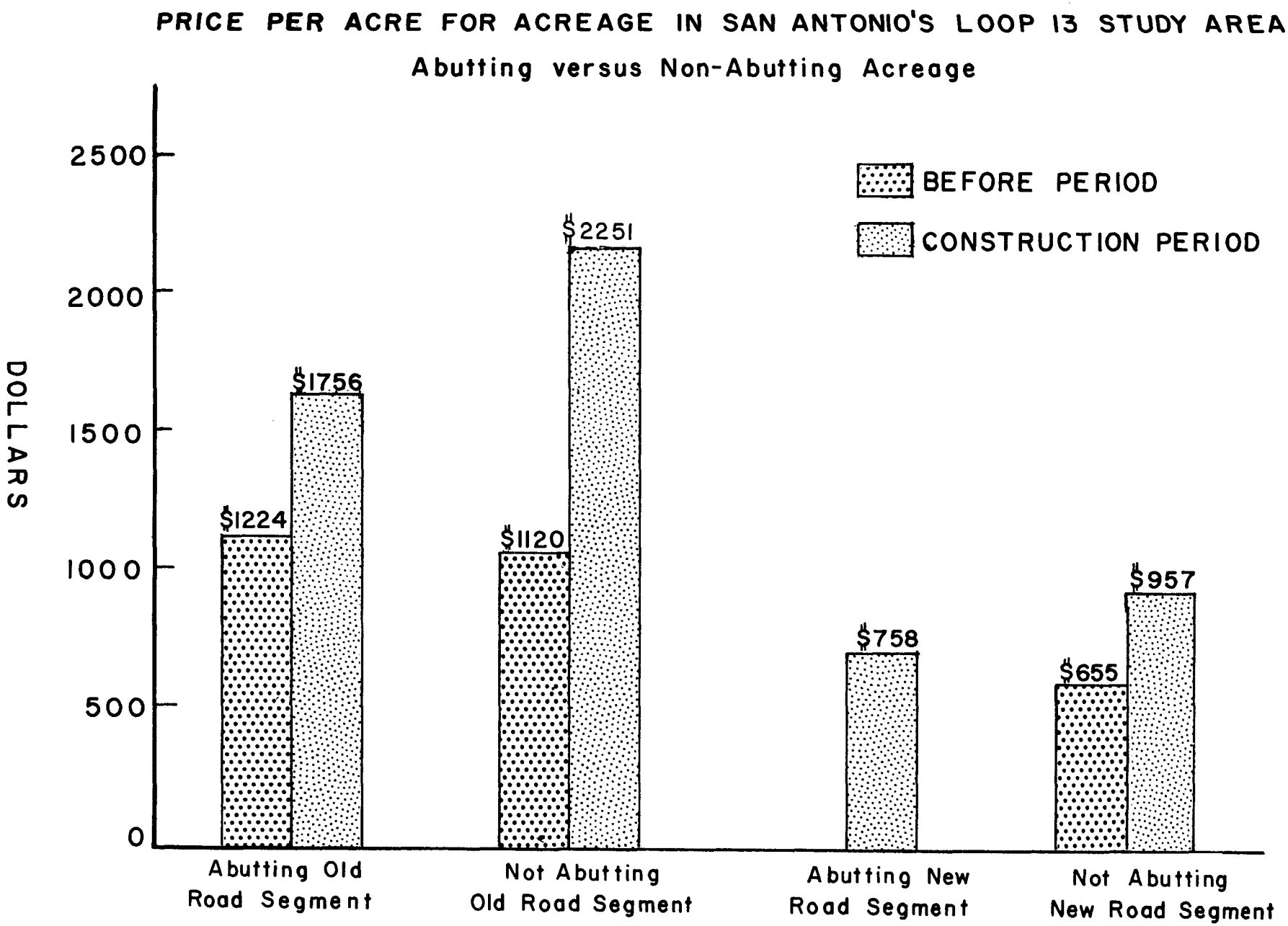

PRICE PER ACRE FOR ACREAGE IN SAN ANTONIO'S LOOP 13 STUDY AREA
Abutting versus Non-Abutting Acreage
DOLLARS
2500
2000
1500
1000
500
0
BEFORE PERIOD
CONSTRUCTION PERIOD
$1224
$1756
$1120
$2251
$758
$655
$957
Abutting Old Road Segment
Not Abutting Old Road Segment
Abutting New Road Segment
Not Abutting New Road Segment

Table 5

SUMMARY

PERCENTAGE INCREASE IN PRICE PER ACRE
OF TRACTS SOLD IN STUDY AREA

	Average Price Paid Per Acre		
	Before Loop 1950-54	Construction 1955-58	Percentage Increase
All sales along old road	$ 1176	$ 1937	65%
Sales of abutting property along old road	1224	1756	43%
Sales of property without loop frontage on old road	1120	2251	101%
All sales along new road	665	927	42%
Sales of abutting property along new road	0	758	0%
Sales of property without loop frontage on new road	655	957	46%

Note: In studying the price data and percentage increases, it should be remembered that the data represent prices paid for property sold during the specific time periods as indicated by Federal Internal Revenue Stamps affixed to deeds prior to being filed at the courthouse.

Changes in Value of Residential Land

Original planning called for the analysis of all residential land sales that occurred from January 1, 1950, through December 31, 1958, within the one-half mile study area band on each side of the Loop right of way. However, so that the data would provide valid "before" and "during construction" price information, it was necessary to study only those subdivisions that existed prior to January 1, 1950. There were some 26 platted subdivisions within the over-all study area in 1958, but only three of any research importance existed prior to 1950. In order to obtain enough sales to permit comparisons, residential land sales in these subdivisions and one other which was platted in 1952 were included. These four subdivisions were: (a) Castle Hills, Unit 1-A, (b) Castle Heights, and (c) Ranchland

Acres--all of which are in the suburban city of Castle Hills--and (d) Country Gentlemen Estates, which is in the suburban city of Balcones Heights. The subdivisions still were not completely developed when studied and thus permitted a study of both unimproved and improved residential lots.

The areas from which residential lot sales were taken are located in the "new road" part of the study area. Residential land sales along the "old road" were not sufficient in number to allow comparisons to be made.

A total of 563 sales of residential lots was studied. Table 6 shows the number of sales of lots with and without improvements for each of the time periods and for each subdivision.

