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LAND USE IMPACT OF IMPROVING  
WEST BERRY STREET IN A DEVELOPED  
AREA OF FORT WORTH, TEXAS

by

Pamela J. Cosby  
Research Associate

Jesse L. Buffington  
Research Economist

Research Report 225-19  
Research Study Number 2-8-77-225  
Economics of Highway Design Alternatives

Sponsored by the  
State Department of Highways  
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College Station, Texas

## PREFACE

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

## ABSTRACT

Previous land use studies about the effects of highway construction have focused mainly on the effects of new construction. Due to the present emphasis on upgrading and expanding existing facilities rather than building new ones, the need arises for information concerning the effects on land use of such improvements. This report relates the findings of research done in an area of Fort Worth, Texas, where a section of West Berry Street was upgraded from a four-lane facility with head-in parking on the sides to a six-lane facility with a continuous left turn lane. The improvement took place in a developed area where the predominant land use was single family residential. Land use changes were analyzed for both abutting and nonabutting properties that might have been affected by the road improvement. Formal planning for the project began in 1969, and the construction was completed in 1972. Total acreage in each type of land use was determined for two *before* years, 1964 and 1968, and for two *after* years, 1973 and 1978. Comparisons were made between the types of land use and rates of change before and after the road improvement. The data are reported in narrative, graphic, and tabular form. Causes of development in the area other than the street improvement were also researched and are reported. Highway planners should be able to use this report and other reports of this study to make more accurate predictions of land use changes due to road improvements.

## IMPLEMENTATION STATEMENT

This report relates the findings of a case study on land use changes that have occurred after an existing road was improved. The findings can be implemented immediately by highway agencies in predicting what would happen as a result of a similar road improvement in a comparable area elsewhere.

This case study is one of several being done in Texas cities. The predictive capabilities will be increased after analysis and comparison of data from all areas is accomplished. Those findings are or will be described in other reports.

## SUMMARY OF FINDINGS

Data were collected and analyzed for the West Berry Street Study area in Fort Worth, Texas, to examine the impact upon land use of improving the street. The approximately one mile long section of West Berry Street that this study concentrates on was changed to a six-lane concrete facility with a continuous left turn lane within the existing right-of-way. It was previously a brick four-lane road with head-in parking on the sides. Data were collected for 1964, which was five years prior to official planning for this project; 1968, the year immediately before planning began; 1973, the first year after construction was completed; and 1978, the year in which data collection took place. The period between 1964 and 1968 is called the *before period*. The years from 1968 to 1973 are called the *short-run after period* and the *long-run after period* is 1973 to 1978.

The findings are summarized as follows:

1. The street improvement took place in the southwestern portion of Fort Worth.
  - a. The area was classified as a developed one throughout the years of study.
    - (1) The total area was 96 percent developed in 1964, the first study year.
    - (2) Ninety-seven percent of the area was developed by the end of 1978, the last study year.
  - b. The predominant land use in the area has remained single family residential with public and commercial uses becoming prevalent.
2. Properties abutting West Berry Street experienced very little change in use between 1964 and 1978.

- a. The only types of developments on abutting land were commercial and public/semi-public (with the exception of streets).
  - b. Commercial acreage increased from 15.31 to 16.02 acres (5 percent) with a corresponding reduction in unimproved land.
  - c. Less than one percent of abutting land remained unimproved in 1978.
3. Nonabutting land also underwent very little change in use.
    - a. The predominant type of land use, single family residential, decreased from 121.74 acres to 114.79 acres (6 percent).
    - b. The much smaller acreages of multiple family residential, commercial, and public/semi-public uses all increased moderately.
    - c. Mobile home acreage decreased and industrial acreage remained constant.
    - d. Ninety-six percent of nonabutting land was improved in 1964 and 97 percent was improved by the end of 1978.
  4. The average annual rates of land use change were very small for both abutting and nonabutting land.
    - a. The average annual rate of change for abutting land was highest in the *before period* when it was 0.23 percent as compared to 0 in the *short-run after period* and 0.12 percent in the *long-run after period*.
    - b. The average annual rate of change for nonabutting land was highest in the *long-run after period* when it was 0.46 percent as compared to 0.18 percent in the *before period* and 0.19 percent in the *short-run after period*.
  5. The improvement of West Berry Street was viewed as a positive influence on land use by people knowledgeable about the area.

- a. The street improvement was not thought to have instigated land use change but rather have spurred revitalization of the area in terms of improvements to existing structures, especially abutting commercial structures.
  - b. The street improvement helped alleviate a congested situation that might have become a detriment to the area if allowed to persist.
6. Land use in this area is in accord with land use plans and zoning.

METRIC CONVERSION FACTORS  
RELEVANT TO THIS REPORT

Approximate Conversions to Metric Measures

<u>U.S. Customary Units Used in Report</u>		<u>Factor (multiply by)</u>		<u>Metric Equivalents</u>
acres	x	0.4	=	hectares
miles	x	1.6	=	kilometers
feet	x	0.3	=	meters

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## INTRODUCTION

### Purpose and Objective of Study

The near completion of the Interstate Highway System, the completion of many urban freeways, and the increasing shortage of funds for future highway construction have caused state highway agencies to concentrate on upgrading and increasing the capacity of existing streets and highways. Much research has been conducted in the past to learn the impact of new highway construction, but little has been done to indicate what happens when an existing highway is upgraded. In order to optimize public benefits, highway agencies need information of this kind to help predict the consequences of improvement of an existing facility.

One important impact of any highway construction is the changes that occur in adjacent land use. The overall purpose of this study is to determine land use changes in areas where an existing highway or street has been improved. This report presents the findings of investigation in an area of Fort Worth, Texas, where a section of West Berry Street was improved. Areas with other types of improvements and areas in varying stages of development with different types of predominant land use when improvement began have been studied or are under study. Reports of findings in those areas are available or are forthcoming.

Objectives of this study area are as follows:

- (1) To determine the initial and long-range land use impacts of different highway design changes on existing highways with a minimum of data collection.
- (2) To determine traffic volume changes resulting from various types of improvements.

## Method of Study

A "before and after" approach was employed in this study to discover land use changes in the West Berry Street study area. Since land use could have been affected by anticipation of a better roadway, data were collected for a time well before the improvement of this facility began (the applicable time periods are defined in the Definitions Section).

Land use data were collected for 1964 and 1968, the two *before* years and 1973 and 1978, the *after* years. On-site inspections aided in identifying the correct land uses.

The land was divided into abutting and nonabutting properties. Abutting properties were defined as those with frontage on West Berry Street. On undeveloped tracts, a section extending back 300 feet from the street was designated as abutting. Land use changes and rates of land development were determined for each category to facilitate comparison.

To determine reasons underlying the land use changes in the area, several knowledgeable people were interviewed. Real estate salespeople and developers provided information on land developments. City officials who were familiar with the area also provided information about land use changes. Other factors which might have influenced changes were also investigated. Among these were: traffic volumes, population, and median family income in the area.

## Location of the Road Improvement

The improved portion of West Berry is within the city limits of Fort - Worth, Texas (Figure 1). Fort Worth is located in Tarrant County, one of the eleven counties making up the Dallas/Fort Worth Standard Metropolitan Statistical Area (SMSA). Due to the interdependence between cities and



counties in the SMSA, a brief discussion of the SMSA as a whole is presented with some specific details about Fort Worth included.

Although the Dallas/Fort Worth SMSA grew at an estimated 8.7 percent between 1970 and 1976, this was somewhat less than the 11.5 percent rate of growth for the state.<sup>1</sup> The cities of Dallas and Fort Worth both lost several residents through out migration to the smaller communities in the SMSA.

The economy of the Dallas/Fort Worth SMSA is well balanced in the areas of manufacturing, trade, transportation, finance, services, and real estate. Manufacturing, the largest contributor to personal income, is comprised primarily of light industry such as electronics, aircraft, apparel, oil-field equipment, food processing, automotive transportation, printing and publishing, and nonelectrical equipment.

The second largest contributor to personal income in the Dallas/Fort Worth area is the wholesale and retail trade sector. Numerous shopping centers, including several regional malls (with greater than 50,000 square feet), are located in the SMSA. Among the many large retail firms is Dallas' original Neiman-Marcus department store, one of the world's best known and most unusual. This area is also the heart of an eleven state wholesale market and distribution network. At the center of the Dallas/Fort Worth wholesale business is the Dallas Market which is the largest wholesale merchandising complex located at one site in the world. Buyers from all fifty states and approximately 25 foreign countries come to choose from merchandise ranging from wearing apparel to toys and home furnishings. Dallas is ranked number one

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<sup>1</sup>Information on the Dallas/Fort Worth SMSA is from: Austin, Joanne P. "Dallas-Fort Worth: The Southwest Metroplex," Texas Business Review, September 1978.

nationally as a market for summer and winter home furnishings, gifts and floor coverings; number one as a regional toy market; and second as a national apparel market.

