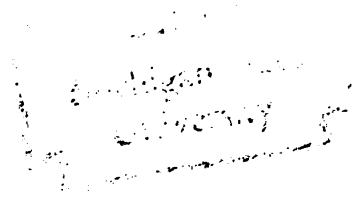
IMPACT OF RESIDENTIAL DEVELOPMENT: A CASE STUDY OF FEDERALLY SUBSIDIZED HOUSING PROGRAMS IN LANSING, MICHIGAN

Thesis for the Degree of M. S.
MICHIGAN STATE UNIVERSITY
JAMES NELSON FOULDS
1975



ABSTRACT

IMPACT OF RESIDENTIAL DEVELOPMENT:
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HOUSING PROGRAMS IN LANSING, MICHIGAN

By

James Nelson Foulds

Housing, because of its physical, economic and social ramifications, has a profound impact on the individual, the neighborhood, and the entire structure of the community. Traditionally, the provision of new housing stock within this country has relied on the operation of the private housing market. It has only been in recent decades that the Congress of the United States, through various departments and agencies, has become directly involved in the provision of housing and housing services to certain income groups.

The City of Lansing, Michigan, has had 2,156 dwelling units constructed prior to January, 1973, which received assistance from three federal housing programs. These programs were designed to serve low and moderate income families with decent, safe, and sanitary housing. How successful were these programs? What impact did the construction of these subsidized units have on the neighborhood in which they were built? What were the specific economic and environmental impacts? This thesis contended that measures of housing program effectiveness and impact were needed in order that national

housing programs were meaningfully evaluated, and that local units of government and private developers could properly plan, implement, and service these residential units.

Based on review of 1970 census data, the Lansing housing market exhibited a strong demand in the small household subgroup. Specifically, dwelling units designed for elderly and small family use in the low and moderate income ranges were in high demand. Research determined that the majority of the thirteen subsidized developments studied were aimed at this particular household need. However, in order to objectively measure the degree of impact these thirteen developments had, it was necessary to design a series of indicators which could measure the relationships between the developments and the sites on which they were constructed, and the developments and the surrounding neighborhoods. The following five indicators were selected;

1. Educational cost-revenue
2. Net residential density
3. Residential vacancy rate
4. Recreational acreage
5. Environmental impact of soils, vegetation, and flood plain location

Each of the five indicators were applied individually to each of the thirteen residential developments. This application revealed, on the negative side, that the majority of developments were not contributing sufficient educational revenue to the local school system, that net residential densities exceeded neighborhood

densities by very high amounts, and that these developments were placing a heavy demand on the neighborhood recreational system. In addition, many of the developments exhibited high vacancy rates. On the positive side, only a small percentage of the developments seemed to be contributing to soil erosion and sedimentation problems, and none of the developments were located within flood plains.

In summary, the following concluding statements were made:

1. That it is feasible to develop a workable evaluative mechanism which utilizes readily available public data and yields measurable results.
2. That the City of Lansing and the Lansing School District should more closely coordinate the analysis of proposed residential development vis-a-vis the expected impact on the local school system.
3. That the City of Lansing should revise the approval process for land development (specifically the zoning and subdivision regulations) to include impact measurement as it relates to the proper utilization of public services and facilities.
4. That the U.S. Department of Housing and Urban Development should update their housing market analysis for the Lansing area so as to more correctly assess the basic housing needs of the community.
5. That the management firms for the thirteen subsidized developments should conduct an attitudinal survey of their respective residents to ascertain the reason for high vacancy rates.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Department of Resource Development

1975

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CHAPTER I

THE NEED FOR HOUSING QUALITY INDICATORS

Introduction to the Problem

Housing, the greatest single investment for the majority of households, plays a significant role in the lifestyle of every individual and family. Without considering the size of the initial housing cost, housing accounts for consumer expenditures of substantial proportions, it has profound impact on the psychological and physiological wellbeing of every person, and it has implications in the economic and social stability of units of local and regional government. One of the major resources, therefore, within any community is the quality and quantity of the existing residential housing stock. The degree to which the quality and quantity of that housing stock is maintained and upgraded is both a function of the operation of the private housing market and the ability of the government structure to influence and support the operation of that market.

Government's role in housing, because of the characteristics of the democratic process, developed very slowly from local regulations of structural quality in the Plymouth Colony in 1626, to billion dollar federal subsidy programs on a national scale during the late nineteen-sixties. This national concern for housing developed from the rapid population growth which outstripped the supply of

suitable available housing. Intervention by the Federal Government in local housing actually started in 1892 when Congress passed a resolution encouraging investigation of slum conditions in cities containing 200,000 population or greater.[1] Because of the controversy surrounding the apparent conflict between government and the matter of private housing, the investigation did not get adequately funded and consequently returned only superficial data on housing conditions in only a few major cities. It was not until the first World War, when an extreme shortage of housing arose for workers in the war industries, that Congress appropriated $175,000,000 for housing purposes to be used by the U.S. Shipping Board and the U.S. Housing Corporation. Only a small portion of these funds were utilized, however, before completion of the Armistice Agreement ending World War I.[2]

It was shortly after the Armistice that conflicts again arose between those individuals who believed the Federal Government should get involved in housing activities, and those individuals who felt that housing should be left strictly in the hands of private business. The decision was eventually made not to become directly involved in housing and the Federal Government sold or turned over to government agencies all housing properties.

Such conflicts were not long submerged, however, as the Depression of the 1930's again posed the question of governmental

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[1] Glenn H. Beyer, Housing and Society (New York, N.Y.: The Macmillan Company, 1968), p. 453.

[2] Ibid., p. 455.

involvement in the housing process. As a result of the ever increasing rate of mortgage foreclosures, Congress passed the Federal Home Loan Bank Act in July of 1932. The intent of this Act was to enable the Federal Government to make monetary advances (secured by first mortgages) to lending institutions on a national basis. This legislation did little to slow the foreclosure rate, however, and Congress quickly followed with the establishment of the Federal Housing Administration under the National Housing Act of 1934. Glenn H. Beyer states that the two primary reasons for the 1934 legislation were, first of all; to stabilize the mortgage system by providing government insurance to long term residential mortgages and, secondly; to provide positive economic influence to a rapidly declining construction industry.[3] The vehicle for accomplishing these activities was to be the Federal Housing Administration (FHA) which would be located in every state and territory. The local offices would process mortgage loan applications received from private lending institutions and review the plan specifications to make sure minimum agency requirements were met. Although FHA insures mortgages on both old and new dwelling units, new construction represents the greatest proportion of housing activity.

It is interesting to briefly compare the national government's role in housing in the United States with those of other countries such as Russia, England, France, West Germany and Sweden. Because of the ravages of war, the population explosion, and

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[3] Ibid., p. 457.

subsequent urbanization, these countries have been subjected to tremendous shortages of housing stock. In writing on housing policy, Nathan Glazer states:

> Each of these countries has different housing policies, in each the problem of housing shortage has been or is so severe that the government makes some estimate of need, decides how much it can afford to build this year or the next, builds it, and in some way rations it out. There is an enormous difference, of course, between Russia and Sweden, in the quality of housing, the size of units, the sophistication of the planning, the proportion of a tenants income he pays for rent, and yet there is some similarity.[4]

Glazer goes on to state that housing shortages of the dimension faced by these countries have not been experienced in the United States. There have been, however, shortages for certain economic groups, which has resulted in certain unique (as compared to other countries) national housing policies. The activities of the FHA, as described above, sets minimum standards in regards to what amenities must be in the dwelling, what floor space it is to have, and what size the parcel will be. The questions as to how much housing should be built, where to build it, and at what interest rate the mortgage will be financed at, are determined by a triad of interests composed of the construction industry, the economic institutions, and the consumer.[5] Local governmental jurisdictions, where all the housing will eventually be built, have little to say about how this housing will impact the community. The only role played

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[4]Daniel P. Moynihan, Toward A National Urban Policy (New York: Basic Books Incorporated, 1970), p. 52.

[5]Ibid., p. 54.

by local communities is to enforce building and zoning codes on a dwelling by dwelling basis.

The Lansing, Michigan housing market has had major residential activity from four federal government programs through the auspices of the 1968 Housing Act. A brief explanation of these programs is included below:

Mortgage Insurance Programs

Section 221(d)4: Mortgage Insurance at market interest rate for construction and rehabilitation of rental housing containing at least five units for families with low and moderate income.

Direct Assistance Programs

Section 221(d)3 BMIR: Mortgage Insurance for the below market interest rate construction and rehabilitation of rental and cooperative housing for families or individuals with low or moderate income.

Section 235: Single or Multi-family ownership through direct monthly assistance to the mortgage on behalf of the lower-income participant.

Section 236: Financing of the construction and rehabilitation or rental of cooperative housing for low income families or individuals.

These programs have contributed an estimated 2,156 dwelling units within the City of Lansing. Once the developments or units are

structurally completed and occupied, it seems an accepted fact that the specific programs have reached a successful conclusion and that no additional criteria are needed.

In the Lansing area, the majority of housing research has been formulated around a wide range of statistical data on the characteristics, nature, and resources of the housing stock in the city and the region. Such a quantative approach to the housing issue tends to obscure the intended accomplishments of housing programs at all levels. For example, much statistical data is available as to the location and number of housing units, type and tenure of unit, number of households, family and household income, etc., but no information exists as to what specific impact the development or developments had on the neighborhood in which they were constructed. Considering the four federal housing programs described previously, meaningful questions must be raised about their overall success. Were the intentions of the programs realized? Did the developments have a positive or negative impact on the neighborhood in which they were located? How do the various governmental housing programs affect the environmental relationships found within that neighborhood?

This thesis, then, postulates that additional measures of the effectiveness of selected federally sponsored housing programs are needed in order to adequately assess the overall quality of these programs. The material presented intends to investigate the impact of these selected programs within the City of Lansing, Michigan, and recommend and apply a set of indicators with which to qualitatively

judge these programs. The Lansing area was selected because it represents a well defined housing market with an extensive amount of data available.

In view of the January 1, 1973 national monitorium on federal housing programs, it appears time for a critical evaluation of traditional views and concepts in the housing development and redevelopment processes. The framework of new programs, or the restructuring of old programs, will depend on the quality of such critical evaluation. Also, the federal housing programs under scrutiny have supplied thousands upon thousands of dwelling units to the American consumer in hundreds of communities. The ramifications of these dwelling units, both positive and negative, are being felt or will be apparent for many years to come. The need for qualitative and quantitative analysis appears just as necessary today as it did before the inception of these programs.