Table 6

NUMBER OF RESIDENTIAL LAND SALES ANALYZED

	Sales Occurred			
	Before Loop 1950-54		Construction Loop 1955-58	
Unimproved Lots in				
Castle Hills Unit 1-A	43		17	
Castle Heights	185		21	
Ranchland Acres	7		23	
Country Gentlemen Estates	68		17	
Total Unimproved Lot Sales Studied		303		78
Improved Lots in				
Castle Hills Unit 1-A	15		25	
Castle Heights	63		41	
Ranchland Acres	1		14	
Country Gentlemen Estates	14		9	
Total Improved Lot Sales Studied		93		89
Total Residential Land Sales Studied		396		167

As was the case in the analysis of acreage sales, the price paid for the subdivision property was usually recorded in the deed as "Ten dollars and other valuable considerations." Hence, for the purposes of this study, prices were determined by the Federal Internal Revenue Stamps affixed to the deed and, when applicable, the amount of the assumed indebtedness.

Price Changes of Residential Lots -- Unimproved and Improved — There was a sizeable over-all increase in the prices paid for residential lots between the "before Loop" and the "construction" periods. The percentage increase was about the same for unimproved lots and improved lots (with houses). Unimproved lots increased 36 percent on the basis of price per square foot and 24 percent on the basis of the sale as a unit. Improved lots increased 35 percent according to the per-square-foot price comparison and 17 percent for the sale as a unit.

A total of 303 sales of unimproved lots that occurred during the "before Loop" period were analyzed. The average number of square feet per lot was 28,608. The average price per lot was $2539 or $0.0887 per square foot.

Seventy-eight sales of unimproved lots took place during the "construction" period. The average of lots sold in the latter period was smaller, being 25,967 square feet in size, and selling for $3140 or $0.1204 per square foot.

The increase in price of vacant lots in the study area between the two time periods amounted to 35 percent per square foot and 24 percent on a per-lot basis.

There were 93 improved residential lots which sold during the "before Loop" period. The average size of these lots was 28,281 square feet. The average price paid was $21,005 or $0.7427 per square foot.

The study included 89 sales of improved properties which occurred during the "construction" period. The lots averaged 24,502 square feet in size and sold for an average price of $24,583 or $1.0033 per square foot.

The increases between the two periods averaged 35 percent per square foot of land and 17 percent per lot as a unit. This reflects the fact that the average size of lot was smaller in the latter period than in the "before" period.

These data are shown in Table 7.

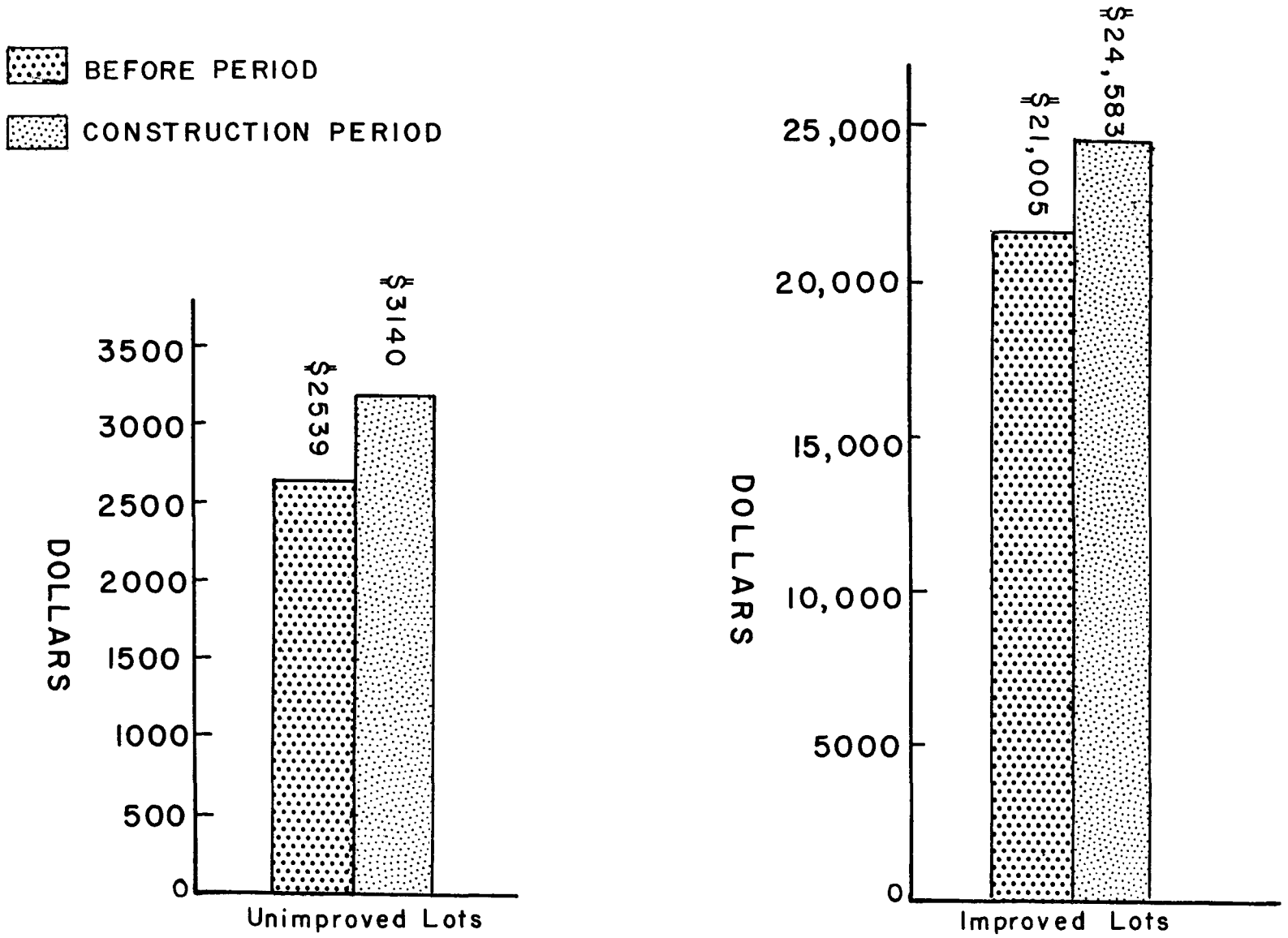
Table 7

ANALYSIS OF RESIDENTIAL LAND SALES

Size and Price Comparisons of Vacant and Improved Residential Lots

	Unimproved Lots	Improved (Houses)
Before Period (1950-54)		
Number of sales studied	303	93
Average number of square feet per lot	28,608	28,281
Average price per square foot	$0.0887	$0.7427
Average price per lot	$ 2539	$21,005
Construction Period (1955-58)		
Number of sales studied	78	89
Average number of square feet per lot	25,927	24,502
Average price per square foot	$0.1209	$1.0033
Average price per sale	$ 3140	$24,583
Percentage Increase on Basis of:		
Square feet of land	36%	35%
Sale as a unit	24%	17%

PRICE PER SQUARE FOOT FOR LOTS IN SAN ANTONIO'S LOOP 13 STUDY AREA



Price Changes of Residential Property by Subdivisions — Castle Heights, Ranchland Acres, and Country Gentlemen Estates were rather comparable areas but differed considerably from Castle Hills Unit 1-A.

