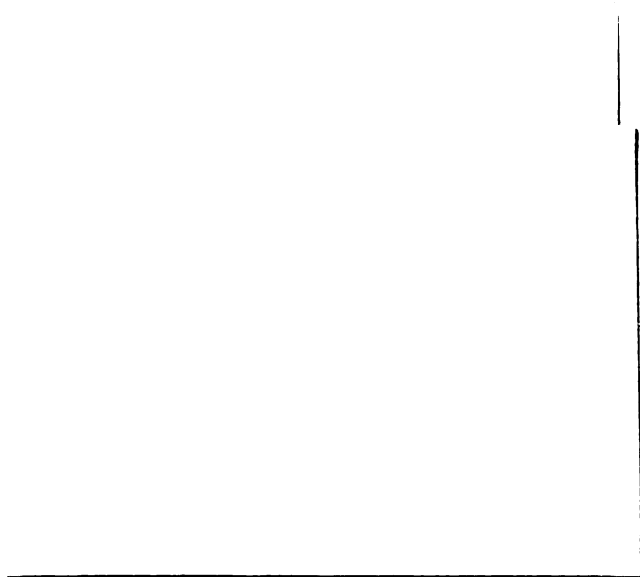


THE EFFECTS
OF A DEPRESSED EXPRESSWAY . .
A DETROIT CASE STUDY

THESIS FOR THE DEGREE OF M. U. P.
MICHIGAN STATE UNIVERSITY

RICHARD DE LA BARRE DUKE
1956



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THE EFFECTS OF A DEPRESSED EXPRESSWAY--
A DETROIT CASE STUDY

By
RICHARD DE LA BARRE DUKE

A THESIS

Submitted to the College of Agriculture of Michigan State
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1956

THESIS

ABSTRACT

Detroit has proposed a system of depressed expressways as a partial solution to its severe traffic problem. These unconventional roadways were certain to affect the land use and property values of the areas through which they passed, but the degree and extent of these effects were unknown.

The purposes of this study were twofold: to measure the degree and extent of change induced by the Edsel B. Ford Expressway, and to develop a technique whereby similar studies could be conducted.

The study area, located in southwestern Detroit was selected because it contained the oldest completed section of a typical depressed expressway and because it contained a diversity of land uses which facilitated the simultaneous investigation of any effects on residential, commercial, and industrial properties. The selection of an exceedingly large study area enabled those properties most distant from the expressway to serve as control.

Land value and assessment statistics for 1,149 property sales were obtained from the Detroit Board of Assessors. Land use changes were determined through an examination of building

permits and the Detroit City Plan Commission's studies. Land value and assessment data were placed on IBM cards, and all values were computed on the basis of dollars per square foot, land value only. Having established comparable values for each property, the IBM cards were tabulated on the basis of their location in each of nine zones paralleling the expressway. Land use data were compiled manually in a similar fashion.

The extent of the expressway's influence was generally limited to within 1,000 feet north or south of the expressway. However, the degree of expressway-induced change varied considerably among the various types of land use: slight land use changes among residential properties were a direct result of the construction; commercial properties adjacent to the expressway experienced building activity over 300 percent higher than the control properties; and industrial properties had negligible land use changes. Property values also varied considerably: residential properties adjacent to the expressway lost up to 50 percent of their value; commercial properties increased by 100 percent; and industrial properties showed a 33 percent increase over the control areas. The aggregate effect of the expressway on these property values was beneficial--properties within 1,000 feet of the expressway have maintained or increased their

values, reversing the pre-expressway trend, while values in the control area have continued to fall.

In addition to the results summarized above, some less evident long-run effects may have far-reaching consequences. The alignment of this expressway has created new problems which will be quite difficult to solve--a strip commercial development over 3/4 mile in length has been forced into permanent existence, and a small residential area has been isolated. Due to the peculiar shape and small size of the severed portion, it will be very difficult to utilize this area as a neighborhood unit as proposed by the Detroit Master Plan.

The permanence and inflexibility of the depressed expressway provides an exceptional opportunity to buffer inharmonious land uses. This quality enhances the possibility of utilizing expressways for purposes in addition to their traffic-carrying function. To insure that all potential advantages are attained, the "buffer ability" as well as the traffic-carrying function of these roadways should be carefully considered in future route determinations.



AERIAL VIEW OF THE
STUDY AREA

SOURCE: DETROIT METROPOLITAN AREA
TRAFFIC STUDY

ACKNOWLEDGMENTS

The writer wishes to express his gratitude to Professor Charles W. Barr for his assistance in the preparation of this manuscript, to John K. Wilkinson for his assistance with the IBM tabulations, to the Detroit City Plan Commission for its wholehearted cooperation in this undertaking, and to the Detroit Board of Assessors for granting access to confidential property sales records.

He is also deeply appreciative of the financial support of the Land Economics Foundation which made it possible for him to complete this investigation.

The author is especially indebted to his wife for her continued assistance and enduring patience, and to his colleague, Robert J. Werner, for a critical reading of the text and for many valuable suggestions.

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STATEMENT OF THE PROBLEM

Detroit, like all large cities, is suffering from a major traffic problem. Traffic has increased 45 percent since 1941, when its strangulating effects had already become apparent.¹ Detroit's Master Plan incorporates a system of depressed expressways as a partial solution to this problem.

These expressways differ greatly from conventional roadways in that they deny direct access to abutting properties and serve motor vehicles only, pedestrian and other nonmotor traffic being prohibited. These depressed roadways, with widths from 300 to 350 feet, are being constructed in new rights-of-way which cut great swathes through the city.

Detroit proposes 127 miles of these expressways. To date 11.8 miles have been built at an average cost of eight and one-half million dollars per mile.² Due to the permanence and high cost of

¹ Detroit Department of Streets and Traffic. City-wide Vehicular Traffic Index. Based on a continuous compilation of traffic counts taken at various separate points throughout the city, selected to reflect annual increases.

² Automobile Safety Foundation. Modern Highways for Michigan. A Report to the Michigan Legislative Highway Study Committee, Lansing, Michigan (October, 1955), p. 50.

these structures, it is pertinent that any effects of existing expressways be known to insure proper location of future routes. Research in other cities which have experienced construction of similar roadways indicates increased values and building activity among adjacent and nearby properties.³

The purposes of this study were twofold: to measure the degree and horizontal extent of changes which may be attributed to the Edsel B. Ford Expressway, and to develop a technique whereby similar studies may be conducted.

³ Westchester County Department of Planning. Traffic Impact. White Plains, New York (1954), pp. 2, 5, 6, 12, 17, 18, 23, 24.

Westchester County Department of Planning. Changes in Westchester and How People Feel About Them. White Plains, New York (January, 1955), pp. 14-16.

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L. V. Norris Engineering Company. A Study of Land Values and Land Use Along the Gulf Freeway in the City of Houston, Texas. Reproduced by Operations Division, Texas Highway Department, Austin, Texas (1951), pp. 15-17.

METHODOLOGY

Method of Control

In order to properly study an area, a method of control must be established. This is necessary to determine which changes occurred as a result of the expressway.

Two methods of control were considered for this study. The first alternative was the selection of an area similar in all respects to the study area, but lacking the presence of an expressway. Because of the difficulties inherent in the selection of such an area and because of the possibility of unknown variables affecting the control area, this method was not considered feasible. The second possibility was the selection of an exceedingly large study area, the portions farthest removed from the expressway serving as the control. It was conceivable that the expressway might have affected the value or land use of distant properties, but any effect would have been relatively insignificant. The control area, therefore, served to aid in determining the relative degree of change over a period of years between the properties both adjacent to and removed from the expressway.

Source and Collection of Data

Land use. Most of the properties within the study area were developed before the advent of the expressway. Therefore, most changes induced by this expressway would probably occur in the more subtle form of alterations of existing buildings. Building permits were examined to determine if any alterations or new construction occurred.

Upon examination, building permits were found to be filed alphabetically by streets and by house numbers within a street without regard to the year of the transaction. As a result, building permits for a period of fifty years (1906-1956) were intermingled. Due to the large number of permits within the study area (estimated twenty thousand permits), it was deemed inadvisable to examine each permit.

Because of the volume and condition of the source material, a sample technique was applied. To be successful, a sample must be taken from a homogeneous group. The 1940 and 1950 United States Decennial Censuses were examined for factors which would serve as guiding criteria. The following were selected:

1. Average value of homes.
2. Average rent.
3. Percentage of total properties for sale or rent.
4. Percentage of dwelling units owner occupied.
5. Percentage of dwelling units with central heat.

These data were recorded for the 28 census tracts within the study area and significant homogeneity was noted.

Having determined an acceptable degree of homogeneity for the area, a sample size of 600 cases (allowing 95 percent accuracy) was secured by selecting street addresses at random from the Sanborn Atlas. These randomly selected street addresses were compared with the building permit file, and the following information was recorded:

1. Date of the permit by year.
2. Reason for which the permit was issued.
3. Census tract and block in which the address was located.
4. Distance by air from the expressway to the block in which located.

Land value. Probably the most feasible criteria for determining true land value are actual property sales. Such sales reflect all the factors of supply and demand for the time and place of the sales and eliminate the bias of values determined through any process employing formula, theory, or opinion.

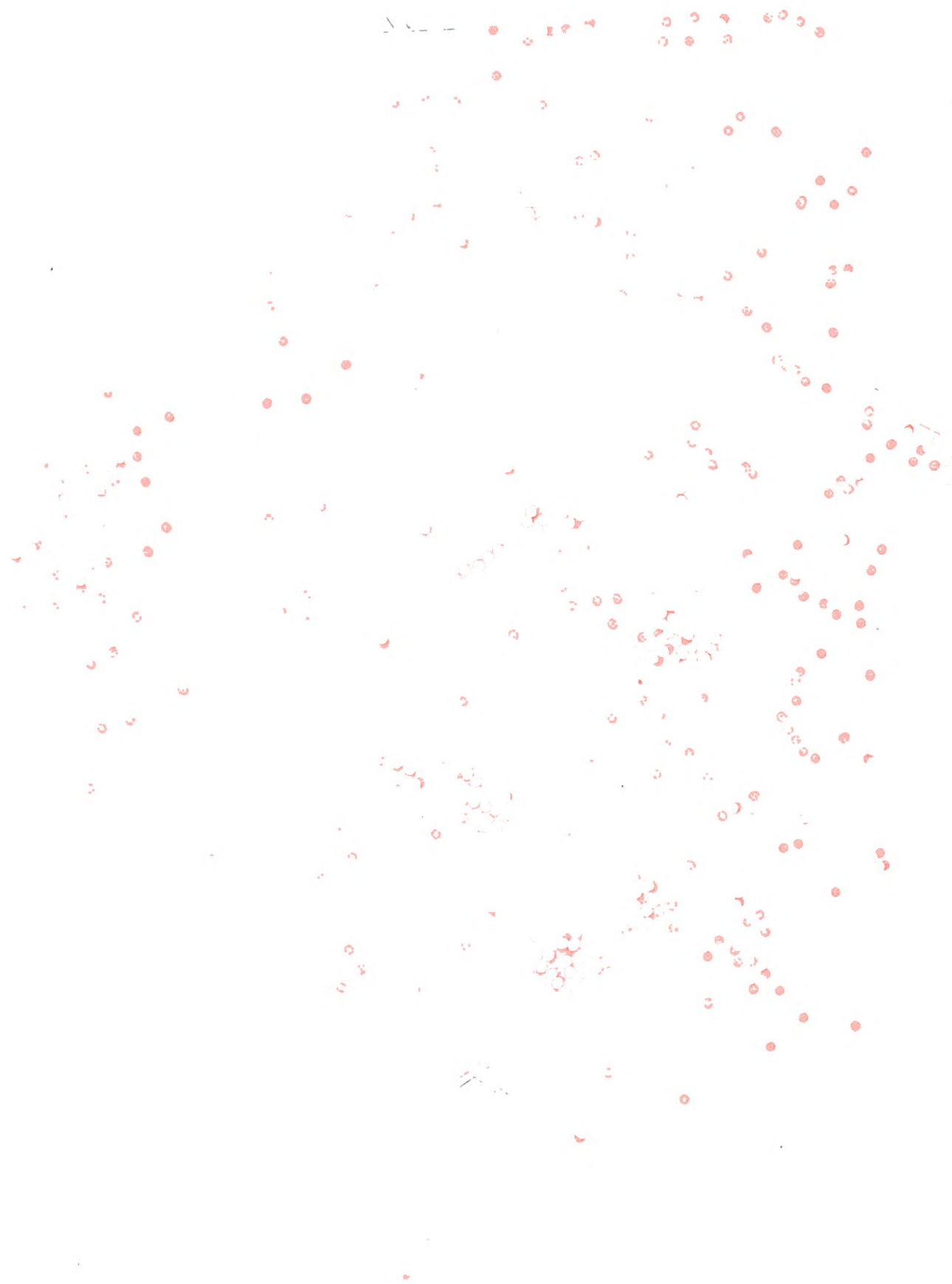
Land value statistics were obtained from 1,149 sales of property occurring between 1945 and 1954 within the study area (see Plate 2). These data were taken from records of the city assessor's office. Here, property sales occurring in the city are systematically recorded to assist in determining assessed values for properties.



