

RAND/WN-9980-HUD

INDEXING THE COST OF PRODUCING HOUSING
SERVICES IN SITE II, 1974-75

Charles W. Noland

May 1978

This Note was prepared for the DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, under Contract No. H-1789. It is intended to facilitate communication of preliminary research results. Views or conclusions expressed herein may be tentative and do not represent the official opinion of the sponsoring agency.



PREFACE

This working note was prepared for the Office of Policy Development and Research, U.S. Department of Housing and Urban Development (HUD). It reports on recent work that is part of a continuing task of the Housing Assistance Supply Experiment (HASE): constructing indexes of the cost of producing housing services in Brown County, Wisconsin; St. Joseph County, Indiana; and the five-state region that contains those counties.*

Both counties are the sites of experimental housing allowance programs that may affect local demand for housing services. To measure market response to the allowance programs, we need production cost indexes for each site and for the region.

This note presents 1974-75 price and index data for St. Joseph County and for the region, providing the basic data an analyst would need to construct a 1974-75 index of the cost of producing housing services. The data were compiled by the author, with advice from members of the HASE Design and Analysis Group. Doris Dong prepared the figure. Charlotte Cox edited the typescript and supervised production of final copy.

This note was prepared pursuant to HUD Contract H-1789, Task 2.10.1.

* Theoretical background for the cost indexes was presented in an earlier note in this series: Charles W. Noland, *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977.

SUMMARY

Suppliers of housing combine various inputs to produce an annual flow of housing services. The design for the Housing Assistance Supply Experiment calls for measuring the real annual cost of those inputs, background inflation in their costs (inflation not caused by local events in the experimental sites), and locally caused inflation in factor costs. An index of the cost of producing housing services is necessary for all the tasks.

We use the terms *index* and *cost index* to refer to a set of annual index numbers: local and regional indexes for each major group of factor inputs. We calculate cost indexes for interest rates, land, improvements, property services, maintenance and repair, and property taxes. The local indexes measure inflation rates in the experimental sites and are used to deflate actual factor input costs to obtain real costs. The difference between the local and regional indexes is an approximate measure of program-induced inflation--inflation attributable to the increased demand for housing caused by the allowance program.

This note provides data necessary to construct the two most common types of index--the Laspeyres and the Paasche--for each major input group. Laspeyres and Paasche indexes are ratios of quantity-weighted prices of the component goods at the beginning and end of the period being indexed. The Laspeyres index uses initial quantities, and the Paasche uses terminal quantities.

Alternatively, both indexes can be formulated as expenditure-weighted price relatives. The expenditure weight for an input is the proportion of total cost attributable to that input. The Laspeyres index is the sum of initial-expenditure-weighted price relatives, and the Paasche index uses terminal expenditure weights.

To measure program-induced inflation, we will compare indexes for each experimental site with similar indexes for the five-state region--Illinois, Indiana, Michigan, Ohio, and Wisconsin--that contains both sites. The St. Joseph County price relatives and indexes for the first

year of program operation (1974-75) presented in this note can be weighted with the appropriate expenditure data to construct an index of local inflation (either Laspeyres or Paasche). Similarly, the regional population-weighted relatives and indexes can be used to construct a first approximation to the inflation rate that would have prevailed in the absence of the experiment (called *background inflation*).

Since the average regional price changes are estimates of price changes in our sites in the absence of both local demand disturbances (including the allowance program) and random errors, the regional index is only an approximation of background inflation for the site. The difference between the local and regional indexes is, then, an approximation of the rate of program-induced inflation.

CONTENTS

PREFACE	iii
SUMMARY	v
TABLES	ix
Section	
I. INTRODUCTION	1
Components of the Index	2
Formulating the Index	4
Choosing the Region	5
Compiling the Data	8
II. INDEX OF OPPORTUNITY COST	9
III. INDEX OF LAND COST	13
IV. INDEX OF IMPROVEMENT COST	14
V. INDEX OF PROPERTY SERVICE COST	17
Employees	17
Utilities	19
Insurance	21
VI. INDEX OF MAINTENANCE AND REPAIR COST	30
Employees	30
Supplies	31
Repairs	31
VII. INDEX OF PROPERTY TAXES	38
Appendix	
A. INDEXES OF MAINTENANCE AND REPLACEMENT COSTS AND CAPITAL ADDITION COSTS	43
B. FEDERAL HOME LOAN BANK BOARD MORTGAGE SURVEY COVERAGE ..	47
C. AREA WAGE SURVEY CITATIONS	49
REFERENCES	51

TABLES

1. Estimated SMSA Populations in Five-State Region as of 1 July 1975	6
2. Regional Mortgage Interest Rates, 1974-75	10
3. Mortgage Data for Major Lenders in St. Joseph County, Indiana, 1974-75	11
4. Regional and Local Mortgage Interest Rates and Opportunity Cost Indexes, 1974-75	12
5. Boeckh Modifiers for SMSAs in Cost Index Region, July-August 1975	15
6. Regional and Local Boeckh Modifiers and Improvement Cost Indexes, 1974-75	16
7. Wage Rates for SMSAs in Cost Index Region, 1975	18
8. Employee Component of Property Service Cost Index: Regional and Local Wage Rates and Indexes, 1974-75	19
9. Rate Schedule for Residential Gas Service: St. Joseph County, Indiana, July 1975	20
10. Retail Prices of Fuel Oil No. 2 at Selected Outlets: St. Joseph County, Indiana, July 1975	21
11. Utility Cost Index: Regional Data and Indexes, 1974-75 ..	22
12. Residential Property Insurance Protection Classes: Minor Civil Divisions in St. Joseph County, Indiana, July 1975	24
13. Homeowner Insurance Premiums for Single-Family Owner- Occupied Residences: Minor Civil Divisions in St. Joseph County, Indiana, July 1975	25
14. Multiple-Peril Insurance Premiums for Single-Family Rental Residences: Minor Civil Divisions in St. Joseph County, Indiana, July 1975	26
15. Homeowner Insurance Premiums for Duplexes with Resident Landlords: Minor Civil Divisions in St. Joseph County, Indiana, July 1975	27
16. Multiple-Peril Insurance Premiums for Duplexes without Resident Landlords and All Residential Buildings with More Than Two Units: Minor Civil Divisions in St. Joseph County, Indiana, July 1975	28

17.	Insurance Rate Index: Regional and Local Data and Indexes, 1974-75	29
18.	Employee Component of Maintenance and Repair Cost Index: Regional and Local Wage Rates and Indexes, 1974-75	30
19.	Supply Cost Index: Commodity Price Indexes, July 1974 and July 1975	32
20.	Component Weights for the Repair Cost Index, by Type of Repair	33
21.	Repair Cost Index: Commodity Price Indexes, July 1974 and July 1975	34
22.	Repair Cost Index: Regional Wage Rates, 1975	35
23.	Repair Cost Index: Regional and Local Wage Rates and Price Relatives, 1974-75	36
24.	Repair Cost Index: Regional and Local Indexes, 1974-75 .	37
25.	Assessed Value, Tax Rates, and State Return Tax Credit by Taxing Jurisdiction: St. Joseph County, Indiana, 1974-75	40
26.	Property Tax Index: Regional and Local Data and Indexes, 1974-75	41
A.1.	Maintenance and Replacement Cost Index: Regional and Local Data and Indexes for Rental Units, 1974-75	44
A.2.	Maintenance and Replacement Cost Index: Regional and Local Data and Indexes for Owner-Occupied Units, 1974-75	45
A.3.	Capital Addition Cost Index: Regional and Local Data and Indexes for Rental and Owner-Occupied Units, 1974-75	46

I. INTRODUCTION

A previous note reported baseline (1974) sources and data for the construction of a housing service cost index in St. Joseph County, Indiana, Site II of the Housing Assistance Supply Experiment (HASE).^{*} Here, we continue the series of cost index working notes by presenting the component price relatives and indexes necessary to construct the local and regional housing service cost indexes for 1974-75, the first experimental year in St. Joseph County.

HASE needs such an index for three related but separate steps in measuring the supply elasticity of housing services. First, we use annual factor input costs in constant dollars as an estimator of the quantity of housing services produced.^{**} The percentage change in the real value of factor inputs equals the percentage change in the quantity of factor inputs. Assuming that the quantity of output is proportional to the quantity of inputs, the percentage change in output equals the percentage change in inputs. Given real value of the annual cost of factor inputs, we can thus calculate the percentage change in the quantity of housing services produced.

Second, we decompose observed rent changes into changes in the quantity of housing services (estimated as described above), changes in producer markup, and changes in the cost of producing housing services. The last component is provided by our housing service production cost index.

Third, we want to measure *program-induced inflation*, which is the pure price inflation attributable to the increased demand for housing caused by the housing allowance program. The difference between the

^{*} Charles W. Noland, *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977. That report gives the theoretical development of the cost index and fully describes its components.

^{**} See Ira S. Lowry (ed.), *General Design Report: First Draft*, The Rand Corporation, WN-8198-HUD, May 1973, Appendix B.

actual inflation rate in the experimental site (called *local inflation*) and the rate that would have prevailed in the absence of the experiment is program-induced inflation. Unfortunately we can measure only *background inflation*--price changes that would have occurred in the absence of *all* local events affecting prices. A regional cost index, similar to those constructed for each site, estimates background inflation. The difference between the local and regional indexes is a first approximation to program-induced inflation.

The above three steps will decompose the rent change between two years into four additive components:

- Change in the quantity of housing services produced (as measured by the real factor costs of producing the services).
- Background inflation in factor prices (inflation not caused by housing allowances or other local events).
- Locally caused inflation in factor prices (reflecting the effects of housing allowances and other local events).
- Change in producer markup.

COMPONENTS OF THE INDEX

The first two uses determine which components are indexed. Together, the plans for the input accounting and production function analysis define seven input categories: (a) opportunity cost of land and improvements, (b) cost of land, (c) cost of improvements, (d) cost of additions to improvements, (e) cost of property services, (f) cost of maintenance and repair, and (g) property taxes.* We either use existing indexes or construct our own for each category.

The opportunity cost of residential land and improvements is the effective market rate of interest on conventional residential mortgages multiplied by the base-year value of residential real estate.**

* Our earlier note called for indexing only six components, but we have since added property taxes.

** Since completion of the *General Design Report*, we have developed an alternative theory that the opportunity cost of capital equals the annual real rate of return times capital value. (See C. Peter

Although the effective market rate may be higher or lower than the mortgage rate an owner actually pays, it measures what an investor must pay for the use of residential land and improvements, i.e., their opportunity cost. Interest rate data are presented in Sec. II.

The value of residential land will be indexed by the national rate of growth in consumer prices, modified within the experimental site by a model of the effects of differential changes in neighborhood amenities. This note is concerned only with the general element of the index--the national inflation rate--which is reported in Sec. III.

Changes in the value of existing improvements will be measured with an index of residential construction costs. Our procedure assumes a longrun equilibrium in the housing market such that existing improvements are valued at their replacement cost. Section IV presents the data for the improvement component.