An analysis of sales in the two general price range groups show that lower-priced vacant lots (with prices of approximately $2300) experienced a greater increase in price (31%) between the periods than did the higher-priced $4000 range) vacant lots (12%). A reversed pattern was found for improved lots. A 21% increase was shown by improved lots in the $35,000 class, whereas, a 12% increase was experienced by improved lots in the $18,000 class.

The details of this information are shown in Table 8.

Table 8

LAND PRICE COMPARISONS BY GROUPS OF SUBDIVISIONS

Unimproved Lots in	Before Loop Construction Period 1950—54	Construction Period 1955-58	Percentage Increase
Castle Hills Unit 1-A			
Price Per Square Foot	$0.2086	$0.2345	12%
Price Per Lot	$ 4058	$ 4409	9%
Castle Heights, Ranchland Acres & Country Gentlemen Est.			
Price Per Square Foot	$0.0759	$0.0997	31%
Price Per Lot	$ 2288	$ 2787	22%
Improved Lots (Houses) in			
Castle Hills Unit 1-A			
Price Per Square Foot of Land	$1.8380	$2.2240	21%
Price Per Sale	$35,100	$40,290	15%
Castle Heights, Ranchland Acres & Country Gentlemen Est.			
Price Per Square Foot of Land	$0.6088	$0.6834	12%
Price Per Sale	$18,294	$18,448	1%

PART III

OPINIONS AND ATTITUDES OF RESIDENTS REGARDING LOOP 13

A second major objective of the Loop 13 study was to ascertain the opinions and attitudes of residents regarding the Loop.

A questionnaire for recording data obtained by personal interviews was devised and pretested. It was decided that a number of interviews would be made of residents whose properties abutted the Loop's frontage roads. To provide a comparison, a like number of interviews would be made of residents of comparable homes located two to four blocks from the Loop. Due to the small number of residences located on abutting land, only a few residential interviews were obtained.

Abutting residential property occurred in three subdivisions: (a) Green Hill Village, (b) Dellview, and (c) Hillcrest. The homes in Green Hill Village generally were priced from $10,000 to $12,000 and those in the other two subdivisions were in the $13,000 to $16,000 price range.

Table 9 presents information concerning the number of resident interviews, the person in the family interviewed, and the ownership of the residence.

Table 9

INFORMATION CONCERNING RESIDENTS INTERVIEWED

	Abutting Property	Non-abutting Property
Attempted Interviews	38	36
Unable to Obtain Interview	4	4
Total Completed Interviews	34	32
Person with Whom Interview Was Obtained:		
Housewife	27	27
Husband	5	3
Both Housewife and Husband	2	-
Grown Daughter	-	2
Total Completed Interviews	34	32
House is Owner Occupied	32	30
House is Rented	2	2
Total Completed Interviews	34	32

Interviews normally were conducted during daytime working hours, thus accounting for the high percentage of housewives interviewed. When no one could be reached at home during three daytime calls, two attempts were made to obtain the interview between 6:00 p.m. and 8:00 p.m. Interviews at this hour were generally held with the husband. If, after three daytime and two evening calls, no member of the family had been contacted, no further effort was made to secure an interview.

All houses were single-family residences and the price range and extremely high percentage of owner-occupied dwellings reflect middle-class type neighborhoods.

Residents' Opinions of the Loop

The approach employed to ascertain the opinion or attitude regarding Loop 13 involved asking each person interviewed a series of questions designed to encourage voluntary comment on the subject. At a later point in the interview, the person was asked several direct questions concerning specific characteristics of the Loop.

The comments made by residents show that two major factors had a direct influence on each person's opinions. These were: (a) the nearness of the home to the Loop, and (b) whether or not construction was in progress on the road in front of or near the home.

Opinions of Abutting and Non-abutting Property Owners — The attitudes of the residents interviewed were favorable toward Loop 13, in a ratio of about 2 to 1.

Owners of non-abutting property held a more favorable attitude toward Loop 13 than did residents of abutting property. The ratio of favorable to unfavorable attitudes was 20 to 17 among those who lived along the Loop, whereas those who lived two to four blocks from the facility indicated a 32 to 8, or 4 to 1 favorable ratio. Table 10 presents the details of this information.

After the completion of the expressway construction program, homeowners on abutting properties might have a more favorable attitude toward the facility. As indicated in Table 10, the ratio of favorable to unfavorable attitudes of residents of abutting properties may change from the present 1 to 1, to about a 2 to 1 favorable ratio.

It also appears to be significant that eight respondents among residents of abutting property pressed a "wait and see" feeling or neutral attitude toward the Loop (as compared to one among the non-abutting group). Their

Table 10

ATTITUDES OF RESIDENTS TOWARD LOOP 13

Abutting Vs. Non-abutting Properties

Attitude Expressed	Abutting Property	Non-abutting Property
Made only favorable comments about Loop 13	9	24
Made only unfavorable comments about Loop 13	3	--
Made both favorable and unfavorable comments about Loop 13	6	7
Made neutral comments only	6	--
Indicated that basic attitude was favorable but also made unfavorable comments that applied to the construction period	5	1
Indicated that basic attitude was neutral but also made unfavorable comments that applied to the construction period	3	--
Completed Interviews	32*	32
Summary:		
Total who made favorable comments	20	32
Total who made unfavorable comments	17	8
Total who made only neutral comments	6	--

* Satisfactory answers were not obtained from two people.

principal comment, "It doesn't bother me," suggests a possible "negative-neutral" opinion.