PROPERTY SALES (APPROXIMATE LOCATIONS)

- BEFORE EXPRESSWAY
- ◐ DURING CONSTRUCTION
- ⊗ AFTER COMPLETION

SOURCE: LANDS DIVISION, DETROIT
ASSESSORS OFFICE
DATE: NOVEMBER, 1955





PROPERTY SALES (APPROXIMATE LOCATIONS)

- BEFORE EXPRESSWAY
- DURING CONSTRUCTION
- AFTER COMPLETION



SOURCE: LANDS DIVISION, DETROIT
ASSESSORS OFFICE
DATE: NOVEMBER, 1955

Each property deed transfer (indicating a property sale) within the City of Detroit is taxed at the rate of \$1.10 per \$1,000 of sales price.

The total amount of this tax is registered on each deed by the device of revenue stamps. A copy of each deed is forwarded from the register of deeds' office to the assessor, giving a record of each property sale.

These deeds are then processed, each sale being field-checked through the previous owner, purchaser, or agent to determine the validity of the sales price as indicated by the revenue stamps. Sales for which prices cannot be verified or corrected are not recorded.

From these records the following information was tabulated for each sale occurring within the study area for the period 1945 to 1954:

1. Date of sale by year.
2. Location and identity of property by subdivision, lot, and ward.
3. Land use at the time of sale.
4. Repeat sales.
5. The price for which the property was sold.

Dimensions of the property examined were secured from base maps of the City Plan Commission.

After these data had been collected, individual sales were keyed on a base map (scale 400 feet equals 1 inch) and the following distances were measured and recorded: from the property to the expressway by air; and by street from the property to the expressway access (functional distance).

Assessments. City tax rolls were examined to determine the assessed value of the properties for those sales recorded for this study. Land, building, and total assessments were recorded for the year in which the property sale occurred.

Processing of Data

Land use. Building permits were tabulated with the aid of a tally sheet. Total permits, permits issued for wrecking or moving residential structures, and permits issued for altering or converting residential structures were separated by distance north or south of the expressway as follows.

1. Over 2,300 feet north.
2. 1,001 to 2,300 feet north.
3. 301 to 1,000 feet north.
4. Adjacent (300 feet north to 300 feet south).
5. 301 to 1,000 feet south.
6. 1,001 to 2,300 feet south.
7. Over 2,300 feet south.

Since these data were recorded by block, it was not possible to determine the exact location of properties for which permits were issued. Because the distance zones encompassed areas of varying widths, it was necessary to adjust the data for all zones, except the fourth, to the number of permits per 600 feet.

Land value and assessments. All data recorded concerning land values or assessments were transferred to IBM cards. One card was allocated to each property for which a sale or resale had occurred during the period of study. For example, a property which sold four times during the study period was given four IBM cards. Each property was identified by a code number, and the following information was placed on each card:

1. Date of the sale by year.
2. Type of land use.
3. Repeat sales, numbered to indicate chronological sequence of sales.
4. Revenue stamp value.
5. Land, building, and total assessments.
6. Size in square feet.
7. Distance to the expressway by air.
8. Functional distance (i.e., distance by street) to the expressway.

To establish a common basis of comparison, all sales values and assessed values for each sale or resale were transformed into dollars per square foot, land value only. This was done by first converting the revenue stamp values to equivalent sales prices. The ratio of assessment for land to buildings was then computed for each sale or resale. The resultant figure was applied to the total sales price to determine the sales price of the land. In the same operation the sales and assessed values were divided by the number of square feet in each property. The resultant sales and

assessed values per square foot were punched into each card. This operation was completed for each card representing a sale or resale.

After establishing comparable values on each card in the above manner, tabulations were computed on the basis of distance from the expressway for the following property classes:

1. All properties.
2. Repeat sales.
3. Residential properties.
4. Commercial properties.
5. Industrial properties.

The procedure was as follows:

1. The IBM cards were sorted into each of the above property classes.
2. After isolation, each group of cards was sorted by distance from the expressway as follows:
 - a. Over 2,500 feet north.
 - b. 1,000 to 2,499 feet north.
 - c. 400 to 999 feet north.
 - d. 100 to 399 feet north.
 - e. Adjacent.
 - f. 100 to 399 feet south.
 - g. 400 to 999 feet south.
 - h. 1,000 to 2,499 feet south.

- i. Over 2,500 feet south.
3. Having separated the cards by distance and type, an average was computed with the aid of the calculating punch. The resultant figure was placed on a distinctive key card. The key cards were then isolated and printed. These data were plotted in the form of bar graphs displayed herein.

The above procedure was performed twice, using the air and functional distance measurements. Since the results were nearly identical, only the data computed on air distance will be referred to throughout the remainder of the study.

Explanation of Charts

The general format is consistent in all charts and will be explained here to avoid repetition.

The charts graphically present data concerning sales or assessed values, or land use, as indicated by sheet titles. Each chart portrays, in four graphs, the following data:

1. The uppermost graph indicates pre-expressway values.
2. The second graph reflects values for the period of expressway construction.
3. The third graph shows values occurring after the expressway was placed in operation.
4. The last graph compares values of the "during" and "after" periods with the pre-expressway values. The dotted lines and bars refer to the "before to during" change; the solid lines and bars refer to the "before to after" change.

Each bar within a graph expresses the average value for the distance interval noted at the top of each chart. The center bar represents values for those cases adjacent to the expressway. The bars on the extreme left and right indicate values for a band parallel to the expressway and approximately 1 mile in width. These serve as control for the study.

THE STUDY AREA

Location

The study area is located in the southwestern portion of Detroit and is bounded generally by Joy Road, Grand River Avenue, West Grand Boulevard, the Michigan Central Railroad, and the Detroit city limits. This area is approximately 4 miles northwest of Detroit's central business district (see Plate 3).

Basis for Selection

There were three prime reasons for selecting this area for study:

1. The area contains the oldest completed section of a depressed expressway in Detroit, thereby providing the longest time period during which any aftereffects may be studied.
2. The expressway passing through this area is typical of the system proposed for Detroit. Therefore, techniques developed in this study would be applicable to the remainder of the expressway system.
3. A diversity of land use exists in the area. This facilitates simultaneous investigation of any effects on residential, commercial, and industrial properties.



LOCATION MAP

- STUDY AREA
- OPEN TO TRAFFIC
- PROPOSED ROUTE

SOURCE: DETROIT CITY PLAN COMMISSION
DATE: NOVEMBER, 1955

Description

Plate 4 shows the land use within the study area before the advent of the expressway. Construction of the area occurred between the turn of the century and 1930, most of the land having been utilized for residential purposes. Major traffic arteries (Michigan, Grand River, Livernois, and Warren Avenues) were developed in typical ribbon commercial fashion. Michigan Avenue has three commercial core sections within the boundaries of the study area--at its intersection with Junction, Chopin, and Central streets. One- and two-story structures with offices or apartments on the second floor comprise the majority of the commercial structures.

An industrial belt approximately 1/2 mile in width straddles the length of the western and southern boundaries. Because the study area was limited to the city proper, only a portion of the industrial belt to the south and west was included. Another industrial corridor 1/4 mile in width lies parallel and adjacent to Livernois Avenue, dividing the study area from north to south.

Before the advent of the expressway, the traffic of the area was served by two major arteries, Grand River on the north, and Michigan Avenue bisecting the southern half of the study area. Both roads give direct access to the central business district.

POPULATION CHARACTERISTICS

A knowledge of the inhabitants of the study area, including unusual variations of nationality, race, or trends indicating internal change, is helpful in analyzing the effects of the expressway. Table I establishes the population composition and trends within the study area as compared with Detroit.

In 1950 the study area as compared to Detroit contained:

1. 9 percent less native-white residents.
2. 6 percent more nonwhite residents.
3. 3 percent more foreign-born residents.
4. 10 percent more residents born in Poland.

During the 10-year period between 1940 and 1950 the study area:

1. Lost 15 percent of its population, while Detroit gained 14 percent.
2. Lost 3 percent of its native-white population, as did the city.
3. Gained 38 percent of its nonwhite population (half the city increase).
4. Lost 16 percent of its foreign-born population (half the city decrease).

TABLE I

POPULATION COMPOSITION--1940 AND 1950

Population	Study Area		Detroit		Change 1940-1950	
	1940	1950	1940	1950	Study Area	Detroit
Total population	101,163	85,857	1,623,452	1,849,568	-15%	+14%
Native white	62%	60%	71%	69%	- 3%	- 3%
Nonwhite	16%	22%	9%	16%	+38%	+78%
Foreign born	21%	18%	20%	15%	-14%	-25%
Born in Poland	14%	12%	3%	2%	-16%	-38%