We should stress that neither the land value index nor the construction cost index is expected to be a true measure of the change in market value for specific properties. Rather, each is a benchmark against which the significance of actual changes can be assessed.

Because additions to improvements are a small portion of annual factor costs, the total input costs are quite insensitive to changes in the cost of such additions. We estimate that a 10 percent increase in the cost of additions to improvements causes an overall increase in factor costs of only 0.46 to 0.54 percent.* Because our results are so insensitive to such changes, it is unnecessary to construct an index that measures changes in the specific costs of rehabilitating or altering residential structures. Instead, we measure inflation for the component for additions to improvements with the same general index of residential construction costs used to measure improvement cost inflation.

Rydell, *Measuring the Supply Response to Housing Allowances*, The Rand Corporation, P-5564, January 1976, Appendix A.) That approach requires only an estimate of the (presumably constant) real rate of return to property value. Changes in the mortgage interest rate become relevant only in discussions of equity yield.

* For the underlying assumptions and supporting calculations, see *General Design Report*, pp. 266-269.

Property services are indexed using wages, costs of utilities, and insurance rates, data for which appear in Sec. V. Price relatives for those components are weighted by relative expenditures to form the index. A similar procedure is followed for maintenance and repair costs, a category that includes wages, supply prices, and repair costs; Sec. VI presents the relevant data. Appendix A shows expenditure weights for the components and uses them to form maintenance and replacement cost indexes and capital addition cost indexes for renters and homeowners.

Property taxes are indexed with the weighted average net tax rate for St. Joseph County. The procedure and index are described in Sec. VII.

FORMULATING THE INDEX

The cost index is a collection of indexes, one for each of the seven input categories described above. Each index is calculated as the sum of the component price relatives,* weighted according to their proportion of total expenditures. Weighting with baseline expenditures yields a Laspeyres index:

$$\lambda = \sum_i \left(E_{i1} \frac{P_{it}}{P_{i1}} \right),$$

where i = the component,

1 = baseline,

t = the current period,

E_{i1} = the baseline expenditure weight for component i ,

P_{i1}, P_{it} = the baseline and current prices of component i .

Using current expenditure weights and the inverse of the above price relatives, a Paasche index can be constructed as follows:

* Throughout this note, "price" refers either to the price of a commodity or service or to the wage rate for labor. A price relative is the ratio of prices for the same item at two different times. In practice, we sometimes approximate price relatives with index numbers for components.

$$\phi = \left[\sum_i \left(E_{it} \frac{P_{i1}}{P_{it}} \right) \right]^{-1}.$$

Either of the above equations yields a regional index if we use regional prices--defined as the mean of the price distribution for each item throughout the region--for P_{i1} and P_{it} . The maximum likelihood estimator of that mean is the population-weighted average of the prices for cities in the region, if two assumptions hold: (a) The prices are all from the same, normally distributed population. (b) The number of observations used to estimate the average price for a city is proportional to its population. This note reports regional indexes that are either our own calculations or have been calculated by the U.S. Bureau of Labor Statistics (BLS) in the same manner.

The regional indexes are only estimates of background inflation, inasmuch as the regional prices are estimates of the price-distribution means. Even if we could measure the means exactly, the resulting index would measure inflation in the absence of all local demand stimuli, not just the allowance program. The difference between our local and regional indexes thus approximates program-induced inflation.

CHOOSING THE REGION

We sought an area that included both experimental sites, was large enough to escape influence by either of them, and had some economic reason for being considered a single unit. We combined seven major trading areas* in the East North Central U.S. to form a region that met those requirements. It consists of nearly all of Illinois, Indiana, Michigan, Ohio, and Wisconsin.** We defined that five-state area,

*1972 *Commercial Atlas and Marketing Guide*, Rand McNally and Company, Chicago, 1972. The trading areas defined in the atlas were "determined after an intensive study of such factors as physiography, population, newspaper circulation, economic activities, highway facilities, railroad services, suburban transportation, and field reports of experienced sales analysts" (p. 65).

** For a comparison of the boundaries of the trading areas and the five-state region, see *General Design Report*, p. 280.

shown in the figure, as the region of interest for cost-indexing purposes.

Regional data collection was constrained by the geographic coverage of the available sources. The geographic areas do not always coincide with each other or with our defined region, but this note carefully documents the areas (or cities) covered by each source.

Most of the sources report data only for standard metropolitan statistical areas (SMSAs) in the region. The figure illustrates the SMSAs for which we collect data and calculate average prices. Those with boundaries that do not lie entirely within the region are included only if the central city or cities that designate the SMSA are within the five states. Table 1 lists the metropolitan areas shown in the figure and presents population estimates as of 1 July 1975.

Table 1
ESTIMATED SMSA POPULATIONS IN FIVE-STATE REGION
AS OF 1 JULY 1975

State and SMSA	Population	State and SMSA	Population
<i>Illinois</i>		<i>Ohio</i>	
Chicago	7,009,500	Akron	671,700
Peoria	355,600	Canton	403,500
Rockford	270,800	Cincinnati	1,370,100
Springfield	181,700	Cleveland	1,974,900
<i>Indiana</i>		Columbus	1,073,000
Evansville	287,900	Dayton	839,900
Fort Wayne	373,200	Toledo	781,800
Gary-Hammond-East Chicago	642,700	Youngstown-Warren	536,600
Indianapolis	1,140,300	<i>Wisconsin</i>	
<i>Michigan</i>		Appleton-Oshkosh	286,300
Detroit	4,420,300	Kenosha	123,700
Flint	518,000	La Crosse	86,600
Grand Rapids	565,200	Madison	302,900
Kalamazoo-Portage	263,200	Milwaukee	1,411,000
Lansing-East Lansing	446,000	Racine	177,100
Saginaw	226,300		

SOURCE: U.S. Bureau of the Census, *Current Population Reports*, Series P-26, Nos. 76-13, 76-14, 76-17, 76-22, 76-35, and 76-49, U.S. Government Printing Office, July-December 1977.



Figure--States and SMSAs in the cost index region

Some sources provide regional indexes, while others give price data for a subset of all metropolitan areas within our region. From the latter we calculate regional prices with 1975 population estimates for SMSAs compiled by the Census Bureau.

Data for Green Bay, Wisconsin, and South Bend, Indiana (our two experimental sites), are not included in the weighted regional averages. We are estimating what prices in those two SMSAs would be absent the allowance program and do not want actual prices, which the program may influence, to affect the estimate.

COMPILING THE DATA

The remainder of this note provides the 1975 prices and indexes for the region as a whole and for St. Joseph County. In addition, it summarizes the 1974 data presented in our previous note and presents the 1974-75 price relatives and indexes for each index component. The final index depends on expenditure weights obtained from HASE surveys. Each analyst who needs cost indexes will compile his own set of expenditure weights, which will depend on the population being analyzed. Such weights, together with the data presented here, will allow construction of a regional and a local housing service cost index for 1974 to 1975.

Consistent with our procedure for compiling 1974 data, we have sought price data for the midpoint of 1975 or as near thereto as sources permit. The reference date for each price is given as precisely as the source reports it.

II. INDEX OF OPPORTUNITY COST

Changes in interest rates index the opportunity cost of residential land and improvements. That cost is the effective market rate of interest on conventional residential first mortgages multiplied by the base-year value of residential real estate. For both the local and background indexes we use effective market interest rates obtained from surveys of major lending institutions.

The effective interest rate is the rate a borrower actually pays, taking into account the contract rate specified by the mortgage, initial fees and points, term, and life of the mortgage. A lender can change the effective rate without altering the contract rate by varying either the term or the points. We want to capture all such changes in the effective borrowing rate.

Residential mortgage data are published monthly in the Federal Home Loan Bank Board (FHLBB) *News*. The series covers fully amortized, conventional first-mortgage loans for purchasing newly built or previously occupied single-family homes. Lenders that originated approximately 90 percent of all conventional home mortgages in 1972 are surveyed.*

The published data cover three SMSAs in our region: Chicago, Cleveland, and Detroit. Table 2 presents the July 1974 and July 1975 effective interest rates in the three metropolitan areas and the population-weighted averages.

We obtain comparable local data from mortgage lenders interviewed as part of the HASE market intermediaries study. In Table 3, we report the July 1974 and July 1975 effective interest rates and supporting data for the five responding institutions. Weighting each institution's effective rate by its proportion of the total dollar volume of mortgages written each year, we obtain the average St. Joseph County effective interest rate for residential first mortgages.

Table 4 summarizes the regional and local interest rate data and gives the 1974-75 opportunity cost indexes.

* See Appendix B for a detailed description of the FHLBB survey and content.

Table 2

REGIONAL MORTGAGE INTEREST RATES, 1974-75

SMSA	Effective Interest Rate ^a	
	July 1974	July 1975
Chicago	8.38	9.00
Cleveland	8.60	8.86
Detroit	8.86	8.88
Weighted average	8.57	8.94

SOURCE: Federal Home Loan Bank Board
News, September 1974 and September 1975.

^aEffective rate including points and term for conventional first mortgages, assuming a ten-year mortgage life. Rates for newly built and previously occupied homes are averaged.

Table 3

MORTGAGE DATA FOR MAJOR LENDERS IN
ST. JOSEPH COUNTY, INDIANA, 1974-75

Date and Lender ^a	Contract Interest Rate (%)	Points	Term (years)	Volume of Mortgages Written ^b (\$ million)	Effective Interest Rate ^c (%)
<i>July 1974</i>					
A	10.00	0	25	17.00	10.00
B	9.50	0	22	7.50	9.50
C	9.00	1	20	7.00	9.17
D	7.50	0	25	2.35	7.50
E	9.00	5	30	10.19	9.84
<i>July 1975</i>					
A	9.75	0	25	15.00	9.75
B	9.25	0	22	8.50	9.25
C	9.00	1	20	3.80	9.17
D	8.00	0	25	1.25	8.00
E	8.75	4	30	13.00	9.41

SOURCE: Obtained by Rand staff in interviews conducted during December 1976 and February and March 1977.

NOTE: Data are for residential first mortgages written during July of each year for 1- to 4-unit structures.

^aNames of financial institutions are on file at Rand and are available only for purposes of future survey work.

^bVolume of mortgages (defined in the note above) written during the entire year.

^cIncluding points and term and assuming a ten-year mortgage life.

Table 4

REGIONAL AND LOCAL MORTGAGE INTEREST RATES AND
OPPORTUNITY COST INDEXES, 1974-75

Item	Region	St. Joseph County
Effective interest rate ^a (%):		
July 1974	8.57	9.61
July 1975	8.94	9.44
Opportunity cost index ^b	104.3	98.2

SOURCE: Tables 2 and 3 above.

^aEffective rate for residential first mortgages including points and term and assuming a ten-year mortgage life.

^bJuly 1974 = 100.