Despite the fact that Dallas/Fort Worth has no inland waterway, it is a major crossroad for nearly all types of domestic and international shipping and is the major point of intersection of routes from New York, Los Angeles, Chicago, and Mexico City. In addition to several interstate, state, and federal highways, the area is served by ten railroads, forty-five common carriers, and five major bus lines. But perhaps the primary factor in the transportation network of Dallas/Fort Worth is the Dallas/Fort Worth Regional Airport that opened in January 1974. The airport is the largest in the nation and is reported to be the third busiest handler of scheduled air carrier operations in the world.

The services sector of the economy of Dallas/Fort Worth is also very important with conventions and tourism rated as two of the area's most important industries. The most popular tourist attraction is Six Flags Over Texas, which bypassed the Alamo in 1963 as the number one tourist attraction in Texas. Other attractions include professional and intercollegiate sports, the Texas State Fair, museums, fine restaurants, and excellent shopping facilities. Dallas has been rated first nationally in total number of meetings held in the city. Both Dallas and Fort Worth have large convention centers, exhibit space, and hotel rooms that attract the convention business. Service income is also generated by health and educational facilities including seven private four-year colleges, one private junior college, and the Baylor University schools of nursing and dentistry. Texas Christian University is one of the private universities and it borders the West Berry Study area having a significant impact on land use.

The finance, insurance, and real estate sector is also very important in the SMSA. Among the over 200 commercial banks in the area are the two largest banks in Texas, located in Dallas. The area has long been recognized as the financial center of the state. The Dallas/Fort Worth area is also the state's leading insurance center with more than 260 insurance companies.

The population of Fort Worth increased by over 100,000 between 1950 and 1970 but then declined by over 35,000 between 1970 and 1975 (Table 1). An increase was again recorded between 1975 and 1977. Dallas also lost population between 1970 and 1975 but not as much as Fort Worth. The Dallas/Fort Worth SMSA showed an increase during the same period (the separate Dallas and Fort Worth SMSA's were combined into one SMSA after the 1970 census was taken).

#### Key Characteristics of Study Area

This study area is one of eighteen study sites chosen for analysis of land use changes relative to street improvements. The study areas were chosen according to the following characteristics:

- (1) Stage of development in the area before the improvement,<sup>2</sup>
- (2) Type of highway or street design change,
- (3) Predominant land use before the improvement, and
- (4) Type of setting (urban or suburban).

---

<sup>2</sup>The percentage of total land area already improved with buildings, parks, roads, and streets is used to determine which stage of development the study area falls within. The three stages of development defined in this manner are: *undeveloped* - 1 to 10% improved, *developing* - 10% to 80% improved, and *developed* - 80% to 100% improved.

Table 1. Population and Percentage Change in Population for Fort Worth, Dallas, and the SMSA<sup>a</sup>

	1950	Change and % Change 1950-1960	1960	Change and % Change 1960-1970	1970	Change and % Change 1970-1975	1975	Change and % Change 1975-1977	1977
Fort Worth	278,778	77,490 28%	356,268	37,208 10%	393,476	35,112 -9%	358,364	9,629 3%	367,993
Fort Worth SMSA	361,253	211,962 59%	573,215	188,870 33%	762,085	-	b	b	b
Dallas	434,462	245,222 56%	679,684	164,717 24%	844,401	31,604 -4%	812,797	31,731 4%	844,528
Dallas SMSA	614,799	468,802 76%	1,083,601	472,533 44%	1,556,134	-	b	b	b
Dallas-Fort Worth SMSA	b	-	b	-	2,378,353	158,595 7%	2,536,948	136,252 5%	2,623,200

<sup>a</sup>Data from the Bureau of the Census, U.S. Department of Commerce Publications.  
<sup>b</sup>Prior to 1970, the Dallas and Fort Worth SMSA's were separate. After the 1970 Census Count, one area was designated as the Dallas-Fort Worth SMSA combining the two separate SMSA's plus some additional territory.

Using these characteristics, different types of study sites have been selected that will permit analyses of various design changes and the resulting impacts on land use. The key characteristics of the West Berry Street area are as follows:

- (1) The stage of area development--developed,
- (2) Type of highway design change--from four-lane, undivided brick road with curbs and gutters and head-in parking to a six-lane concrete road with a continuous left turn lane and curbs and gutters,
- (3) Predominant land use before the improvement--single family residential, and
- (4) Type of setting--urban.

#### Sources of Data

The source of information about the design change of West Berry Street and the construction dates was the District 2 Office of the SDHPT in Fort Worth. Data on land use was obtained primarily from the Dallas-Fort Worth Regional Planning Office of the SDHPT in Grand Prairie. The City of Fort Worth also provided some land use information and data on zoning. On-site inspection and city directories also helped in the determination of the correct land uses. Interviews with real estate developers, SDHPT personnel, city planners and other city officials, residents of the area, and property owners also provided information on land use changes that have taken place in this area.

Traffic volume data were obtained from the SDHPT and the City of Fort Worth. The U.S. Census was the source of population and other socioeconomic data.

## Definitions

The following land use categories and time periods were used in this study:

Single-Family Residential - tract improved with occupiable house for one family.

Multiple-Family Residential - tract improved with duplex or apartment complexes designed to house two or more families.

Mobile Homes - tract improved with one or more mobile homes.

Commercial - tract improved with a commercial business.

Public/Semi-Public - tract improved with a governmental office, park, public-owned utility, church, or other nonprofit organization.

Industrial - tract improved for manufacturing, product storage, etc.

Streets and Roads - land improved with a street or road; includes land dedicated as right-of-way.

Unimproved - land which has not been developed for any particular use; also includes previously developed land that is presently vacant or unused and land used for agricultural purposes.

Time periods used in the analysis are as follows:

Before Period - the period from 1964 to 1968 which ends the year before the road improvement began.

Short-Run After Period - the period which includes changes that occurred since the end of 1968 through 1973. This period includes the year in which the improvement occurred.

Long-Run After Period - the period which includes changes that occurred since the end of 1973 through 1978.

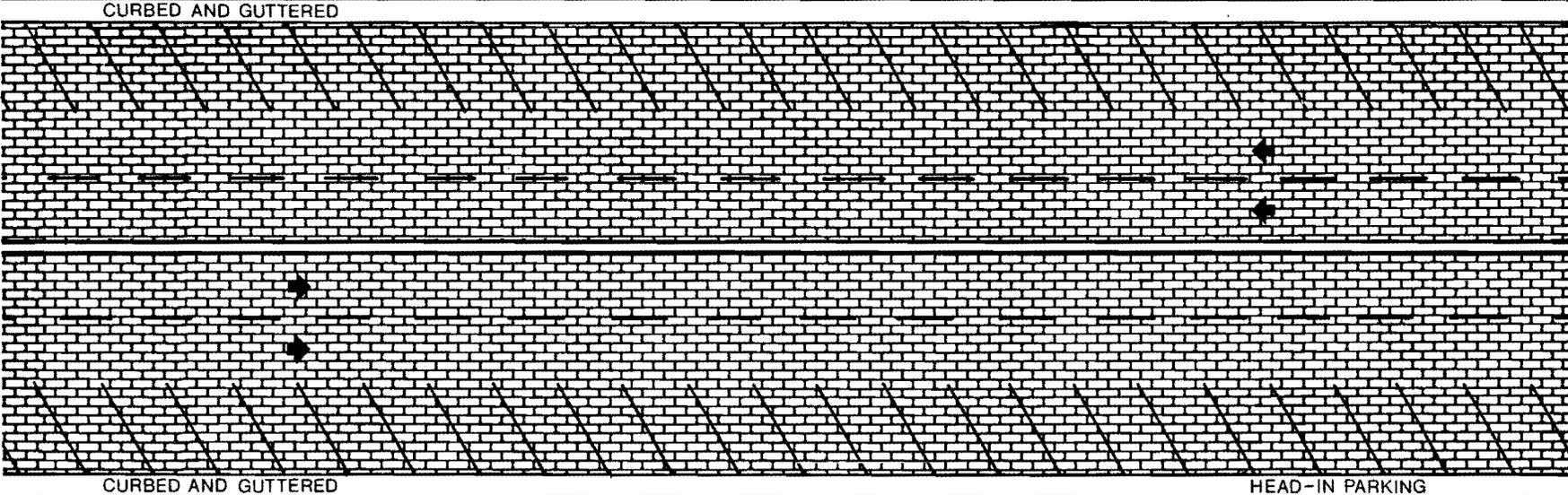
CHARACTERISTICS OF AREA STREETS AND ROADS BEFORE  
AND AFTER IMPROVEMENT OF WEST BERRY STREET

Berry Street is an east-west thoroughfare in the southwestern portion of Fort Worth. It begins at Stadium Drive, which runs next to the Texas Christian University, and extends east for around seven miles. This study concentrates on a section of the western end of Berry Street. The study section begins at University Drive and extends east for somewhat less than one mile to Stanley Avenue.