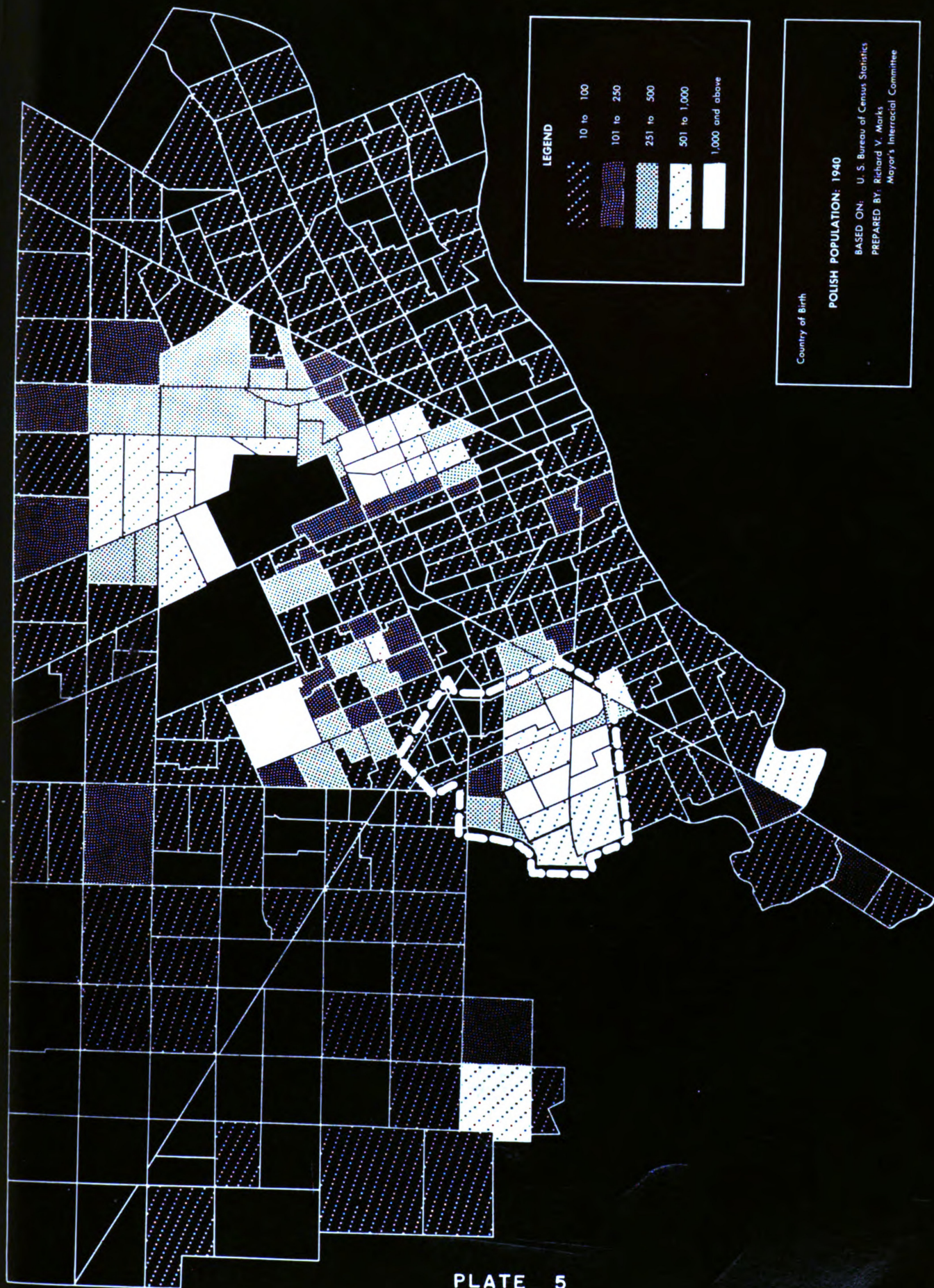
Source: 1940 and 1950 United States Censuses of Population.

Of special significance is the fact that the study area's total population decreased by 15 percent while that of the city increased 14 percent. This difference can be attributed to two factors: there was a general decrease in family size in both the study area and the city; and the study area lost dwelling units, while the city gained dwelling units.

A general decrease in family size in both areas was more than compensated for in the city by an increase in dwelling units. In other words, although there were less persons per family, there were more families in the city. However, a similar reduction in

family size, coupled with a small loss of dwelling units, resulted in a reduced population for the study area. In this case, there were fewer families as well as a smaller number of persons per family.

The comparatively high ratio of residents born in Poland indicates the presence of an ethnic group (see Plate 5). The presence of this group may account for the high volume of alterations and conversions occurring near the expressway during the construction period (see Chart 1). Even though expressway construction has destroyed their homes, the families are reluctant to move from the vicinity. Instead, they have preferred to move in with nearby families. Their acceptance into these homes indicates the existence of a close-knit group. It is quite feasible that residents might prefer to suffer certain discomforts, rather than lose their associations with the group by moving from the area. Such strong social cohesion might offset any adverse effects the expressway may have had.



Country of Birth

POLISH POPULATION: 1940

BASED ON: U. S. Bureau of Census Statistics
 PREPARED BY: Richard V. Marks
 Mayor's Interracial Committee

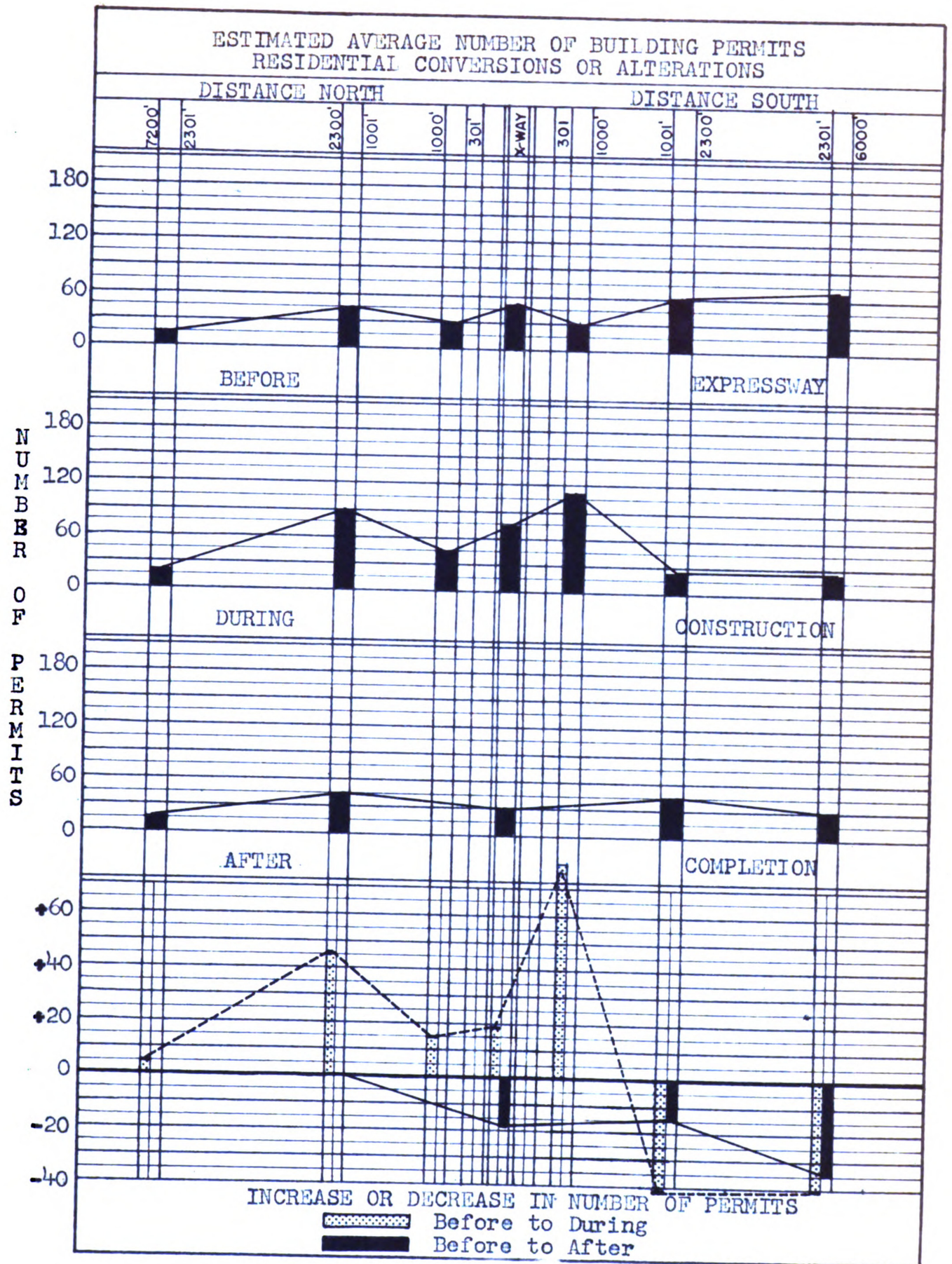


CHART 1

ECONOMIC SITUATION

Before analyzing the effect of the expressway on property values or assessments, the general economic situation should be considered. Building cost indices are useful for this purpose as property values are generally reflected by construction costs.

Plate 6 has recorded building cost indices from three sources. Note that there has been a constant rise during the period of study, with one exception--the 1949 decline in construction costs. This decrease occurred during the period of expressway construction, and data on sales value could reasonably be expected to reflect this change.

Total assessments were not readily available for the study area. However, the encompassing wards increased 11 percent, as compared to a city-wide increase of 13 percent, from the pre-expressway period through the period in which the expressway was placed in operation.⁴ Data were not available for the total assessed value of those properties removed from the tax rolls for the expressway construction.

⁴ Detroit Board of Assessors, Secretary's Office. Oral communication. (December, 1955), Ward Totals 1945-1954.

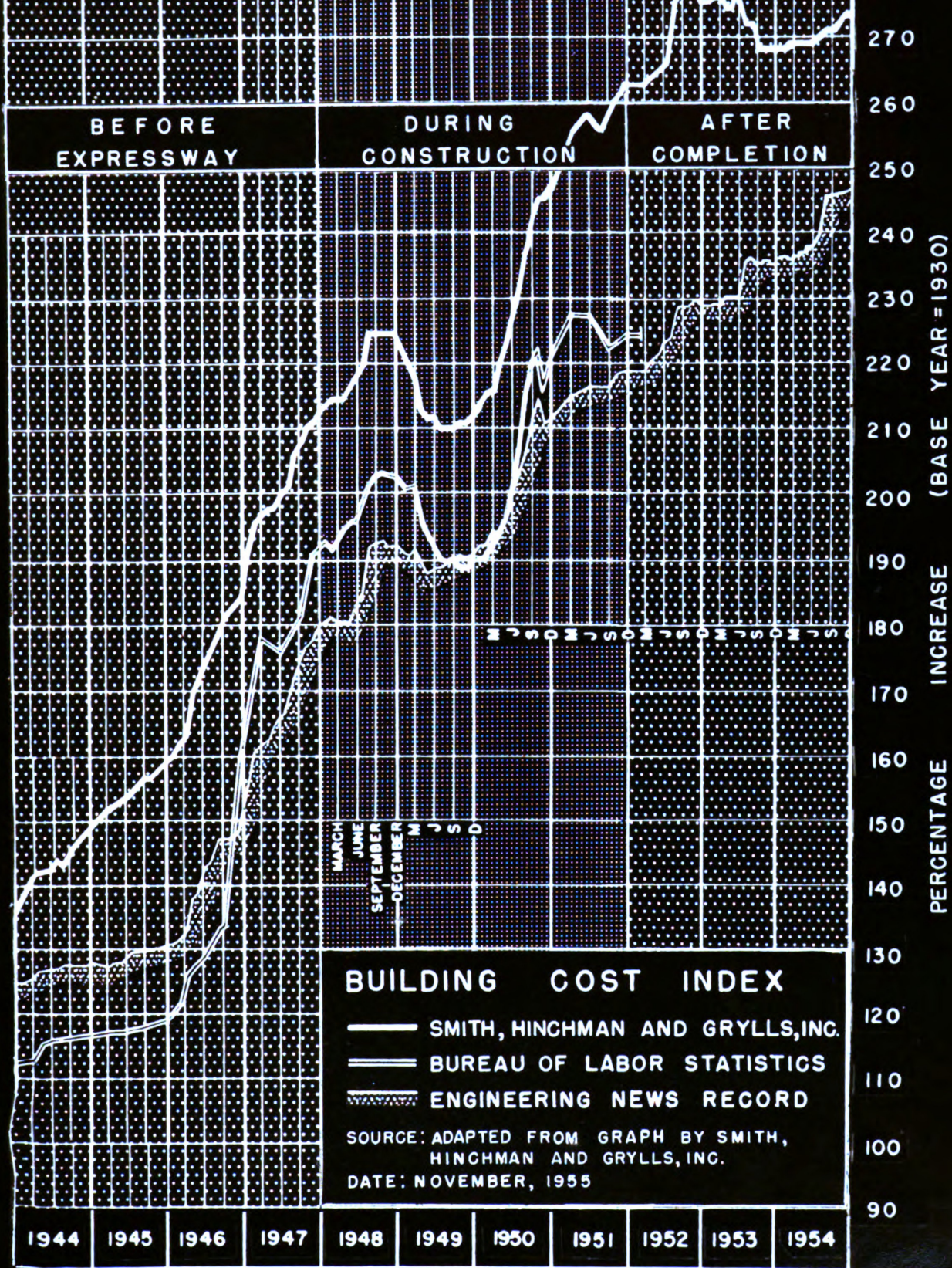


PLATE 6

An analysis of the economic situation reveals three factors of importance:

1. There has been an appreciable rise in construction costs during the study period.
2. There was a reversal of this trend during the period of expressway construction.
3. Total assessed values have increased.