Opinions on the Basis of Construction — Varying stages of Loop construction existed at the time the resident interviews were conducted. In Green Hill Village, where 11 abutting residents were interviewed, the initial stage of construction consisting of frontage roads was completed in December, 1957, and work was presently underway on the center roads. In Dellview, where eight interviews were obtained, the initial stage of construction of frontage roads was completed in March, 1957, and work was well-advanced on the center section at the time of the interviews. In Hillcrest, which yielded 12 interviews, full expressway construction was completed in April, 1958.

Table 11 summarizes the residents' attitudes as related to construction work in progress in front of the houses at the time of the interviews.

Specific Comments of Residents About Loop 13

The principal favorable comments on Loop 13 concerned the ease of getting to various places in the city via the Loop. These were expressed as:

"All parts of the city are more accessible;"
"It is easier to drive to work;"
"The air force bases are more accessible;"
"It is easier to drive to schools and churches."

Major criticisms that were expressed concerned the "noise" and "dust" during the construction period. Six other specific comments reflected permanent rather than temporary conditions and related specifically to fast traffic and its danger to children.

The favorable and unfavorable comments are shown in Table 12.

Opinions as to the Effect on the Value and Attractiveness of the Home

Inquiries were made relative to the past or future effects of the expressway on the property value of each respondent. About a third of the interviewees, mostly housewives, stated that they did not know what effect the Loop had had or would have on the value of their properties. Table 13 indicates that almost all the respondents, who thought that some future effects might occur, believed that their property would increase in value.

Table 11

ATTITUDES OF RESIDENTS TOWARD LOOP 13

By Construction Status And By Subdivisions

Attitude Expressed	Green Hill Village		Dellview		Hillcrest	
	Abutting, Under Construction	Non-abutting	Abutting, Under Construction	Non-abutting	Abutting, Construction Completed	Non-abutting
Favorable	2	7	1	4	6	13
Unfavorable	-	-	1	-	-	-
Both favorable and unfavorable	1	3	1	3	3	1
Neutral	4	-	1	-	1	-
Indicated favorable, but unfavorable toward construction	3	1	2	-	-	-
Indicated neutral, but unfavorable toward construction	1	-	2	-	-	-
Total	11	11	8	7	10*	14
Summary:						
Total who made favorable comments	6	11	4	7	9	14
Total who made unfavorable comments	5	4	6	3	3	1
Total who made only neutral comments	4	-	1	-	1	-

* Complete information was not obtained from two people.

Table 12

SPECIFIC COMMENTS OF RESIDENTS ABOUT LOOP 13

	Abutting Residences	Non-abutting Residences
Favorable Comments		
All parts of the city are more accessible	3	10
It is easier to drive to work	8	4
The air force bases are more accessible	1	5
It is easier to drive to schools and churches	6	-
It is easy to drive to shopping centers	4	-
Saves driving time	-	4
Easier to travel north of the city	1	2
Convenient to go around town, not necessary to drive thru downtown	1	2
Easier for my husband (salesman) to get to his customers	1	1
Will relieve traffic congestion on other streets	-	2
"It's progress"	1	1
Reduce mileage	-	1
Total Favorable Comments	26	32
Unfavorable Comments		
Noisy while under construction	7	-
Dusty while under construction	5	1
Causes additional traffic on our street	1	4
Traffic is too fast - dangerous to children	2	1
Don't want to live close to Loop	1	1
Necessary to drive extra miles leaving and returning home because of limited access and one-way frontage roads	2	-
Heavy traffic on frontage roads (in front of house) while under construction	1	-
Traffic lights and school zones (on frontage roads) defeat purpose of expressway	-	1
Total Unfavorable Comments	19	8
Neutral Comments		
"It doesn't bother me"	8	-
"I guess it will be all right"	1	-
Total Neutral Comments	9	-

Table 13

OPINIONS ON THE EFFECTS OF LOOP 13
ON THE VALUE OF HOMES

	Abutting Property	Non-abutting Property
Respondent Stated:		
Loop 13 has had an effect on the value of his property (home):		
Has increased in value	11	11
Has decreased in value	1	-
Loop 13 has had no effect on the value of his property (home)	9	13
Do not know if Loop 13 has had any effect on the value of his property	13	8
Total Interviewed	34	32
Loop 13 will have (in the future) an effect on the value of his property (home):		
Will cause an increase in value	15	18
Will cause a decrease in value	2	1
Loop 13 will have (in the future) no effect on the value of his property (home)	6	6
Do not know if Loop 13 will have (in the future) any effect on the value of this property (home)	11	7
Total Interviewed	34	32

Each person also was questioned as to whether or not Loop 13 had affected the physical attractiveness of his home. With the exception of a few who objected to the dust during the construction period, no one stated that the appearance of his residence had been adversely affected.

Resident Travel Characteristics

Travel data were obtained in 60 of the resident interviews; 29 of these respondents lived on abutting property and 31 lived two to four blocks from the Loop.

There were 121 automobile drivers among the 240 members of the 60 households. The three subdivisions in which these residences are located are adjacent to the "inside" of Loop 13. Consequently, residents in these areas could travel to downtown San Antonio and to many parts of the city without the necessity of crossing or using the Loop. San Pedro and Fredricksburg Roads radiate from the downtown area, and these streets reach into the vicinities of the subdivisions. In addition, the subdivisions are served by West Avenue, Vance-Jackson, Blanco, and Babcock Roads, which lead into heavily-traveled Fredricksburg Road, a major radial thoroughfare.

Interviews were conducted with 70 employed persons in the 60 households. This number included 58 men and 12 women. One-half the respondent workers lived in residences located on abutting properties.

Slightly less than half (47 percent) of the employed persons used a part of Loop 13 enroute to and from work. Among those using the Loop were 20 workers from households on abutting properties and 13 workers from non-abutting properties. In particular, Loop 13 served those workers who were employed at Lackland Air Force Base, which is located to the southwest of the subdivisions. Also the Loop was used to some extent by employees at Kelly Air Force Base, which adjoins the Lackland Base.

Forty percent of the housewives used Loop 13 regularly in travel to downtown San Antonio. Seventeen of these housewives resided on abutting properties, while seven resided on non-abutting properties. Some 40 percent of all housewives made downtown trips once each month, 13 percent visited the area twice each month, and 12 percent made the trip once a week. Five housewives drove downtown only about once a year, and one housewife made the trip twice daily. The consensus of opinion of the housewives was that shopping prices were slightly lower in downtown San Antonio as compared with prices at local shopping centers, but that the lower prices were offset by the inconvenience and cost of parking, loss of time, traffic tension, and distance.

