

A Method of Measuring Changes in the Value of Residential Properties

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● SECTION 210 of the Federal Highway Revenue Act of 1956 calls for the identification and measurement of benefits arising from highway improvements. The benefits may be either direct or indirect and may accrue to either users or non-users. Included among the non-user benefits are increases in real estate values that take place in the areas served by new highways.

The value of land is largely dependent upon the use to which it is put but the relation between land use and land values is a curious one. Generally speaking, a prospective change in land use will produce a change in land values and a change in land values will cause a change in land use. Land use and land values are not, however, wholly interdependent. Shifts in land use almost always are accompanied by changes in land values but the value of land may fluctuate even when its use or prospective use remains fixed.

A new highway has a decided impact upon land values if it creates changes in land use. Sometimes the appreciation of land values is spectacular, especially at interchanges where motels, filling stations, and restaurants compete for a limited number of sites. Land at these strategic locations may increase in value many times over. Manufacturing companies also may bid the price of land beyond the reach of other potential users if it meets certain industrial requirements. Changes in land values that occur directly from changes in land use are an important area of highway benefit research.

Perhaps equally important but frequently unnoticed are changes in land values that are not derived directly from changes in land use. Some properties increase or decrease in value although no change is made or contemplated in their present use. Residential land values may appreciate if the new highway acts as a stimulus for economic growth. Land tends to increase in value when new manufacturing companies, new businesses and new families move into the area. Even the prospect of a more prosperous community may increase the value of real estate. The gain in land values is shared by the established residences where no change in land use is planned.

This report sets forth a method of recording and analyzing changes in the value of residential properties. If these changes can be related to the program of highway development, they will constitute an important measure of non-user benefits. A small annual appreciation in residential property values attributable to a new highway amounts to a very large benefit when it is applied to the thousands of property owners in the area affected. The individual gains may be insignificant compared to some of the windfalls that accrue to the owners whose land has been put to a new use but the aggregate gain to all residential property owners may be far greater than the aggregate gain enjoyed by the owners whose land has been transferred to a new or more intensive use.

Of more importance perhaps to highway planners than the amount of accrued benefits is the wide distribution of non-user benefits. ("Economic impact research can be invaluable for general public relations activities involving highway improvement" (1).) Those benefits that accrue to residential property owners directly affect a large number of individuals and probably wield a greater and more favorable influence upon public opinion than the benefits reaped by the few property owners who made large profits because their land was strategically situated.

Land values, for this type of study, may be measured in a number of ways; the three most widely used are: (1) the appraisal method, (2) the assessment method and (3) the market method. Each method has its advantages and its disadvantages. The market expression of land value or the price that is actually paid for a property is perhaps the most realistic measure of its value and is the one used in this project.

Changes in market prices for land do not reflect accurately changes in land values unless the land under consideration is uniform in quality. In this study comparisons

have been limited to those of identical properties, that is, properties in which there has been no change in the assessed valuation between sales. In southern New England and perhaps elsewhere the kind and quality of land varies from field to field and the required uniformity can be achieved best by restricting the analysis to the resale of identical properties. Otherwise properties sold in any one year or in any one area would not be strictly comparable and price differentials would reflect their basic dissimilarities as much as any change in true value. If a new highway has an effect on land values, price changes that occur over a period of time for identical properties would be a measure of the impact.

Changes in the Value of Residential Properties Along the Connecticut Turnpike

A continuing study is being made of the changes that occur in the value of residential properties located in New London and Windham counties. The Connecticut Turnpike passes through these counties and the towns have been divided into two broad groupings (Fig. 1). The first group includes towns any portion of which lies within five miles of the Turnpike. (Also included in this group are towns lying within five miles of Route Conn. 95 which is an alternate route that receives traffic from the Connecticut Turnpike east of New London. A separate analysis of these towns may be made in future years. The records for Canterbury and Bozrah are incomplete and are not included in the analysis.) These are called turnpike towns. The second group consists of all other towns in the area and they are labeled control towns.

The Connecticut Turnpike was authorized in 1953 and opened for traffic on January 2, 1958. All properties that were sold in the period 1950 to 1955 and then resold either in 1956 or 1957 have been listed. The combination of 1956 and 1957 resales will be used as a base period. (The use of 1956-57 resale prices as a benchmark may reduce the apparent magnitude of later changes in real estate values. The potential effect of the Connecticut Turnpike upon land values may have influenced the prices of real estate in 1956-57.) The prices paid for properties sold between 1950 and 1955 and then resold in 1958 or later will be analyzed.

Comparisons will be made between the resale prices in the two groups of towns and for the two periods of time in an effort to determine the impact of the Connecticut Turnpike upon the value of residential property.

When deeds are recorded in Connecticut the federal transfer tax is evidenced by documentary stamps or by a notation attached to the instrument. This indicates the price that was paid for each property. (Occasionally the buyer assumes an existing mortgage and the seller pays a tax only on the amount of his equity. In these instances the selling price is represented by the sum of the mortgage and the amount on which a transfer tax was paid.) No tax is paid on conveyances of real property when the consideration is less than \$100. A tax of 55 cents is levied on each \$500 of the selling price. Thus a property that sold for \$2500 would require a transfer tax of \$2.75.