EFFECTS OF THE EXPRESSWAY

Residential Properties

Residential land use. The composition of housing types within the study area as compared to Detroit is indicated in Table II. Within the study area as compared to Detroit, there are more two-family homes, and there are relatively few multifamily dwelling units.

The high percentage of two-family dwelling units within the study area is significant in that the majority of the homes were originally designed as single-family units. Attempts to retain property income have resulted in an increasing number of tenants. In the last twenty years approximately 40 percent of these homes have been converted to two-family units, with a resultant blighting influence on the area.

Table III compares the study area's housing age with that of Detroit. Within the study area over 50 percent of the dwelling units were built prior to 1920, and 95 percent of the housing was built prior to 1930.

Total dwelling units within the study area have decreased 2.1 percent since 1940. (Detroit increased by 18.3 percent during the

TABLE II
HOUSING TYPES--1950

Housing Type	Percent in Study Area	Percent in Detroit
Single family	44.8	48.3
Two-family	39.3	23.6
Multifamily	14.6	25.7
Total*	98.7	97.6

Source: U.S. Bureau of the Census, 1950 United States Census of Population, Bulletin P-D17, Table 3, U.S. Department of Commerce.

* Exclusion of census category, "1 and 2 dwelling unit, semi-detached," accounts for the failure of totals to reach 100 percent.

TABLE III
AGE OF HOUSING

Year Built	Percent in Study Area	Percent in Detroit
1940-1949	1	17
1930-1939	4	11
1920-1929	42	37
Before 1920	53	35

Source: U.S. Bureau of Census, 1950 United States Census of Population, Bulletin P-D17, Table 3, U.S. Department of Commerce.

same period.) Only a portion of the dwelling units lost by the study area were as a direct result of expressway construction. Industrial expansion, in one instance, accounted for the demolition of an entire block of housing.

An understanding of housing conditions may be derived through comparison of the United States Census data in Table IV. Within the study area as compared to Detroit:

1. Population density is higher.
2. There are fewer dwelling units with central heat.
3. Although below the Detroit percentage, dilapidation is high.

There is considerable evidence that the study area is becoming blighted. Population density, age of housing, percentage of dilapidation, and lack of central heat within the area all reinforce this conclusion. Detroit City Plan Commission's studies⁵ rating blight throughout the city have placed approximately 75 percent of the study area in need of major improvement, the remaining 25 percent requiring the more severe treatment of redevelopment.

The greatest change in residential land use occurred during the construction of the expressway. Those homes within the route

⁵ Detroit City Plan Commission. Neighborhood Conservation Map No. 2, Generalized Planning Areas (August, 1954).

Detroit City Plan Commission. Redevelopment. Master Plan Technical Report, Second Series (June, 1954), p. 10b.

TABLE IV
HOUSING CHARACTERISTICS--1950

Characteristics of Dwelling Units	Study Area	Detroit
Population per dwelling unit	3.4	3.1
Owner occupancy	56%	53%
Dwelling units with central heat	72%	82%
No bath--dilapidated	8.0%	8.7%
No water--dilapidated	2.8%	4.1%

Source: U.S. Bureau of Census, 1950 United States Census of Population, Bulletin P-D17, Table 3, U.S. Department of Commerce.

had to be wrecked or moved to make way for the facility. The decision to wreck or move was made by a city survey group. To insure compatibility in its new location, no house could be moved until the proposed site was examined. Only 27.5 percent of the homes examined were allowed to be moved.⁶

Due to the cost and difficulty inherent in moving these structures, the majority were relocated within the study area (see Plate 7). A comparison with the land use map reveals that these were

⁶ Harold Raymond, Member of the Inspection Team, Detroit City Plan Commission. Oral communication (December, 1955).



NEW LOCATIONS OF HOUSES REMOVED FROM EXPRESSWAY

- EXPRESSWAY
- CITY LIMITS
- RELOCATED HOUSE

SOURCE: CITY PLAN COMMISSION
DATE: NOVEMBER, 1955

moved to previously subdivided land which had never been utilized (see Plate 4). Thus, the expressway has aided the study area through the development of vacant properties.

An adverse effect of the expressway, not immediately obvious, is the dissection of the residential area. The unfortunate placement of the expressway leaves a small triangular-shaped area surrounded by three major arteries--Michigan Avenue, Livernois Avenue, and the expressway (see Plate 4). This area, proposed for single-family use by the Master Plan, was becoming blighted before the advent of the expressway. Doomed to isolation and too small to be an independent neighborhood, the area will be very difficult to maintain as stable residential property. In addition, its peculiar shape will create problems in any attempt to utilize this area for another land use.

Residential land values and assessments. Residential land values are represented by Chart 2. Before the expressway construction, property values ranged from 35 cents per square foot north of the expressway to under 15 cents per square foot in the extreme southern portion of the study area, intermediate values occurring in a somewhat even plane between these two points.

The lower graph, indicating increase or decrease in value, demonstrates the adverse effect of the expressway on residential

SECRET

AVERAGE SALES VALUE PER SQUARE FOOT ALL RESIDENTIAL SALES

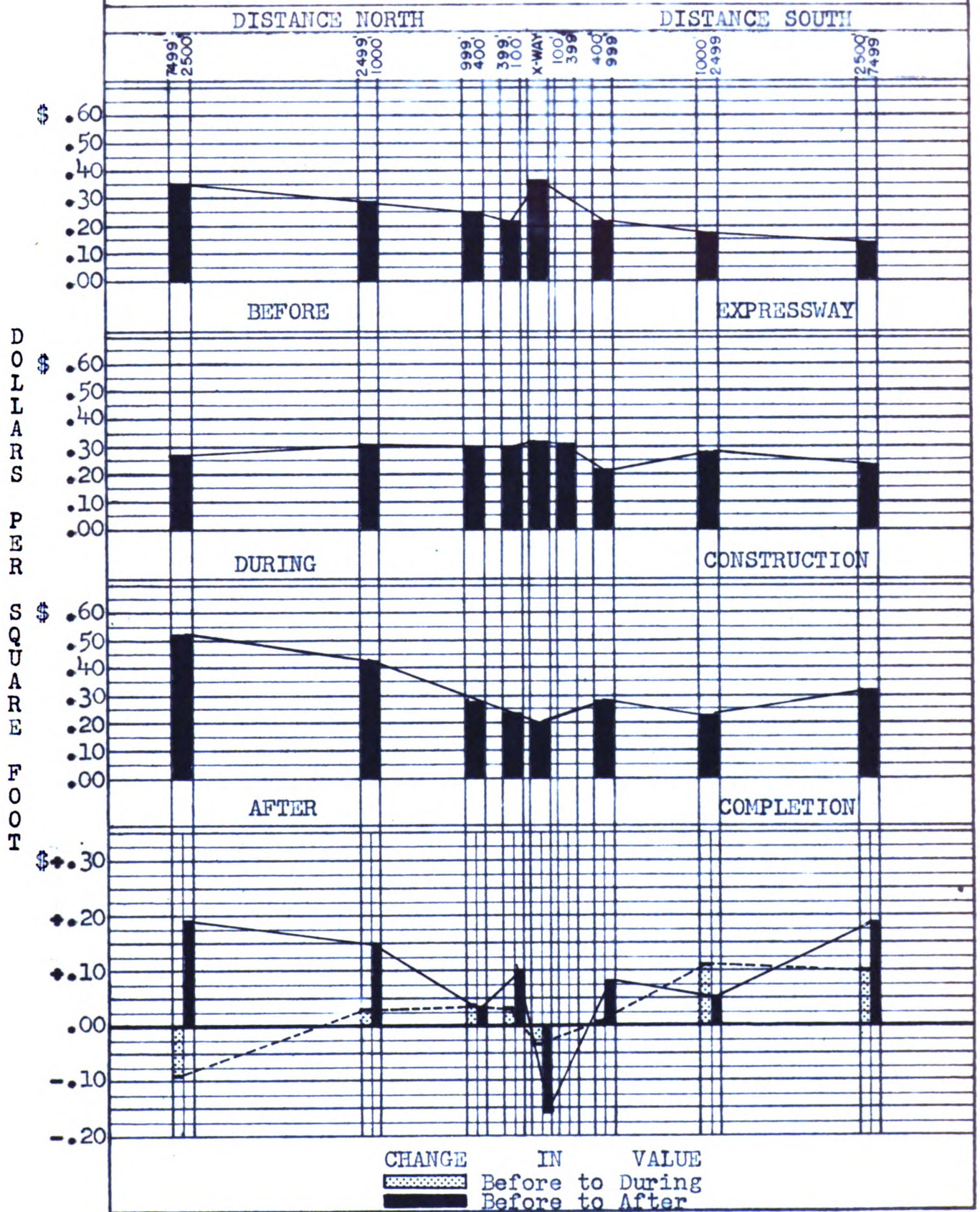


CHART 2

properties near or adjacent to it. The effects are noticeable during the period of construction, being slightly offset by the generally depressed economic situation. The detrimental effects are plainly evident during the after period. A general increase in value, ranging to over 50 percent in the control areas, was noted in all but those properties adjacent to the expressway, where a decrease of over 50 percent occurred. Increasing values are evident in distance zones progressing outward from the expressway, the detrimental effects being limited to within 1,000 feet of the expressway. The long-run effect may prove to be the reverse. In time, the advantages accruing from the expressway may offset the present adverse effects. Typical of these advantages with a possible long-run effect are: increased light and air; reduced travel time; and reduced traffic on those minor streets which were not bridged over the expressway.

Chart 3 graphically portrays assessments for the property values last discussed. The trend here is the opposite of that occurring in values. Assessments have been falling throughout the area, with the exception of those properties in the extreme southern portion of the study area. However, they have been decreasing less rapidly near the expressway. This may be due to the assessor's incorrect appraisal of the expressway's effects on these properties.