III. INDEX OF LAND COST

Land is an input to the production of housing, and if its price increases, the price of housing will rise to cover it. The allowance program may contribute to changes in land prices. For example, if allowance recipients prefer a certain neighborhood, their attempts to obtain housing there could cause a localized increase in land prices. Most changes in land prices, however, will come from nonallowance sources: better roads, new schools, new shopping centers, and general price inflation. Because neighborhoods change slowly, the most important source of land price change during the experiment will be changes in the general value of the dollar, which we measure with the consumer price index (CPI).

We plan to use the CPI, modified by a function whose arguments are neighborhood characteristics, to estimate changes in neighborhood land value. We will check the CPI's validity as the general inflator for land value by doing cross-sectional studies similar to the one done at baseline in Site I. The July 1974 CPI value is 148.3;^{*} for July 1975 it is 162.3.^{**} The resulting 1974-75 index (July 1974 = 100) is 109.4.

The local index will be constructed from annual estimates of St. Joseph County land prices. The procedure is described elsewhere;^{***} because it uses no outside data, none are reported here. Actual land prices will be reported in a separate working note.

^{*} U.S. Bureau of Labor Statistics, *CPI Detailed Report for July 1974*, U.S. Government Printing Office, October 1974, p. 7. The figure reported above is the unadjusted index (1967 = 100) for all items, U.S. city average.

^{**} U.S. Bureau of Labor Statistics, *CPI Detailed Report for July 1975*, U.S. Government Printing Office, September 1975, p. 8. The figure reported above is the unadjusted index (1967 = 100) for all items, U.S. city average.

^{***} C. Peter Rydell, *Rental Housing in Site I: Characteristics of the Capital Stock at Baseline*, The Rand Corporation, WN-8978-HUD, August 1975, pp. 24-26. For a brief description of the procedure, see Noland, *Indexing the Cost of Producing Housing Services: Site II*, 1974, p. 20.

IV. INDEX OF IMPROVEMENT COST

Improvement cost is indexed with American Appraisal Associates' Boeckh building cost modifiers for residential structures of siding or stucco. The modifiers are Laspeyres indexes with expenditure weights calculated from baseline cost studies of standard building types. The weights reflect factor shares and construction costs generally encountered in the North Central U.S. in 1967, the baseline period for the modifiers. At that time, the index for Milwaukee was set to 1.00, and the indexes for all other cities reflected the baseline cost of the standard building type in any city divided by its cost in Milwaukee. The modifiers are thus also geographic indexes.

Excluding our two sites, American Appraisal publishes modifiers for 27 SMSAs in our cost index region. Table 5 presents the July-August 1975 modifiers for those cities as well as the unweighted regional average, which is used to construct the regional index.*

The July-August modifier for South Bend is used to index improvement cost in St. Joseph County. Table 6 presents the regional and local modifiers and indexes.

* For a description of the methodology and derivation of this procedure, see the Appendix to Noland, *Indexing the Cost of Producing Housing Services: Site II*, 1974.

Table 5

BOECKH MODIFIERS FOR SMSAs IN COST
INDEX REGION, JULY-AUGUST 1975

State and SMSA	Boeckh Modifier for Residential Construction ^a	State and SMSA	Boeckh Modifier for Residential Construction ^a
<i>Illinois</i>		<i>Ohio</i>	
Chicago	1.93	Akron	1.90
Peoria	1.80	Cincinnati	1.88
Rockford	1.71	Cleveland	1.97
Springfield	1.70	Columbus	1.81
<i>Indiana</i>		Dayton	1.80
Evansville	1.72	Toledo	1.89
Fort Wayne	1.77	Youngstown	1.83
Gary	1.82	<i>Wisconsin</i>	
Indianapolis	1.81	Kenosha	1.81
<i>Michigan</i>		La Crosse	1.66
Detroit	1.97	Madison	1.74
Flint	1.80	Milwaukee	1.85
Grand Rapids	1.68	Oshkosh	1.67
Kalamazoo	1.70	Racine	1.81
Lansing	1.87		
Saginaw	1.81	Unweighted average	1.80

SOURCE: *Boeckh Building Cost Modifier*, American Appraisal Associates, Pub. 8, No. 4, July-August 1975.

NOTE: 1967 = 100.

^aSiding or stucco exteriors.

Table 6

REGIONAL AND LOCAL BOECKH MODIFIERS AND
IMPROVEMENT COST INDEXES, 1974-75

Item	Region	St. Joseph County
Boeckh modifiers:		
July-August 1974	1.72	1.68
July-August 1975	1.80	1.74
Improvement cost index ^a	104.7	103.6

SOURCE: *Boeckh Building Cost Modifier*, American Appraisal Associates, Pub. 8, No. 4, July-August 1975; Charles W. Noland, *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, p. 23; and Table 5 above.

^a July-August 1974 = 100.

V. INDEX OF PROPERTY SERVICE COST

The property service cost index has three components: costs of employees, costs of utilities, and insurance rates. The first two have subcomponents, the sources and data for which are documented separately for each component. The price relative or index for each component will be weighted by its share of the baseline cost of services based on information obtained from the HASE surveys. Summing these expenditure-weighted price relatives yields the property service cost index.

EMPLOYEES

Most employees who provide services for residential properties in St. Joseph County are either managers or janitors. Area Wage Survey (AWS) publications provide data for (a) office and clerical workers and (b) janitors, porters, and cleaners.* Changes in the wage rates for those two categories, weighted equally, form the employee cost component of the property service cost index.

Table 7 presents 1975 regional wage rates for the above occupational groups by SMSA. Table 8 summarizes the regional and local wage rates and presents the 1974-75 price relatives. Weighting the relatives equally and averaging them yields the regional and local indexes for the employee cost component of the property service cost index, given on the last line of Table 8.

* In preceding notes we used the AWS mean wage rate for janitors, porters, and cleaners in all industries. Between 1974 and 1975, the percentage of nonmanufacturing employees surveyed in that category increased significantly in both experimental sites. The average wage rate in all industries then decreased, because the rate for janitors, porters, and cleaners is lower in nonmanufacturing than in manufacturing industries. To resolve that problem, we decided to price the group's wage rate in manufacturing industries only, a classification that is comparable for both sites over the relevant period. The change affects 1974 data reported below in Tables 7, 8, 18, 22, 23, and 24.

Table 7

WAGE RATES FOR SMSAs IN COST INDEX REGION, 1975

State and SMSA	Month of Publication (1975)	Janitors, Porters, and Cleaners ^a (\$/hr)	Office and Clerical Workers ^b (\$/wk)
<i>Illinois</i> Chicago	May	4.21	161.63
<i>Indiana</i> Indianapolis	October	4.47	153.42
<i>Michigan</i> Detroit	March	5.35	191.15
<i>Ohio</i> Akron	December	4.91	165.81
Canton	May	4.48	148.02
Cincinnati	February	4.16	144.99
Cleveland	September	4.76	157.87
Columbus	October	4.12	148.37
Dayton	December	4.85	161.95
Toledo	May	4.76	161.98
<i>Wisconsin</i> Milwaukee	April	4.47	149.25
Weighted regional average	--	4.60	164.34

SOURCE: U.S. Bureau of Labor Statistics, *Area Wage Survey* (AWS), U.S. Government Printing Office; specific sources are listed in Appendix C.

^a Mean wage rate for men and women in all-size manufacturing establishments.

^b Weighted average of mean wages for men and women (all industries and all-size establishments) in 13 occupational groups from AWS Table A-1 ("Office Occupations: Weekly Earnings"): (1) accounting clerks, class A; (2) accounting clerks, class B; (3) file clerks, class B; (4) order clerks; (5) payroll clerks; (6) keypunch operators, class A; (7) keypunch operators, class B; (8) secretaries; (9) general stenographers; (10) senior stenographers; (11) switchboard operator-receptionists; (12) typists, class A; (13) typists, class B.

Table 8

EMPLOYEE COMPONENT OF PROPERTY SERVICE COST INDEX:
REGIONAL AND LOCAL WAGE RATES AND INDEXES, 1974-75

Item	Region	St. Joseph County
<i>1974 Wage Rate</i>		
Janitors, porters, and cleaners (\$/hr)	4.15	3.91
Office and clerical workers (\$/wk)	150.63	127.73
<i>1975 Wage Rate</i>		
Janitors, porters, and cleaners (\$/hr)	4.60	4.15
Office and clerical workers (\$/wk)	164.34	136.96
<i>Employee Cost Index</i>		
Janitors, porters, and cleaners	110.8 ^a	106.1 ^b
Office and clerical workers	109.1 ^a	107.2 ^b
Arithmetic average	110.0 ^a	106.6 ^b

SOURCE: U.S. Bureau of Labor Statistics (BLS), *Area Wage Survey (AWS)*, Bulletin 1795-18 and Supplement 1 to Bulletin 1795-18, U.S. Government Printing Office, March 1974 and March 1975, Tables A-1 and A-5; BLS, *Area Wage Survey*, various 1974 bulletins--specific sources are listed in Appendix C; Charles W. Noland, *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, pp. 25-26; and Table 7 above.

NOTE: St. Joseph County wage rates are from AWS Bulletin 1795-18 and Supplement 1 to that bulletin. Regional rates for office and clerical workers are from Table 7 above and pp. 25-26 of WN-9736-HUD. Regional rates for janitors, porters, and cleaners are population-weighted averages of SMSA rates from 1974 and 1975 AWS publications listed in Appendix C (see note on p. 17).

^a1974 = 100.

^bMarch 1974 = 100.

UTILITIES

The Federal Power Commission (FPC) annually publishes typical residential electric bills for all U.S. cities with populations of at least 2,500. The bills are computed for various consumption levels using rate schedules applicable to the majority of each area's customers. We index the cost of 500 kWh per month, which is close to the average monthly usage level of 487 kWh during 1974 in the East

North Central U.S.* For January 1975, the typical residential bill for 500 kWh of electricity was \$15.20 in the East North Central U.S. and \$13.88 in St. Joseph County.**

The BLS provides us with an annual index for the Region V CPI gas component.*** It is based on three gas bills priced at the prevailing rates for each city in which the BLS collects gas rate data. With July 1972 as the base, the July 1975 index is 148.14.

Locally, we calculate the cost of 110.42 therms of residential gas per month, the average North Central U.S. household consumption level in 1970.**** Table 9 gives the gas rates for the predominant

Table 9

RATE SCHEDULE FOR RESIDENTIAL
GAS SERVICE: ST. JOSEPH COUNTY,
INDIANA, JULY 1975

Quantity Consumed (therms)	Price (\$ per therm)
First 10	.3459
Next 40	.1831
All additional	.1357

SOURCE: Compiled by Rand site office and housing allowance office staff, South Bend, Indiana.

NOTE: Rates are for Indiana Public Service Company residential gas service, Rate 11, including a purchased gas adjustment factor of \$.0145 per therm.

* Federal Power Commission, *Typical Electric Bills*, FPC R 86, U.S. Government Printing Office, December 1975, p. 174.