The total number of round trips from all households for all purposes (work, shopping, etc.) on the nearest past weekday was 137. The round trips averaged 2.3 per household, 1.6 per automobile, and 1.1 per driver. The 29 households located on abutting properties had 118 members, 54 drivers, and 41 automobiles. In comparison, the 31 households on non-abutting properties had 122 members, 67 drivers, and 47 automobiles. The number of round trips from the households on the nearest past weekday was 52 (1.8 per family) for residents of abutting properties and 85 (2.7 per family) for residents of non-abutting properties. The difference in number of trips can be partially explained by these facts: the majority of the non-abutting property owners were older, had more children of "driver age", and had purchased their homes an average of four years earlier than had owners of abutting property. The younger couples were more "tied down" by smaller children, and their frequency of trips may have been further affected by the usual economic strain associated with payments involving new house furnishings and higher housing cost.

Additional information pertaining to the expected daily traffic volume at major intersections along the Loop 13 route is given in PART IV -- CHANGES IN LAND USE.

PART IV

OPINIONS AND ATTITUDES OF BUSINESSMEN TOWARD LOOP 13

A third phase of this study was to learn the opinions and attitudes relative to the Loop that were held by approximately 80 managers of businesses located in the study area. At the time of the study, negotiations for right of way were in progress in much of the area from Bullitt Street, near the entrance to the airport, to Highway 81. This segment of Loop 13 consisted only of the two-lane Northeast Military Drive and Zercher Road.

It was felt that conducting interviews with men whose businesses were located on this part of Loop 13 might possibly interfere with the process of right of way acquisition. Therefore, interviews were limited to those businessmen located along the new part of Loop 13, from about San Pedro westward to Highway 90. From among some 25 business establishments located in this segment, 21 interviews were obtained. The businesses were classified as to general type on the basis of the Standard Industrial Classification, as shown in Table 14.

It was felt that the particular location of a business establishment in relation to the Loop might have an effect upon the owner's or manager's attitude toward the Loop. Only four of the establishments at which interviews were obtained, were located on the Loop frontage road. These were two swimming pool contractors, a commercial firm, and a motel. The remaining 17 businesses were located on a crossroad within one-half mile of the Loop. Eight of the 21 businesses existed before the Loop was constructed, and thirteen were established after the Loop was opened to traffic.

Eight of the 13 owners and managers who had established businesses after the Loop was opened to traffic stated that consideration was given to Loop characteristics in the selection of a site. The other five owners stated that the Loop was not a factor in their selection of a location. Each of those who considered the influences of the Loop, stated that he was receiving some of the anticipated benefits although the facility was incomplete.

Each owner or manager was questioned with regard to "advantages" or "disadvantages" of a location on or near the Loop as far as his particular business was concerned. Five of the 21 owners and managers stated that the Loop offered no particular advantages to their businesses. Two of these were at locations on the Loop frontage road.

Sixteen mentioned advantages of a Loop 13 location. The principal advantages mentioned were ease of access to work or town and customers'

access to the store. Only five owners or managers mentioned disadvantages of a location on or near the Loop. The principal comments were:

"Traffic is too fast."
"Potential customers drive by me."
"The limited access and one-way frontage roads hurt my business."

Table 14

GENERAL TYPES OF BUSINESSES INTERVIEWED

Based on Standard Industrial Classification

SIC Number		Number Interviewed
Division A: Agriculture		
0193	Animal Kennel	1
0722	Veterinary Hospital	2
Division C: Contract Construction		
1611	Swimming Pool Contractor	2
Division F: Wholesale and Retail Trade		
5082	Commercial and Industrial Machinery	1
5211	Lumber Yard	1
5331	Variety Store	1
5411	Grocery Store	2
5621	Women's Ready-to-Wear Store	1
5812	Eating Places	1
5813	Drinking Places (Lounge)	1
5984	Ice Dealer	1
5997	Gift Shop	1
Division H: Services		
7013	Motel-Tourist Court	4
7211	Laundry and Cleaner	1
7931	Bowling Alley	1
	Total Interviews	21

An analysis of responses on the basis of frequency or infrequency of customers' visits revealed no significant differences. It should be remembered, however, that 17 of the 21 businesses were located on a cross street within a half-mile of the Loop and that only four businesses were located on Loop frontage. All retail stores were on locations removed from the Loop.

The spokesman of each business was specifically questioned as to his attitude toward the limited access feature of the Loop. Table 15 gives a summary of the responses on the basis of location in relation to the Loop.

The favorable to unfavorable ratio relative to limited access was about 2 to 1. Of those interviewed, approximately 1 out of 5 had a neutral attitude toward the limited access feature of the Loop.

The principal favorable comments did not concern the business establishments, but were general remarks such as: "It is a good idea," and "It is safer." The few unfavorable attitudes were expressed by comments previously noted.

Table 15

SUMMARY OF BUSINESS OWNERS' ATTITUDES
TOWARD LIMITED ACCESS OF LOOP 13

Summary of Comments Toward Limited Access	Total Business	Business Located on Loop	Business Located on Other Street
Made Favorable Comments Only	10	1	9
Made Unfavorable Comments Only	3	-	3
Made Both Favorable and Unfavorable Comments	4	1	3
Made Neutral Comments	4	2	2
	21	4	17