AVERAGE ASSESSED VALUE PER SQUARE FOOT ALL RESIDENTIAL SALES

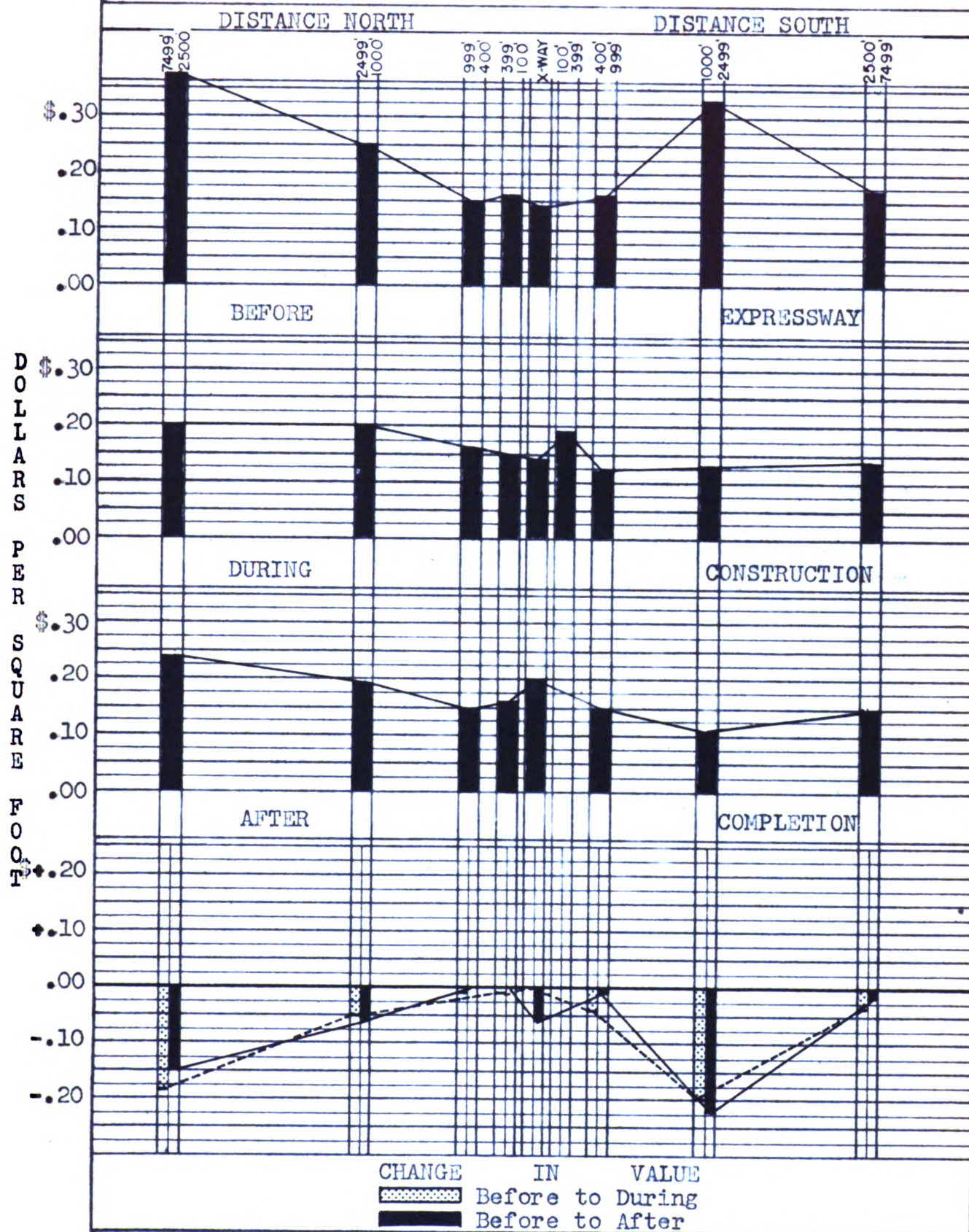


CHART 3

Commercial Properties

Commercial land use. The majority of commercial land use within the study area is located on Michigan Avenue. It is composed of a ribbon type development, the direction of growth being westerly. Plate 4, showing land use, indicates two significant facts:

1. Before the advent of the expressway, the majority of the vacant commercial land on Michigan Avenue was located along its westerly half mile.
2. This same property is paralleled by the expressway, which abuts the rear line of these properties (see Plate 1, Frontispiece).

Traffic counts reveal that the opening of the expressway has lessened congestion on Michigan Avenue, traffic volumes having been reduced about 30 percent (see Table V).

Commercial building activity along Michigan Avenue, as determined from building permits, is shown in Table VI. Along Michigan Avenue within the study area, commercial building activity increased considerably during the postwar period. However, increases during the most recent period (1952-1955) were less than either of the two preceding time periods.

Table VII, expressing commercial development, indicates the relative growth along sections of Michigan Avenue. (The adjacent properties are those along the western 1/2 mile of Michigan Avenue.)

TABLE V

24-HOUR TRAFFIC COUNTS ON MICHIGAN AVENUE

At Its Intersection With:	Before Expressway		After Expressway	
	Date	Volume	Date	Volume
Livernois Avenue	July, 1951	41,243	Oct., 1955	30,049
Clark Street	Aug., 1950	48,000	Dec., 1954	36,000
Hubbard Street	June, 1951	56,099	Nov., 1955	33,255

Source: Detroit Department of Streets and Traffic.

TABLE VI

BUILDING PERMITS ISSUED ALONG MICHIGAN AVENUE--
1940-1955

Time Period	Total Permits	Permits for New Structures
1940-1943	104	14
1944-1947	162	35
1948-1951	157	34
1952-1955	125	22

Source: Detroit Department of Safety Engineering (based on 100 percent sample).

TABLE VII

PERCENT OF INCREASE OR DECREASE IN TOTAL COMMERCIAL
BUILDING PERMITS OVER PERIOD 1940-1943

Period of Comparison	Distance South of the Expressway				
	Adjacent	100'-399'	400'-999'	1000'-2499'	2500'-6999'
1944-1947	346	125	0	-23	48
1948-1951	330	50	-20	-30	62
1952-1955	138	25	0	-33	43

Source: Detroit Department of Safety Engineering (based on 100 percent sample).

These data demonstrate that commercial activity at a distance greater than 400 feet south of the expressway was negligible, and there was considerable commercial building activity among properties adjacent to the expressway.

An inspection of annual building permits showed an exceedingly large increase during 1947 in the area adjacent to the expressway. This may indicate speculation by individuals who assumed that the expressway would pass near their properties. Although the route was not officially established until 1948, it was quite obvious that the expressway would pass through the general vicinity because

it was to connect with the completed Industrial Expressway which terminated at the city limits.

The decline of building activity among adjacent properties during the period 1952-1955 is probably due to the decreased availability of vacant commercial property.

Commercial building activity among properties in the area adjacent to the expressway increased upwards of 300 percent during the study period (see Table VII). However, several factors must be taken into account in appraising what effect the expressway has had on this activity:

1. Most of the vacant commercial land remaining on Michigan Avenue was in the area adjacent to the expressway.
2. The westerly direction of commercial growth along Michigan Avenue placed these adjacent properties next in line for development.
3. The postwar building boom gave an impetus to the development of these properties.
4. The construction of the expressway reduced congestion on Michigan Avenue and offered the advantage of time-distance savings.

It is not possible to determine the extent of the expressway's influence in this case. However, data indicate that any effect demonstrated was beneficial.

The location of the expressway in relation to these commercial properties will prove to be a detriment in the long run. Placed

adjacent to the rear lot line or alley, the expressway permanently blocks commercial expansion. An excellent opportunity to provide parking was missed, and there remains no possibility of efficiently consolidating these properties for commercial use. This unfortunate alignment has resulted in a permanent ribbon type commercial area along Michigan Avenue. Highly inefficient and economically unprofitable, this type of development is against all modern principles of commercial design.

Commercial land values and assessments. The expressway's effect on commercial land value is difficult to evaluate because of the heterogeneous nature of these properties. Considerable difference of character is noted along the length of an artery having commercial land use. This variance in quality accounts for the range in property values in Chart 4.

Commercial properties within 1,000 feet of the expressway have increased in value, those properties just south of the expressway having increased approximately 100 percent. However, the control area decreased in value, with the exception of those properties 1,000 to 2,500 feet south of the expressway. The increase of values in this zone (1,000 to 2,500 feet south of the expressway) is probably due to local factors as this distance interval includes one of the

AVERAGE SALES VALUE PER SQUARE FOOT ALL COMMERCIAL SALES

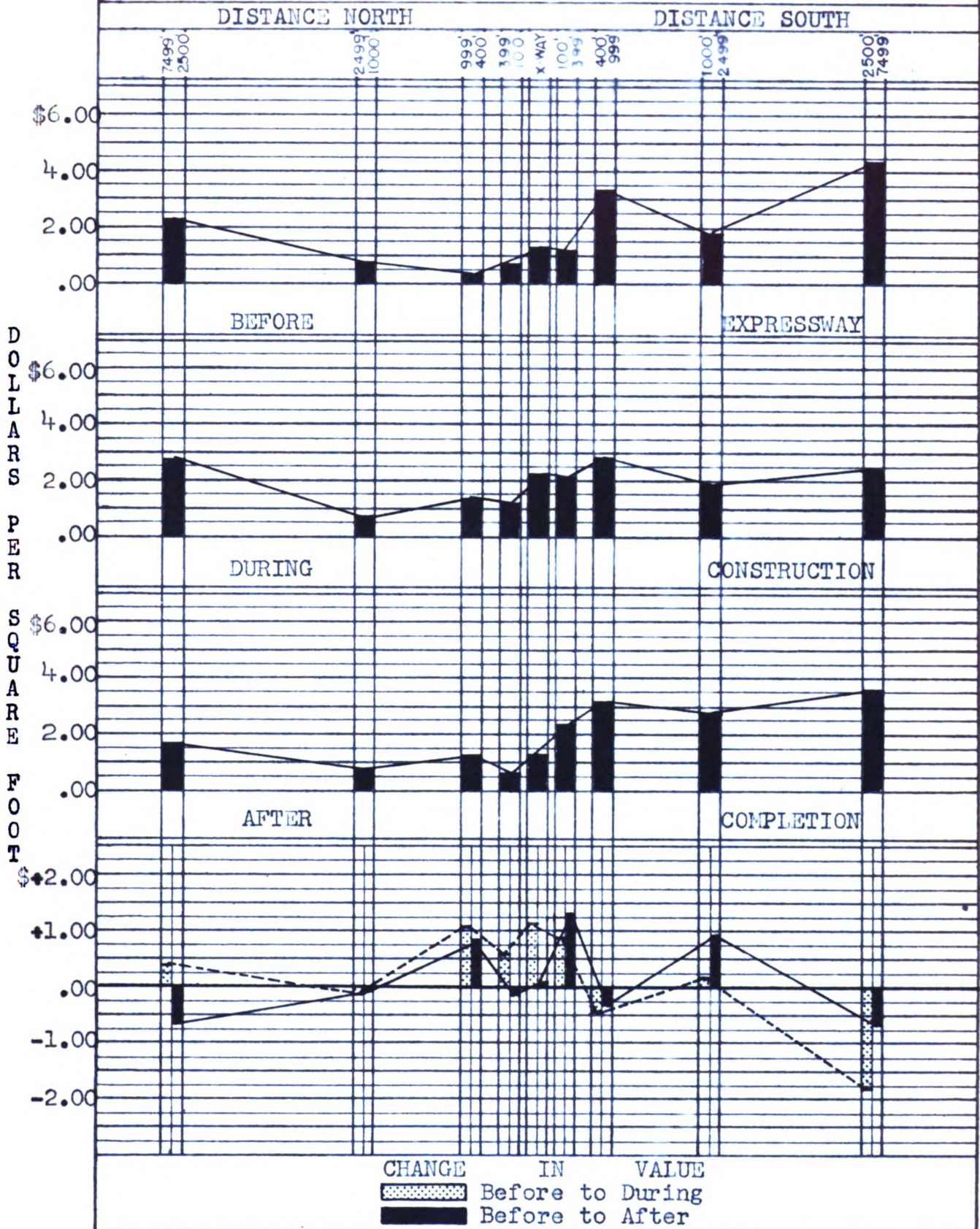


CHART 4

more stable shopping areas along Michigan Avenue. In addition, the expressway is more readily accessible at this point due to the proximity of a major traffic artery, Livernois Avenue.