** *Typical Electric Bills*, pp. xii and 38.

*** BLS Region V includes Minnesota in addition to the five states composing our region.

**** Kent P. Anderson, *Residential Energy Use: An Econometric Analysis*, The Rand Corporation, R-1297-NSF, October 1973, p. 53. The consumption figures in this publication are for the entire U.S. The figures in the text above are for the North Central U.S., obtained from the primary data compiled for Anderson's study.

type of residential service in St. Joseph County during July 1975. Applying those rates to the average consumption figure of 110.42 therms per month yields a typical residential gas bill of \$18.98 for July 1975.

The BLS bases its annual index for the Region V CPI fuel oil component on the price of fuel oil No. 2, sampling outlets in 10 metropolitan areas. With July 1972 as the base, the July 1975 index is 199.57. Table 10 lists the retail prices of fuel oil No. 2 at 12 St. Joseph County outlets. The average price per gallon in July 1975 was \$.342.

Table 10

RETAIL PRICES OF FUEL OIL NO. 2 AT
SELECTED OUTLETS: ST. JOSEPH
COUNTY, INDIANA, JULY 1975

Outlet	Price (\$/gallon)	Outlet	Price (\$/gallon)
A	.309	H	.339
B	.336	I	.354
C	.334	J	.343
D	.325	K	.349
E	.364	L	.354
F	.349		
G	.345	Average	.342

SOURCE: Compiled by Rand site office staff, South Bend, Indiana. Names and addresses of the twelve outlets are on file at Rand for survey purposes only.

Table 11 summarizes 1974 and 1975 utility data and presents the 1974-75 utility price indexes for the region and St. Joseph County.

INSURANCE

The BLS collects homeowner insurance premium data for 14 Region V metropolitan areas and provides us with an annual index for this CPI component. With July 1972 as the base, the July 1975 index is 114.62.

Locally, we price two types of property insurance--homeowner and "multiple peril." The first provides comprehensive coverage to home-

Table 11

UTILITY COST INDEX: REGIONAL DATA
AND INDEXES, 1974-75

Item	Region	St. Joseph County
1974		
Electricity ^a	12.28	11.18
Gas ^b	116.74	17.10
Fuel oil ^c	191.44	.330
1975		
Electricity ^a	15.20	13.88
Gas ^b	148.14	18.98
Fuel oil ^c	199.57	.342
<i>Utility Indexes^d</i>		
Electricity	123.8	124.2
Gas	126.9	111.0
Fuel oil	104.2	103.6

SOURCE: Charles Noland, *Indexing the Cost of Producing Housing Services: Site, II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, Table 7, p. 29; and pp. 19-21 above.

^aDollars per month.

^bFor the region, an index with July 1972 = 100; for St. Joseph County, dollars per month.

^cFor the region, an index with July 1972 = 100; for St. Joseph County, dollars per gallon.

^d1974 = 100.

owners and resident landlords of small multiunit buildings. Other residential properties are insured under combined coverages called multiple-peril insurance. Since rate schedules differ by area, type of building, and insurance company, our method of obtaining typical insurance bills was complex. First, we identified four of the largest homeowner insurance writers in Indiana: Allstate, Indiana Insurance Companies, State Farm, and United Farm Bureau. Investigation indicated that all four write significant amounts of homeowner insurance in St. Joseph County. Allstate writes few multiple-peril policies,

and we were unable to obtain Indiana Insurance Companies' multiple-peril schedules. We used rate schedules of all four suppliers to price homeowner insurance; to price multiple-peril insurance, we used State Farm and United Farm Bureau schedules.

Next we identified four property types and priced policies for each: (a) single-family owner-occupied, (b) single-family rental, (c) duplex with a resident landlord, and (d) duplex without a resident landlord or buildings with three or more units. The first and third types are insured by homeowner policies; multiple-peril policies cover the second and fourth.

Insurance rates depend on the protection class of the area in which a property is located. Protection classes are based on ratings of an area's water supply, fire department, fire alarm system, fire prevention program, and building department, and on the condition of its buildings. The lower the protection class, the less risk to property, and hence the lower the rate schedule. Table 12 presents the July 1975 protection classes for the 20 minor civil divisions (MCDs) in St. Joseph County.

Tables 13 through 16 present July 1975 insurance premium data for the county's MCDs. For each property type and area the tables give the number of properties and average baseline (1974) value of improvements (rounded to the nearest thousand). Premiums are averaged across all companies priced.

Each combination of property type and MCD has an average insurance premium. When weighted by the number of properties and averaged, they yield a July 1975 average annual premium of \$69.09 based on baseline property value for all St. Joseph County residential properties.

Table 17 summarizes the insurance data and presents the 1974-75 regional and local insurance rate indexes.

Table 12

RESIDENTIAL PROPERTY INSURANCE PROTECTION CLASSES:
MINOR CIVIL DIVISIONS IN ST. JOSEPH COUNTY,
INDIANA, JULY 1975

Minor Civil Division	Protection Class	Minor Civil Division	Protection Class
South Bend	3	Green township	10
Mishawaka	4	Harris township	9
Lakeville	8	Liberty township	10
New Carlisle	7	Lincoln township	10
North Liberty	8	Madison township	10
Osceola	9	Olive township	10
Walkerton	8	Penn township	9
Centre township	9	Portage township	10
Clay township ^a	9	Union township	9
German township	10	Warren township	10

SOURCE: Provided by Insurance Services Office of Indianapolis, Indiana.

^aIncludes Indian Village and Roseland.

Table 13

HOMEOWNER INSURANCE PREMIUMS FOR SINGLE-FAMILY OWNER-OCCUPIED RESIDENCES:
MINOR CIVIL DIVISIONS IN ST. JOSEPH COUNTY, INDIANA, JULY 1975

Minor Civil Division ^a	Number of Properties ^b	Average Value ^c (\$)	Annual Premium (\$)				Average
			Company A ^d	Company B ^e	Company C ^f	Company D ^g	
South Bend	22,844	13,000	42	69	52 ^h	56	54.75
Mishawaka	8,642	15,000	45	72	56	60	58.25
Lakeville	20	16,000	62	85	69	74	72.50
New Carlisle	262	17,000	65	89	70	76	75.00
North Liberty	180	13,000	55	78	64 ^h	69	66.50
Osceola	514	15,000	64	90	73	79	76.50
Walkerton	278	14,000	57	80	66	71	68.50
Centre township	896	28,000	112	154	117	130	128.25
Clay township ⁱ	4,161	24,000	94	129	98	108	107.25
German township	604	31,000	130	184	139	153 ^j	151.50
Green township	661	28,000	115	164	124	136	134.75
Harris township	535	19,000	76	105	79	86	86.50
Liberty township	179	20,000	82	116	88	95	95.25
Madison township	119	21,000	86	121	92	100	99.75
Olive township	179	13,000	61	90	72 ^h	78	75.25
Penn township	4,331	20,000	79	109	82	91	90.25
Portage township	581	13,000	61	90	72 ^h	78	75.25
Union township	357	18,000	73	102	75	84	83.50
Warren township	773	17,000	73	103	80	86	85.50

SOURCE: Tabulations by HASE staff from the baseline homeowner survey for St. Joseph County, Indiana; and homeowner insurance premium schedules published by the indicated companies.

^aOnly minor civil divisions (MCDs) with sampled properties of the designated type are included.

^bEstimated number of properties in each MCD with only a single-family owner-occupied residence, excluding mobile homes and farm properties.

^cAverage of July 1974 market values of improvements. This is the same value as that reported in *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, Table 9, making the last column's premiums the inputs to an insurance rate index.

^dPremiums are for the following insurance type: homeowner standard policy, \$50 deductible, for frame construction. They are computed from Allstate Insurance Company's Indiana rate schedule that was effective 3 October 1972. That schedule was in effect in St. Joseph County on 1 July 1975.

^ePremiums are for the following insurance type: homeowner form 1, coverage A, \$50 all-peril deductible (Loss Ded. No. 3), for frame construction. They are computed from Indiana Insurance Companies' Indiana rate schedule that was effective June 1975. That schedule was in effect in St. Joseph County on 1 July 1975.

^fPremiums are for the following insurance type: homeowner form 2, \$50 all-peril deductible, for frame construction. They are computed from State Farm Fire and Casualty Company's Indiana rate schedule that was effective 1 October 1973. That schedule was in effect in St. Joseph County on 1 July 1975.

^gPremiums are for the following insurance type: homeowner coverage A, \$50 all-peril deductible, for frame construction. They are computed from United Farm Bureau Mutual Insurance Company's Indiana rate schedule that was effective 1 November 1974. That schedule was in effect in St. Joseph County on 1 July 1975.

^hPremium was interpolated between those for coverages of \$12,000 and \$14,000.

ⁱIncludes Indian Village and Roseland.

^jPremium was interpolated between premiums for coverages of \$30,000 and \$35,000.

Table 14

MULTIPLE-PERIL INSURANCE PREMIUMS FOR SINGLE-FAMILY RENTAL RESIDENCES: MINOR CIVIL DIVISIONS IN ST. JOSEPH COUNTY, INDIANA, JULY 1975

Minor Civil Division ^a	Number of Properties ^b	Average Value ^c (\$)	Annual Premium (\$)		
			Company C ^d	Company D ^e	Average
South Bend	3,615	5,000	31	39	35.00
Mishawaka	1,022	8,000	41	48	44.50
Lakeville	24	7,000	41	50	45.50
New Carlisle	15	10,000	52	61	56.50
North Liberty	39	10,000	52	61	56.50
Osceola	46	6,000	43	50	46.50
Walkerton	101	8,000	45	54	49.50
Centre township	39	6,000	43	50	46.50
Clay township ^f	188	7,000	47	55	51.00
German township	44	9,000	58	69	63.50
Green township	24	6,000	45	54	49.50
Liberty township	8	10,000	63	74	68.50
Olive township	8	6,000	45	54	49.50
Penn township	161	8,000	51	59	55.00
Portage township	186	6,000	45	54	49.50
Union township	10	10,000	61	69	65.00
Warren township	52	8,000	53	62	57.50

SOURCE: Tabulations by HASE staff from the baseline landlord survey for St. Joseph County, Indiana; and multiple-peril insurance premium schedules published by the indicated companies.

NOTE: A nonresident landlord cannot cover his rental properties with an extension of his homeowner policy. Such properties must be insured with multiple-peril policies. Companies A and B are not included in the table: Because Allstate writes almost no multiple-peril insurance in St. Joseph County and we were unable to obtain the necessary rate schedules from Indiana Insurance Companies, schedules for these two companies were not included in the average premium calculations.

^aOnly minor civil divisions (MCDs) with sampled properties of the designated type are included.

^bEstimated number of properties in each MCD with only a single-family rental residence, excluding mobile homes and farm properties.

^cAverage of July 1974 market values of improvements. This is the same value as that reported in *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, Table 10, making the last column's premiums the inputs to an insurance rate index.