PART V

CHANGES IN LAND USE

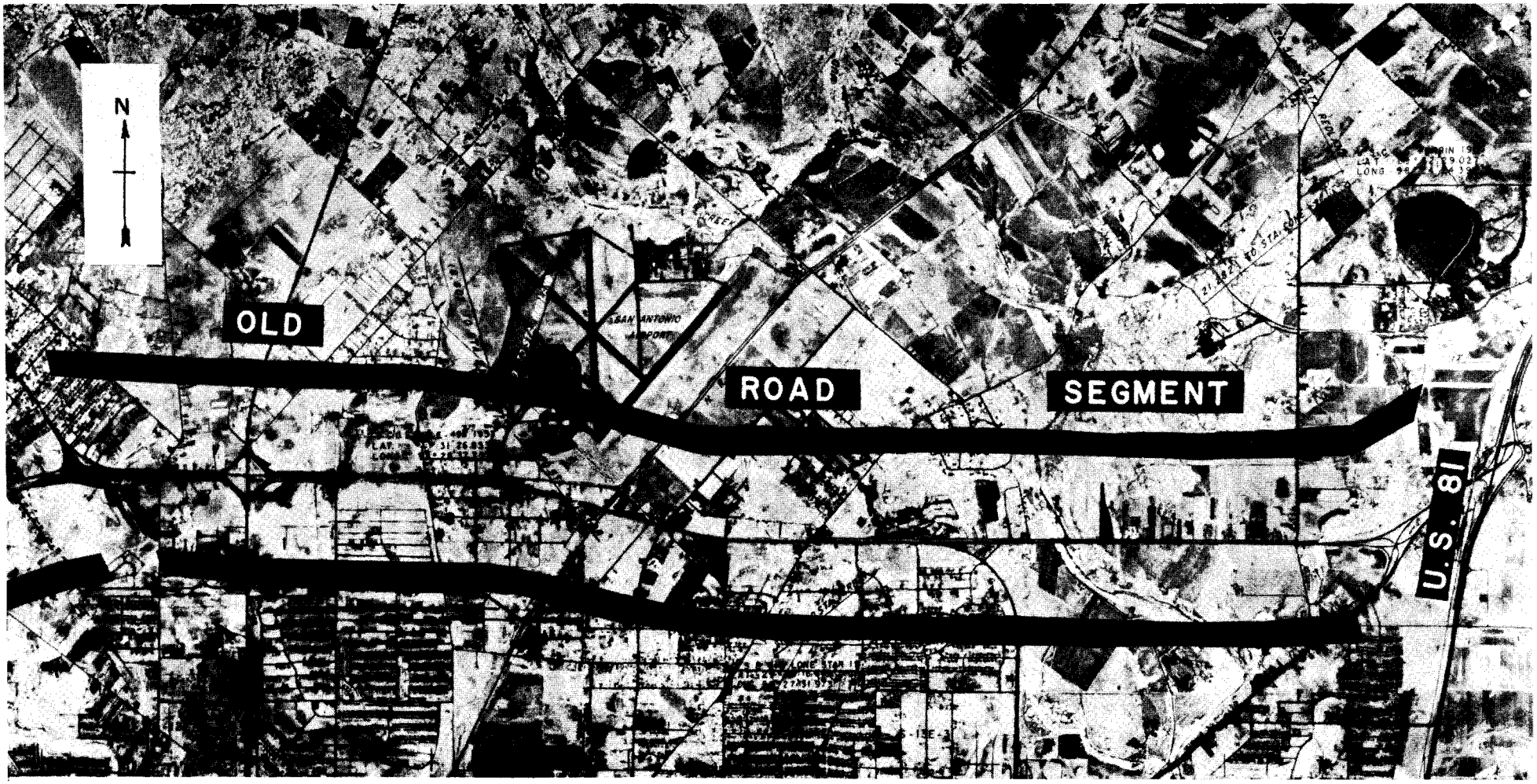
The most immediate purpose of the Loop 13 project is to divert through traffic from the central city, thereby relieving the radial expressways of a portion of their burden. However, the cumulative influences of the project within the vicinity of the 20-mile study area may eventually produce another factor of great importance to San Antonio. The expressway construction opened the door of accessibility to a land area that is critical to the logical directional growth of the city. The study area vicinity, located north of downtown San Antonio, is the only large area available for urban growth that is not obstructed by major man-made physical barriers such as Fort Sam Houston, Brooks Air Force Base, Stinson Field, East Kelly Air Force Base, Kelly Air Force Base, Medina Base, and Lackland Air Force Base—all of which tend to encircle the city in all other directions.

The area north of downtown San Antonio already dominates other areas of the city in the number of middle-and upper-income residences. North has been the logical direction for residential expansion and such a trend has been assured by the convenience of expressway facilities. The land area along and north of the 14-mile "new road" segment of the study area is capable of providing ample room for the major portion of a normal population growth in San Antonio for the next fifteen years, and more than moderate land-use change may be expected in the "old road" segment of the study area which extends to U. S. 81 East.

For the purpose of this study, land uses within the half-mile band on each side of the expressway route were plotted for 1950, 1955, and 1959 to indicate changes involving the following: (1) residences and apartments, (2) commerce and industry, (3) parks and schools, and (4) military installations—colleges, airports, power plants, and other public properties with the exception of parks and schools.