Some of the land value increases occurring near the expressway appear to have been speculative, increases noted during the construction period being lost during the next time period.

Chart 5 indicates that assessments of commercial properties follow very closely the pattern of sales values. It is interesting to note, however, that the value increases of properties adjacent to the expressway were not followed by assessment increases. Thus, it becomes more strongly evident that the increases were of a speculative nature.

Industrial Properties

Industrial land use. Information obtained from a survey conducted by the Detroit City Plan Commission permits the industrial developments within the area to be compared with those of the city (see Table VIII). A comparison of the study area's industry with that of Detroit reveals that:

1. Generally the study area was developed more recently.
2. Density, measured by land coverage and employment, is quite similar.

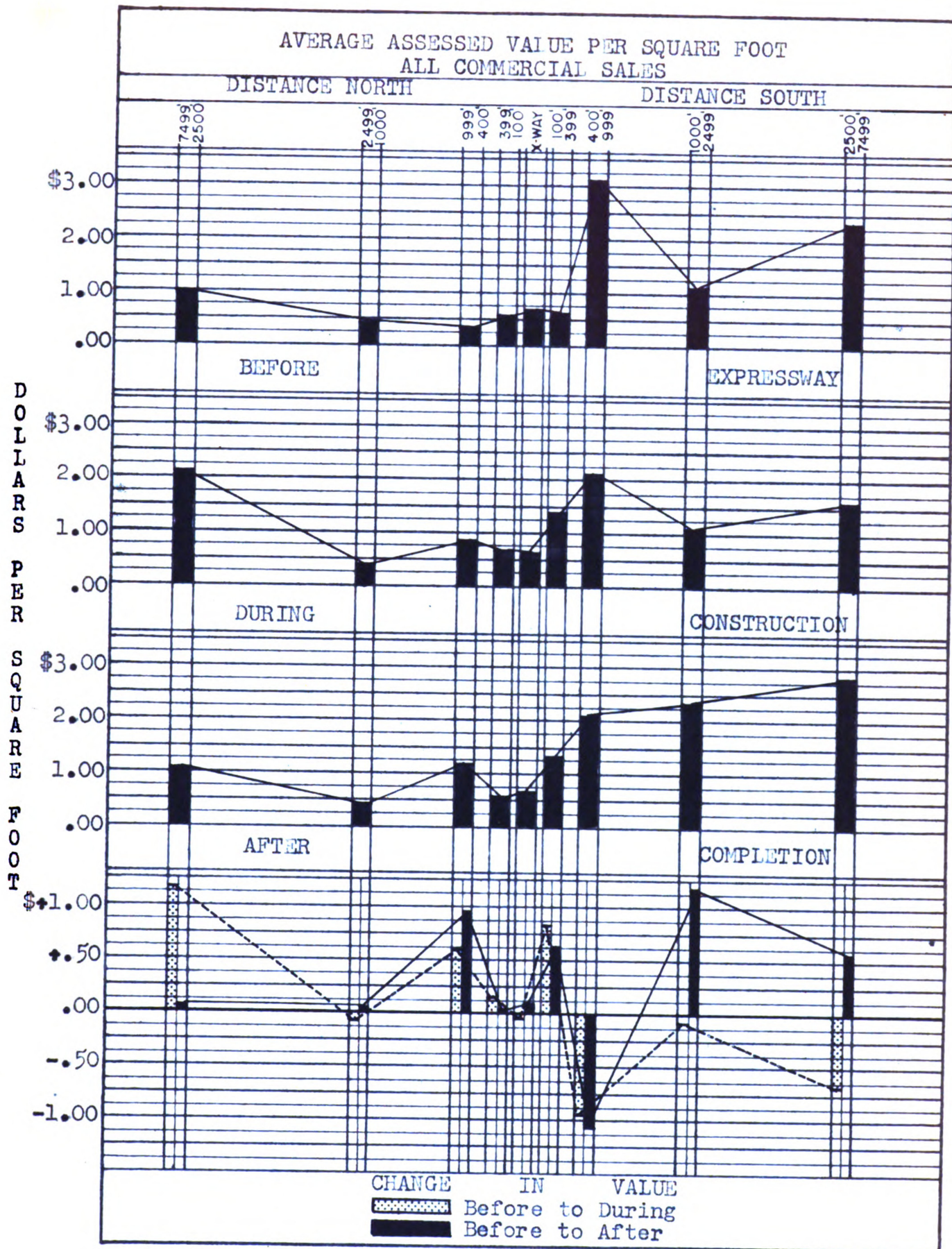


CHART 5

TABLE VIII
CHARACTERISTICS OF INDUSTRY--1954

Industrial Factor	Study Area	Detroit
Median age of structures	24 years	28 years
Median coverage of lots by structures	58.9%	58.8%
Median number employed	32.8 persons	31.8 persons
One-story structures	76.0%	71.5%
Planning to move	14.1%	17.4%
Owner occupied	83.9%	70.9%

Source: Detroit City Plan Commission (unpublished data).
Detroit Industrial Questionnaire, 1954.

3. In the study area there are more one-story buildings (the height most desired by industrialists), more owner occupancy, and fewer firms planning to move.

Additional information, based on attitudes, indicated the owners' satisfaction with their plants (see Table IX).

The existence within the study area of a higher than average percentage of owner occupancy, newer buildings, and one-story buildings is probably directly correlated with the lower percentage of plants planning to move from the area. These facts suggest that

TABLE IX
SATISFACTION EXPRESSED BY PLANT OWNERS

Attitude Toward:	Percent Satisfactory	
	Study Area	Detroit
Street pattern	74.6	62.3
Section in which located	86.6	84.7
Plant layout	76.9	78.3
Plant conditions	92.0	90.8
Plant size	79.8	77.4

Source: Detroit City Plan Commission.

stability of industry is greater in the study area than in the city.

Satisfaction expressed in Table IX further confirms this.

To determine what effect the expressway may have had, the number of new plants and additions to existent buildings was obtained. Growth occurring through new plant construction is indicated by Table X. Construction of new industrial plants within the study area was below the city average during 1946-1950 (the period of expressway construction), and was only one-fourth that of the city during the period 1951-1954 after the expressway had been placed in operation.

TABLE X
PERCENT OF TOTAL PLANTS BY YEAR BUILT

Year Built	Percent of Total Plants Built Within Time Period		
	Study Area	Detroit	Difference
Before 1941	78.8	68.5	+10.3
1941-1945	8.7	10.3	- 1.6
1946-1950	10.6	13.7	- 3.1
1951-1954	1.9	7.5	- 5.6
Total	100.0	100.0	0.0

Source: Detroit City Plan Commission.

Expansion of existent plants is another index of industrial growth. Table XI shows the growth that occurred through additions to existent plants. The number of additions within the study area as compared to Detroit:

1. Were higher for every time period.
2. Were markedly higher between 1946-1950, the period of expressway construction.
3. Had a relative decrease during 1951-1954, after the expressway had been placed in operation.

Industry within the study area appears to have had above average vigor (newer buildings, more one-story plants, fewer concerns

TABLE XI
PERCENT OF TOTAL PLANTS HAVING ADDITIONS

Year Added	Study Area	Detroit	Difference
Before 1941	46.6	37.7	+ 8.9
1941-1945	20.9	13.4	+ 7.5
1946-1950	40.9	25.0	+15.9
1951-1954	32.4	28.4	+ 4.0

Source: Detroit City Plan Commission.

planning to move, and higher owner occupancy) but although ample vacant industrial land was available, very little new construction occurred.

There were significantly more plant additions during the period of expressway construction. One large plant, located at the intersection of Livernois Avenue and the expressway, bought and demolished an entire block of housing to make room for expansion during this period. Although direct access to the expressway was achieved through this action, the expansion was predicated on other factors; and the existence of the expressway had no influence on

this expansion.⁷ After the expressway was placed in operation, plant additions were just above the city average and there was a decrease in the number of new plants built.

The above-average character of the study area's industry along with the existence of vacant land should have induced considerable growth during the postwar period. Therefore the expressway, coupled with these factors, should have increased growth even more. However, the small amount of growth recorded indicates that the expressway had little effect on the study area's industry.

Industrial land values and assessments. Due to the nature of the land use, difficulties were encountered in analyzing industrial sales trends. The scattered location of industry does not facilitate analysis of value trends. The land use map shows the location of the industrial properties within the study area (see Plate 4).

Chart 6 indicates the pattern of industrial sales value. Note the marked increase in values of properties adjacent to the expressway. The properties whose sales are reflected in these values are

⁷ L. E. Dalton, Works Manager, Kelsey-Hayes Wheel Plant. Oral communication. "Plant expansion was planned before the expressway was known . . . the expressway did not enter into the decision. Any effect of the expressway probably was beneficial." (February 6, 1956.)

AVERAGE SALES VALUE PER SQUARE FOOT ALL INDUSTRIAL SALES

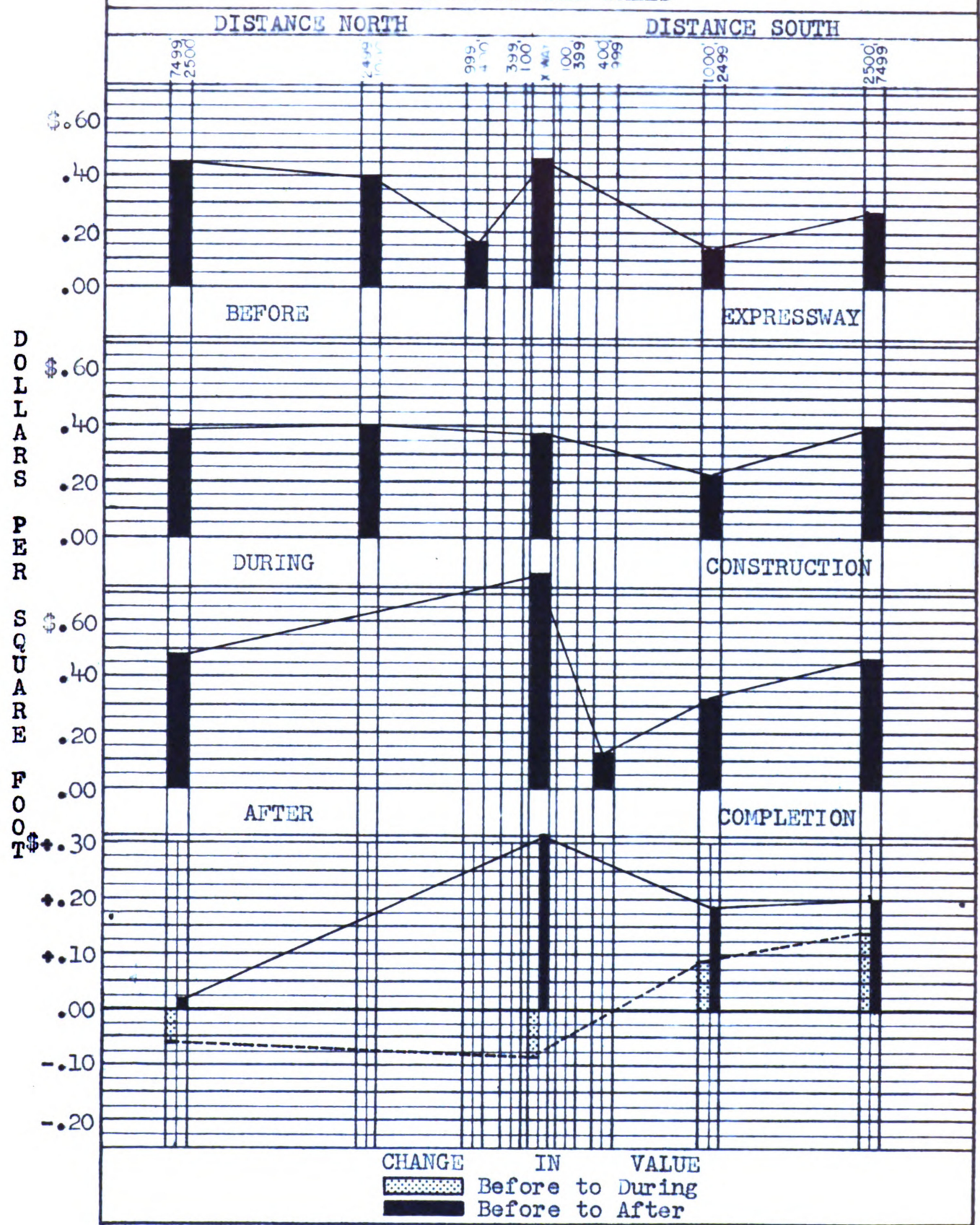


CHART 6

located at the northeast corner of the intersection of the expressway with Livernois Avenue (see Plate 4). During the construction of the expressway, the large plant to the east bought these homes and expanded into this area in accordance with the Detroit Master Plan. The proximity of these properties to this major intersection, coupled with their industrial potential, has resulted in increases upwards of 75 percent of their original value.