It should be stated that the indicators to be developed within this thesis are based primarily on the physical and economic relationships of individual federally assisted developments to the surrounding neighborhood. The social framework, within each development, will not be analyzed due to the limits of time and dollars associated with this project. In no way does this concentration of "external" physical and economic indicators diminish the importance of research into the "internal" social environments found within these developments. The environmental effects of dwellings and housing developments on their inhabitants has been receiving recent

attention from the New York State Urban Development Corporation.[6] Also, Leon Festinger and Herbert J. Gans have contributed significant research on neighborhood social structure and the influence of spatial arrangements on this social structure.[7] In the final analysis, it will be the combination of these internal and external indicators which will produce meaningful criteria which will further our knowledge about the impact of housing on the individual, the neighborhood, and the community.

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[6]Theodore Liebman, Michael J. Kirkland and Anthony Pangoro, "Housing Criteria Drawn From Human Response," AIA Journal (March, 1974), p. 46.

[7]Harold M. Proshansky, William H. Ittelson, and Leanne G. Rivlin, Environmental Psychology (New York: Holt, Rinehart, and Winston, Inc., 1970), pp. 501, 509.

CHAPTER II

FEDERAL HOUSING PROGRAMS

Introduction

As noted in Chapter I of this thesis, the role of government in the housing delivery process developed very slowly. The material contained within this chapter intends to briefly cover the major items of housing related legislation at the national level, and to explain the framework of the programs impacting Lansing, Michigan. This background information was deemed necessary because, before any type of critical analysis can be done with regard to those federally assisted residential projects within Lansing, the overall program intent must first be described so that a level of understanding may be reached as to the major direction of national housing policy. The formulation and application of indicators on the physical and economic characteristics of the developments, therefore, will be more meaningful if considered within the context of total housing program design.

Evolution of Federal Housing Programs

The continuing spread of housing deterioration in our urban and rural areas is one of the biggest problems confronting the United States today. Program proposals being developed at the

national, state, region, municipal, neighborhood, or even block level, are attempting to find the answer to this most perplexing problem. The plight of the poor and disadvantaged was dramatically demonstrated by the civil disturbances which occurred in numerous urban areas in the late nineteen-sixties and early nineteen-seventies. Although not directly housing related, these disturbances either started in areas of poor housing quality, or quickly spread into these blighted areas. Partially as a response to the crisis situation in the urban centers, and partially as a revision of past national direction, Public Law 90-448 (more commonly known as the Housing and Urban Development Act of 1968) was approved on August 1, 1968. In this legislation, Congress reaffirmed the national goal of "a decent home and a suitable living environment for every American family" (as initially stated in the Housing Act of 1949).

This legislation did differ from previous national efforts in housing. To understand the degree of that difference, it is first necessary to go back to the goals and policies of the New Deal programs in the 1930's. The New Deal utilized a series of tools to fight the high unemployment rate and the associated economic downturn which was engulfing the United States. These efforts placed heavy reliance on the creation of jobs and economic "pump priming" activities. The tools specifically designed for housing were to support private, nonsubsidized home financial arrangements and construction.[1]

[1] U.S., Congress, Joint Economic Committee, The Economics of Federal Subsidy Programs, Joint Committee Report (Washington, D.C.: U.S. Government Printing Office, 1972), p. 597.

As discussed in Chapter I, the establishment of the Federal Home Loan Bank system in 1932, and the creation of the Federal Housing Administration in the National Housing Act of 1934, were intended to restore confidence in residential property values and to encourage new construction activity. Through the direction of the Housing Act of 1937, however, the Federal Government established a program of subsidy housing payments to low income families and individuals. This action represented the first time that a program involved non-recoverable payments which directly impacted the housing consumer. This low rent public housing program, as it was referred to, had three primary purposes;[2]

1. The provision of decent, safe, and sanitary housing to people not able to pay for it;
2. The creation of employment patterns in the housing industry; and
3. The elimination of blighted housing.

Although the above described programs resulted in the construction of many new housing units, it was not until the Housing Act of 1949 that the country clearly had a housing policy direction with a balance between subsidized and unsubsidized programs. That policy direction was an indication that a suitable housing situation was the right of every citizen, and that national housing programs were not to be carried out solely for economic purposes. As stated within the Housing Act of 1949:

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[2] Ibid., p. 601.

> The Congress hereby declares that the general welfare and security of the nation and the health and living standards of its people require housing production and related community development sufficient to remedy the serious housing shortage, the elimination of substandard and other inadequate housing through the clearance of slums and blighted areas, and the realization as soon as feasible of the goal of a decent home and a suitable living environment for every American family, thus contributing to the development and redevelopment of communities and the advancement of the growth, wealth, and security of the nation.[3]

The 1949 housing legislation was divided into three primary parts; Title I of the Act established a new program which dealt with the clearance and redevelopment of blighted areas. It authorized grants of federal money equal to two-thirds of the difference between the acquisition costs of blighted districts and the resale price paid by the developer. The influence this legislation had on increasing the supply of housing for low and moderate income households was very minimal. The funds were used primarily for the acquisition and clearance of central city commercial land. Title II of the 1949 Act expanded the provisions of the earlier legislation concerning the Federal Housing Administration mortgage insurance authorizations. This action was the primary impetus for the tremendous increase in new housing inventory in the suburban areas during the nineteen-fifties. The only impact, however, Title II had on the lower income households was directly related to the "filtering" down of older housing units within the central city areas. Title III authorized the construction of 810,000 public housing units within a six year

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[3]National Commission on Urban Problems, More Than Shelter, Research Report No. 8 (Washington, D.C.: U.S. Government Printing Office, 1968), p. 10.

planning period. As explained by the National Commission on Urban Problems in 1968, this objective was never realized:

> Those opposed to public housing had desperately tried to eliminate the program from the 1949 Act. Having failed in that attempt, they managed in succeeding years effectively to limit authorizations to 35,000 annually, or one quarter of the number authorized in the Act. Even so, because of local apathy and resistance, the average annual production for the next 17 years through 1966 was under 26,000. By the end of the 17th year, only 431,000 units--slightly more than half of those originally authorized for the first six years--had been placed under management. During that same period, urban renewal had displaced 210,000 families and 87,000 individuals. Of these, a majority were within the income limits set for admission to public housing.[4]

The decade of the 1950's brought little shift in the emphasis on new construction specifically for moderate income families. The Eisenhower Administration sponsored an effort in the mid-fifties to expand upon the Housing Act of 1949. As a result, the Omnibus Housing Act of 1954 increased the scope of the clearance and redevelopment program and changed the name of urban renewal. Also included in the 1954 legislation was the requirement that each locality participating in any of the governmental programs designed to eliminate and prevent the expansion of urban blight must prepare a "Workable Program" statement which detailed the overall plan of action in relation to this particular problem. The Workable Program places two requirements for codes and code enforcement on local units of government. The first requirement was the adoption of the latest published edition of one of the nationally recognized model housing, building, plumbing, electrical, fire prevention, and related

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[4] Ibid., p. 11.

codes and ordinances, or state and local codes with comparable standards. The second requirement was the establishment of an effective code enforcement procedure to promote minimum housing standards with direct reference to sanitary and safety conditions.[5] The Workable Program was to outline the housing problem faced by the locality, whether it was in the form of a deteriorating housing supply or a lack of adequate housing units, and formulate a process by which these conditions could be alleviated.

The momentum for federal involvement in the housing industry had begun to significantly increase. That momentum was quickened by the altering economic and social conditions taking place in the United States from the mid-forties to the mid-fifties. During and after World War II, the migration of major segments of the population from rural areas to urban areas had increased significantly. This demographic movement from the rural to urban centers resulted in a counter-movement of middle income families to the outlying suburban areas. This migration to suburban tracts, of course, was a direct result of programs by the Federal Housing Administration which insured single family detached units within the income ranges of middle income families. As land continued to be developed around the urban fringes, however, the amount of cheap land available for residential use began to decline. Population pressures did not decrease and developers and governmental officials

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[5]James N. Foulds, "Code Enforcement and Housing Quality" (Working Paper, Lansing Planning Department, 1974), p. 2.

began to look toward multi-family housing as a more logical choice.[6] In a report prepared by the National Center For Housing Management, Inc., in which a citizen task force analyzed the federal housing subsidy programs and policies, the following statement was made:

> To prescient local and federal officials, as well as developers, the answer to this "people concentration" and "land contraction" problem was clear. In the years ahead, the trend in and around large metropolitan areas would be toward vertical rather than horizontal construction. Social attitudes toward living conditions and space possibilities would have to follow economic realities. Their judgement soon proved correct. In the period from 1956 to 1960, multi-family construction continued its movement upward to over 700,000 units, the ratio of single-family to multi-family construction dropped to an 8-1 ratio.[7]

Up to 1959, the involvement of FHA in multi-family housing was on a relatively small scale. This changed, however, when Congress approved the Section 202 FHA program which was designed for elderly families and individuals who did not qualify for public housing subsidies, but had insufficient income to find decent housing in the private market. The Section 202 program did not supply large numbers of units for elderly consumption, but it did represent the first step by Congress and the Executive Branch in extending direct housing subsidy support beyond public housing legislation and thereby lowering the cost of multi-family housing for those individuals who could not find adequate shelter. Because of this new emphasis on multi-family construction, the period from 1961 to 1965 the

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[6]U.S., Congress, House, Hearings Before House Banking and Currency Committee, Congressional Record Vol. CXIV (Washington, D.C.: Government Printing Office, 1968), 7:9255.