^dPremiums are for the following insurance type: (a) multiple-peril coverage for frame construction; (b) basic coverage (coverage A) from Table I (including the special apartment form) for \$50 flat deductible; (c) loss of rents coverage (Table V) assuming monthly rent equals \$120 times the number of units and repair or rebuilding is estimated to take ten months; and (d) increased limits of liability and medical payments coverage (Table II)--\$100,000 for liability, and \$1,000 per person and \$10,000 per accident for medical payments. Premiums were calculated by State Farm Fire and Casualty Company and reflect rate schedules in effect on 1 July 1975 in St. Joseph County, Indiana.

^ePremiums are for the following insurance type: (a) "home defender" coverage for frame construction; (b) coverage A (dwellings) assuming eight premium points for rating factors other than fire protection class; (c) \$50 all-peril deductible; and (d) increased limits of liability and medical payments coverage for the initial one-family residence--\$50,000 per person and \$100,000 per occurrence for liability, and \$1,000 per person and \$10,000 per accident for medical payments. Premiums are computed from United Farm Bureau Mutual Insurance Company's Indiana rate schedule that was effective 1 November 1974. That schedule was in effect in St. Joseph County on 1 July 1975.

^fIncludes Indian Village and Roseland.

Table 15

HOMEOWNER INSURANCE PREMIUMS FOR DUPLEXES WITH RESIDENT LANDLORDS:
MINOR CIVIL DIVISIONS IN ST. JOSEPH COUNTY, INDIANA, JULY 1975

Minor Civil Division ^a	Number of Properties ^b	Average Value ^c (\$)	Annual Premium (\$)				Average
			Company A ^d	Company B ^e	Company C ^f	Company D ^g	
South Bend	505	8,000	37	60	48	51	49.00
Mishawaka	249	14,000	44	70	54	58	56.50
North Liberty	10	11,000	52	74	60 ^h	65	62.75
Centre township	10	22,000	86	119	89	99	98.25
Clay township ⁱ	15	18,000	73	102	75	84	83.50

SOURCE: Tabulations by HASE staff from the baseline landlord survey for St. Joseph County, Indiana; and homeowner insurance premium schedules published by the indicated companies.

NOTE: A landlord may insure an entire duplex with his homeowner comprehensive coverage if he lives in the building. We assume that all landlords in this situation opt for homeowner rather than multiple-peril coverage.

^a Only minor civil divisions (MCDs) with sampled properties of the designated type are included.

^b Estimated number of properties in each MCD with only a duplex with a resident landlord, excluding farm properties.

^c Average of July 1974 market values of improvements. This is the same value as that reported in *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, Table 11, making the last column's premiums the inputs to an insurance rate index.

^d Premiums are for the following insurance type: homeowner standard policy, \$50 deductible, for frame construction. They are computed from Allstate Insurance Company's Indiana rate schedule that was effective 3 October 1972. That schedule was in effect in St. Joseph County on 1 July 1975.

^e Premiums are for the following insurance type: homeowner form 1, coverage A, \$50 all-peril deductible (Loss Ded. No. 3), for frame construction. They are computed from Indiana Insurance Companies' Indiana rate schedule that was effective June 1975. That schedule was in effect in St. Joseph County on 1 July 1975.

^f Premiums are for the following insurance type: homeowner form 2, \$50 all-peril deductible, for frame construction. They are computed from State Farm Fire and Casualty Company's Indiana rate schedule that was effective 1 October 1973. That schedule was in effect in St. Joseph County on 1 July 1975.

^g Premiums are for the following insurance type: homeowner coverage A, \$50 all-peril deductible, for frame construction. They are computed from United Farm Bureau Mutual Insurance Company's Indiana rate schedule that was effective 1 November 1975. That schedule was in effect in St. Joseph County on 1 July 1975.

^h Premium is that reported for \$10,000 coverage.

ⁱ Includes Indian Village and Roseland.

Table 16

MULTIPLE-PERIL INSURANCE PREMIUMS FOR DUPLEXES WITHOUT RESIDENT LANDLORDS AND ALL RESIDENTIAL BUILDINGS WITH MORE THAN TWO UNITS: MINOR CIVIL DIVISIONS IN ST. JOSEPH COUNTY, INDIANA, JULY 1975

Minor Civil Division ^a	Number of Properties ^b	Average Value ^c (\$)	Average Number of Units	Annual Premium (\$)		
				Company C ^d	Company D ^e	Average
South Bend	1,677	22,000	4	112	136	124.00
Mishawaka	493	31,000	4	145	192	168.50
Lakeville	5	30,000	4	157	240	198.50
New Carlisle	5	11,000	2	57	70 ^f	63.50
North Liberty	5	13,000	3	80	104	92.00
Osceola	7	15,000	3	105	160	132.50
Walkerton	52	36,000	7	230	367	298.50
Centre township	7	16,000	3	110	171	140.50
Clay township ^g	23	19,000	2	124	118 ^f	121.00
Green township	4	15,000	2	87	107 ^f	97.00
Penn township	6	28,000	3	173	300	236.50

SOURCE: Tabulations by HASE staff from the baseline landlord survey for St. Joseph County, Indiana; and multiple-peril insurance premium schedules published by the indicated companies.

NOTE: A landlord cannot cover a residential property on which he does not reside with an extension of his homeowner policy. Although 3- and 4-unit properties could be covered by such an extension if the landlord resides on the property, nearly all properties with three or more units are covered with multiple-peril policies. Companies A and B are not included in the table: Because Allstate writes almost no multiple-peril insurance in St. Joseph County and we were unable to obtain the necessary rate schedules from Indiana Insurance Companies, schedules for these two companies were not included in the average premium calculations.

^aOnly minor civil divisions (MCDs) with sampled properties of the designated type are included.

^bEstimated number of properties either with two units and no resident landlord or with more than two units, excluding farm properties.

^cAverage of July 1974 market values of improvements. This is the same value as that reported in *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, Table 12, making the last column's premiums the inputs to an insurance rate index.

^dPremiums are for the following insurance type: (a) multiple-peril coverage for frame construction; (b) basic coverage (coverage A) from Table I (including the special apartment form) for \$50 flat deductible; (c) loss of rents coverage (Table V) assuming monthly rent equals \$120 times the number of units and repair or rebuilding is estimated to take ten months; and (d) increased limits of liability and medical payments coverage (Table II)--\$100,000 for liability, and \$1,000 per person and \$10,000 per accident for medical payments. Premiums were calculated by State Farm Fire and Casualty Company and reflect rate schedules in effect on 1 July 1975 in St. Joseph County, Indiana.

^ePremiums are for the following insurance type: (a) multiple-peril coverage for frame construction; (b) apartment rates with 80 percent co-insurance (Rate Table 7); (c) \$100 deductible; and (d) building rate only with no extended coverage. Premiums are computed from United Farm Bureau Mutual Insurance Company's Indiana rate schedule that was effective 1 June 1974. That schedule was in effect in St. Joseph County on 1 July 1975.

^fDuplexes must be covered with United Farm Bureau's "home defender" coverage. Such premiums are for the following insurance type: (a) "home defender" coverage for frame construction; (b) coverage A (dwellings) assuming eight premium points for rating factors other than fire protection class; (c) \$50 all-peril deductible; and (d) increased limits of liability and medical payments coverage for the initial two-family residence--\$50,000 per person and \$100,000 per occurrence for liability, and \$1,000 per person and \$10,000 per accident for medical payments. Premiums are computed from United Farm Bureau Mutual Insurance Company's Indiana rate schedule that was effective 1 November 1974. That schedule was in effect in St. Joseph County on 1 July 1975.

^gIncludes Indian Village and Roseland.

Table 17

INSURANCE RATE INDEX: REGIONAL AND
LOCAL DATA AND INDEXES, 1974-75

Item	Region	St. Joseph County
Insurance data: ^a		
1974	105.10	62.71
1975	114.62	69.09
Insurance index ^b	109.1	110.2

SOURCE: Charles W. Noland, *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, p. 36; and pp. 21 and 23 above.

^aIndexes for the region with July 1972 = 100, and dollars per year for St. Joseph County.

^bJuly 1974 = 100.

VI. INDEX OF MAINTENANCE AND REPAIR COST

The component costs of maintenance and repair--for employees, supplies and repairs--are indexed with wage rates and material prices. Wages are obtained primarily from AWS publications, but for some occupations and cities we use union wage scales from other sources. Wholesale price index (WPI) components index material prices.

Because the WPI is a national index, all cities in the region have the same index; we cannot distinguish local or regional price changes from national ones. However, the commodities indexed for the WPI are generally supplied in a national market. A local increase in demand for them could result in either shortages or price increases, but only briefly until local stocks were replenished. There would be at most a temporary divergence between the local and regional indexes.

EMPLOYEES

The wage rate change for janitors, porters, and cleaners, as reported in the AWS, forms the price relative for the employee component. Table 18 gives the wage rate data and the 1974-75 employee cost index.

Table 18

EMPLOYEE COMPONENT OF MAINTENANCE AND REPAIR COST
INDEX: REGIONAL AND LOCAL WAGE RATES
AND INDEXES, 1974-75

Item	Region	St. Joseph County
Janitors, porters, and cleaners: ^a		
1974 wage rate	4.15	3.91
1975 wage rate	4.60	4.15
Employee cost index	110.8 ^b	106.1 ^c

SOURCE: Table 8 above.

^aDollars per hour.

^b1974 = 100.

^cMarch 1974 = 100.

SUPPLIES

Nine commodity groups--commonly used maintenance supplies--make up the component for supplies. Table 19 presents the July 1974 and July 1975 WPI data and the 1974-75 index for each group. Because we have no expenditure data for these detailed categories, the groups are weighted equally. By averaging the price relatives in the last column of Table 19, we obtain the supply cost component (both regional and local indexes) of the maintenance and repair cost index.

REPAIRS

Table 20 lists nine repair index components. Because cost breakdowns are not available, the total cost of each repair type is apportioned between labor and material. Wage rate and material price relatives are weighted with those proportions--which are, in effect, expenditure weights.* We treat the resulting indexes as repair-type price relatives and weight them with HASE baseline expenditure data to compute the repair index. The items to be indexed (both labor and materials) as well as the weights within each repair category are indicated in the last two columns of Table 20. We price nine commodities and nine occupations.

Table 21 presents July 1974 and July 1975 WPI data for the commodity groups and the 1974-75 index for each. Table 22 gives rates for the wage categories listed in Table 20. For the first seven categories, wage rates are presented for all SMSAs in the region that had AWS data. Wage rates for plumbers and roofers are from the *Engineering News Record*, a construction industry weekly; rates for those categories do not appear in any AWS publication.

Every rate was not available for every city. That inconsistency is a consequence of using different sources, each having different characteristics. The last row of Table 22 shows the population-weighted

*The weights are from a study for the New York City Housing and Development Administration (see the note to Table 20). The data are for 1967 to 1969 and are directly applicable to large, rent-controlled buildings in New York. We have been unable to find a set of weights based on properties like those in our experimental sites.