Similar increases were evident in the southern portion of the study area. It was difficult to determine the exact extent of the expressway's influence on these more distant properties. However, the increases occurring here were probably due to the same factors which caused the general increase of property values indicated earlier (see Plate 6).

Assessments of industrial properties indicated several major dissimilarities (see Chart 7). Properties adjacent to the expressway have decreased in assessed value by over 50 percent, whereas their sales value increased by over 75 percent. Information from the assessor's office reveals this to be the result of a time lag. Originally assessed as residential properties, these values dropped as the homes were destroyed for industrial expansion. Current assessment of the property (1955 assessments were not included in the data) is

AVERAGE ASSESSED VALUE PER SQUARE FOOT ALL INDUSTRIAL SALES

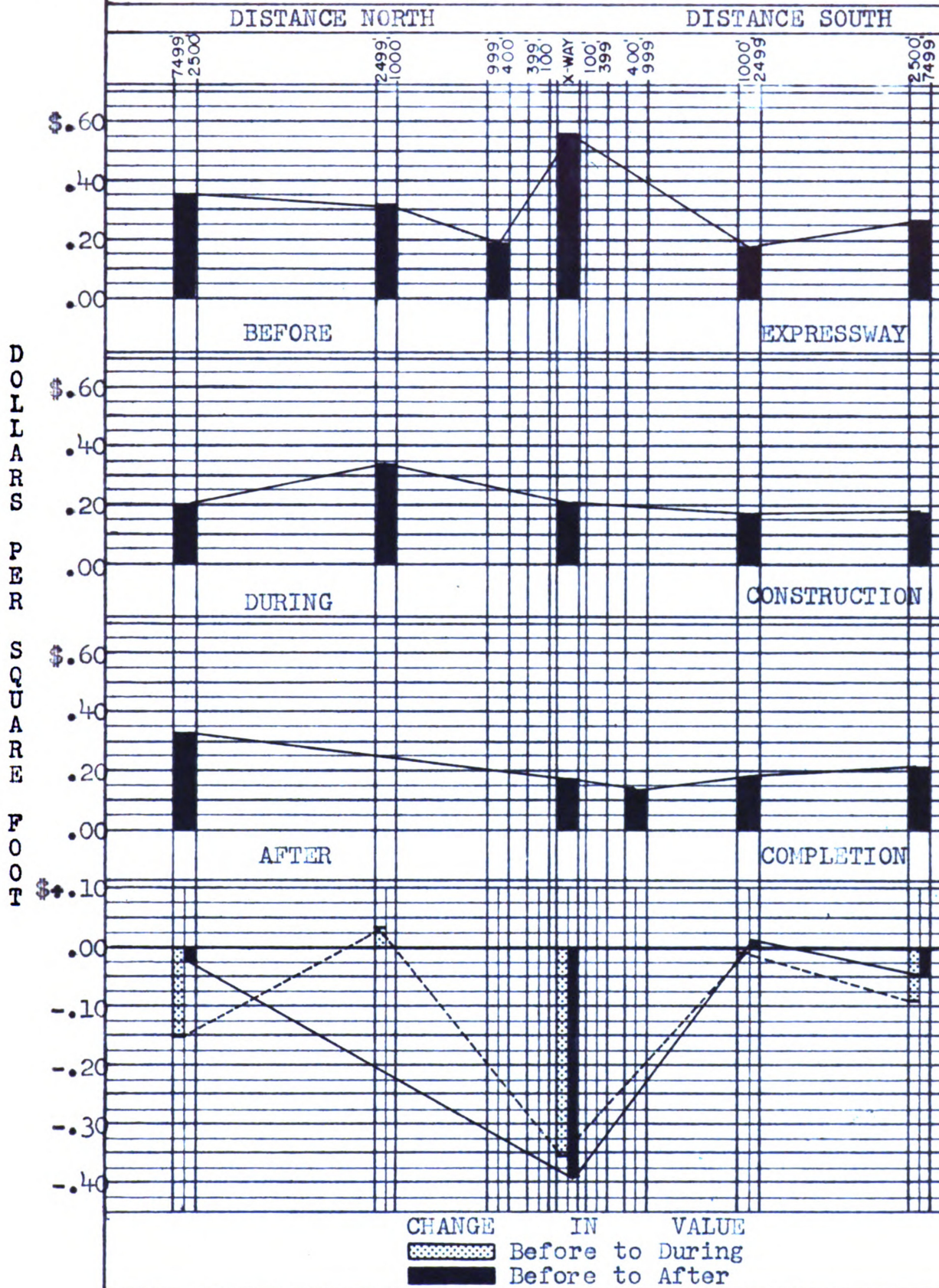


CHART 7

commensurate with its new capacity, a reassessment having been made after the completion of the addition.

In light of the increasing values reflected by sales, the stable or slightly decreasing level of industrial assessments in the southern control portion of the study area may be an indication of the extent of the expressway's influence. The area had been declining in value (reflected by assessments) but recently began to gain value (indicated by sales). A reappraisal of this property for assessment purposes may be in order.

Aggregate Land Values and Assessments

Classes of land use have been examined, the effect of the expressway on their respective values being noted. Due to the differing effects on each type of property, and the wide range of values, a similar comparison was made for the aggregate of sales recorded, the results appearing in Chart 8. Several interesting factors were indicated by the data:

1. In general, the "before to during" and "before to after" values were in alignment, the latter reflecting greater change in most cases.
2. The general trend has been toward lower values.
3. Property within 1,000 feet of the expressway increased slightly, or decreased less than values in general.

AVERAGE SALES VALUE PER SQUARE FOOT ALL SALES

DISTANCE NORTH

DISTANCE SOUTH

7493' 2500' 2499' 1000' 999' 400' 399' 100' XWAY 100' 399' 400' 999' 1000' 2499' 2500' 7499'

DOLLARS PER SQUARE FOOT

\$3.00
2.00
1.00
.00
BEFORE
EXPRESSWAY
\$3.00
2.00
1.00
.00
DURING
CONSTRUCTION
\$3.00
2.00
1.00
.00
AFTER
COMPLETION
\$.50
\$.00
-.50
-1.00
-1.50

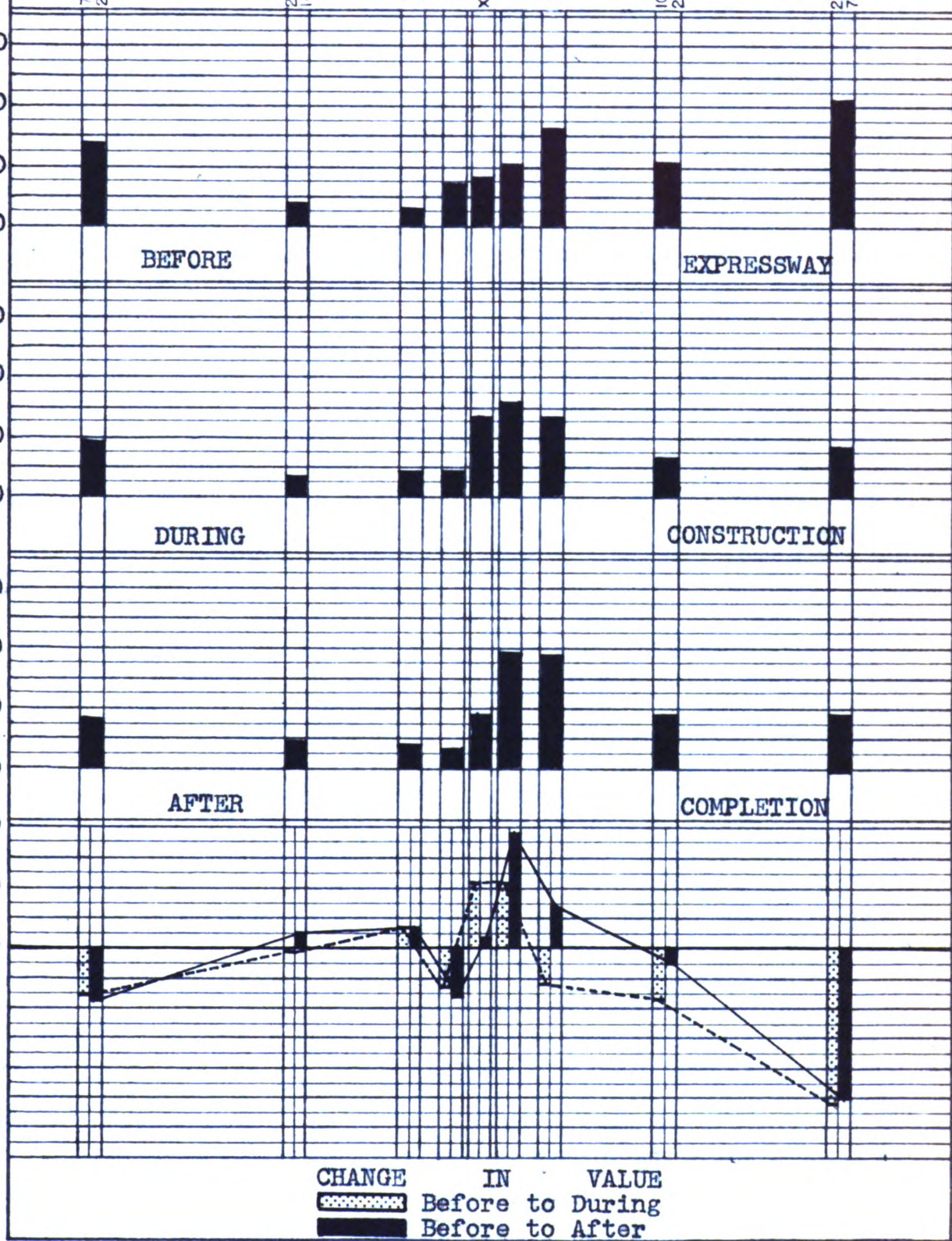


CHART 8

The over-all effect of the expressway has proven to be beneficial. Although few total value increases occurred, there has been a general tendency toward stabilization. Pre-expressway values have been maintained near the expressway, while the control areas to the north and south have fallen considerably.

Aggregate assessments indicated that in general, assessments have followed the trends established by property sales (see Chart 9). The most noticeable exception occurred between 400 and 1,000 feet south of the expressway. Here, assessments have fallen at about the same rate as properties further to the south, while property sales indicated that values have remained stable.