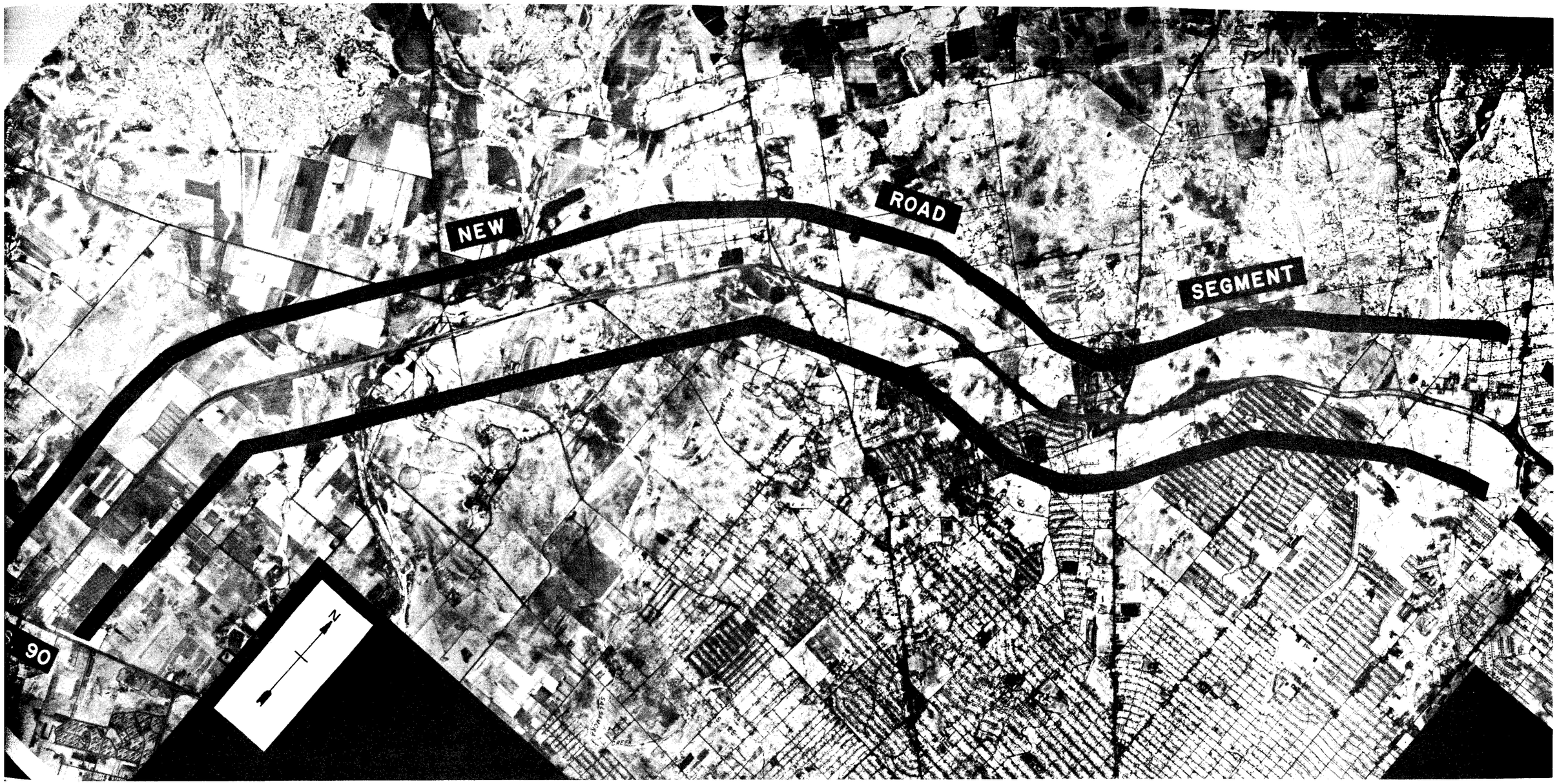
Residences and Apartments

There was comparatively little change from 1950 to 1959 in the number of residences and apartments in the area from U. S. 81 to U. S. 281, the "old road segment." The increase in number of residences and apartments along this portion of the expressway route amounted to approximately 10 percent from 1950 to 1955, and to 16 percent from 1950 through 1959. The "old road" study area contained all or part of nine residential subdivisions, but only Ridgeview and Park Hill Acres subdivisions had demonstrated any



AERIAL PHOTOGRAPH OF OLD ROAD SEGMENT
OF LOOP 13, SAN ANTONIO, 1959

Study area indicated by heavy bands



AERIAL PHOTOGRAPH OF NEW ROAD SEGMENT OF LOOP 13, SAN ANTONIO, 1959

Study area indicated by heavy bands

significant development. Additional residences existed at scattered locations throughout the other subdivisions, but residential development was slow along this six-mile stretch of the expressway route which coincides with Northeast Military Drive for most of the distance. Approximately 55 percent of the abutting land was undeveloped in 1959.

The most extensive increase in the number of residences occurred along the route from U. S. 281 to the intersection of U. S. 90 on the west. It is estimated that the number of residences increased 225 percent from 1950 to 1955, and fivefold from 1950 to early 1959.

Approximately 96 percent of the increase in number of residences occurred along the route from U. S. 281 westward to Bandera Road, which intersects Loop 13 at about half the 14-mile "new road" distance to U. S. 90. The more rapid increase in number of residences in this segment was due primarily to the extension of existing subdivisions to adjoin the expressway at Crest Hills Village and Dellview Subdivisions and at the City of Castle Hills. This expansion appeared to be normal growth rather than a direct influence of Loop 13. Some 17 subdivision plats had been filed at city and county offices for the U. S. 281 to U. S. 90 portion of the study area, but streets had not been developed and in nine of the platted subdivisions no construction had occurred.

Only some 20 residences were scattered along the study area in the seven-mile distance from Bandera Road to Lackland Heights. One of the more newly-developed areas, it was growing rapidly in the vicinity of Lackland Air Force Base, at the U. S. 90 intersection. Most of this seven miles of the expressway is bordered by farmland and a few platted but undeveloped subdivisions.

Approximately 19 percent of the abutting properties on both sides of the expressway supported man-made structures along the 13.94 miles from U. S. 281 to U. S. 90.

Commercial and Industrial

There were 81 commercial and industrial establishments in the study area in the spring of 1959, with wholesale and retail trade comprising 52 percent, services 25 percent, contract construction 10 percent, agricultural industries 6 percent, and manufacturing 6 percent. There also was one gravel deposit being worked. In addition, a large office building on abutting land near the San Antonio International Airport housed the offices of some 75 businesses not classified in the above categories. (These businesses were not surveyed because a part of the property was yet to be acquired for right of way.)

Seventy-seven percent of 81 commercial and industrial establishments were in the retail trade and service categories. Gasoline service stations and restaurants were foremost in the list for retail trade; amusement, aircraft services, and motels were the most common services.

Fifty-six of the businesses were on the old road (Northeast Military Drive) from U. S. 81 to U. S. 281. For the 20-mile expressway route, major clusterings of establishments were found at interchanges with such radial thoroughfares as the Austin Highway, Broadway Avenue, and Fredricksburg Road. There were scattered locations of gasoline service stations, restaurants, and motels along the "old road" and a cluster of retail and service establishments in the immediate vicinity of the International Airport. Only 25 establishments existed in the 14-mile stretch from U. S. 281 to U. S. 90, and most of these were located at the Hillcrest Shopping Center.

The major business establishments constructed within the 1955-1959 period included the Hillcrest Shopping Center, the enlargement of the Petroleum Center (office building) near the airport, and a grocery supermarket near the Fredricksburg Road intersection. Recent land purchases had been made to enlarge the International Airport to accommodate larger jet transport planes.

The total number of establishments in the study area were: 23 in 1950, 41 in 1955, and 81 in early 1959. Here again, businesses in the Petroleum Center are disregarded. Most of the increase resulted from the development of gasoline service stations, motels, restaurants, drive-in theatres, and liquor stores along the expressway route, and clusters of retail trade and service institutions at the Hillcrest Shopping Center and the International Airport.

Among the areas that are most subject to future change in land use for commerce and industry are the San Antonio International Airport area and the area north of U. S. 90 near the Medina-Lackland Air Force Bases. Consideration is given to these two areas under the discussion of the Military Installation land-use category.

Additional areas that hold potentials for commercial and industrial development are in the vicinities of interchanges with U. S. 87, U. S. 281, U. S. 81, and Bandera Road. Each of these intersecting highway facilities enables traffic to flow to downtown San Antonio to the south. The U. S. 87 and Bandera Road interchanges lie in the "new road" segment of the expressway study area.