[7]National Center for Housing Management, Report of the Task Force On Improving the Operation of Federally Insured or Financed Housing Programs Vol. III (Washington, D.C.: National Center for Housing Management, 1972), p. 50.

multi-family housing starts were three times greater than what they had been in the previous five year period. As the percentage of multi-family starts increased, pressure began to mount for continued expansion of federal involvement in the housing industry.[8] The result of this pressure was the enactment of the Section 221(d)(4) Below Market Interest Rate Program (BMIR). This program provided that FHA insured loans at a less than market interest rate would be made to a limited group of non-profit eligible applicants. The Section 221(d)(4), which was specifically intended for moderate income rental housing, was broadened to include applicant sponsors from the private sector. By the end of 1967, these two sections and the federal rent supplement program, had produced only 96,000 dwelling units. This number had been reached with only limited involvement from the private housing industry.[9] To find out why the public programs were not enticing more private developers, the Johnson Administration established the Kaiser Commission in 1968. This group was charged with research into the existing multi-family subsidy structure and to recommend more innovative measures for dealing with the subsidized housing question of moderate and low income families. The Kaiser Commission recommended a much broader role for the federal government in the total housing picture

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[8]U.S., Congress, House, Hearings Before House Banking and Currency Committee, Congressional Record Vol. CXIV (Washington, D.C.: Government Printing Office, 1968), 7:20053.

[9]U.S., Congress, House, Resolution No. 1238, Congressional Record Vol. CXIV (Washington, D.C.: Government Printing Office, 1968), 15:20058.

and a closer partnership with the private housing industry. These recommendations were directly contained in the 1968 Housing and Urban Development Act. The 1968 Act created the Section 235 program for subsidizing single-family housing and the Section 236 program for subsidizing multi-family housing. These two new housing subsidies provided for FHA insured financing with back-up financing from the Federal National Mortgage Association and the Government National Mortgage Association. The prevailing FHA interest rates would be lowered by providing direct interest subsidies within the 235 and 236 programs.[10] Private enterprise, therefore, would be the primary tool for providing the housing for moderate and low income families, while the federal government would supply a portion of the financing. This housing partnership seemed to work, for by the end of 1971 subsidized housing starts had increased to over 430,000 dwelling units.[11]

Programs Impacting Lansing, Michigan

As described in Chapter I of this thesis, an estimated 2,156 dwelling units have been constructed within the City of Lansing utilizing four of the subsidy programs available under the Department of Housing and Urban Development guidelines. Three of

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[10]U.S., Congress, House, Administration of Low Income Programs, Congressional Record Vol. CXIII (Washington, D.C.: Government Printing Office, 1968), 16:21628.

[11]U.S., Congress, House, Hearings Before House Banking and Currency Committee, Congressional Record Vol. CXVII (Washington, D.C.: Government Printing Office, 1968), 7:59.

these programs, Section 221(d)(4), 221(d)(3) BMIR, and Section 236, have been responsible for the majority of the subsidized units within Lansing. The specific structure of these programs is outlined below:[12]

Title Section 221(d)(4) Moderate Income Rental Housing

Housing Type - New construction or rehabilitated housing in excess of five or more units.

Eligible Applicants (Mortgagors) - All private profit motivated individuals, partnerships, or corporations.

Period of Amortization (Maximum) - Forty years, or seventy-five percent of the remaining economic life, whichever is less.

Eligibility of Occupant - All families are eligible.

Rate of Interest - Seven percent.

Title Section 221(d)(3) BMIR: Low and Moderate Income Housing

Housing Type - New construction or rehabilitated housing, for rental or cooperative management, either detached or semi-detached, in excess of five or more units.

Eligible Applicants (Mortgagors) - All non-profit organizations, limited dividend entities, public bodies, cooperatives.

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[12]National Center for Housing Management, Report of the Task Force on Improving the Operation of Federally Insured or Financed Housing Programs, Vol III (Washington, D.C.: National Center for Housing Management, 1972), pp. 71-79.

Period of Amortization (Maximum) - Forty years, or seventy-five percent of the remaining economic life, whichever is less.

Eligibility of Occupant - All families of low or moderate income (as defined by HUD guidelines); individuals of 62 years or more, handicapped or displaced persons.

Rate of Interest - An established range from seven to three percent.

Title Section 236: Low and Moderate Income Rental Housing

Housing Type - New construction or rehabilitated housing to exceed five or more units. The established rents must not exceed twenty-five percent of the localities maximum income limits.

Eligible Applicants (Mortgagors) - Private corporations, non-profit entities, limited dividend sponsors, cooperatives.

Period of Amortization (Maximum) - Forty years, or not to exceed seventy-five percent of the remaining economic life, whichever is less.

Eligibility of Occupant - Low and moderate income families, handicapped, elderly, displaced persons, military personnel.

Rate of Interest - An established range which has a minimum of one percent.

CHAPTER III

THE LANSING HOUSING MARKET

Urban Detroit Region

Lansing, Michigan, located in the central "palm" of the mitten-shaped lower peninsula, functions as the regional center for that portion of Michigan. Practically and economically, Lansing is considered a part of the midwestern industrial sector of the nation. It functions as a manufacturing center, a regional trade and distribution center, a cultural and educational center, and a governmental center.[1]

The region surrounding Lansing is defined as including Clinton, Eaton, and Ingham Counties and constitutes a Standard Metropolitan Statistical Area (SMSA) as defined by the U.S. Bureau of the Census. The proximity of the region to the developing urban corridor from Chicago and Detroit to Cleveland and Pittsburgh indicates the important role of this Tri-County area within the state and the Great Lakes Region. The Lansing SMSA is most directly influenced, obviously, by the Detroit Metropolitan area, or more practically defined by Constantinos A. Doxiadis as the Urban Detroit Area. Quoting from the Doxiadis Report:

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[1]City of Lansing, Community Needs - A Program for the Future, Community Renewal Program (Lansing, Michigan: Planning Department, 1969), p. 1.

> To define the Urban Detroit Area, it was necessary to consider present and future trends in urbanization. It also was necessary to determine spheres of influence of neighboring urban centers (Chicago, Cleveland and Pittsburgh) similar in scale to Detroit. In addition, the topographic characteristics of the Detroit region and its proximity to Canada were taken into account.
>
> Analysis along these lines showed that, for all practical purposes, the urban influence of Detroit extends approximately:
>
> - 100 miles to the northwest (i.e., Lansing)
> - 100 miles to the west, where it contacts the sphere of Chicago's influence
> - 100 miles to the southwest, approaching Cincinnati's sphere of influence
> - 75 miles to the southeast, meeting the influence of Cleveland
> - 100 miles to the north
> - 75 miles to the east into Canada
>
> The Urban Detroit Area, therefore, includes 25 counties in Michigan, 9 in northern Ohio, and 3 in Canada, an area of 23,059 square miles.[2]

The Doxiadis Report goes on to state that no estimate of the economic activity of the Detroit area has been made. It also states that the urban area cannot expand beyond present boundaries because of the significant economic barriers presented by the influences of the Chicago and Cleveland-Pittsburgh areas. Justification of the expansion of the Urban Detroit Area at the expense of the Chicago, Cleveland-Pittsburgh areas cannot be substantiated at this time.

Since urbanization is a process of constant change, transitional areas which represent dual uses and functions of both

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[2]Constantinos A. Doxiadis, Emergence and Growth of an Urban Region - The Developing Urban Detroit Area, Vol. I (Detroit, Michigan: Detroit Edison Company, 1966), p. 144.

urban and rural characteristics can be found. There are three principal zones of transition in the Urban Detroit Area:

- Predominately rural areas - densities of less than 50 persons per square mile.
- Predominately urban areas - densities of at least 1,000 persons per square mile.
- Areas of transition - average densities ranging from 50 to 1,000 persons per square mile.

The transitional areas include the Ingham-Eaton-Clinton County SMSA, which was characterized by the highly rural Eaton and Clinton Counties, and the predominately urban Ingham County. This Tri-County Area is an integral part of the Detroit to Battle Creek Corridor, which also includes the counties of Washtenaw, Jackson, and Calhoun. The four other urbanizing corridors in the Urban Detroit Area include:

- Detroit - Pontiac, Flint, and Bay City pattern
- Detroit - Port Huron and Sarnia pattern
- Detroit - Toledo pattern
- Detroit - Windsor pattern

These corridors contain the overall general densities of 100 to 1,000 persons per square mile with higher densities occurring in the vicinity of urban centers.[3]

The Tri-County SMSA has been divided, for planning purposes, by the Tri-County Regional Planning Commission into the following governmental unit classifications:

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[3] Ibid., p. 161.

- City of Lansing
- Five-township area which consists of the cities of DeWitt, East Lansing, and the charter townships of Delta, Delhi, Lansing and Meridian. (Urbanized Area)
- Remainder of the Tri-County Region

There are approximately 1,700 square miles of land comprising the Tri-County Region, of which only approximately 9 percent had been developed in 1965. The region (Tri-County) contains seventy-eight local units of government which includes three counties, twelve cities, fifteen villages and forty-eight townships.[4] The three county areas has one of the highest average densities in the State of Michigan, with a 1970 average density of 220.0 persons per square mile.

Population and Household Trends

Table 1 indicates the high percentage of population growth in the Region since 1900. In the SMSA, total population increased from 96,622 in 1900 to 378,423 in 1970, an increase since the turn of the century of approximately 290 percent. In 1960, to 1970, the greatest percentage of population growth occurred in the urban areas of Lansing and East Lansing, and in the urbanizing townships of Bath, DeWitt, Watertown, Delta, Windsor, Delhi, Meridian, and Lansing.

In 1960, the number of households in the Region numbered 85,117 and this increased to 110,525 in 1970. This represented a

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[4]Tri County Regional Planning Commission, Regional Data Book (Lansing, Michigan: Tri-County Regional Planning Commission, 1962), p. 2.

TABLE 1

POPULATION GROWTH 1900-1970, TRI-COUNTY REGION

Year	Regional Population	Percent Change
1900	96,622	--
1910	106,938	10.7%
1920	134,041	25.3%
1930	172,498	28.7%
1940	191,411	11.0%
1950	244,159	27.6%
1960	298,949	22.4%
1970	378,423	26.6%

SOURCE: U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing, 1970: Lansing, Michigan.

growth of almost 30 percent, or an increase per year of 2,540 households. When comparing this increase to the State of Michigan increase in total households, it is found that between 1960 and 1970 that the entire state experienced a growth of 15.9 percent. This can be compared with the 29.3 percent growth rate of households in Michigan between 1950 and 1960; and a 29.8 percent growth rate between 1940 and 1950. The growth trends in the Lansing SMSA for 1960-1970, therefore, are almost double that in other parts of Michigan.[5]

The Housing Market Analysis, prepared for the Lansing Community Renewal Program, described new residential construction in the Region as characterized by more apartment and townhouse developments instead of single-family detached structures. This

[5]U.S., Department of Commerce, Bureau of the Census, Housing Characteristics for States, Cities and Counties, 1972: Michigan, 1, 4.

trend, according to the above report, is due to the spiraling prices of labor and materials and the high interest rates of lending institutions. Economies of scale dictate that high-density, common-wall projects will give the highest return for initial dollar investment. From 1960 to 1967 the number of new housing units authorized in the Region of 2 or more units in the structure, increased from 26 to 2,732. Also during this time span, approximately 27,000 building permits for residential units were issued, or about 3,000 units per year. Of this total, however, approximately 1,000 units were never built.[6] Also, large numbers of mobile homes were added to the housing stock and were not reflected in this building permit data.