The improvement changed this section from a four-lane road with head-in parking to a six-lane road with a continuous left turn lane. The street had curbs and gutters before and after the improvement. The street was unique in that it was constructed of bricks. It is now concrete. The order initiating investigation, planning, and engineering was issued in 1969, and the contract for construction was let in 1971. The project was completed in 1972. No right-of-way was acquired since the state already owned sufficient acreage. The before and after designs are depicted in Figure 2.

Traffic counts were collected for West Berry Street and other streets in the area to determine how traffic has changed (Table 2). West Berry has experienced a considerable amount of fluctuation in the average daily number of vehicles. The earliest count available for the western end of the study section indicated 15,315 vehicles per day in 1957. The count fluctuated up to 16,477 in 1959 and then back down to the 12,000's in 1960 and 1961. After more fluctuation the count was at 16,100 in 1969, the year official planning for the road improvement began. The count was 16,100 in 1971 while construction was underway and then fluctuated up and down from that time until 1979. The 1979 count was 19,031. The count representing the eastern end of the study area was considerably higher than that for the western end until the mid

# Before Period Design



# After Period Design

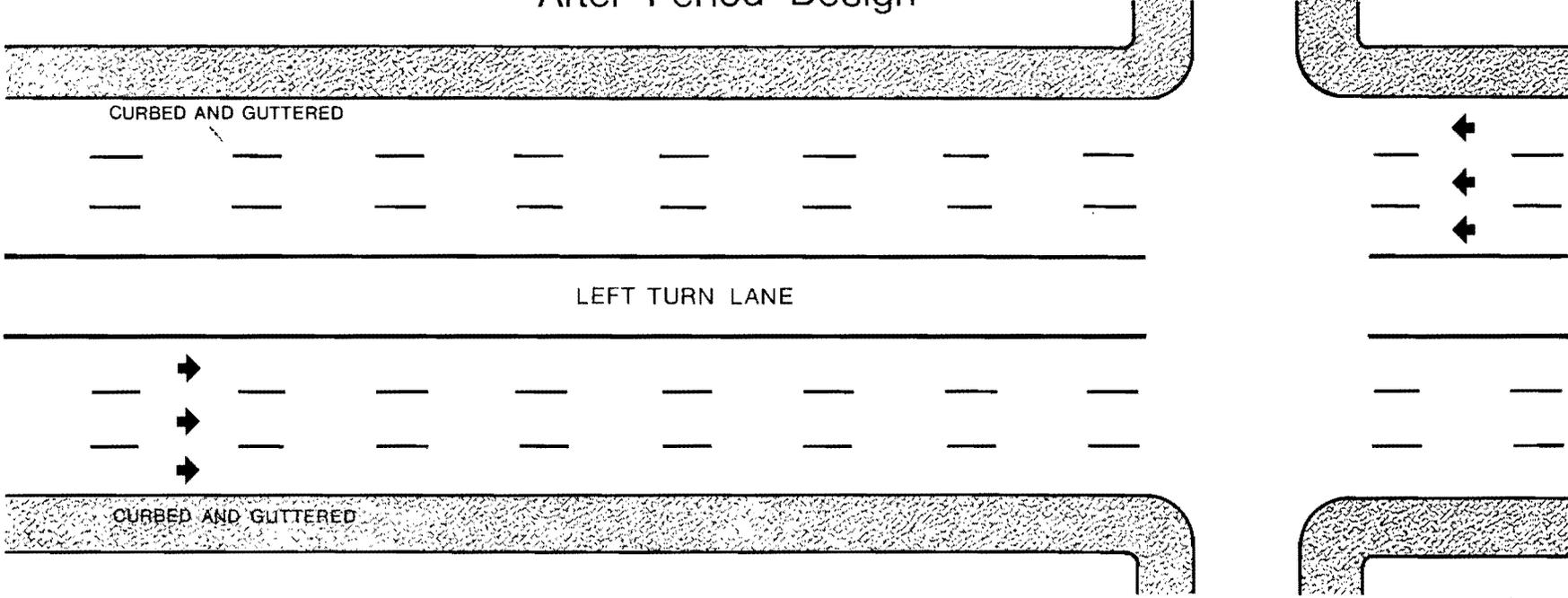


Figure 2. Design of West Berry Street Before and After Improvement.



and late 1970's. The counts for the eastern end also fluctuated in the 1950's and 1960's but declined in the 1970's. The count for the eastern end was 16,800 in 1979 after having been as high as 19,100 in 1964. It is difficult to draw any conclusions from these counts for West Berry due to the fluctuations, however it is certain that the traffic was more efficiently and safely carried by the improved road.

#### Intersecting Streets

University Drive is the most heavily traveled street that intersects the study section of West Berry Street. The counts for University remained fairly constant between 1957 and 1979 (Table 2). The count for north of West Berry fluctuated from the mid 18,000's to the mid 22,000's. The 1957 count was 20,330, and the 1979 count was 20,412. The counts for south of West Berry ranged between 9,000 and the high 14,000's. The 1957 count was 11,265, and the 1978 count was 11,598. The improvement of West Berry Street appeared to have no effect on the traffic volume of University Avenue.

Two other intersecting streets have had large increases in traffic. Forest Park Boulevard, which is approximately in the middle of the study area, increased steadily in traffic volume from 6,930 in 1957 to 15,160 in 1977. McCart Avenue, which is just to the west of Forest Park Boulevard, had a volume of 6,616 in 1957 and 13,500 in 1975. The increases in volume for both of these streets did not appear to have been affected by the improvement of West Berry since the increases occurred steadily over the years with no large increases or decreases associated with the West Berry improvement.

## Parallel Streets

Traffic counts were collected for two streets that run parallel to West Berry Street and that may be alternate routes to some locations. Seminary Drive, a parallel street that lies south of West Berry Street, has had widely varying traffic counts at two locations. A point west of McCart Avenue had much less traffic in early years than did West Berry, but a point east of McCart increased in traffic volume to the point of being comparable to West Berry. It is possible that Seminary Drive may be attracting some traffic away from West Berry.

Rosedale Street is also parallel to West Berry. This street, that is north of West Berry, has not had significant increases in traffic at one location and has actually lost volume at another location. It is possible that Rosedale Street may have lost some traffic to West Berry Street.