Aggregate Land Values as Indicated by Repeat Sales

When the same property was sold more than once during the study period, it provided a very desirable check upon the general trends.

Repeat sales were classified as those sales involving more than one transfer of the same property during the study period. These have been included in the previous analysis and are also shown independently in Chart 10. The change in value of repeat sales has followed a pattern similar to that of all sales, with one major exception. Properties within 1,000 feet of the expressway

AVERAGE ASSESSED VALUE PER SQUARE FOOT ALL SALES

DISTANCE NORTH

DISTANCE SOUTH

DOLLARS
PER
SQUARE
FOOT

\$1.50

1.00

.50

.00

BEFORE

EXPRESSWAY

\$1.50

1.00

.50

.00

DURING

CONSTRUCTION

\$1.50

1.00

.50

.00

AFTER

COMPLETION

\$.50

+.25

.00

-.25

-.50

-.75

CHANGE IN VALUE
Before to During
Before to After

CHART 9

AVERAGE SALES VALUE PER SQUARE FOOT ALL REPEAT SALES

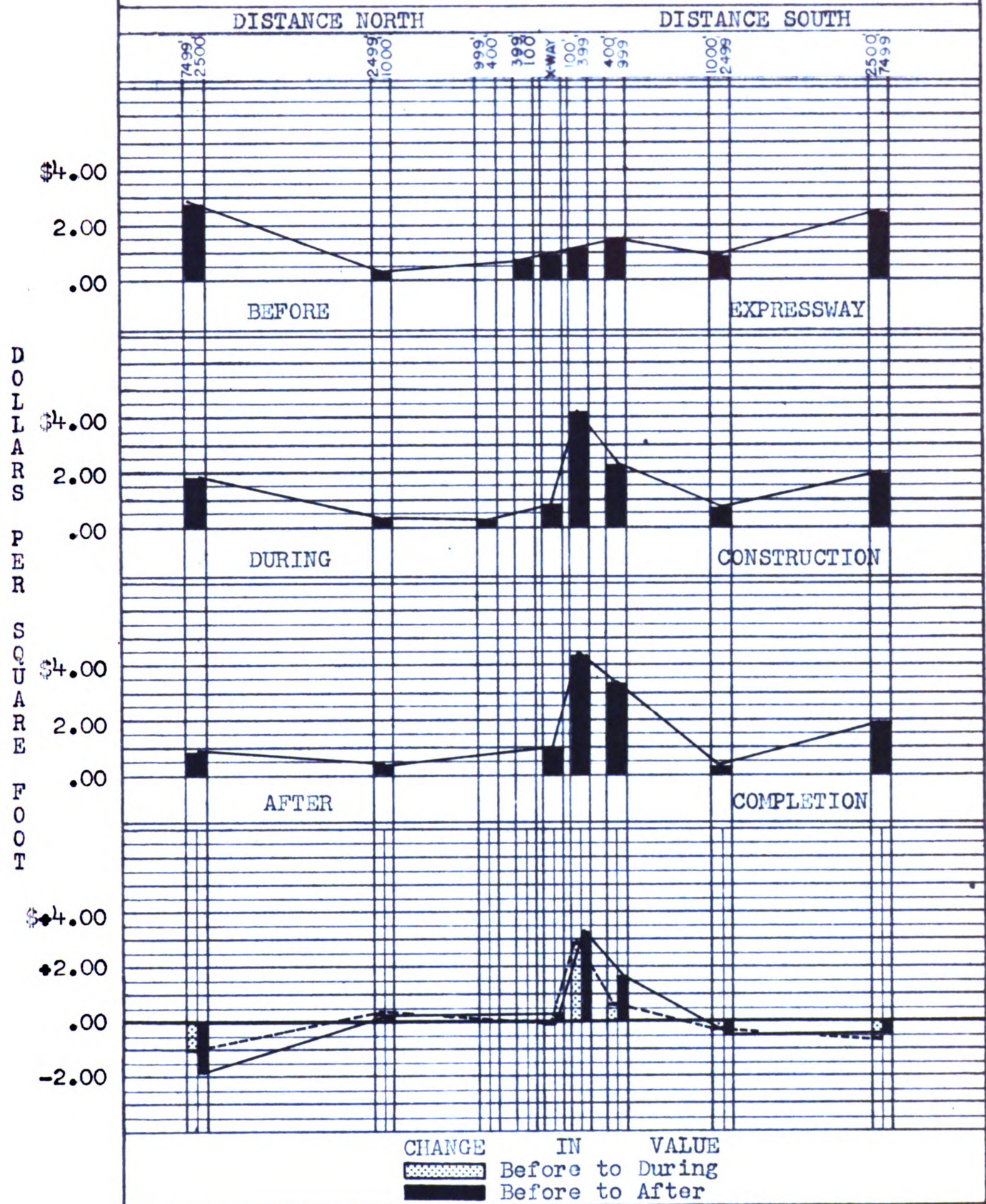


CHART 10

have increased markedly in value over the general level, reaching a 200 percent increase just south of the expressway.

These repeat sales are probably most indicative of the expressway's effects because they indicate trends in properties sold more than once.

A review of the assessments for these same properties indicated a similar pattern (see Chart 11). An apparent over-assessment of properties close to the expressway during the period of construction was corrected before the "after" period.

AVERAGE ASSESSED VALUE PER SQUARE FOOT ALL REPEAT SALES

DISTANCE NORTH

DISTANCE SOUTH

DOLLARS
PER
SQUARE
FOOT

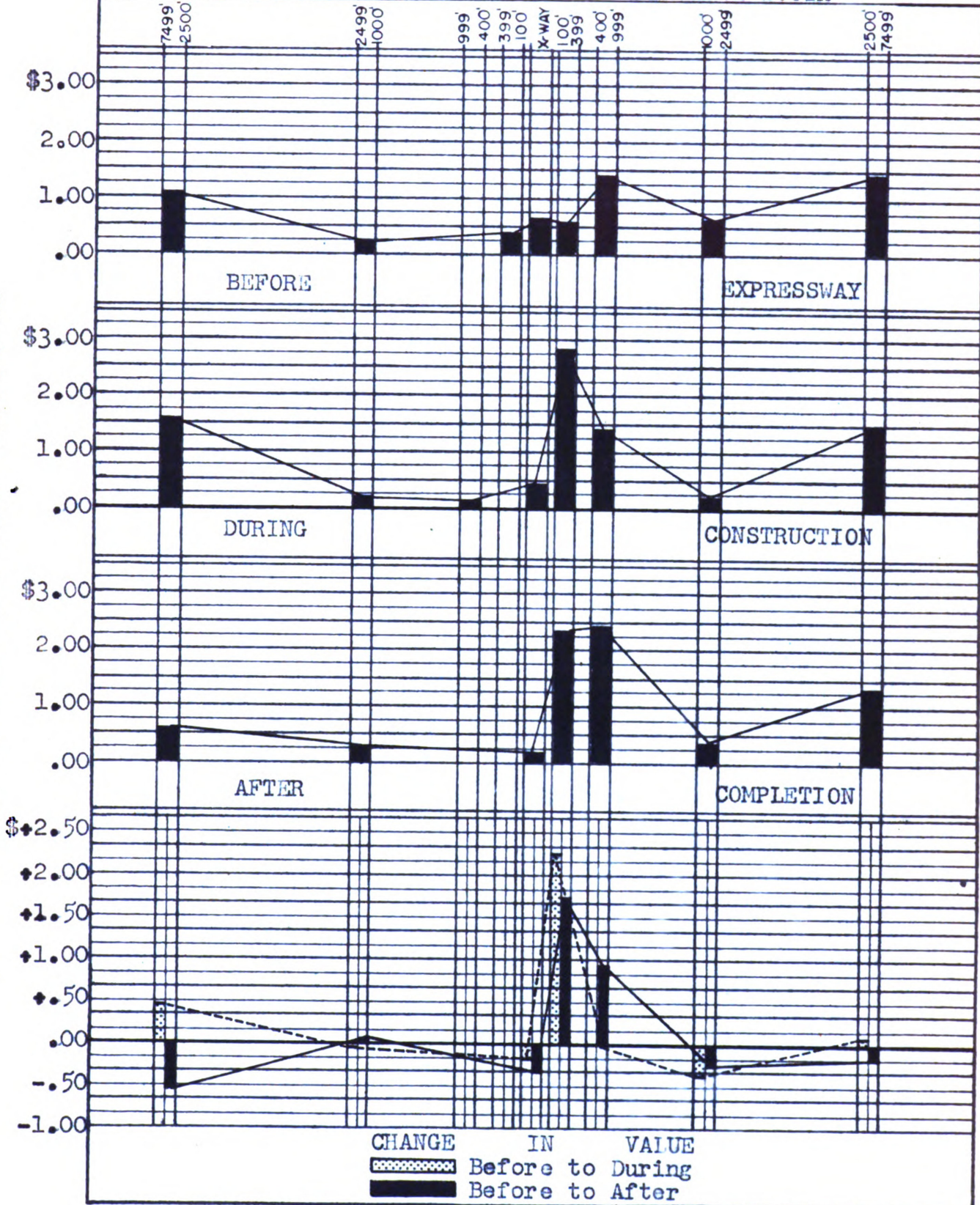


CHART 11

CONCLUSIONS

The purposes of this study were twofold: to measure the degree and extent of change induced by the expressway, and to develop a technique whereby similar studies could be conducted.

In fulfilling the first purpose, the following discoveries were made:

1. The degree of expressway-induced change varied considerably between residential, commercial, and industrial properties.
 - a. Residential.
 - (1) Land use changes were limited to movement of homes displaced by the expressway.
 - (2) Properties lost up to 50 percent of their value.
 - b. Commercial.
 - (1) Building activity increased over 300 percent.
 - (2) Properties had value increases of over 100 percent.
 - c. Industrial.
 - (1) Land use changes were slight and occurred through additions to existent plants.
 - (2) Properties increased in value at the same rate as the control area, but reached levels one-third higher.

- d. The aggregate effect on property values has been beneficial. Properties within 1,000 feet of the expressway have maintained their previous values or increased slightly, while values in the control area have fallen.
2. The extent of the expressway's influence was in most cases limited to within 1,000 feet north or south of the route.

The technique developed for this study has proven to be workable and satisfactory in Detroit. Its basic procedures should be adaptable to other communities for similar research studies.

EPILOGUE

The results summarized above, while significant, are of minor importance in relation to other less evident but very real long-run effects. The alignment of this expressway has created new problems which will be quite difficult to solve. This placement of the expressway adjacent to the rear of the strip commercial properties has forced a most undesirable type of development into permanent existence.

The selection of this route for the expressway has isolated a small residential area in opposition to the "neighborhood theory" principle. This theory, adopted in the Detroit Master Plan, subdivides residential areas into self-contained units. These various neighborhoods are to remain intact, with major traffic arteries surrounding them. In this case, the severed area is too small to be self-sufficient.

The primary function of depressed expressways is to move vehicular traffic. However, this does not preclude the possibility of these routes serving additional purposes--as a means of redevelopment and as a buffer between residential and nonresidential properties. In the case at hand, both possibilities existed, yet neither were fully realized. An excellent opportunity to redevelop the marginal strip

commercial properties along Michigan Avenue was missed, and the barrier effect of the expressway will work against the isolated residential section.

Economic considerations have a direct influence on the location of such a route; however, false economies resulting from the procurement of the cheapest right-of-way may prove very costly to future generations.

In conclusion, it appears that the one most important characteristic of the depressed expressway is its sphinx-like permanence. This factor should be carefully considered in the determination of other proposed routes to insure the compatibility of these facilities with their future surroundings.

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