The U. S. 87 interchange area holds a high potential for land-use change in the unplatted acreage that abuts Loop 13 on the north and lies on both sides of U. S. 87. A similar, but much smaller, area lies on both sides of U. S. 87 and abuts the Loop on the south. The latter area is bordered by large residential subdivisions near the City of Balcones Heights. Since these interchange areas are composed of unimproved properties to a large extent, they are particularly inviting to commercial and perhaps industrial investments.

The growth of retail trade, services, amusement facilities, and some minor light industries in the area would be supported by the large residential areas to the south. Additional future support of growth lies in the Texas State Highway Department's traffic projection of an anticipated 62,000 daily traffic volume at the U. S. 87 interchange by 1975.

The U. S. 281 interchange area also shows considerable potential for commercial development. The land is unplatted at each quarter of the interchange but holds some scattered housing in the northwest quarter. Commercial growth at the intersection would find some support from nearby North Crest, Wood Park, Ridge View, and Castle Hills subdivisions. Again, a strong future growth factor is indicated by the Texas State Highway Department's anticipation of a 53,000 daily traffic volume at the intersection by 1975.

The east terminal of the study area finds Loop 13 West, Loop 13 South, and U. S. Highway 81 intersection. In 1959 the area contained a considerable number of commercial establishments and some warehouse facilities along U. S. 81, which leads into Broadway Avenue in the direction of downtown San Antonio. Some of the unplatted land along the north side of Loop 13 holds possibilities for additional commercial and industrial development. Future commercial development here may be slow and restricted to traffic-serving enterprises as very little support for other types of business could be expected from the small residential subdivision that is located between Loop 13 South and U. S. 81. Some future support for commercial growth in the area may be derived from the Texas State Highway Department's anticipated 47,000 daily traffic volume at the intersection in 1975.

The intersection of Bandera Road and Loop 13 in the "new road" segment of the study area holds potentials for commercial and industrial land-use changes that may well take place within the next few years. The area is just north of the city limits of San Antonio and presently supports only three business establishments. The area on the north of the intersection along Bandera Road is platted for residential purposes. Only some 40 houses are scattered throughout the large platted subdivisions, but the area has extremely good residential growth potentials. The anticipated

residential development to the north and immediately south of the Loop, plus an anticipated 37,000 daily traffic volume by 1975, gives support to a prediction of a steady increase in commercial enterprises.

The H.G.&N. Railroad (Missouri Pacific) bisects the study area east of the International Airport, and T.&N.O. Railroad (Southern Pacific) crosses the study area just west of the City of Castle Hills. These additional transportation facilities provide prime locations for industrial establishments north of the city limits of San Antonio.

Parks and Schools

A relatively small land area in the study band is devoted to parks and schools. Triangular-shaped, 34-acre McArthur Park abuts the expressway route for 3,000 feet along the "old road" at the intersection of Northeast Military Drive and Zercher Road. It is the only land devoted to parks in the study area. Four schools are located on expressway frontage roads. These are at Zercher Road, at the intersection with Harry Wurzbach Military Highway, at the intersection with Honeysuckle Lane, and at the intersection with West Avenue. The two latter locations are in the City of Castle Hills. One additional school is located on non-abutting property in the Green Hill Village subdivision. Parks and schools existing in the study area were as follows: two in 1950, three in 1955, and six in 1959. One or more additional parks and schools will be needed later to serve the anticipated population growth in the "new road" segment of the study area.

Military Installations and Public Facilities

The land-use map of the City of San Antonio treats military installations, colleges, airports, power plants, and other public properties (except parks and schools) as a single land-use category. The major area in this category in the study band is the San Antonio International Airport. This public facility is located on non-abutting property, north of the "old road" expressway route. Airport expansion was planned for 1959, at which time it would abut Loop 13. The air terminal has attracted other enterprises such as personal flight service, aircraft maintenance and sales, private hangars, flight-training schools, restaurants, and confectionaries. The present program for doubling the size of the Petroleum Center office building is credited to some extent to its convenience to air transportation. Additional changes in land use in the vicinity of the airport will doubtless occur with the expansion of the facility. The complete encirclement of San Antonio by Loop 13 will provide further accessibility to the airport.

Two large military installations, Medina and Lackland Air Force Bases, are located in close proximity to each other, and abut U. S. 90 West. Although the bases are located south and outside the west terminal point of the study area, their significant location creates radiating influences that are translated into important land-use changes within the study area.

Two plats for subdivisions in the area have recently been filed at the County Clerk's Office. The platted areas lie on each side of Loop 13 and adjacent to U. S. 90. In 1959 the larger subdivision, Lackland Heights, was experiencing a rapid build-up of homes in the $10,000 price class for families of military personnel. Geographic factors and the position of the two Air Force bases cause the land north of U. S. 90 to be more suitable for future residential development than the land south of U. S. 90.

The northward routing of the Loop through farm and ranchland has made large acreages of land suitable for residential purposes. Loop 13 may lead to more intensive usage of this outlying area because much of the land could become a reasonable substitute for land nearer the central city. The expressway system will increase the supply of land within a reasonable "time proximity" to the central business district. This land area presently holds major importance for the families of Air Force personnel, but the area is extremely valuable as a possible location for much of San Antonio's future population growth.

The combined and projected impacts of the military bases and future population growth are destined to cause additional land-use changes that are normally associated with residential development, such as retail trade, services, and amusement establishments. A daily traffic volume of 32,000 vehicles at the Loop 13 and U. S. 90 intersection by 1975 is projected by the Texas Highway Department.

The need for controls and regulations becomes apparent in the process of projecting the residential growth trends in the area. For example, residential uses tend to move to outlying areas before industry. If the residential demand is unrestricted, it may remove undeveloped lands from the market in advance of the industrial movement. Industries are thereby denied access to the open areas and the competitive advantages of an expressway site.

The situation resulting from the lag in movement of industries would be less serious if zoning authorities controlled development and preserved specific outlying areas for industry. The logic of government intervention lies in the fact that society's economic investment in the expressway can be more fully recovered by orderly and non-conflicting development.

The study reported here, together with a file of materials withheld from this report, comprises a rather full description of the area adjacent to a 20-mile segment of Loop 13. At some future date, a follow-up study will allow a detailed analysis of the economic impact of a major circumferential route. There can be little doubt that such information will continue to have a large number of important applications for many years to come.