Deeds to property are recorded in the land records of each town and are filed by date of record. (In New England the town is roughly equivalent to the township elsewhere in the United States.) In all cases

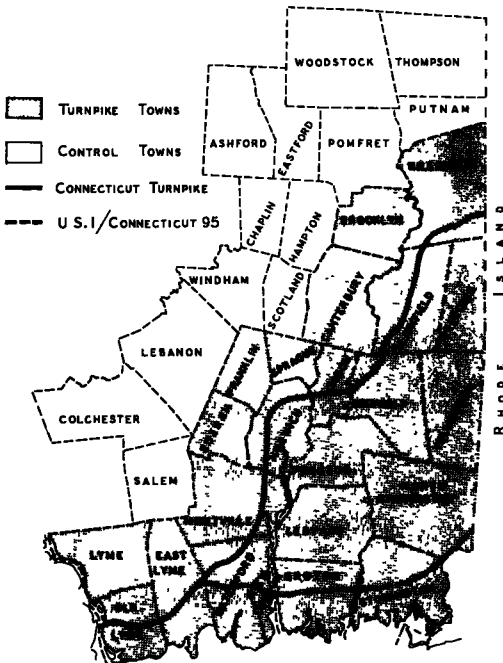


Figure 1. Turnpike and control towns in New London and Windham Counties, Connecticut, 1959.

index volumes alphabetically list the grantors and grantees. The last previous conveyance is mentioned in the deed and a volume and page reference is made. Resales for any given period were determined by examining all sales occurring in any one year beginning at the end of the calendar year.

At the outset certain kinds of sales had to be eliminated. Only sales which appear to have been made "at arms length" were included. Those transactions where the price paid might have been influenced by the relationship of the buyer to the seller were omitted. Transfers within the same family were excluded as were all those entered into by executors, administrators, trustees or others acting in a fiduciary capacity. Sales to which a governmental or semi-public agency was a party were not included. Disposals of property were also omitted if the title had been acquired through foreclosure.

The stricture calling for identical sales also reduced the number of usable transactions. Only those properties which had not changed between the first and the second sale were included. Transactions where only a portion of the original property was resold were rejected. For example, if a tract of land were sold and then subdivided, resales of the individual parcels were not included. A conveyance from a person who had only a partial interest in the premises was excluded for the same reason. Any substantial change in the property between sales was also a cause for rejection. If buildings were added to or removed from a piece of land or if existing buildings were altered, the property was not included. This eliminated those pieces of real estate where between sales a house was built, a garage added, a new bedroom constructed, a barn was demolished or central heating was installed.

Assessment records were used to determine whether or not substantial changes had been made on the property. The Board of Assessors requires each property owner to report annually any changes made to his property. These are then incorporated in the assessed valuation of the property for that year. Sales of identical properties are defined as those sales in which there has been no change in the assessed valuation between sales. In those towns where a general reassessment had taken place the detailed assessment sheets were examined for each property.

In the subsequent analysis land and buildings are treated as a unit. The principal interest in this analysis centers on changes that occur in the value of residential properties. No attempt is made to isolate changes that occur in land values from changes that occur in the combined value of land and buildings. The purchaser of a piece of property pays a price for the entire property including both land and buildings. To separate the value of the land from the total price, either an assessment value or a value set by an appraiser would be necessary. One of the difficulties in the assessment and appraisal methods of measuring the value of real estate is that the initial determination depends upon the judgment of an individual. If several assessors or appraisers are used, variations in the judgment factor are multiplied. This source of error is largely avoided when the value of land is not analyzed separately. Sales of land without residential buildings were excluded.

There were 692 resales of residential properties reported for the 1956-57 period in the turnpike towns and 103 resales in the control towns. (Sales made in 1956 and again in 1957 have been recorded but are not included in this analysis.) These resales comprise approximately 5 percent of all sales of land with buildings in the area and less than 1 percent of all homes in each area.

The formula used for computing annual appreciation of the value of residential properties was:

$$\sum \frac{P_2 - P_1}{\left(\frac{M_2 - M_1}{12} \right)} \div \sum P_1$$

P_1 = the price paid in the first sale of the property 1950-55;

P_2 = the price paid in the first sale of the property 1956 or 1957; and

$M_2 - M_1$ = the number of months that elapsed between sales.

(Changes in the value of the dollar may be incorporated in this formula when comparisons are made between 1956-57 resale prices and those of subsequent years.)

The annual appreciation of residential property in the turnpike towns was 4.9 percent in the period 1950-55 to 1956-57. In the control towns there was a slightly larger annual appreciation (5.2 percent). Each \$1,000 of residential property in the turnpike towns on July 1, 1950 increased in value on the average to \$1,343 by July 1, 1957. The comparable figure for control towns was \$1,364.