## CHARACTERISTICS OF THE STUDY AREA BEFORE AND AFTER IMPROVEMENT OF WEST BERRY STREET

### Size and Boundaries of the Study Area

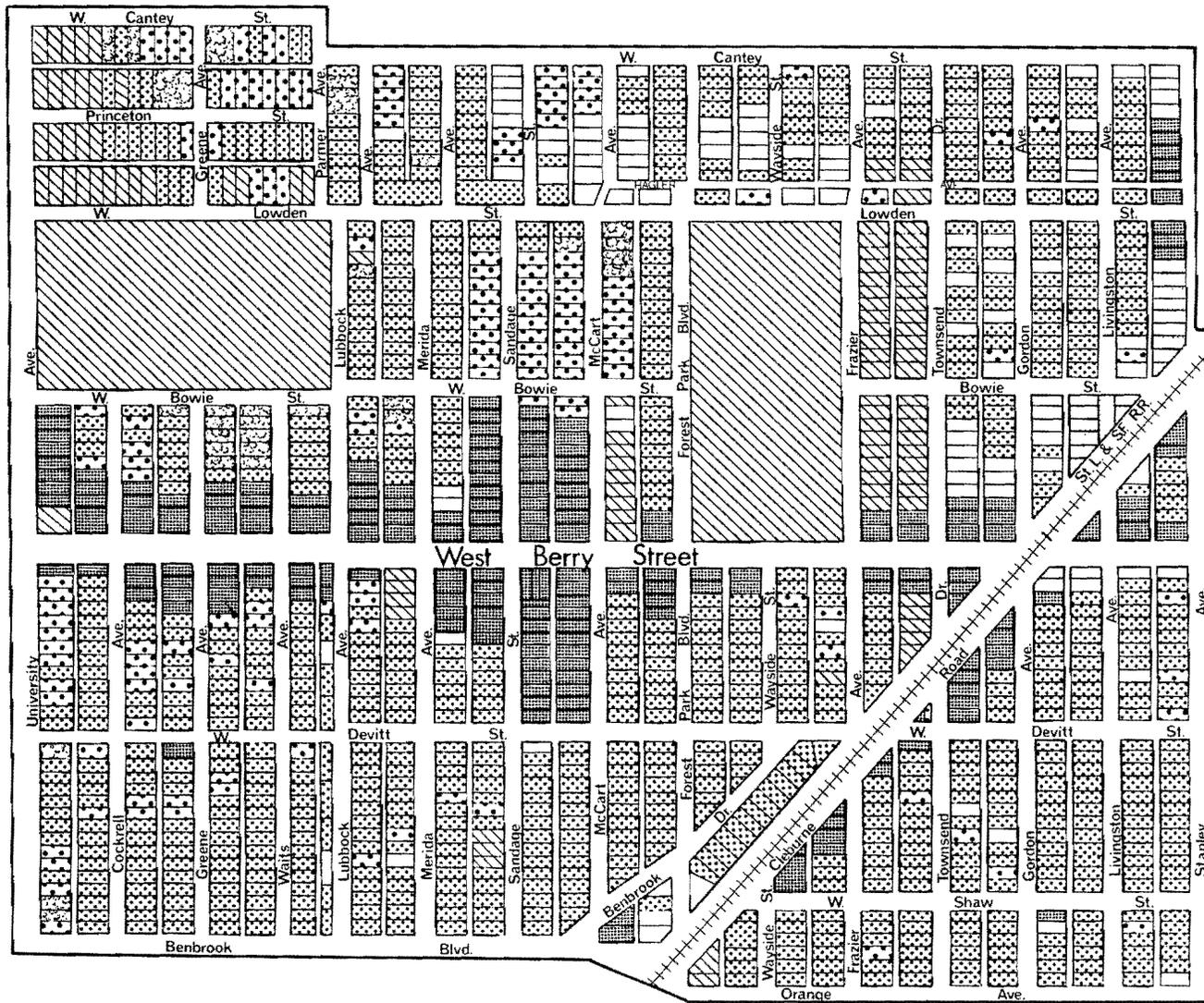
The study area encompasses approximately 340.68 acres. An area was chosen to include approximately three blocks (or the equivalent distance) of land on each side of West Berry Street, thus including both abutting and non-abutting land. University Avenue and Stanley Avenue form the western and eastern boundaries, respectively. West Cantey Street delineates the northern boundary. Benbrook Boulevard and Orange Avenue mark the southern boundary. The study area extends approximately 1,800 feet on each side of West Berry Street and is approximately 4,630 feet long.

### Land Use Characteristics

As indicated in the maps in Figures 3, 4, 5, and 6, the total study area contains several types of land use. In 1964, 96 percent of the total study area was developed. Single family residential has remained the predominant type of development although there was a small decrease in total single family acreage between 1964 and 1978 (Table 3). Mobile home acreage also decreased slightly while multiple family residential increased by a small amount. Industrial acreage remained constant. Commercial, public/semi-public, and streets and roads all increased with commercial acreage increasing most. Ninety-seven percent of the study area was improved in 1978.

### Land Use Change

The West Berry Street study area has not undergone extensive land use change in the study years, 1964 through 1978. Most of the area was already



### LAND USE LEGEND

-  UNIMPROVED
-  RESIDENTIAL-SINGLE FAMILY
-  RESIDENTIAL-MULTIPLE FAMILY
-  COMMERCIAL
-  INDUSTRIAL
-  PUBLIC-SEMI PUBLIC
-  MOBILE HOMES

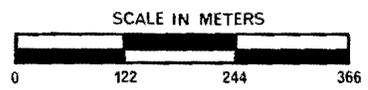
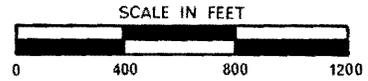
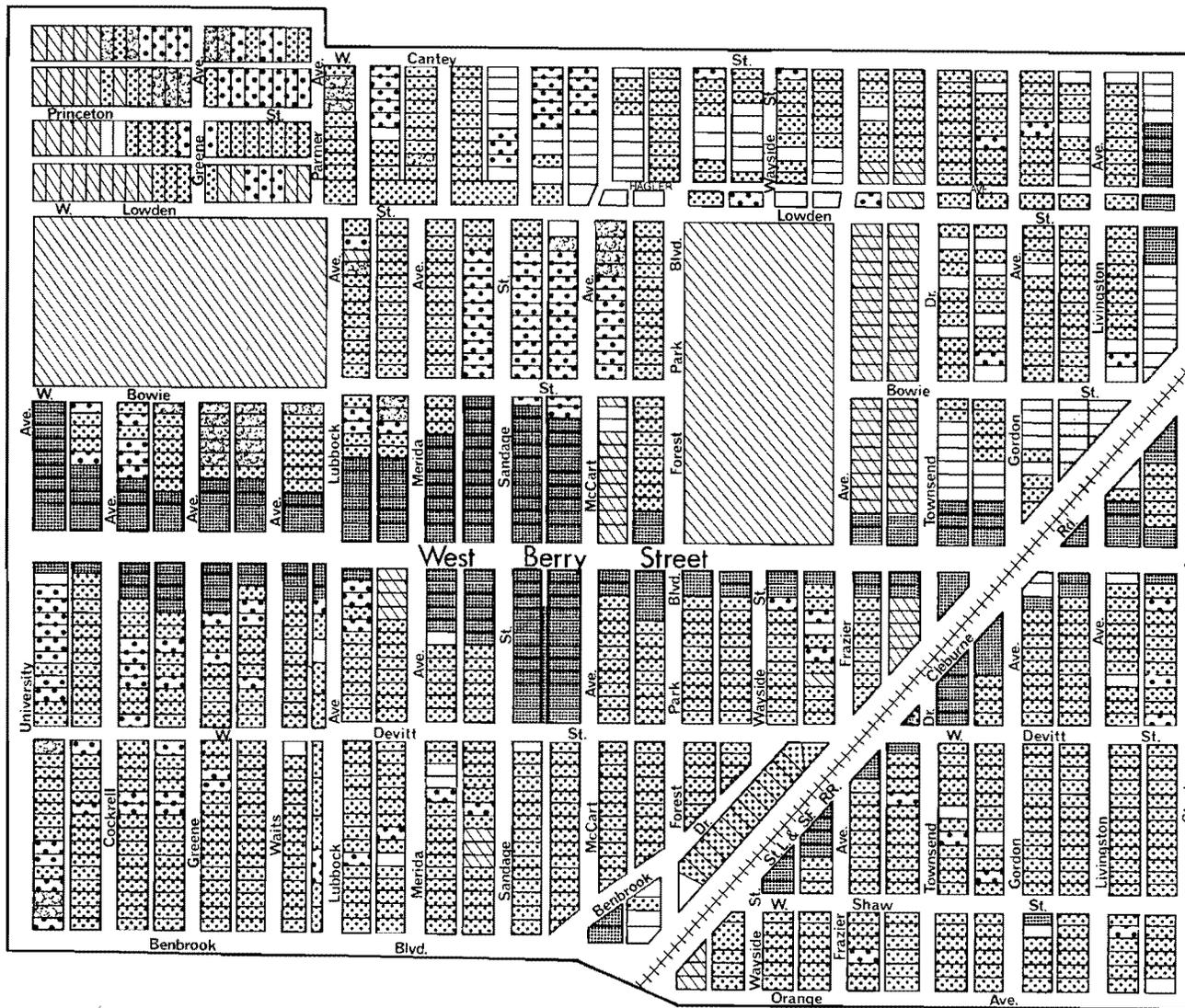


Figure 3. Land Use in the West Berry Street Study Area in 1964.



### LAND USE LEGEND

-  UNIMPROVED
-  RESIDENTIAL-SINGLE FAMILY
-  RESIDENTIAL-MULTIPLE FAMILY
-  COMMERCIAL
-  INDUSTRIAL
-  PUBLIC-SEMI PUBLIC
-  MOBILE HOMES

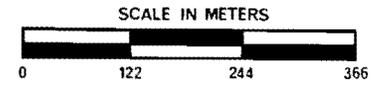
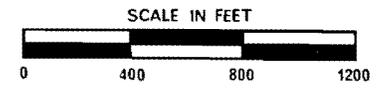


Figure 4. Land Use in the West Berry Street Study Area in 1968.