It was estimated by the Federal Housing Administration that 600 housing units were razed per year in the Region during the first three years of the nineteen seventies, and that 450 units had been demolished during the last five years of the nineteen sixties.[7] This high rate of demolition can be linked to significant expansion by commercial and industrial land uses, highway expansion and growth of the State Governmental Complex in Lansing. The urbanized area has also seen a stricter code enforcement emphasis, and this has added to the high rate of demolitions.[8]

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[6]Tri-County Regional Planning Commission, Preliminary Study of Housing in the Tri-County Region (Lansing, Michigan: Tri-County Regional Planning Commission, 1970), p. 4.

[7]City of Lansing, Michigan, Housing Market Analysis - Community Renewal Program (Lansing, Michigan: Planning Department, 1972), p. 16.

[8]Tri-County Regional Planning Commission, Housing Market Analysis (Lansing, Michigan: Tri-County Regional Planning Commission, 1973), p. 13-1.

City of Lansing

Employment:

The City of Lansing is a 33.6 square mile unit of municipal government which received its home rule charter in 1912. The major factors in Lansing's economy are manufacturing, government, and education. In 1970, the total City employment was 52,731 or 35.2 percent of the employment in the Region. The major ten employers in Lansing are enumerated in Table 2.

TABLE 2

MAJOR EMPLOYERS IN THE CITY OF LANSING, 1971

Employer	Employees
Oldsmobile	15,900
State of Michigan	11,019
Fisher Body Division	4,978
Lansing School District	2,854
Lansing Motor Wheel	2,795
Lansing Municipal Government	1,643
Diamond Reo	1,642
Michigan Bell Telephone	1,000
Municipal Utilities	807
Consumers Power Company	648

SOURCE: U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing, 1970: Lansing, Michigan.

When considering total employment in the City, industrial employment has been decreasing over the past twenty year period

according to the U.S. Census.[9] The increase in governmental and educational employment, however, has countered this decreasing trend. The State of Michigan, currently the second largest employer, is expected to be the major employer in Lansing by 1990 based on the projected expansion of the State Governmental Complex in the downtown area.[10]

Population Trends:

Since 1940, the population of Lansing has increased from 78,753 to 131,546 in 1970, according to the U.S. Census. Annexations accounted for a large part of this increase between 1960 and 1970 (approximately 12,228 persons). The Housing Market Analysis for Lansing estimates that during this decade, 8,400 persons migrated out of the City.[11] Also calculated in this report were population projections which gave Lansing a total growth potential of slightly over 8 percent. Figures on migration from the 1970 U.S. Census and death rates from the Michigan Health Department were utilized in establishing the growth rates. Listed in Table 3 are population projections for the City of Lansing to 1980.

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[9]Tri-County Regional Planning Commission, The House We Live In - A Comprehensive Growth Plan (Lansing, Michigan: Tri-County Regional Planning Commission, 1968), p. 20.

[10]City of Lansing, Housing Market Analysis - Community Renewal Program (Lansing, Michigan: Planning Department, 1972), p. 34.

[11]Ibid., p. 35.

TABLE 3

POPULATION PROJECTIONS, 1970-1980

Year	Population	Numeric Change	Population Change
1970	131,546		
1975	141,382	9,836	7.4
1980	153,002	11,620	8.2

SOURCE: U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing, 1970: Lansing, Michigan.

Non-white population increased from 3,046 (3.4 percent) in 1950 to 13,259 (10 percent) by 1970. When comparing the City to the metropolitan area, approximately three-fourths of the total non-white population are residing in Lansing.

Household Trends:

Over the past decade, total households have increased 27 percent or 9,089 households in Lansing. The five township urbanized area surrounding Lansing showed a higher rate of increase than the City or the total metropolitan area. Although total households increased within the Region, households size experienced a substantial decrease from 3.17 in 1960 to 3.06 in 1970. The larger number of single person households and older households without children contributed to this decrease. Examination of population characteristics reveals that these trends can be expected to continue. The relationship of total households distribution within the Region is portrayed in Table 4.

TABLE 4

LANSING HOUSEHOLD TRENDS, 1960-1970

Area	Households 1960 Number	%	1970 Number	%	Change Number	%
Lansing City	33,558	39.4	42,647	38.5	9,089	+27.0
Urbanized Area (Inc. Lansing)	56,237	66.0	75,770	68.5	19,533	+34.7
Region	85,117	100.0	110,525	100.0	25,408	+29.8

SOURCE: U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing, 1970: Lansing, Michigan.

It is estimated by the Planning Department of the City of Lansing that new household formation will total 8,957 by 1980. A steady growth rate is indicated for households with six persons and over, a decreasing growth rate for households with three to five persons, and an increasing growth rate for one and two person households.[12]

The 1970 U.S. Census reported that there were 7,375 elderly households in Lansing. These households represented 42 percent of the metropolitan total and 60 percent of the elderly household total in the urbanized area. Comparing this figure to elderly household comparisons in the 1960 U.S. Census, only 37 percent were located in Lansing and 40 percent in the surrounding five townships. This

[12]City of Lansing, Housing Market Analysis - Community Renewal Program (Lansing, Michigan: Planning Department, 1972), p. A-41.

indicates that elderly households are concentrating in the immediate Lansing area and therefore would be demanding certain goods and services, with housing the largest and most expensive. This demand function becomes more interesting when income distribution among elderly households is taken into account. Utilizing data which was collected for the Community Renewal Program, it was determined that 40 percent of the husband-wife elderly families located in Lansing in 1970 had incomes under $5,000.00.

Nationally, approximately 90 percent of all elderly individuals and 40 percent of all elderly families lived on less than $5,000.00 annual income in 1969.[13] Elderly households on a broad scale, as well as in Lansing, are not able to allocate large amounts for their housing expenditure. From an elderly submarket standpoint it becomes apparent that the Lansing Housing Market would be a prime target area for federal or state housing subsidy programs.

It should be stressed that, since 1971, the Lansing Public Housing Commission has completed 329 housing units designed especially for elderly occupancy. The U.S. Department of Housing and Urban Development has also subsidized several small projects throughout the area.

When comparing the elderly household income distribution with the distribution for all households in the Lansing market, it becomes apparent that the elderly subgroup are in an extremely

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[13]American Institute of Planners, A Technical Guide to Regional Housing Planning (Washington, D.C.: American Institute of Planners, 1972), p. 12.

disadvantageous economic position when it comes to meeting their housing needs. Table 5 illustrates this disparity and also points up that approximately one-third of the black households in Lansing earned incomes of $6,000.00 or less in 1970. Therefore, it seems an additional housing subgroup would have difficulty in supplying the economic resources necessary to provide adequate housing.

TABLE 5

HOUSEHOLD INCOME BY RACE, CITY OF LANSING, 1970

Income	Total	White	Black and Others
Less than $3,000	2,942	2,262	680
$3,000 - $5,999	4,904	4,358	546
$6,000 - $9,999	10,831	9,705	1,126
$10,000 - $14,999	13,774	12,982	792
$15,000 - $24,999	8,657	8,285	372
$25,000+	1,535	1,491	44
Total Number of Households	42,643	39,083	3,560
Median Income	$11,489	$11,604	$8,042
Mean Income	$12,238	$11,862	$7,510

SOURCE: U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing, 1970: Lansing, Michigan.

While black households in Lansing represent only 10 percent of all households, they constitute 17 percent of households earning less than $6,000.00 annually. Also, while median household income in 1970 was slightly over $11,000, the Black household could only produce a median income of just over $8,000.

Building Trends:

During the last half of the 1960-1970 decade, building permit trends indicated large numbers of apartment and townhouse construction. Inflationary factors in material and labor costs have forced many housing consumers out of the buyers market and into the rental market. According to figures compiled by the Community Renewal Program in Lansing, the average cost per dwelling unit increased from $10,300 in 1960 to $21,000 in 1970, excluding land costs. With this increased cost factor, it is not surprising to note that the rental market has become a major factor in the City. By 1970, rental housing units in Lansing were comprising approximately 30 percent of the total market with the majority of these units in multi-family structures.

Discussions held by the Lansing Planning Department with members of the Lansing Home Builders Association revealed that the following items seemed paramount in the recent shift toward multi-family rental occupancy.[14]

1. Managed multi-family developments offer the tenant maximum freedom from maintenance labor and maintenance expense.

2. Improved design and construction characteristics make the multi-family dwelling closer in demand desirability to a single family detached dwelling.

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[14]City of Lansing, Housing Market Analysis - Community Renewal Program (Lansing, Michigan: Planning Department, 1972), p. B-10.

3. The subsidy programs for multi-family structures available through the U.S. Department of Housing and Urban Development make multi-unit living more economically desirable.

4. The formation of large numbers of small households make one and two bedroom units more desirable from a marketing standpoint.

Table 6 illustrates the degree of this shift to increasing multi-unit occupancy by indicating that structures containing two dwelling units or more accounted for over 50 percent of the total rental units in the City.

TABLE 6

LANSING OCCUPIED HOUSING UNITS BY TENURE AND BY NUMBER OF UNITS IN STRUCTURE, 1970

Structure	Total Occu.	Owner Occu.	Renter Occu.
1 Unit, detached	30,775	26,068	4,707
1 Unit, attached	569	284	285
2 Units	3,881	1,067	2,814
3 - 4 Units	2,289	358	1,931
5 - 9 Units	1,752	308	1,444
10 - 19 Units	1,618	59	1,559
20 - 49 Units	802	24	778
50 Units or more	645	0	645
Mobile Home or Trailer	316	298	18
Total	42,647	28,466	14,181

SOURCE: U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing, 1970: Lansing, Michigan.