Table 19

SUPPLY COST INDEX: COMMODITY PRICE INDEXES, JULY 1974 AND JULY 1975

Commodity Group	WPI Code Number	WPI Index ^a		1974-75 Index ^b
		July 1974	July 1975	
Soap and synthetic detergent	0671	132.1	149.5	113.2
Builders hardware	104101	140.5	159.1	113.2
Furniture hardware	104104	177.0	201.5	113.8
Metal doors, sash, and trim	1071	149.8	160.5	107.1
Lighting fixtures, residential, incandescent, ceiling, enclosed bowl	10830103.05 ^c	152.5	167.3	109.7
Insect screening, galvanized	10890126.01	153.1	168.3	109.9
Electric lamps/bulbs, incandescent, 100 watts, inside frosted	11770101.02 ^d	147.7	178.8	121.1
Paint brush	15970141.05 ^e	126.9	141.1	111.2
Household maintenance brushes	159703	151.6	172.2	113.6
Supply cost index	--	--	--	112.5

SOURCE: U.S. Bureau of Labor Statistics, *Wholesale Prices and Price Indexes, Data for July 1974* and *Wholesale Prices and Price Indexes, Data for July 1975*, U.S. Government Printing Office, October 1974 and September 1975.

^a1967 = 100.

^bBoth regional and local index. July 1974 = 100.

^cListed in July 1975 as code 10830103.06.

^dListed in July 1975 as code 11770101.03.

^eListed in July 1975 as code 15970141.07.

Table 20

COMPONENT WEIGHTS FOR THE REPAIR COST INDEX, BY TYPE OF REPAIR

Type of Repair	Index Components				Component Weight
Carpentry	1.00	Wages	1.00	Carpenters	1.00
Electrical work	.75	Wages	1.00	Electricians	.75
	.25	Commodities	1.00	Electrical machinery and equipment	.25
Flooring work	.80	Wages	1.00	Carpenters	.60
	.40	Commodities	1.00	Floor coverings	.40
Glass work	.75	Wages	1.00	Helpers, maintenance trades	.75
	.25	Commodities	1.00	Flat glass	.25
Masonry work	.75	Wages	1.00	Helpers, maintenance trades	.75
	.25	Commodities	1.00	Concrete products	.25
Miscellaneous repairs	1.00	Wages	.50	Janitors, porters, cleaners	.50
			.50	Helpers, maintenance trades	.50
Painting	.80	Wages	1.00	Painters	.80
	.20	Commodities	1.00	Prepared paint	.20
Plumbing and heating work	.60	Wages	.10	Boiler tenders	.06
			.20	Firemen, stationary boilers	.12
			.70	Plumbers	.42
	.40	Commodities	.10	Hardware	.04
			.20	Heating equipment	.08
			.70	Plumbing fixtures	.28
Roofing work	.60	Wages	1.00	Roofers	.60
	.40	Commodities	1.00	Prepared asphalt roofing	.40

SOURCE: Ira S. Lowry (ed.), *General Design Report: First Draft*, The Rand Corporation, WN-8198-HUD, May 1973, Table D-5, p. 275.

NOTE: Most of the categories, indexed items, and weights are given in George Sternlieb, *The Urban Housing Dilemma*, Department of Rent and Housing Maintenance, Housing and Development Administration, New York, 1972, pp. 245-259.

Table 21

REPAIR COST INDEX: COMMODITY PRICE INDEXES,
JULY 1974 AND JULY 1975

Commodity Group	WPI Code Number	WPI Index ^a		1974-75 Index ^b
		July 1974	July 1975	
Prepared paint	0621	149.7	167.1	111.6
Hardware	104	139.7	163.5	117.0
Plumbing fixtures and brass fittings	105	152.1	160.9	105.8
Heating equipment	106	137.1	150.2	109.6
Electrical machinery and equipment	117	126.3	140.8	111.5
Floor coverings	123	115.9	123.9	106.9
Flat glass	1311	128.6	140.2	109.0
Concrete products	133	155.2	171.2	110.3
Prepared asphalt roofing	1361	198.7	220.5	111.0

SOURCE: U.S. Bureau of Labor Statistics, *Wholesale Prices and Price Indexes, Data for July 1974* and *Wholesale Prices and Price Indexes, Data for July 1975*, U.S. Government Printing Office, October 1974 and September 1975.

^a1967 = 100.

^bBoth regional and local index. July 1974 = 100.

average of each wage category, based on the cities for which wage data were available.

Table 23 summarizes the 1974 and 1975 regional and local wage rate data for the nine wage categories in Table 20. In addition, it presents the regional and local price relatives. When those relatives and the indexes from Table 21 are weighted with Table 20 weights, the resulting figures are the 1974-75 indexes for the nine repair index components. Table 24 presents the regional and local indexes.

Table 22

REPAIR COST INDEX: REGIONAL WAGE RATES, 1975

State and SMSA	Month of Publication ^a (1975)	Hourly Wage (\$)								
		Boiler Tenders ^b	Carpenters, Maintenance ^c	Electricians, Maintenance ^c	Engineers, Stationary ^c	Helpers, Maintenance Trades ^c	Janitors, Porters, and Cleaners ^d	Painters, Maintenance ^e	Plumbers ^e	Roofers ^e
<i>Illinois</i>										
Chicago	May	6.16	7.04	6.95	7.21	5.27	4.21	7.16	11.92	12.20
Peoria	(f)	--	--	--	--	--	--	--	9.82	--
<i>Indiana</i>										
Evansville	(f)	--	--	--	--	--	--	--	11.62	--
Indianapolis	October	4.81	6.84	6.89	5.95	4.88	4.47	6.54	11.05	--
<i>Michigan</i>										
Detroit	March	6.92	6.81	7.32	6.95	5.64	5.35	6.85	13.42	11.90
Grand Rapids	(f)	--	--	--	--	--	--	--	11.19	--
Lansing-East Lansing	(f)	--	--	--	--	--	--	--	11.55	--
<i>Ohio</i>										
Akron	December	5.82	5.97	6.14	6.09	5.17	4.91	6.02	--	--
Canton	May	5.25	6.09	6.16	6.44	--	4.48	6.30	--	--
Cincinnati	February	5.94	6.26	6.11	6.33	5.17	4.16	5.72	12.60	10.63
Cleveland	September	5.57	6.61	6.84	6.48	5.36	4.76	6.67	12.43	12.25
Columbus	October	4.74	5.77	6.34	6.05	--	4.12	5.92	12.52	11.15
Dayton	December	5.37	6.75	6.89	6.72	5.10	4.85	6.78	11.90	--
Toledo	May	5.43	6.05	6.48	6.21	5.25	4.76	6.15	12.85	--
Youngstown-Warren	(f)	--	--	--	--	--	--	--	11.94	--
<i>Wisconsin</i>										
Madison	(f)	--	--	--	--	--	--	--	11.44	--
Milwaukee	April	5.28	6.11	6.93	5.94	5.26	4.47	6.34	11.98	--
Weighted regional average	--	5.96	6.66	6.87	6.71	5.32	4.60	6.70	12.25	11.92

SOURCE: U.S. Bureau of Labor Statistics, *Area Wage Survey*, U.S. Government Printing Office; specific sources are listed in Appendix C. Wages for plumbers and roofers are from the *Engineering News Record*, Vol. 195, No. 12, 18 September 1975, pp. 71-76.

NOTE: The wage rates in columns 3 through 9 were obtained from the AWS. Dashes in those columns indicate either that no AWS was published for the SMSA or that the wage for a trade in a particular SMSA was suppressed. Dashes in the last two columns indicate that the wage rate for the SMSA was not published in the *Engineering News Record*.

^aAWS collection dates for the indicated SMSA. These dates do not apply to wage rates in the last two columns.

^bMean wage rate for men only in all industries and all-size establishments. This trade was formerly reported as "firemen, stationary boilers."

^cMean wage rate for men only in all industries and all-size establishments.

^dMean wage rate for men and women in all-size manufacturing establishments.

^eUnion wage rate, including fringe benefits, as reported in the *Engineering News Record*. All rates are those in effect on 1 August 1975 except those for plumbers in Peoria, Evansville, Indianapolis, Grand Rapids, Lansing-East Lansing, Dayton, Toledo, Youngstown-Warren, Madison, and Milwaukee, which are the rates in effect on 2 July 1975.

^fDates in column 2 refer only to AWS data, and no AWS publication is available for these SMSAs.

Table 23

REPAIR COST INDEX: REGIONAL AND LOCAL WAGE RATES
AND PRICE RELATIVES, 1974-75

Trade	Hourly Wage Rate (\$)				1974-75 Relative (1974 = 100)	
	1974		1975		Region	St. Joseph County
	Region ^a	St. Joseph County ^a	Region ^b	St. Joseph County ^c		
Boiler tenders ^d	5.42	5.36	5.96	5.96	110.0	111.2
Carpenters, maintenance	6.13	5.56	6.66	5.92	108.6	106.5
Electricians, maintenance	6.21	5.50	6.87	6.02	110.6	109.5
Engineers, stationary	6.14	5.61	6.71	6.15	109.3	109.6
Helpers, maintenance trades	4.75	4.43	5.32	4.81	112.0	108.6
Janitors, porters, and cleaners	4.15	3.91	4.60	4.15	110.8	106.1
Painters, maintenance	6.30	7.83	6.70	7.83	106.3	100.0
Plumbers	11.32	9.37	12.25	10.38	108.2	110.8
Roofers	11.27	8.83	11.92	9.45	105.8	107.0

SOURCE: U.S. Bureau of Labor Statistics (BLS), *Area Wage Survey (AWS)*, Supplement 1 to Bulletin 1795-18, U.S. Government Printing Office, March 1975, Tables A-5 and A-6; BLS, preliminary tabulations of rates and hours for building trades, October 1975; Charles W. Noland, *Indexing the Cost of Producing Housing Services: Site II, 1974*, The Rand Corporation, WN-9736-HUD, May 1977, Table 17, p. 43; and Tables 8 and 22 above.

^aFrom Noland, Table 17, p. 43, except the rate for janitors, porters, and cleaners, which is from Table 8 above.

^bFrom Table 22 above.

^cMarch 1975 AWS wage rates for boiler tenders, carpenters, and electricians, and janitors, porters, and cleaners; see notes to Table 22 above for coverage. July 1975 union wage rates including fringe benefits published by the BLS for painters, plumbers, and carpenters. No source could be found for engineers and helpers. Linear regression analysis indicated that wage rates for boiler tenders, electricians, maintenance mechanics, and tool and diemakers are good predictors of the wage rate for stationary engineers. We used the average 1974-75 price relatives for those four trades as the estimated price relative for stationary engineers. Wage data since 1960 indicate that wage rate changes for carpenters, electricians, and pipefitters closely paralleled those for helpers. We used the average 1974-75 price relatives for those three trades as the estimated price relative for helpers, the data being inadequate for regression analysis. All wages are from the South Bend AWS.