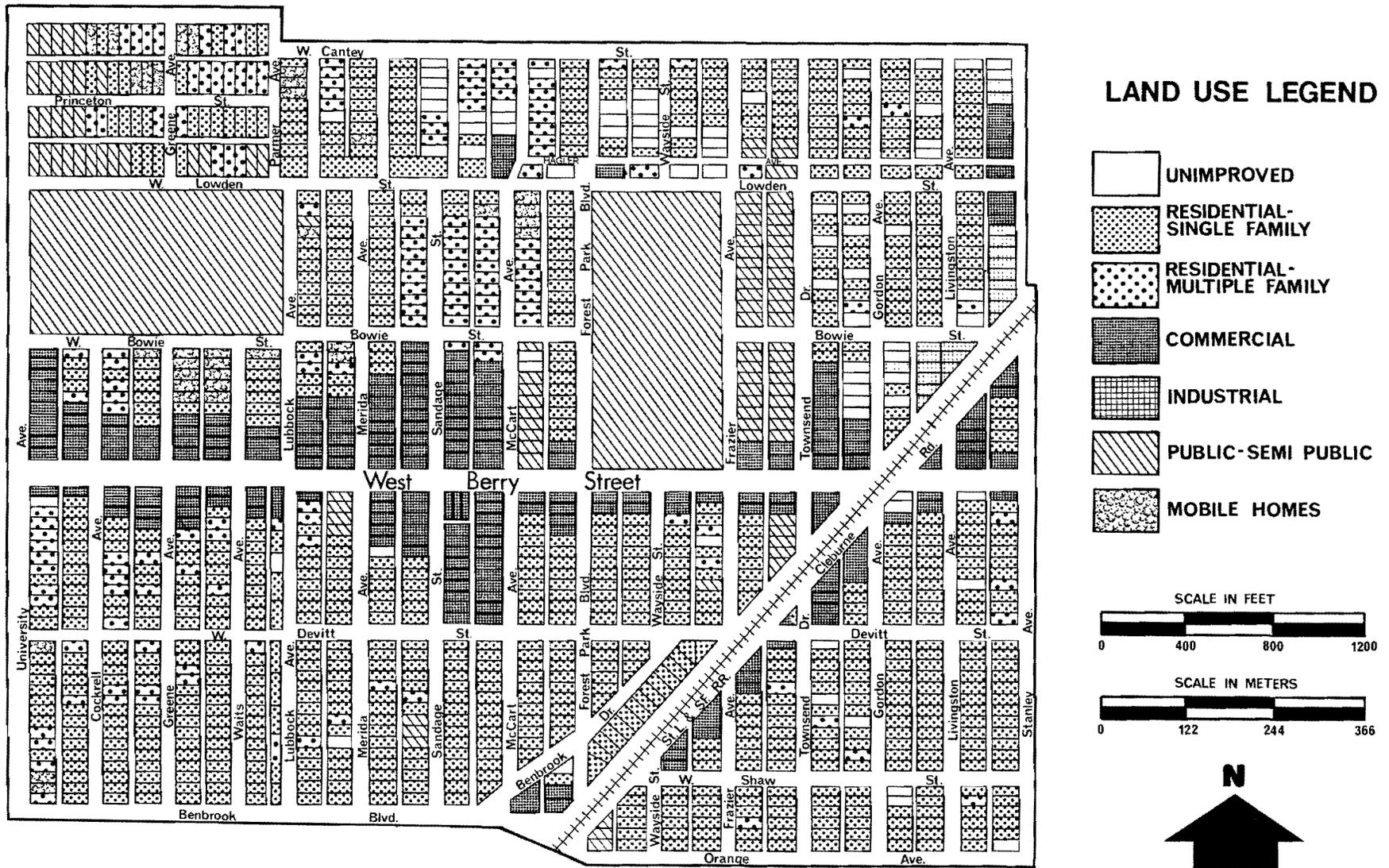
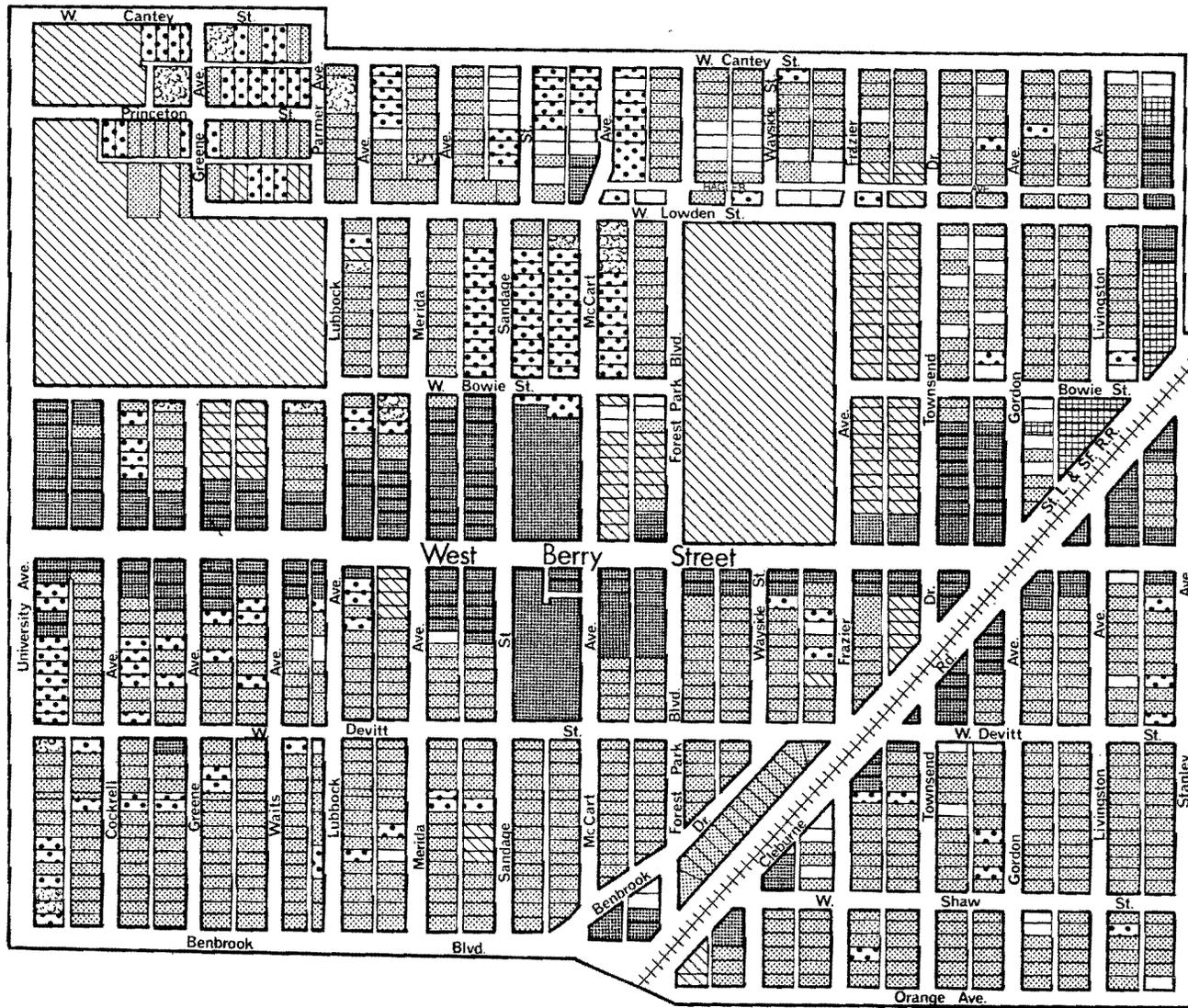


Figure 5. Land Use in the West Berry Street Study Area in 1973.



### LAND USE LEGEND

-  UNIMPROVED
-  RESIDENTIAL - SINGLE FAMILY
-  RESIDENTIAL - MULTIPLE FAMILY
-  COMMERCIAL
-  INDUSTRIAL
-  PUBLIC-SEMI PUBLIC
-  MOBILE HOMES

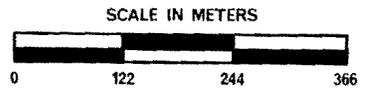
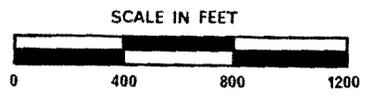


Figure 6. Land Use in the West Berry Street Study Area in 1978.