Building permit data, however, points up the fact that multi-family construction has been declining slightly since 1968. Average value per unit, on the other hand, has been taking a drastic upswing in the multi-family category. Since 1968, in structures containing less than 100 dwelling units, the average price per unit has increased from $7,600 to an almost doubled figure of $15,020 by 1970. Single family detached constructed did not suffer a similar economic fate over the same three year time span, average cost per unit only increased from $18,000 to $21,230.[15] As short term construction loans become more expensive to finance, it would seem logical to assume that condominium ownership[16] of multi-family projects would be more attractive to developers. Quicker cash flows could be achieved from the sale of individual units in multiple projects and thereby minimize high construction costs and the traditionally slow return on investments from rental developments. The Lansing Housing Market, however, has not responded in large numbers to the condominium concept. At this writing, there are less than five condominium developments within the City of Lansing.

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[15]City of Lansing, Housing Market Analysis - Community Renewal Program (Lansing, Michigan: Planning Department, 1972), p. B-19.

[16]Referring to individual ownership of the interior of the dwelling unit and shared ownership in the exterior and land investments.

Summary of Lansing Housing Market

The preceding pages have attempted to describe various characteristics of the housing market within the City of Lansing, and the relationships to the remainder of the urbanized area and the region. Chester Rapkin states that a market is created:

> . . . whenever buyers and sellers are in such free communication that the same commodity or service commands the same price, or prices tend toward equality easily and quickly.[17]

Glenn H. Beyer relates it more closely to the subject matter when he states:

> Housing markets are necessarily local, for it is at the community level that competition exists among different houses for a single buyer. This simple concept defines the extent and limits of the housing market area. This area usually includes a central city, some incorporated and/or unincorporated suburbs, and fringe and ribbon developments extending out from these suburbs. Frequently, facilities are important factors in the delineation of the market area. On the basis of this definition, many housing market areas closely approximate the labor market areas, omitting only far-out isolated houses in which some urban workers live.[18]

The general characteristics of the Lansing housing market can be summarized as follows:

1. Because of its close geographic proximity, the Urban Detroit Area has significant economic impact on the Tri-County Region.

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[17]Chester Rapkin, Louis Winnick and David M. Blank, Housing Market Analysis - A Study of Theory and Methods (Washington, D.C.: Government Printing Office, 1953), p. 129.

[18]Glenn H. Beyer, Housing and Society (New York, N.Y.: Macmillan Co., 1968), p. 129.

2. From an urbanization standpoint, the Lansing area must be considered a transitional zone with average densities ranging from 50 to 1,000 persons per square mile. This transitional characteristic includes both urban and rural land uses with the highest residential density found in the City of Lansing.

3. In the three county area, total population increased from 96,622 in 1900 to 378,423 in 1970. The adjacent cities of Lansing and East Lansing, and the townships of Bath, DeWitt, Watertown, Delta, Windsor, Delhi, Meridian, and Lansing contain the greatest amount of development.

4. Total employment in the SMSA was 143,047 persons in 1970. Of this total, Ingham County provided approximately 100,000 of these workers, with Lansing supplying over 52,000 to the ranks of the employed in 1970.

5. Of the major employers in Lansing, automotive associated industry provides approximately 25,000 jobs and the public or semi-public jobs total at almost 17,000. Lansing has a diversified employment base, therefore, and does not place primary dependence on the automobile industry.

6. Household formation totaled 42,647 in 1970 and is expected to increase to slightly over 51,000 by 1980. The majority of this increase is to be found in households containing one and two persons. Within the housing market,

consequently, this will put increased demand on one and two bedroom dwelling units.

7. In 1970, there were 7,375 elderly households in Lansing. This represented 42 percent of the total in the entire metropolitan area. In addition, 40 percent of these elderly households had incomes under $5,000.00. Provision of adequate housing resources by this subgroup would be difficult.

8. Black households in 1970 also had a large percentage (33 percent) earning less than $6,000.00 per year. Utilizing a general rule of not more than 25 percent of annual income for housing purposes, this would mean that a household having a $6,000.00 yearly income could only spend a maximum of $125.00 a month for shelter.

9. Average construction cost per dwelling unit increased from $10,300 in 1960 to $21,000 in 1970, excluding land cost.

10. By 1970, approximately 30 percent of all occupied housing units were rental units. Half of these rental units were in multi-family structures. Single unit, detached structures still dominated over 70 percent of the market in Lansing. The average price for such a unit was over $21,000 in 1970, excluding land cost.

CHAPTER IV

A METHODOLOGY FOR DEVELOPING HOUSING QUALITY INDICATORS

Housing Research in the Lansing Region

The Tri-County Area of Ingham, Eaton and Clinton Counties, considered a Standard Metropolitan Statistical Area by the Bureau of the Census, does not have a specified organization or structure engaged in providing either housing units or housing services to the moderate and low income regional population. The City of Lansing has established a Housing Commission for the purpose of developing and leasing housing for low income families and individuals, and Ingham County has discussed the possibility of creating a county housing commission, but these are the only two bodies actively involved in the housing question in the region. Two planning agencies have, however, done extensive research into the characteristics and future trends of the housing supply as they affect the City of Lansing, the urbanizing townships, and the remainder of the region. These two agencies are the Tri-County Regional Planning Commission and the City of Lansing Planning Board. This housing research was started in the mid-sixties through the provision of planning monies from the U.S. Department

of Housing and Urban Development (HUD) authorized by Section 701 of the Housing Act of 1954. Since that time, housing work elements from these two agencies have been required by HUD in order that existing housing trends and future housing needs be given constant and meaningful attention by the local units of government. Research material for this thesis was, in large part, obtained from information supplied by these two agencies.

Publications entitled Housing Market Analysis - Tri-County Region and Social Impact on the Tri-County Housing Market by the Tri-County Regional Planning Commission contain listings of all the multi-family housing that were constructed and/or insured by assistance from the Federal Government. These housing developments, as they pertain to the City of Lansing, were extracted from these documents and cross checked with the Housing Market Analysis for Lansing as prepared by the Community Renewal Program. Small descrepancies were noted in the number of dwelling units allotted to each development, but these were cleared up by contacting the management office at the respective locations, and by checking Building Department records in the City of Lansing.

Even with the moritorium on federal housing programs, certain of these projects within Lansing are still in the preconstruction stage and receiving the necessary approvals from HUD and the financial institutions. A cut-off date of January, 1973, was established in order that all developments considered would be completed and occupied at the time of this research. Utilizing this date, a total of 13 developments were listed containing 2,156

dwelling units. The characteristics of these developments are described in Table 7.

TABLE 7

FEDERALLY SPONSORED MULTI-FAMILY DEVELOPMENT, 1973

Name	Development No.	Federal Program	Units
Colonial Townhouses	1	221d(3)	241
Village Townhouses	2	221d(3)	309
Sunnyridge Townhouses	3	221d(3)	116
Vincent Court	4	221d(3)	56
Highlands Co-operative	5	221d(3)	414
Marscot Meadows Townhouses	6	221d(4)	148
Cranbrook Manor	7	236	136
Coronado Gardens	8	236	64
Embassy Apartments	9	236	66
Woodbridge Commons	10	236	157
Canterbury Commons	11	236	91
Pinebrook Manor	12	236	136
Lansing Elderly Development	13	236	222

SOURCE: Tri-County Regional Planning Commission, Housing Market Analysis (1973), p. 13-1.

These thirteen developments will be the projects on which the qualitative indicators will be applied. Five indicators will be formulated later in this text and each one will be compared to each of the thirteen housing developments described in Table 7. This comparison will result in a numeric rating scale which will weigh each indicator against every development. When each housing development has been rated according to the five indicators, then all individual ratings will be placed in a comparative matrix to determine if there is a common thread among indicators throughout all

developments. It is hoped that, in the long run, this method will constitute a usable procedure for determining the positive or negative aspects of certain site characteristics within housing developments of any kind. Also, within the short run, it will assist the City of Lansing and the U.S. Department of Housing and Urban Development in gaining a better understanding of what impact large scale housing developments have on neighborhoods.

The Concept of Neighborhood

In order that qualitative housing indicators may be formulated for the previously described federally assisted developments, it is first necessary to identify a neighborhood area for each project. This will be necessary because in order to rationally construct a rating system, each development will have to be compared to the "neighborhood" in which it is located. In this way, characteristics found within any specific site will not be compared to a set of general characteristics on a city-wide basis. Because the urbanized composition of Lansing will change depending on the geographic area you are in, it appeared more logical to compare individual developments to their immediate neighborhoods so that some type of similar base could be assumed.

Historically, discussion about the formation and structure of neighborhoods has centered around three fundamental aspects: (a) social, (b) physical, and (c) institutional.[1] The social aspect

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[1]Glenn. H. Beyer, Housing and Society (New York, N.Y.: Macmillan Co., 1968), p. 313.

of neighborhood structure had very strong roots early in the settlement history of the United States. Immigration patterns in America found that those individuals who had the same background, in terms of language, religion, and race, tended to establish or locate in neighborhoods with similar characteristics. Tannenbaum, in her 1948 work on neighborhood analysis, states that: "Group support is the strongest factor making for security in the individual."[2] Beyer takes this a step further when he suggests that large urban settlement patterns are characterized by small subgroup formations which tend to be internally similar.[3] Such subgroups will reinforce the individual to the extent that he is able to compete in the larger, and more complex urban group situation.

The second aspect of neighborhood formation and structure, physical factors, consist of the configuration of land forms and dwelling unit placement. The physical boundaries of neighborhoods are often impossible to determine, but it is the ultimate physical composition that will have profound impact on the social and institutional framework of the neighborhood. Festinger, Schachter and Back stated in 1950 that:[4]

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[2]Judith Tannenbaum, "The Neighborhood: A Socio-Psychological Analysis," Land Economics, Vol. XXIV (1948), pp. 358-369.

[3]Glenn H. Beyer, Housing and Society (New York: Macmillan Co., 1968), p. 314.

[4]L. Festinger, S. Schachter and K. Back, "Social Pressures in Informal Groups," Environmental Psychology: Man and His Physical Setting, ed. Harold M. Proshansky, William H. Ittelson and Leanne G. Rivlin (New York: Holt, Rinehart and Winston, Inc., 1970), p. 501.