These base figures will be used to test a number of hypotheses. For example, one hypothesis may be that the value of residential properties in the turnpike towns will increase at a greater rate than the value of residential properties in the control towns in the period 1958-1961. Figure 2 suggests some of the trend lines that might appear in case real estate values in general increase in that period.

The hypothesis used in the example would be supported according to trend line A which shows that the annual appreciation of residential property in the turnpike towns increased at a higher rate than in the control towns. In trend lines B and C the hypothesis would be rejected as property values in the turnpike towns either just kept pace with those in the control towns (trend line B) or were lower (trend line C).

In the turnpike towns 50 properties or 7.2 percent of the properties declined in value between 1950-55 and 1956-57 (Table 1). Almost the same number experienced no change in value. A higher proportion of properties in the control towns either dropped in price or were resold at the former price. A larger proportion of properties in the control towns compared to the turnpike towns rose sharply in value. One fourth of them had an annual appreciation of 10 percent or more. Only 16 percent of the properties in the turnpike towns had increases of this magnitude. Nearly 70 percent of the properties in the turnpike towns had modest increases in price ranging from less than one percent a year to 10 percent a year.

The largest gains in property values accrued to the lower priced homes. In the turnpike towns residential properties selling for \$7,000 or less had an annual appreciation of 13.5 percent between 1950-55 and 1956-57 (Table 2). The more expensive properties had annual gains of over four percent in the turnpike towns. Properties originally selling for \$14,000 or more in the control towns had an annual appreciation of less than three percent. Changes in appreciation of property values in the various price ranges will be observed during the years immediately following the opening of the turnpike.

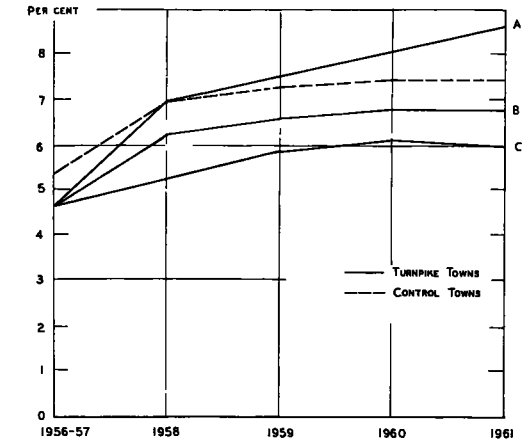


Figure 2. Annual percentage change in value of residential property in turnpike and control towns between 1950-56 and 1956-57 and hypothetical annual percentage changes between 1950-56 and 1958, 1959, 1960 and 1961.

A theoretical basis for measuring changes in the value of real estate that do not entail changes in land use has been suggested. The methods used to obtain

TABLE 1

ANNUAL PERCENTAGE CHANGE IN SALE PRICES OF RESIDENTIAL PROPERTIES IN TURNPIKE AND CONTROL TOWNS—NEW LONDON AND WINDHAM COUNTIES 1950-55 TO 1956-57

Percentage Change	Turnpike Towns		Control Towns	
	Residential Properties No.	%	Residential Properties No.	%
Total	693	100.0	103	100.0
-5.0 and less	14	2.0	4	3.9
-0.01 to -5.0	36	5.2	8	7.8
0	51	7.4	11	10.6
0.01 to 5	310	44.7	35	34.0
5.01 to 10	172	24.8	19	18.4
10.01 to 20	66	9.5	18	17.5
Over 20	44	6.4	8	7.8

TABLE 2

ANNUAL PERCENTAGE CHANGE IN SALE PRICES OF RESIDENTIAL PROPERTIES IN SPECIFIED PRICE RANGES IN TURNPIKE AND CONTROL TOWNS—NEW LONDON AND WINDHAM COUNTIES, 1950-55 TO 1956-57

Original Sale Price	Turnpike Towns Percentage Change	Control Towns Percentage Change
Under \$7,000	13.5	11.2
\$7,000-\$14,000	4.3	5.0
Over \$14,000	4.4	2.9

data on the resales of residential property have been tested. Obviously no conclusions can be drawn from data which cover only the base period. In subsequent years a more rigorous test of the method can be imposed and its usefulness in measuring the impact of highway improvement on real estate values can be assessed.

ACKNOWLEDGMENTS

This report is one of a series of social and economic impact studies that analyze the effect of the Connecticut Turnpike upon two counties in eastern Connecticut. The entire series will cover the following areas of inquiry: agriculture, manufacturing, real estate values, recreation, population, and local government. Most of the other reports will be published by the Storrs Agricultural Experiment Station. The project is under the direction of Walter C. McKain, Jr., Professor of Rural Sociology at the University of Connecticut. It is sponsored jointly by the Storrs Agricultural Experiment Station at the University of Connecticut, the Connecticut State Highway Department and the Bureau of Public Roads of the United States Department of Commerce.

REFERENCES

1. Levin, David R., "Economic Impact on Highway Improvement." Presented at the Fourth National Seminar of the American Right-of-Way Association, San Francisco, May 29, 1958.