Table 3. Changes in Land Use of All Properties  
by Time Period and Year<sup>a</sup>

Land Use and Type of Change	Total Acres by Time Period and Year <sup>b</sup>			
	Before		After	
	1964	1968	1973	1978
Residential-Single Family	121.74	120.14	118.96	114.79
Absolute Change	-1.60		-1.18	-4.17
Percent Change	-1%		-1%	-4%
Residential-Multiple Family	20.79	21.44	22.58	22.58
Absolute Change	+0.65		+1.14	0
Percent Change	+3%		+5%	0
Residential-Mobile Homes	4.81	4.81	4.81	3.07
Absolute Change	0		0	-1.74
Percent Change	0		0	-36%
Commercial	26.68	28.51	30.53	33.65
Absolute Change	+1.83		+2.02	+3.12
Percent Change	+7%		+7%	+10%
Public/Semi-Public	50.85	50.85	50.85	55.91
Absolute Change	0		0	+5.06
Percent Change	0		0	+10%
Industrial	2.60	2.60	2.60	2.60
Absolute Change	0		0	0
Percent Change	0		0	0
Streets and Roads	99.02	100.17	100.17	100.17
Absolute Change	+1.15		0	0
Percent Change	+1%		0	0
Unimproved	13.04	12.16	10.18	9.06
Absolute Change	-0.88		-1.98	-1.12
Percent Change	-7%		-16%	-11%

<sup>a</sup>Total acreage equals 340.68.

<sup>b</sup>One acre equals .4046856 hectares.

developed before the road improvement occurred. The few occurrences of change are discussed in terms of their location to West Berry Street. Tracts of land were classified according to their location relative to the street. Tracts with frontage on the road were classified as abutting. All other land was classified as nonabutting.

*Abutting Properties.* In 1964, the first year of the *before period*, less than two percent of the 47.14 abutting acres remained undeveloped. Public/semi-public was the land use covering most acreage (Table 4). This was due primarily to one large school campus that abutted West Berry Street. In terms of number of establishments, commercial land use was predominant. The only change at all on abutting land between 1964 and 1978 was the change of 0.71 acres from unimproved land to commercial. In 1978, only 0.14 acres of abutting land remained unimproved. Abutting land use changes are depicted in Figure 7.

*Nonabutting Properties.* In 1964, only 12.19 of the 293.54 nonabutting acres were still unimproved (Table 5). Single family residential use covered 41 percent of nonabutting land (121.74 acres). Public/semi-public use consisted of 32.60 acres and multiple family residential use covered 20.79 acres. Mobile homes were located on 4.81 acres and 2.60 acres were in industrial use. Streets and roads acreage was 87.44.

In the *before period*, 1964 to 1968, the only changes were a 1.60 acre reduction in single family residential acreage, a 0.65 acre increase in multiple family residential use, and a 1.40 acre increase in commercial acreage.

The same type of changes continued in the *short-run after period*. Single family residential use decreased by 1.18 acres, multiple family residential increased by 1.14 acres, and commercial acreage increased by 2.02 acres.

Table 4. Changes in Land Use of Abutting Properties  
by Time Period and Year<sup>a</sup>

Land Use and Type of Change	Total Acres by Time Period and Year <sup>b</sup>			
	Before		After	
	1964	1968	1973	1978
Commercial	15.31	15.74	15.74	16.02
Absolute Change	+0.43		0	+0.28
Percent Change	+3%		0	+2%
Public/Semi-Public	18.25	18.25	18.25	18.25
Absolute Change	0		0	0
Percent Change	0		0	0
Streets and Roads	12.73	12.73	12.73	12.73
Absolute Change	0		0	0
Percent Change	0		0	0
Unimproved	0.85	0.42	0.42	0.14
Absolute Change	-0.43		0	-0.28
Percent Change	-51%		0	-67%

<sup>a</sup>Total acreage equals 47.14.

<sup>b</sup>One acre equals .4046856 hectares.

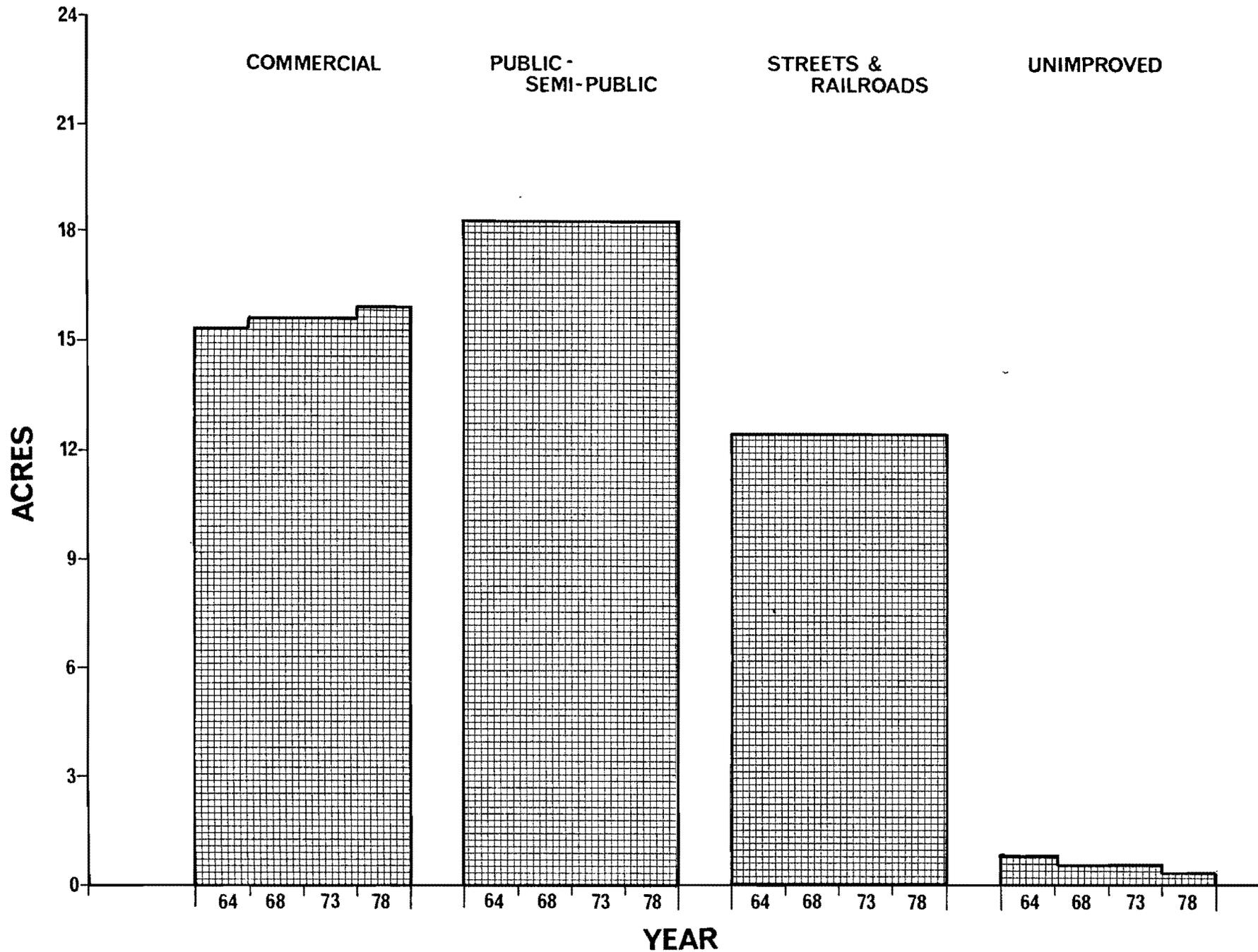


Figure 7. Changes in Abutting Land Uses in the West Berry Street Study Area

Table 5. Changes in Land Use of Nonabutting Properties  
by Time Period and Year<sup>a</sup>

Land Use and Type of Change	Total Acres by Time Period and Year <sup>b</sup>			
	Before		After	
	1964	1968	1973	1978
Residential-Single Family	121.74	120.14	118.96	114.79
Absolute Change	-1.60	-1.18	-4.17	
Percent Change	-1%	-1%	-4%	
Residential-Multiple Family	20.79	21.44	22.58	22.58
Absolute Change	+0.65	+1.14	0	
Percent Change	+3%	+5%	0	
Residential-Mobile Homes	4.81	4.81	4.81	3.07
Absolute Change	0	0	-1.74	
Percent Change	0	0	-36%	
Commercial	11.37	12.77	14.79	17.63
Absolute Change	+1.40	+2.02	+2.84	
Percent Change	+12%	+16%	+19%	
Public/Semi-Public	32.60	32.60	32.60	37.66
Absolute Change	0	0	+5.06	
Percent Change	0	0	+16%	
Industrial	2.60	2.60	2.60	2.60
Absolute Change	0	0	0	
Percent Change	0	0	0	
Streets and Roads	87.44	87.44	87.44	86.29
Absolute Change	0	0	-1.15	
Percent Change	0	0	-1%	
Unimproved	12.19	11.74	9.76	8.92
Absolute Change	-0.45	-1.98	-0.84	
Percent Change	-4%	-17%	-9%	

<sup>a</sup>Total acreage equals 293.54.