> The architect who builds a house or designs a site plan, who decides where the roads will and will not go, and who decides which directions the houses will face and how close together they will be, also is, to a large extent, deciding the pattern of social life among the people who will live in those homes.

It must be stated, however, that while the physical setting has great bearing on the amount of individual contact people have, it will require a certain amount of homogeneity among the population to make the contact a positive one. As an example, neighbors with children of the same age will find that conflict will arise if child rearing techniques are drastically different among the two families. This will also be true of differences in political issues, yard maintenance and general life style. Propinquity, therefore, is not the most dominate characteristic in neighborhood formation and structure. A certain amount of population homogeniety must be present also.

A third aspect of neighborhood composition lies in the orientation that institutional forces give to the residents. The service area of an elementary school may have significant impact on the work and recreational activities taking place within that neighborhood. The service area of the elementary school may even give an approximate definition as to the physical boundaries of that neighborhood. In many municipalities in the United States, the recreational activities of City agencies are centered around the school grounds or land immediately adjacent to the school. The same influential pattern can be found in the operation of many different types of institutions; churches, hospitals, colleges or universities, etc.

To summarize, the character of the neighborhood, in terms of its social and physical aspects, will be given further clarification by the number and type of institutions found within that neighborhood.

This short discussion on the composition of residential neighborhoods is an attempt to further explain the necessity of judging the selected developments against their immediate environmental surroundings. The actual physical definition of these surroundings, for purposes of this thesis, was taken from research prepared in the first Community Renewal Program Grant for the City of Lansing.[5] In an attempt to study the physical, social, and economic problems of the entire City, the Community Renewal Program (CRP) Staff divided Lansing up into thirty-four (34) study areas. These study areas were based primarily on the assumption that each area should be as homogeneous as possible in terms of housing quality, income levels, and certain selected social indicators. After an indepth analysis of each of these criteria, boundary lines were drawn by the CRP Staff for neighborhood delineation. Some of the specific factors utilized in determining these boundaries are identified as follows:

1. The physical boundaries should follow permanent, but well defined lines such as streets, highways, railroads, rivers, streams, and so forth.

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[5]City of Lansing, Neighborhood Analysis Booklet - Community Renewal Program (Lansing, Michigan: Planning Department, 1967), p. 5.

[6]Criteria drawn from CRP working papers and discussions with Planning Department staff members.

2. Boundaries of neighborhoods must be within the Lansing City Limits.

3. An analysis of the housing quality was undertaken by field checking every housing unit in the City. Boundaries were drawn, as much as possible, with the intent of dividing areas into segments of homogeneous housing quality.

4. The range in total number of population was established in the approximate vicinity of 1,000 to 10,000 persons. This range was derived from two sources:

   a. For meaningful purposes the Bureau of the Census recommended the establishment of census tracts should contain between 2,500 and 8,000 inhabitants.

   b. National standards for planning urban settlements recommended that the approximate population size of a neighborhood intending to support an elementary school was in the range of 5,000 to 10,000 persons.

5. An individual housing development, built at one time and containing homogeneous housing types, should be included within one study area.

6. There should not be wide discrepancies in the distribution of family income throughout the neighborhood.

When the CRP Staff completed the study area delineation, the "neighborhoods"[7] as defined, were very similar to the census

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[7]The term "neighborhood" will be used interchangeably with the term "study area." For purposes of this thesis, it is felt that the definition of a homogeneous study area will be synonomous with a neighborhood. Discussion in the text has addressed the concept of neighborhood composition and referred to it as an area with similar internal characteristics.

tract boundaries established by the Bureau of the Census. This was not considered a problem, since for statistical purposes, comparisons could still be made on a block-by-block basis between census tracts and CRP Study Areas. Certain characteristics of the study areas are described in Table 8.

TABLE 8

STUDY AREA CHARACTERISTICS, 1970

Study Area	Population	Housing Units	Median Family Income	Density-Persons/Acre
3	5,815	1,856	13,560	5.62
15	5,760	2,182	6,149	11.14
23	10,500	2,901	11,560	1.05
24	6,801	1,985	13,341	7.05
29	1,772	594	11,545	2.32
30	3,681	1,037	10,246	5.64
32	1,053	299	10,323	1.66
34	498	132	11,545	1.12

SOURCE: U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population and Housing, 1970: Lansing, Michigan.

Formulation of Indicators

The selection of which indicators to use became a very perplexing problem in the initial formulation of this thesis. As stated previously, the "internal" social factors of each development were ruled out because of the extensive monetary and time investment required to do an adequate survey of the resident population. Concentration was placed on external physical features of the

developments because, although much design time is invested into the physical characteristics of the site, and although there are a multitude of regulations at the federal, state and local levels governing the construction of the site, there is a conspicuous absence of data as to the "post construction" performance of the physical characteristics of the project within the neighborhood. With this in mind, five areas were chosen in which it appeared that measurements could be formulated in an attempt to qualitatively analyze the developments. The five areas range from economic considerations of cost-benefit comparisons, to natural resource features of each specific residential site. Although obviously subjective in overall compilation, the five areas were finally selected because they could be reduced to a measurable element of information. That element of information could be considered unique to each of the thirteen developments on which they were eventually applied. However unique these five indicator areas were, they could always be compared to a larger geographic area and a definite comparable relationship could be determined. In this way, a common framework could be established which would enable the degree of homogeniety or dissimilarity between the development and the neighborhood to be determined within the five specific categories. The following paragraphs will describe the composition of the five indicators and will briefly explain the rating system that permitted their application within the thirteen developments and the eight neighborhoods selected.

The specific areas of investigation are identified by the following general statements of explanation relating to each indicator.

1. Educational Cost-Revenue: An economic comparison of elementary and junior-senior high school costs with the property tax revenue earmarked specifically for these purposes. These two factors are collected for both the development and the neighborhood and then compared as to either positive or negative revenue benefits.

2. Density: A method of measuring intensity of development by comparing dwelling units per net acre figures for the neighborhood and the residential development. The comparison will reveal the relative compatability in land use pattern between the two residential uses and should generally indicate gross demand for public services and utilities.

3. Vacancy Rate: A comparison between the development and neighborhood dwelling unit vacancy rates. Such a comparison will indicate whether the quality and type of housing is competitive with the housing stock in the neighborhood.

4. Recreational Acreage: The comparison of development and neighborhood recreational acreages to determine if the development had a positive or negative impact on the amount of recreational land available per person in the neighborhood.

5. Environmental Impact: The measurement of three environmental indicators to quantify the impact of residential development on the neighborhood and the community.

In the development and application of these indicator categories, the following assumptions and limitations are applied.

1. That the municipal government of Lansing expects residential development to significantly contribute to the educational costs of the K-12 students generated. In addition, that an average cost per student can be calculated and realistically applied to revenues generated from local property taxes.
2. That developments with higher residential densities demand more in public services and utilities and, that this cost is not totally returned to the community via tax revenues or service charges.
3. That developments with vacancy rates which are substantially higher than normal market rates for that structure, represent a housing resource which is not meeting the basic housing needs of the community.
4. That there exists a recreational acreage standard which can be applied at the neighborhood level, and that it is feasible to adequately measure existing or proposed residential uses to determine the impact that development has on the recreational quality within a specific neighborhood.
5. That certain soil types, because of their location and composition, are not suited for residential development.
6. The lack of vegetation and forest cover can lead to the loss of topsoil from the site and result in the

build up of soil particles in the sewer system and natural water courses.

7. The increased water run-off from the site can reduce the water recharge capability of the area.

8. Residential development within a flood plain area represents a significant danger to human life and real property.

Indicator Number 1:
Educational Cost-Revenue

One of the most important considerations in the economic feasibility of a residential development is the relative demand it will place on necessary community facilities and utilities. If the demand for sewer, water or electrical service places an economic burden on the community, it will soon become apparent to the developers that the scale of their proposal is too large or that they are developing in the wrong community. For purposes of this discussion, however, a cost-revenue factor was needed which would have an easily detectable connection between the specific development and the neighborhood. Educational costs were selected as the best representation of a comparable economic indicator in residential land uses. In March of 1971, the Urban Land Institute published a study on cost-revenue analysis of suburban land use alternatives. Quoting from that report,[8]

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[8]Urban Land Institute, Urban Land--Who Pays For What? A Cost-Revenue Analysis of Surburban Land Use Alternatives (Washington D.C.: Urban Land Institute, 1971), p. 4.

> One local public service--elementary and high school education--does appear to vary significantly with different types of urban land use. Furthermore, data on the school cost-revenue impact of varying land-uses are not difficult to isolate and the analysis of these data is relatively uncomplicated.
>
> School expenditures frequently account for up to 70-80 percent of total local governmental expenditures. . . . A concentrated focus on local school services appears to be most relevant, productive, and appropriate.

The variables in this type of cost-revenue comparison are relatively easy to calculate and were obtained from the Lansing Assessor's Office or the Lansing School District. A breakdown of those variables reveals the following definitions:

A. Average Cost Per Student - This figure was obtained from the Lansing School District and represents the average cost of educating one student with the K-12 class framework (kindergarten through high school). This figure is calculated from all property tax based school expenditures and includes both operating and capital costs spread on an individual student basis.

B. Total Students Within Geographical Area - The total number of K-12 students are obtained from school district census figures and Planning Department estimates, which are conducted yearly, and represent figures from both the neighborhood and the specific development. For example, neighborhood "y" contains 400 students, while development "y" contains 40 students.

C. Total School Costs - Again this represents two figures, one from the development and one from the neighborhood.

It is simply the total costs generated from each geographic area and is calculated by multiplying the total number of students in each respective area by the average cost per student. The figures are then assumed to represent the total K-12 educational costs produced from the neighborhood and/or the development.

D. Property Tax Revenue - The K-12 school property tax revenues were obtained from the Lansing Assessor's Office for the neighborhood and the development respectively. Total revenues includes both residential and non-residential taxes for the entire neighborhood. Taxes from the development were derived from a single source . . . residential land use.

E. Educational Benefit - This dollar figure is considered the contribution, from both the neighborhood and the development, of each individual toward the cost of the K-12 educational system in the Lansing School District. The figures are calculated by subtracting total school costs from total property tax revenue (refer to statements C and D), and dividing by the total population for each respective area. The answer obtained can either be expressed in positive or negative dollars, since the property tax revenues provided may not in all cases equal or exceed the total educational costs incurred. If costs are greater than revenues, then the neighborhood or the development is considered to have a "negative educational

benefit" in terms of the cost of education within the Lansing School District. From the perspective of the development, however, this could be considered a positive benefit.