^dFormerly reported as "firemen, stationary boilers."

Table 24

REPAIR COST INDEX: REGIONAL AND LOCAL INDEXES, 1974-75

Type of Repair	Index Component	Component Weight	1974-75 Index (1974 = 100)	
			Region	St. Joseph County
Carpentry	Carpenters, maintenance	1.00	108.6	106.5
Electrical work	Electricians, maintenance	.75	110.6	109.5
	Electrical machinery and equipment	.25	111.5	111.5
	Weighted average	--	110.8	110.0
Flooring work	Carpenters, maintenance	.60	108.6	106.5
	Floor coverings	.40	106.9	106.9
	Weighted average	--	107.9	106.7
Glass work	Helpers, maintenance trades	.75	112.0	108.6
	Flat glass	.25	109.0	109.0
	Weighted average	--	111.2	108.7
Masonry work	Helpers, maintenance trades	.75	112.0	108.6
	Concrete products	.25	110.3	110.3
	Weighted average	--	111.6	109.0
Miscellaneous	Janitors, porters, and cleaners	.50	110.8	106.1
	Helpers, maintenance trades	.50	120.0	108.6
	Weighted average	--	111.4	107.4
Painting	Painters, maintenance	.80	106.3	100.0
	Prepared paint	.20	111.6	111.6
	Weighted average	--	107.4	102.3
Plumbing and heating work	Engineers, stationary	.06	109.3	109.6
	Boiler tenders	.12	110.0	111.2
	Plumbers	.42	108.2	110.8
	Hardware	.04	117.0	117.0
	Heating equipment	.08	109.6	109.6
	Plumbing fixtures and brass fittings	.28	105.8	105.8
	Weighted average	--	108.3	109.5
Roofing work	Roofers	.60	105.8	107.0
	Prepared asphalt roofing	.40	111.0	111.0
	Weighted average	--	107.9	108.6

SOURCE: Tables 20, 21, and 23 above.

VII. INDEX OF PROPERTY TAXES

The property tax index should account for any change in tax bills not caused by physical changes in a property's land or improvements. The preferred computational procedure, comparing actual tax bills for quantity-constant properties (those with no physical change), awaits final public record data files. Meanwhile, an index of the average net county tax rate provides a close approximation. For each property in the county,

$$B = (T) (V), \quad (7.1)$$

where B = property tax bill,

T = net tax rate,

V = net assessed value (land and improvements).

The net tax rate is the published tax rate less a fixed percentage based on the sales tax rebated to each jurisdiction by the state, called the *state return tax credit*. Net assessed value is the assessed value of land and improvements, less exemptions (mortgage, veteran, old age, blindness, and nonprofit). We form our index of the tax bill by assuming that the assessed value is constant (for quantity-constant properties) and using an index of the net tax rate.

Since 1974 there has been no general reassessment in any St. Joseph County taxing jurisdiction. Net assessed values have thus changed for only two reasons--selected reassessment or change in exemption status. Incidence of the latter is so small that we can neglect it without affecting the index.

Selected reassessment, which we also do not allow for, is initiated upon one of two events: (a) a building permit in excess of a certain value is issued for the property, or (b) the owner requests (and the state tax board allows) an individual reassessment. The first occurrence reflects an actual change in the quantity of capital that we would not want to build into our index. Because the second almost always reduces assessed value, our ignoring it imparts a small upward bias to the index.

Each year we collect tax rates and state tax credit rates for all 29 jurisdictions in St. Joseph County, and we calculate the weighted average net tax rate for the county (see Table 25). Each jurisdiction's weight is its total net assessed value of residential property. The ratio of the resulting average rates gives a local 1974-75 index of 98.4 (1974 = 100).

For our regional index we use the property tax component of the Region V CPI, sent to us annually by the Bureau of Labor Statistics. During 1974-75 the regional index rose 5.5 percent, while our local index for St. Joseph County fell 1.6 percent (see Table 26).

Table 25

ASSESSED VALUE, TAX RATES, AND STATE RETURN TAX CREDIT BY TAXING JURISDICTION:
ST. JOSEPH COUNTY, INDIANA, 1974-75

Taxing Jurisdiction	Net Assessed Value ^a (\$) 1974 ^d	Tax Rate ^b		State Return Tax Credit		Net Tax Rate ^c	
		1974 ^d	1975 ^e	1974 ^d	1975 ^e	1974 ^d	1975 ^e
Centre township (excluding South Bend)	5,969,812	7.830	7.704	.20060	.20104	6.259	6.155
Clay township (excluding Roseland, Indian Village, Mishawaka, and South Bend)	23,135,274	8.195	7.993	.20000	.20023	6.556	6.393
Roseland	1,117,243	9.465	9.282	.20681	.20196	7.508	7.407
German township (excluding South Bend)	4,630,671	8.075	7.874	.20127	.20148	6.450	6.288
Green township	5,881,418	7.825	7.634	.20022	.20021	6.258	6.106
Harris township	3,461,219	8.602	8.477	.20023	.20088	6.880	6.774
Liberty township (excluding North Liberty)	1,960,818	7.845	7.710	.20000	.20000	6.276	6.168
North Liberty	1,011,260	10.445	10.309	.20000	.20003	8.356	8.247
Lincoln township (excluding Walkerton)	1,140,173	7.135	8.620	.20000	.20004	5.708	6.896
Walkerton	1,910,195	10.085	11.600	.20000	.20003	8.068	9.280
Madison township	5,003,980	8.472	8.327	.20194	.20072	6.761	6.656
Olive township (excluding New Carlisle)	3,266,988	7.155	7.040	.20046	.20000	5.721	5.632
New Carlisle	1,327,186	9.935	9.810	.20033	.20000	7.945	7.896
Penn township (excluding Osceola, Mishawaka, and South Bend)	20,449,666	8.632	8.450	.20000	.20000	6.906	6.760
Osceola	1,941,686	9.862	9.690	.20000	.20000	7.890	7.752
Mishawaka (Penn township)	35,981,001	11.370	11.310	.20000	.20004	9.096	9.048
Portage township (excluding South Bend)	3,357,348	8.095	7.826	.20000	.20000	6.476	6.261
South Bend (Portage township)	120,796,884	12.961	12.715	.20000	.20000	10.369	10.172
Union township (excluding Lakeville)	3,160,876	7.075	7.052	.20283	.20345	5.640	5.617
Lakeville	213,407	9.225	9.253	.20215	.20479	7.360	7.358
Warren township	6,763,093	7.915	7.744	.20076	.20018	6.326	6.194
Indian Village	1,526,659	8.305	8.062	.20000	.20022	6.644	6.448
South Bend (Centre township)	9,876,212	12.966	12.715	.20036	.20064	10.368	10.164
South Bend (Clay township)	2,045,273	13.041	12.781	.20000	.20015	10.433	10.223
South Bend (German township)	644,726	13.011	12.763	.20079	.20092	10.399	10.199
South Bend (Penn township)	3,676,303	13.758	13.499	.20000	.20001	11.006	10.799
Mishawaka (Penn township, Penn-Harris-Madison)	4,273,290	12.182	11.990	.20000	.20003	9.746	9.592
Mishawaka (Penn township, Penn-Mishawaka School)	30,649	7.820	7.770	.20000	.20000	6.256	6.216
Mishawaka (Clay township)	17,136	11.315	11.112	.20000	.20020	9.052	8.887
Weighted average ^f	--	11.162	10.984	.20017	.20017	8.876	8.734

SOURCE: Tabulations by HASE staff from the public records file, Site II, baseline; and published tax rates for St. Joseph County, Indiana.

^a Assessed value of land plus assessed value of improvements less the following exemptions: mortgage, veteran, old age, blindness, nonprofit.

^b Per \$100 assessed value.

^c Per \$100 assessed value. Calculated as follows:

$$\text{tax rate} - (\text{tax rate} \times \text{state return tax credit}).$$

^d For taxes levied in 1974, payable in 1975.

^e For taxes levied in 1975, payable in 1976.

^f Net assessed values are used as weights.

Table 26

PROPERTY TAX INDEX: REGIONAL
AND LOCAL DATA AND INDEXES,
1974-75

Year	Region	St. Joseph County
<i>Data</i>		
1974	102.5 ^a	8.876 ^b
1975	108.1 ^a	8.734 ^b
<i>Index</i>		
1974	100.0	100.0
1975	105.5	98.4

SOURCE: Special tabulations by the BLS and Table 25 above.

^aBLS tabulations. July 1972 = 100.

^bWeighted average net tax rate for St. Joseph County from Table 25 above.

Appendix A

INDEXES OF MAINTENANCE AND REPLACEMENT COSTS
AND CAPITAL ADDITION COSTS

Some of our analyses require combining the components given in Secs. IV and V into expenditure-weighted indexes. This appendix presents such indexes for two major expenditure groups analyzed by HASE-- (a) maintenance and replacements and (b) capital additions.

We calculate separate indexes for rental and owner-occupied units using expenditure weights constructed from the baseline surveys of landlords and homeowners. For renters, we use Site I baseline (1973) data; for homeowners, Site II baseline (1974) data. Tables A.1 through A.3 present the components, expenditure weights, and final indexes.

Table A.1

MAINTENANCE AND REPLACEMENT COST INDEX: REGIONAL AND LOCAL DATA AND INDEXES FOR RENTAL UNITS, 1974-75

Category	Expenditure Weight ^a	1974-75 Price Relative ^b		Expenditure-Weighted Price Relative	
		Region	St. Joseph County	Region	St. Joseph County
Air conditioning work	.001	108.3 ^c	109.5 ^c	0.1	0.1
Carpentry	.011	108.6	106.5	1.2	1.2
Contracts	.024	110.8 ^d	106.1 ^d	2.7	2.5
Electrical work	.019	110.8	110.0	2.1	2.1
Employee expenses ^e	.216	110.8 ^d	106.1 ^d	23.9	22.9
Flooring work	.091	107.9	106.7	9.8	9.7
Glass work	.054	111.2	108.7	6.0	5.9
Landscaping and paving	.012	111.4 ^f	107.4 ^f	1.3	1.3
Masonry work	.028	111.6	109.0	3.1	3.1
Miscellaneous repairs	.122	111.4	107.4	13.6	13.1
Painting	.154	107.4	102.3	16.5	15.8
Plumbing and heating work	.134	108.3	109.5	14.5	14.7
Roofing work	.068	107.9	108.6	7.3	7.4
Supplies	.066	112.5 ^g	112.5 ^g	7.4	7.4
1974-75 maintenance and replacement cost index ^h	--	--	--	109.7	107.1

SOURCE: Survey of landlords, Site I, baseline; and Tables 18, 19, and 24 above.

NOTE: Components may not add to totals because of rounding.

^aComputed from the survey of landlords, Site I, baseline.