<sup>b</sup>One acre equals .4046856 hectares.

In the *long-run after period*, single family residential acreage continued to decline as well as did mobile home residential acreage. Commercial and public/semi-public acreage both increased. In 1978, only three percent of nonabutting land remained unimproved. Nonabutting land use changes are shown in Figure 8.

More change occurred on nonabutting land than on abutting. This is accounted for, in part, by the greater area in nonabutting acreage. A better comparison is made in a later section when change is put on an annual rate basis.

#### Influence of Other Major Roads

Although West Berry Street is the focus of this study, other roads in the area have also affected land use. The maps in Figures 3, 4, 5, and 6 indicate that several of the commercial establishments in the study area are located along Cleburne Road. This road, as well as the railroad that runs parallel to it, must surely attract development. University Drive and Stanley Avenue, as well as other streets in the study area, also have been factors in the decisions to develop this area. However, based on the way the study area is delineated, West Berry is the most important thoroughfare and the focal point of the study.

#### Land Use Controls and Plans

Land use in Fort Worth is regulated by zoning. Land in the West Berry Street Study Area is zoned primarily as the land use exists today with single and multiple family housing, commercial along the major streets, and governmental and institutional zoning where schools exist. The area has undergone very few changes in zoning during the years that this study concentrates upon.

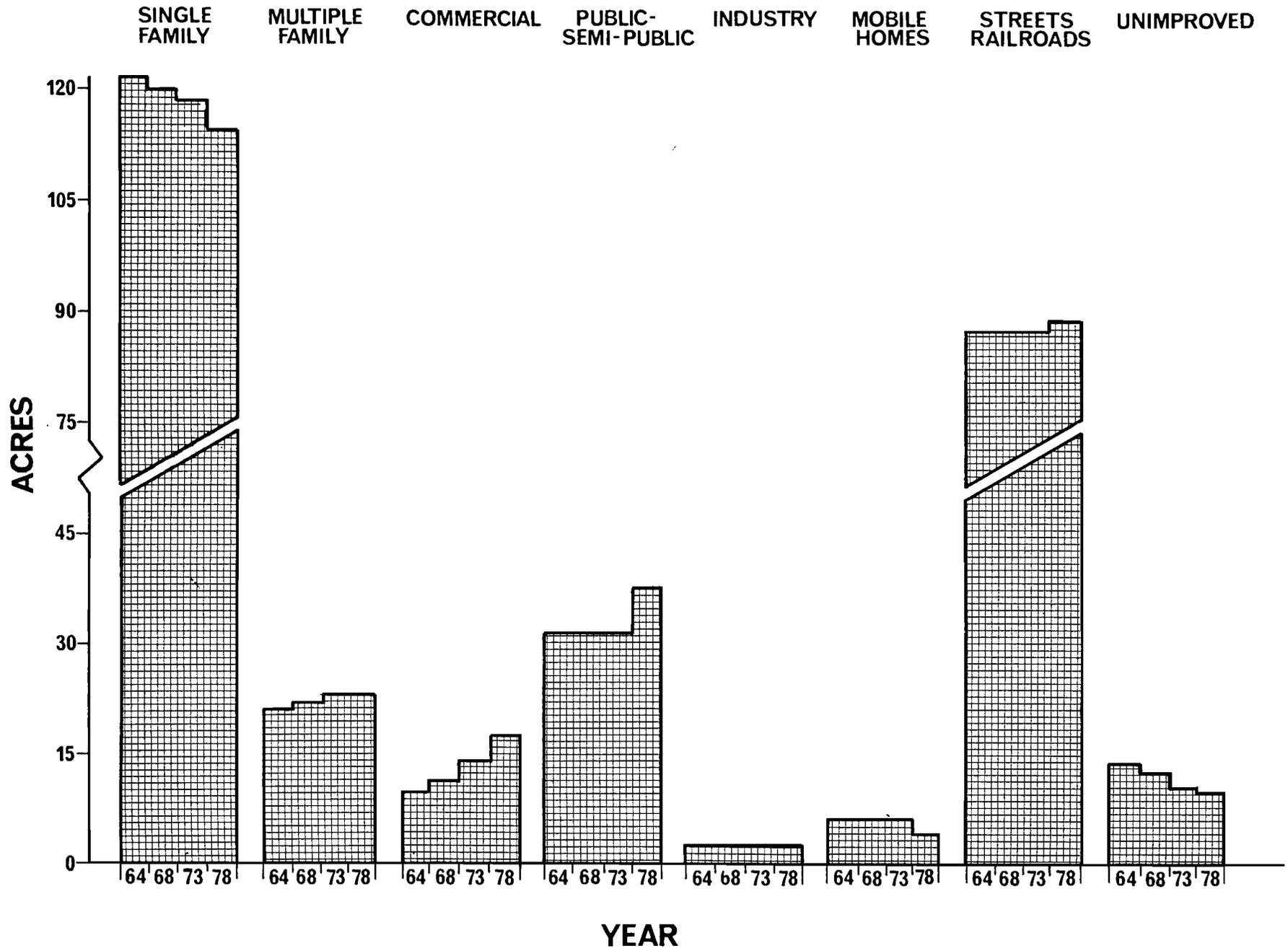


Figure 8. Changes in Nonabutting Land Uses in the West Berry Street Study Area

Among the few exceptions was the extension of commercial zoning along West Berry Street to allow room for parking behind the businesses when the head-in parking along the street was removed. Overall, zoning was not a major force in land use changes in the area.

A 1967 Dallas-Fort Worth Regional Transportation Study report indicated that land use in the West Berry Street study area would remain the same through 1985. This projection has held true so far since only very minor changes have occurred. The area has been and is expected to remain a mixture of residential, commercial, and public land uses. Another plan in a 1970 City of Fort Worth publication entitled *Sector One, Fort Worth Texas* also indicated that land use would remain as it has.

#### Socio-Economic Characteristics

Selected socio-economic characteristics were investigated to reveal differences between the study area, Fort Worth as a whole, and the Fort Worth SMSA. U.S. Census data from 1960 and 1970 were used to give an idea of changes in the time period just before and during the improvement of West Berry Street. Unfortunately, 1980 data are not available to include more recent changes. Census tract data were used to approximate the statistics for the West Berry study area which is in Census Tract 43. The study area covers a little over half of the census tract.

As Table 6 indicates, the census tract lost population between 1960 and 1970, declining from 5,737 to 4,327 (7 percent). The city gained population during the same period (10 percent) as did the SMSA (33 percent).

The median school years completed remained constant at 12.7 years for the census tract, which was higher than that for the city or SMSA in both years. Median family income in the census tract was higher than that in Fort Worth in

Table 6. Comparison of 1960 and 1970 Socio-Economic Characteristics of Census Tract 43 to Fort Worth and the Fort Worth SMSA

Socio-Economic Characteristics	SMSA			Fort Worth			Census Tract 43		
	1960	% Change	1970	1960	% Change	1970	1960	% Change	1970
Population	573,215	+33%	762,085	356,268	+10%	393,516	5,737	-7%	5,327
Median School Years Completed	11.4	+6%	12.1	11.4	+4%	11.9	12.7	0	12.7
Median Family Income	\$5,617	+80%	\$10,101	\$5,484	+69%	\$9,271	\$6,816	+48%	\$10,086
Median Income of Families and Unrelated Individuals	\$4,952	+74%	\$8,607	\$4,622	+63%	\$7,515	\$5,622	+28%	\$7,203
Median Value of Owner Occupied Residences	\$8,800	+49%	\$13,100	\$8,500	+31%	\$11,100	\$11,800	+19%	\$14,000
Median Rent Paid by Tenants	\$65	+38%	\$90	\$64	+27%	\$81	\$88	+8%	\$95
Total Employed	214,782	+45%	310,567	138,094	+16%	160,451	2,584 <sup>a</sup>	+5%	2,725
Professional, Technical, and Kindred Workers	28,126	+75%	49,284	18,541	+32%	24,412	707	+7%	753
Managers and Administrators	20,944	+24%	26,056	12,939	+2%	13,128	416	-18%	342
Sales Workers	35,220	-29%	24,959	11,117	+19%	13,201	221	+0.5%	222
Clerical and Kindred Workers	17,017	+251%	59,658	23,193	+29%	30,033	610	+12%	683
Craftsmen, Foremen, and Kindred Workers	30,833	+53%	47,072	16,828	+25%	21,051	200	+28%	256
Operatives	33,680	+59%	53,682	20,164	+41%	28,462	117	+81%	212
Laborers	5,782	+146%	14,250	6,805	+17%	7,943	23	+17%	27
Service Workers	18,649	+68%	31,314	13,508	+38%	18,706	80	+155%	204
Private Household Workers	10,345	+59%	4,292	4,837	-27%	3,515	18	+44%	26