To clarify how the educational cost-revenue benefit would be applied to the eight neighborhoods and the thirteen developments under consideration, a hypothetical example will be utilized to demonstrate its applicability.

Neighborhood "X" has the following characteristics:

--400 students enrolled in the K-12 school system

--Average cost per student in the system = $1,000.00

--Total K-12 educational costs = $400,000.00

--Revenue from property tax for K-12 education = $5,000,000.00

--Total population = 1,200 persons

The educational cost-revenue benefit for Neighborhood "X" would be calculated as follows:

--Total property tax revenue minus (-) total educational costs = $100,000.00

--$100,000.00 divided by (+) total population = $83.35

So in this case, the educational benefit would be $83.35 and would represent the positive per capita contribution of Neighborhood "X" in excess of total school costs.

Development "Y", located within Neighborhood "X", has the following characteristics:

--40 students enrolled in the K-12 system

--Average cost per student in the system = $1,000.00

--Total K-12 educational costs = $40,000.00

--Revenue from property tax for K-12 education = $35,000.00

--Total population = 200 persons

The educational cost-revenue benefit for Development "Y" would be calculated as follows:

--Total property tax minus (-) total educational costs = $5,000.00

--$5,000.00 divided by (+) total population = $25.00

Therefore, the educational benefit would be -$25.00 would represent a deficit per capita contribution of Development "Y" towards the educational cost of the 40 students which it has generated.

The method used in comparing Development "Y" with Neighborhood "X" was admittedly a subjective one, but a system had to be devised which would allow numerical comparison of all developments to all neighborhoods in each of the six indicators. In terms of the educational cost-revenue benefit, it was determined that the following numerical ratings should apply in each designated situation:

A. If the development is providing a negative educational benefit and the neighborhood is providing a positive benefit, then the development will be given a rating of "0" (i.e., negative dollars compared to positive dollars).

B. If the development is providing approximately the same benefit as the neighborhood, then the development will be given a rating of "1". For purposes of this research, "approximately the same" was arbitrarily defined as pertaining to two numbers, where the difference between them did not exceed 25 percent of the larger number. For example, if a neighborhood was supplying a per capita benefit of $10.00 and the development was producing a benefit of $7.50, then the development would be given a rating of "1" because the difference between the two numbers did not exceed 25 percent of the larger number.

C. A rating of "2" was given if the educational benefit for the development exceeded that of the neighborhood by more than 25 percent.

Returning to the previously described example of Neighborhood "X" and Development "Y", if the rating system as explained is applied to the benefits of $83.35 and -$25.00, a rating of "0" must be given since the development falls far short of the neighborhood in providing for the educational costs of the students found within the project.

Indicator Number 2: Density

Density is most commonly used as a measure of population utilization within a specific geographic area. The rational control of residential density is extremely important to residents of the community and to municipal officials. Public health and safety

have generally been considered as the primary concern in attempting to control density within the context of the public interest. The Hygiene of Housing Committee of the American Public Health Association addressed the density question through the establishment of criteria considered to be major factors in the determination of an adequate environment.[9] Of the eight factors listed by the Committee, all of them could be either negatively or positively affected by the degree of residential density. For example, regulation of residential density is considered an effective way in controlling contagion, to protect from noise and air pollution, and to provide for adequate light, air and ventilation. The following statements are indicative of the general situations in which residential density can have significant impact.

A. Natural Hazard Areas - Urban or rural areas which are subject to periodic flooding or high water tables require that development be carefully controlled or totally excluded. Flooding presents the danger of loss of life and/or property, while high water tables represent a health hazard in terms of the potential of a polluted ground water supply. Through the use of zoning controls, development can be effectively regulated within areas of the flood plain or high water tables. Intense residential development within such naturally hazardous

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[9]F. Stuart Chapin, Jr., Urban Land Use Planning (Urbanna, Illinois: University of Illinois Press, 1965), p. 42.

areas presents a problem of environmental quality for both the development and the community.

B. Adjacent Land-Use Impact - In many cases the compatability of different land use types creates a problem because of noise, water, or air pollution and the resultant impact on adjacent development. Adequate buffer strips or setbacks are required in zoning or subdivision regulations in order to offset or minimize the possibility of adverse environmental influence.

C. Economy - The efficiency of land use development and its public dollar implications are a strong weapon utilized by local units of government in justification of limitations placed on residential density. A simple example of density impact on a localities economy is the expense incurred by the public in supplying utilities and services to residential developments. If the dwelling unit density becomes too great, the community may find itself unable to supply the necessary sewer and water service to the site. Density controls, therefore, become a fiscal tool in which a local government can assure that public facilities will be effectively utilized but will not over-burden the design capacity.[10]

For purposes of this thesis, density will be utilized to relate building intensity between the development and the

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[10] Ibid., p. 49.

neighborhood in which it is located. This is a very simple comparison, but inherent are the environmental and economic factors discussed previously. Since density is such an important consideration in residential development patterns, an indicator was selected which would enable simple comparison of development intensity. Net density was utilized because it represents the most standard measure of residential land use. Net density is defined as the total number of dwelling units per acre excluding allowance for street right-of-way.[11] The range of net densities developed by the Hygiene of Housing Committee of the American Public Health Association is given in Table 9 and represents a commonly used guide in the investigation of residential density. The Lansing Zoning Ordinance, although published in the nineteen-forties, has similar density categories in the residential classification.

The use of the net density indicator will allow some assumptions to be made concerning the intensity of development within and around the federally assisted housing project. If the net density within the development is substantially higher than the net density found within the neighborhood than it can be safely assumed that the housing project is demanding more in terms of sanitary and storm sewers, water lines, electrical distribution and other associated public costs. In terms of the rating system utilized in the comparisons, it was determined that the lowest or poorest ranking should occur in cases where the housing development

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[11] Ibid., p. 49.

TABLE 9

RESIDENTIAL DENSITY STANDARDS

Dwelling Unit Type	Dwelling Units Per Net Acre
1 family detached	5-7
2 family detached	10-12
Townhouse or rowhouse	16-19
Multifamily -	
2 story	25-30
3 story	40-45
6 story	65-75
9 story	75-85
13 story	85-95

SOURCE: F. Stuart Chapin, Jr., Urban Land Use Planning (Urbanna, Illinois: University of Illinois Press, 1965), p. 49.

had an abnormally high net density in relation to the total neighborhood. The term "abnormally high" will refer to the development-neighborhood density relationship where the development net density does not exceed the neighborhood net density by more than 100 percent. Such a drastic variance in density would place strenuous demands on the utility system in the neighborhood and additionally represent an upward change in the density development pattern of the neighborhood.

Also, any net density relationship between the development and the neighborhood which is less than 100 percent, will be considered to be compatible to established land use patterns. If the development density is equal to or less than the neighborhood, it will also be considered as compatible. Admittedly, this is a subjective conclusion, but the primary subject matter of this thesis

was not to construct foolproof theories of density comparison. Perhaps if the central theme of usable residential indicators is considered worthwhile, then future research could concentrate upon improving the internal construction of each indicator.

The rating system for the net density indicator was formulated in the following manner:

A. The numeric rating of "2" was given if the federally assisted development had a net density equal to, or less than that of the neighborhood.

B. The numeric rating of "1" was given if the federally assisted development had a net density not exceeding 200 percent of the neighborhood net density.

C. The numeric rating of "0" was given if the development had a net density exceeding 200 percent of neighborhood net density.

Indicator Number 3: Vacancy Rate

The number of dwelling units which are vacant and available is a common measure of the balance between the supply and demand functions of the local housing market. The market can either have an excess of units over those demanded or, a shortage of units below that which is demanded. When high vacancy rates do occur over long periods of time, it is evident that the project is not supplying the type of unit demanded by the consumer, or that the

housing market is over supplied with that type of unit. Glenn H. Beyer lists the following general conclusions concerning vacancy rates,[12]

A. Large Communities tend to have higher vacancy rates than small communities.

B. Communities with large numbers of rental units tend to have higher vacancy rates than communities possessing large numbers of owner occupied units.

C. Communities with large numbers of multi-family units generally have higher vacancy rates than communities containing predominately single family detached units.

D. High vacancy rates are more predominate in the lowest and highest priced dwelling units.

E. Vacancy rates generally decrease as the size of the dwelling unit increases.

If a housing market is to offer reasonable housing alternatives for the consumer, then a certain number of dwelling units must always be available. If the vacancy rate becomes too high, the owner of the vacant units may face severe economic hardship from the loss of regular income. The resultant loss of revenue will have a direct impact on the type of new housing which will be constructed. Vacancy rate research, therefore, becomes an integral part of economic feasibility studies for proposed residential projects. The

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[12]Glenn H. Beyer, Housing and Society (New York, N.Y.: Macmillan Company, 1968), p. 134.

vacancy ratio may become the key indicator in determining whether a certain size and type of unit has a chance in a particular locality. In terms of the research this thesis is undertaking, it is relevant because it will be an indication of the thoroughness of the Department of Housing and Urban Development's market research investigation. If market research is underestimating demand for a particular unit within a community or neighborhood, then methods of analysis and procedures for feedback should be developed so that additional units are not funded in the same locality.

A major difficulty in utilizing the vacancy rate indicator was the existence of current vacancy data within the selected neighborhood areas. Because of the ever changing nature of housing markets, up-to-date information on vacancies is often difficult to obtain. The Lansing area is fortunate, however, in that regular surveys are conducted by the R. L. Polk Company of Detroit, Michigan, in the annual compilation of their comprehensive Lansing City Telephone Directory. The interviewers used by the Polk Company canvass such a large section of the housing market that they generally have information on approximately 90 percent of all households in the City of Lansing. The vacancy rate information is published as part of a series of management reports entitled "Profiles of Change" which are available for sale to either public or private researchers.[13]

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[13]R. L. Polk Company, Profiles of Change - Lansing, Michigan (Detroit, Michigan: Urban Statistical Division, 1971-1972).

The data contained within this report is based on census tract boundaries and fits in quite closely with the neighborhood boundaries to be used for this study.