^bUnless otherwise noted, the price relative is the index for the corresponding repair group in Table 24 above. 1974 = 100.

^cTable 24 above, plumbing and heating work.

^dTable 18 above.

^eIncludes unpaid labor and tenant repairs and replacements.

^fTable 24 above, miscellaneous repairs.

^gTable 19 above.

^h1974 = 100.

Table A.2

MAINTENANCE AND REPLACEMENT COST INDEX: REGIONAL AND LOCAL DATA AND INDEXES FOR OWNER-OCCUPIED UNITS, 1974-75

Category	Expenditure Weight ^a	1974-75 Price Relative ^b		Expenditure-Weighted Price Relative	
		Region	St. Joseph County	Region	St. Joseph County
Air conditioning work	.001	108.3 ^c	109.5 ^c	0.1	0.1
Carpentry	.003	108.6	106.5	0.3	0.3
Electrical work	.025	110.8	110.0	2.8	2.8
Flooring work	.220	107.9	106.7	23.7	23.5
Glass work	.069	111.2	108.7	7.7	7.5
Landscaping and paving	.004	111.4 ^d	107.4 ^d	0.4	0.4
Masonry work	.014	111.6	109.0	1.6	1.5
Miscellaneous repairs	.278	111.4	107.4	31.0	29.9
Painting	.109	107.4	102.3	11.7	11.2
Plumbing and heating work	.205	108.3	109.5	22.2	22.4
Roofing work	.072	107.9	108.6	7.8	7.8
1974-75 maintenance and replacement cost index ^e	--	--	--	109.2	107.4

SOURCE: Survey of homeowners, Site II, baseline; and Table 24 above.

NOTE: Components may not add to totals because of rounding.

^aFor single-family units only. Computed from the survey of homeowners, Site II, baseline.

^bUnless otherwise noted, the price relative is the index for the corresponding repair group in Table 24 above. 1974 = 100.

^cTable 24 above, plumbing and heating work.

^dTable 24 above, miscellaneous repairs.

^e1974 = 100.

Table A.3

CAPITAL ADDITION COST INDEX: REGIONAL AND LOCAL DATA AND INDEXES FOR RENTAL AND OWNER-OCCUPIED UNITS, 1974-75

Category	Expenditure Weight		1974-75 Price Relative		Expenditure-Weighted Price Relative			
	Rental Units ^a	Owner-Occupied Units ^b	1974-75 Price Relative		Rental Units		Owner-Occupied Units	
			Region	St. Joseph County	Region	St. Joseph County	Region	St. Joseph County
Air conditioning work	.010	.038	108.3 ^e	109.5 ^e	1.1	1.1	4.1	4.2
Carpentry	.170	.320	108.6 ^d	106.5 ^d	18.5	18.1	34.8	34.1
Construction	.701	.543	104.7 ^e	103.6 ^e	73.4	72.6	56.9	56.2
Landscaping and paving	.119	.099	111.4 ^f	107.4 ^f	13.3	12.8	11.0	10.6
1974-75 capital addition cost index ^g	--	--	--	--	106.2	104.6	106.7	105.1

SOURCE: Survey of landlords, Site I, baseline; survey of homeowners, Site II, baseline; and Tables 6 and 24 above.

NOTE: Components may not add to totals because of rounding.

^aComputed from the survey of landlords, Site I, baseline.

^bFor single-family units only. Computed from the survey of homeowners, Site II, baseline.

^cTable 24 above, plumbing and heating work. 1974 = 100.

^dTable 24 above, carpentry. 1974 = 100.

^eTable 6 above. 1974 = 100.

^fTable 24 above, miscellaneous repairs. 1974 = 100.

^g1974 = 100.

Appendix B

FEDERAL HOME LOAN BANK BOARD MORTGAGE SURVEY COVERAGE

Every issue of the Federal Home Loan Bank Board *News* containing mortgage data includes the technical note reproduced below. It describes the content and coverage of their survey and provides technical definitions and information on statistical procedures and timing.

TECHNICAL NOTE

Data are weighted averages compiled by the Federal Home Loan Bank Board in cooperation with the Federal Deposit Insurance Corporation from individual loan statistics reported by a sample of major mortgage lenders.

Coverage The series covers fully amortized conventional first mortgage loans for purchasing (and combination construction-purchase loans where construction financing is combined with permanent financing in a single transaction) single-family homes originated by savings and loan associations, mortgage bankers, commercial banks and mutual savings banks. Such lenders accounted for approximately 90 percent of all conventional home mortgage originations in 1972.

Sample The sample of lenders reporting data consists of savings and loan associations holding about 70 percent of the assets of all FSLIC-insured associations, mortgage bankers accounting for approximately 25 percent of all mortgage banker conventional home mortgage originations, commercial banks holding about 42 percent of all home mortgages held by FDIC-insured commercial banks, and mutual savings banks holding about 60 percent of all mutual savings bank holdings of home mortgages. Substantially all of the largest lenders of the covered types are included in the survey, with small institutions selected at random from a number of different geographic-size strata, the sampling fraction being reduced as size declines.

Statistical procedures Loans reported by individual lenders are assigned weights based on the relationship of the assets (or other measure of size) of the lenders in the sample in each of a number of strata, which are defined in terms of type of lender, lender size and geographical location, to the assets of all lenders in a stratum. This provides appropriate weight for the smaller lenders represented by reduced sampling fractions, which tend to be outside major metropolitan areas. The averages, however, will reflect changes in relative lending volume among types of lender, among geographic areas, and among sizes of lender.

Geographic area averages are based on the location of the property securing loans and are subject to more sampling error and more erratic fluctuation than the national averages; small month-to-month changes, therefore, should be interpreted with caution.

Timing The series covers all loans closed by participants during the first five full working days of a month. During months when lending terms are in process of change, the averages may not be representative of the month as a whole. Most mortgage lending, moreover, is based on prior commitments made by lenders. As a consequence, reported terms on loans closed in most cases reflect the interest rates and terms offered borrowers by lenders a month, or more, prior to the reporting date. The series, as a result, should not be interpreted as a measure of "market rates and terms" during the reporting period.

Definitions The cost of private (i. e., non-Government) mortgage insurance is excluded from the averages. Most lenders make a separate charge for such insurance which is excluded from reported fees and charges. In the case of the relatively small number of lenders which include such a charge in the contract rate, however, a downward adjustment is made in the reported contract rate to eliminate such charges and make the rate comparable to that charged by other lenders; the effect of this adjustment is minor, reducing the contract rate by only 1 or 2 basis points.

Fees and charges are defined to include all fees, commissions, discounts and "points" paid by the borrower, or seller, in order to obtain a loan, including any general charge for making the loan and specific charges made to offset specific lending expenses. Charges for mortgage, credit, life or property insurance, property transfer costs, and title search and insurance costs are excluded, but other fees are reported without deducting payments made by the lender to others for services rendered.

The effective interest rate includes the contract interest rate plus fees and charges amortized over a ten-year period, the latter being a rough estimate of the actual average life of conventional mortgages.

Appendix C

AREA WAGE SURVEY CITATIONS

Data for Tables 7 and 22 in this note were obtained from Area Wage Surveys published by the U.S. Bureau of Labor Statistics. Data for Table 7 are from AWS Tables A-1 and A-5 and data for Table 22 are from AWS Tables A-5 and A-6 of the following AWS bulletins:

1974

Chicago, IL	1795-27	May 1974
Indianapolis, IN	1775-27 Supplement 2	October 1974
Detroit, MI	1775-89 Supplement 1	March 1974
Akron, OH	1795-10 Supplement 1	December 1974
Canton, OH	1795-23	May 1974
Cincinnati, OH	1795-16	February 1974
Cleveland, OH	1850-17	September 1974
Columbus, OH	1775-23 Supplement 2	October 1974
Dayton, OH	1850-14	December 1974
Toledo, OH	1775-63 Supplement 1	April 1974
Milwaukee, WI	1775-83 Supplement 1	May 1974

1975

Chicago, IL	1850-33	May 1975
Indianapolis, IN	1850-66	October 1975
Detroit, MI	1850-22	March 1975
Akron, OH	1850-80	December 1975
Canton, OH	1795-23 Supplement 1	May 1975
Cincinnati, OH	1795-16 Supplement 1	February 1975
Cleveland, OH	1850-64	September 1975
Columbus, OH	1850-78	October 1975
Dayton, OH	1850-73	December 1975
Toledo, OH	1850-34	May 1975
Milwaukee, WI	1850-21	April 1975

REFERENCES

- Anderson, Kent P., *Residential Energy Use: An Econometric Analysis*, The Rand Corporation, R-1297-NSF, October 1973.
- Boeckh Building Cost Modifier*, American Appraisal Associates, Pub. 8, No. 4, July-August 1975.
- Engineering News Record*, Vol. 195, No. 12, 18 September 1975.
- Federal Home Loan Bank Board, *News*, September 1974 and September 1975.
- Federal Power Commission, *Typical Electric Bills*, FPC R 86, U.S. Government Printing Office, December 1975.
- Lowry, Ira S. (ed.), *General Design Report: First Draft*, The Rand Corporation, WN-8198-HUD, May 1973.
- 1972 Commercial Atlas and Marketing Guide*, Rand McNally and Company, Chicago, 1972.
- Noland, Charles W., *Indexing the Cost of Producing Housing Services: Site II*, 1974, The Rand Corporation, WN-9736-HUD, May 1977.
- Rydell, C. Peter, *Measuring the Supply Response to Housing Allowances*, The Rand Corporation, P-5564, January 1976.
- _____, *Rental Housing in Site I: Characteristics of the Capital Stock at Baseline*, The Rand Corporation, WN-8978-HUD, August 1975.
- Sternlieb, George, *The Urban Housing Dilemma*, Department of Rent and Housing Maintenance, Housing and Development Administration, New York, 1972.
- U.S. Bureau of the Census, *Current Population Reports*, Series P-26, Nos. 76-13, 76-14, 76-17, 76-22, 76-35, and 76-49, U.S. Government Printing Office, July-December 1977.
- U.S. Bureau of Labor Statistics, *Area Wage Survey*, various bulletins, as follows: No. 1850-33; No. 1850-66; No. 1850-22, No. 1850-80; Supplement 1 to No. 1795-23; Supplement 1 to No. 1795-16; No. 1850-64; No. 1850-78; No. 1850-73; No. 1850-34; No. 1850-21; No. 1795-18 and Supplement 1 to No. 1795-18; U.S. Government Printing Office, March 1974, February-December 1975.
- _____, *CPI Detailed Report for July 1974*, U.S. Government Printing Office, October 1974.
- _____, *CPI Detailed Report for July 1975*, U.S. Government Printing Office, September 1975.

_____, *Wholesale Prices and Price Indexes, Data for July 1974*, U.S. Government Printing Office, October 1974.

_____, *Wholesale Prices and Price Indexes, Data for July 1975*, U.S. Government Printing Office, September 1975.