<sup>a</sup>One hundred ninety-two people in Census Tract 43 did not report their occupation in 1960.

both years and higher than in the SMSA in 1960 but slightly lower than in the SMSA in 1970. Median family income in the census tract increased from \$6,816 to \$10,086 (48 percent) between 1960 and 1970. Median income of families and unrelated individuals was higher in the census tract than in the other two areas in 1960 but lower in 1970. This is probably attributable to an increasing number of college students moving into the area who generally have low incomes. The median value of owner occupied residences was higher than in Fort Worth and the SMSA as was the median rent paid by tenants.

The total number of employed people in the census tract increased by five percent. All categories of workers increased except managers and administrators. The increases in other categories of employment that are traditionally the higher paying jobs were generally lower than the increases in the city and the SMSA. This is consistent with the income figures for the three areas.

Summarizing, the median resident in Census Tract 43 was better educated than those in Fort Worth and the SMSA. Income figures did not reflect the higher level of education, however, as income in the census tract was below or only slightly higher than that in the city and SMSA. Residents of the census tract lived in houses with a higher median value than in the other two areas, and the median rent paid by tenants was also higher in the census tract.

## IMPACT OF THE STREET IMPROVEMENT ON LAND USE IN THE STUDY AREA

To examine the impact of the improvement of West Berry Street, two types of data were used. These types were:

- (1) land use change, and
- (2) opinions of people knowledgeable about the area.

### Effects on Abutting and Nonabutting Land

Specific shifts in land use during each time period were examined. Table 7, which shows changes in absolute acres, indicates not only changes from unimproved land to some improved use but also changes from one type of improvement to another. These changes could potentially point out important aspects of land use transformation that could be, in part, a result of the road improvement. Table 8 is expressed in terms of percentage changes for each land use type and time period. The percentages are adjusted for differences in lengths of time periods and for the larger acreage in the nonabutting category. This permits a more meaningful comparison between the abutting and nonabutting categories. These changes are discussed first for abutting property and then for nonabutting.

*Abutting Property.* As Table 7 indicates, very little change occurred on abutting land. Small amounts of unimproved land were developed into commercial property in both the *before period* and the *long-run after period*. When the changes are put on an average annual percentage basis, the *before period* still leads the *long-run after period*, however, the percentages are so small that little inference can be made as to the affect of the improvement of the street (Table 8).

Table 7. Absolute Changes In Land Use of Abutting and Nonabutting Acreage by Time Period and Type of Land Use Change

Type of Land Use Change	Before Period		Short-Run After Period		Long-Run After Period		Total After Period	
	1964-1968		1968-1973		1973-1978		1968-1978	
	Abutting <sup>a</sup>	Nonabutting <sup>b</sup>	Abutting	Nonabutting	Abutting	Nonabutting	Abutting	Nonabutting
	----- Acres <sup>c</sup> -----							
Single Family to Commercial	0	1.12	0	0.17	0	1.86	0	2.03
Single Family to Multiple Family	0	0.48	0	0.28	0	0	0	0.28
Single Family to Public/Semi-Public	0	0	0	0	0	1.47	0	1.47
Single Family to Unimproved	0	0	0	0.28	0	0.14	0	0.42
Multiple Family to Commercial	0	0	0	0	0	0.14	0	0.14
Mobile Homes to Public/Semi-Public	0	0	0	0	0	1.74	0	1.74
Commercial to Unimproved	0	0	0	0.14	0	0	0	0.14
Unimproved to Commercial	0.43	0.28	0	0.87	0.28	0.84	0.28	1.71
Unimproved to Multiple Family	0	0.17	0	0.86	0	0.14	0	1.00
Unimproved to Single Family	0	0	0	0.11	0	0.28	0	0.39
Total Land Changing Use	0.43	2.05	0	2.71	0.28	6.61	0.28	9.32
Improved Land	0	1.60	0	0.87	0	5.35	0	6.22
Unimproved Land	0.43	0.45	0	1.84	0.28	1.26	0.28	3.10

<sup>a</sup>Total abutting acreage equals 47.41.

<sup>b</sup>Total nonabutting acreage equals 293.54.

<sup>c</sup>One acre equals .4046856 hectares.

Table 8. Percentage Changes in Land Use of Abutting and Nonabutting Acreage by Time Period and Type of Land Use Change

Type of Land Use Change	Before Period		Short-Run After Period		Long-Run After Period		Total After Period	
	1964-1968		1968-1973		1973-1978		1968-1978	
	Abutting	Nonabutting	Abutting	Nonabutting	Abutting	Nonabutting	Abutting	Nonabutting
	----- Percent -----							
Single Family to Commercial	0	0.10	0	0.01	0	0.13	0	0.07
Single Family to Multiple Family	0	0.04	0	0.02	0	0	0	0.01
Single Family to Public/ Semi-Public	0	0	0	0	0	0.10	0	0.05
Single Family to Unimproved	0	0	0	0.02	0	0.01	0	0.01
Multiple Family to Commercial	0	0	0	0	0	0.01	0	0.005
Mobile Homes to Public/ Semi-Public	0	0	0	0	0	0.12	0	0.06
Unimproved to Commercial	0.23	0.03	0	0.06	0.12	0.06	0.06	0.06
Unimproved to Multiple Family	0	0.01	0	0.06	0	0.01	0	0.03
Unimproved to Single-Family	0	0	0	0.01	0	0.02	0	0.01
Commercial to Unimproved	0	0	0	0.01	0	0	0	0.005
Total Land Changing Use	0.23	0.18	0	0.19	0.12	0.46	0.06	0.31
Improved Land	0	0.14	0	0.06	0	0.37	0	0.21
Unimproved Land	0.23	0.04	0	0.13	0.12	0.09	0.06	0.10

*Nonabutting Properties.* The period of most change on nonabutting land, both in terms of absolute acres and average annual percentage change, was the *long-run after period*. The average annual percentage change was 0.46 as compared to 0.18 in the *before period* and 0.19 in the *short-run after period*. The higher rate in the *long-run after period* could reflect some response to the improvement of West Berry Street that provided better access and gave the area a revitalized appearance. Some of the land use change on nonabutting land was due to the redevelopment of single family residences into commercial and multiple family residential uses.

#### Opinions of Knowledgeable People

Numerous interviews were conducted with people who had knowledge of this study area. A better understanding of why the street was improved and of the land use changes that have taken place was obtained.

Those interviewed from the State Department of Highways and Public Transportation said the street was improved to more efficiently handle the volume of traffic that it was carrying. The concensus was that the elimination of head-in parking had had more affect on land use than any other aspect of the street improvement. The extent of the impact was considered to be small due to the lack of extensive land use change. Upgrading of existing structures was said to be common after the street improvement. Some conversion from residential to commercial occurred, primarily on nonabutting land.

Officials from the City of Fort Worth also said that the types of land use have not changed extensively but that several buildings have been improved. The quality of development that exists in the area is said to be better than it was prior to the street improvement.

Business people contended that most owners were opposed to the elimination of head-in parking. There was a fear that their businesses would be jeopardized. This has not been the case, however, and the business community is generally pleased with the better appearance of the street and buildings.

In summary, those interviewed did not express the opinion that the improvement of West Berry Street had instigated changes in the types of land use present in the area. Instead, the street improvement was said to have spurred a revitalization of the area in terms of improvements being made to existing structures.

### Conclusions

The West Berry Street study area was highly developed prior to the improvement of the street. There has been little change in land use since the street improvement. Abutting land has remained primarily commercial and public/semi-public. Nonabutting land has remained primarily single family residential. The upgrading of existing structures and the conversion of some residential property to commercial were said to have been stimulated somewhat by the improvement of the street. In summary, the improvement of West Berry Street is seen as a positive force in the revitalization of a previously developed area but has not caused extensive land use change.