The structure of the vacancy data obtained from "Profiles of Change" had the following breakdown:

--Structures with one housing unit

--Structures with two or four housing units

--Structures with five to nineteen housing units

--Structures with twenty or more housing units

Because of the problem inherent in comparing vacancy rate information for one development to vacancy rate data for an entire neighborhood, it was determined that rates should be compared only for similar types of units. The method used, therefore, was to categorize each of the thirteen developments according to the number of dwelling units contained within each structure and determine if the vacancy rate was above or below that of similar developments within the same neighborhood. Such a comparison would give a strong indication of the ability of the federally assisted development to compete against other housing developments in the same area. If the development was found to be non-competitive with similar developments, it could be assumed that substantial public and private resources had been expended to support a non-functional residential project. It could be determined, however, through review of information received from each or all of the five remaining indicators, what factors make the development appear so unattractive to potential housing consumers.

The rating system included the following three points:

A. A numeric rating of "2" was given if the vacancy rate for the federally assisted development was less than similar residential developments (having similar dwelling unit to structure composition) within the same neighborhood. The point should be made that a rate of 10 percent in unit vacancies was considered to be the maximum allowable level for residential projects. The American Institute of Planners publication, entitled A Technical Guide to Regional Housing Planning,[14] recommends that the vacancy rate for the typical multiple family development not exceed 10 percent if the project is to remain economically viable. Therefore, if the vacancy rates for both the neighborhood and the development exceeded 10 percent of total units, a rating of "0" was given because the high vacancy rate was representative of a residential project which was not successfully competing in the housing market.

B. A numeric rating of "1" was given if the development and the neighborhood had similar vacancy rates. A similar vacancy rate was defined as one which was equal to or was not greater than 50 percent of the vacancy rate in comparable structures within the neighborhood.

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[14]American Institute of Planners, A Technical Guide to Regional Housing Planning (Washington, D.C.: American Institute of Planners, 1972), p. 10.

C. In all cases where both the development and neighborhood vacancy rates exceeded 10 percent, a rating of "0" was given. If the development exceeded the neighborhood vacancy rate by more than 50 percent, a numeric rating of "0" was also given.

Indicator Number 4:
Recreational Acreage

Traditionally, the work ethic in America was the driving force behind the fulfillment of personal and societal needs. As the industrial economy prospered, however, it became apparent that an increasing segment of the population were engaging in various forms of recreational activities which were apparently fulfilling basic needs in their lives. With the increase in educational attainment and corresponding income levels, the rise in the total number of aged persons, and the increased mobility of the general population, local units of government were hard pressed to meet the demand for recreational activities. The use of land for all types of recreational purposes logically paralleled the increased demands of a recreating population. As organized recreation programs developed, the need for guidelines and standards in relation to playgrounds and park formulation became evident. Standards developed by the National Recreational Association have been widely utilized by state, regional, and local governmental organizations. The parks system in the City of Lansing, under the auspices of the Parks and Recreation Department, has approximately 1,400 acres of land devoted to

public recreation.[15] This system of recreational lands is operated on the basis of the type of facility in relation to the geographic area it serves; neighborhood, community, or region. Regional recreational facilities serve a specialized recreational demand, while neighborhood and community facilities serve the day-to-day needs of the resident population. At the present time, parks and playgrounds represent about 15 percent of Lansing's developed area, and is distributed in about 88 various sites throughout the community. Also, approximately 650 acres, located in 38 sites outside the city limits serve the recreational needs of municipal as well as regional residents.[16] According to the Lansing Recreation Plan,

> The most significant deficiency in Lansing's recreational system is the number and distribution of neighborhood and community facilities. While there appears to be a surplus of land in large parks and reservations, much of this land is held for purposes of "flood control" rather than active recreation. In the future, facilities of more modest size and appropriate location are needed in many of the neighborhoods. On the basis of its prospective area and population, the Lansing urbanized area would justify some 5,000 to 5,500 acres by 1975 to 1980. Thus an additional 3,000 to 3,500 acres would seem to represent the bracket of a reasonable "target."[17]

Of the 34 neighborhoods identified by the Community Renewal Program for Lansing, each was examined in terms of the adequacy of parkland available to the residents. Because of the importance of recreational activities, and because of the apparent lack of parks

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[15] Including public school sites.

[16] City of Lansing, Lansing Recreation Plan (Lansing, Michigan: Department of Parks and Recreation, 1969), p. 16.

[17] Ibid., p. 15.

and parkland in some of the neighborhoods, it was considered extremely important in this thesis to judge the impact major residential developments had on the recreational acreage in each neighborhood. Were the high density residential projects reducing the person-per-recreation-acre ratio to such a low level that the quality of recreational experience was reduced for all residents of the neighborhood? The standards used by the Lansing Parks and Recreation Department are identified in Table 10.

TABLE 10

NEIGHBORHOOD RECREATIONAL AREA STANDARDS

Facility	Size	Area/1,000 Persons	Service Radius
Play lot	1500-5000 sq. ft.	4000 sq. ft.	1/8 mile
Playground	3-6 acres	1.25 acres	1/2 mile
Playground with Elementary School	8-12 acres	1.75 acres	1/2 mile
Neighborhood Park	3 or more acres	1.00 acres	1/2 mile

SOURCE: Lansing Parks Department

It would be very beneficial if the municipality could legally require proposed residential developments to include recreational acreage according to the above described standards as part of the zoning or subdivision approval process. If that were the case, a certain stable level of recreational acreage could be maintained at the neighborhood level. A series of court decisions has made it quite clear, however, that communities could not require the dedication of public recreation or open space lands as a requirement of

the development procedures without just compensation to the property owner.[18] In the words of one court decision; "What is attempted under the guide of police power is, in reality, the exercise of the power of eminent domain without compensation for taking, and therefore, is unconstitutional."[19] Any acreage that is dedicated for public use within large scale residential projects is usually obtained through unofficial bargaining between the local unit of government and the property owner or developer. This negotiation usually centers around the number of dwelling units allowed per acre vs. the amount of land to be dedicated for public use. The City of Lansing has obtained substantial acreage for recreation use through this process.

How have the thirteen federally assisted residential developments under consideration performed in this regard? It was considered important to determine if they were positively or negatively impacting the recreational acreage within each neighborhood. A rating system was devised which compared the public recreational acreage supplied by each assisted development to that acreage already existing in the respective neighborhood. The rating system utilized the standards for neighborhood facilities as described in the Lansing Recreation Plan (Table 10). For ease of statistical comparison, the facility acreages were combined and reduced to a

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[18] William H. Whyte, The Last Landscape (Garden City, N.Y.: Doubleday and Company, Inc., 1968) p. 43.

[19] Ibid., p. 43.

figure of neighborhood recreational acreage (NRA) per 100 persons. The calculated utilized standard was, therefore, .41 NRA's per 100 persons. Although this may appear to be a generalization of recreation standards at the neighborhood level, the point must be re-emphasized that the NRA figure will be used as an indicator of the adequacy of general recreational acreage and not a measure of specific acreage deficiencies. If the NRA figure appears low, than it would be obvious that problems exist in the supply of recreational land versus the residential demand. It is not the intention of this indicator to identify each specific problem, but merely to point the direction of additional inquiry. The rating system was constructed as follows:

A. A numeric rating of "2" was given if the NRA figure for the development was in excess of the NRA figure for the neighborhood. In order to achieve a rating of "2", however, the development must not go below the recommended standard of .41 recreational acres per 100 persons.

B. A numeric rating of "1" was given if the development was the same or was deficient by 10 percent or less from the computed neighborhood recreational acres per 100 persons.

C. A numeric rating of "0" was given if the NRA figure for the development was below the recommended .41 recreational acres per 100 persons. A rating of "0" was given also if the development was below the neighborhood figure by more than 10 percent.

Indicator Number 5:
Environmental Impact

The task of providing for a manmade and natural environment which supplies the wide range of human requirements is extremely difficult. The increase in population since the turn of the century has placed ever increasing demands on the quantity and quality of existing natural resources. Along with this population increase, other factors of demand, such as the shorter work week, higher incomes, and greater mobility, also place mounting pressures on the environment. The use of logical planning principles, in terms of residential development patterns, is a positive method in which needs for residential land can be accomplished in a manner which provides for the widest range of human benefits, but within environmentally acceptable limits. The question must be asked, however, what are these environmentally acceptable limits? What yardstick can be utilized to judge when too much development has been taking place, and what the environmental consequences of this development will be? The explanation of the preceding four indicators have been primarily concerned with the economic, demographic, and recreational characteristics of the neighborhoods and residential developments. But natural characteristics are also vital to the proper formulation of a comprehensive set of physical indicators. Indicators must also be developed which will rate the intensity of development and suggest ways in which local governmental units and private enterprise <u>can</u> permit development within environmentally acceptable parameters. But this task, either theoretically or realistically, is extremely

difficult. As expressed by Robert C. Wood, undersecretary of the Department of Housing and Urban Development in the Johnson Administration:

> To paraphrase Mr. Kipling, farm is farm and town is town and never the twain shall meet . . . the twain have met, but not very gracefully. They have met out on the urban fringe in the neighborhood of that strange, latterday urban phenomenon known as suburbia.
>
> This is the land where the bulldozer has taken over from the plow. It is the place where the barbecue pit has replaced the harvest table, and the gray flannel suit the honest coverall.
>
> It is the place where most of our urban growth has happened in the 20 years since World War II and will continue to happen in the foreseeable future. Unfortunately, that growth has not been kind to the land. It has too often totally ignored any kind of soil or water conservation measures, much less good ones. Subdivisions have been placed in the middle of flood plains, and strip developments have been thrust through with little feeling of harmony for the environment, and little regard of soil and water conservation.[20]

Acknowledging that there is a problem in environmental control, the question must be raised as to the best method of providing for such safeguards. At the present time, using Lansing, Michigan as an example, control of land development is handled through two primary tools--the zoning ordinance, and subdivision regulations. Both controls have their primary roots in the State of Michigan, enabling legislation and are structured in such a way as to leave decision-making in the hands of local units of government.[21]

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[20]U.S. Department of Agriculture and U.S. Department of Housing and Urban Development, Soil, Water and Suburbia (Washington, D.C.: Government Printing Office, 1967), p. 11.

[21]Michigan, City and Village Zoning Act, and Subdivision Control Act (State of Michigan: Public Acts of 1921 and 1967).

The Lansing Zoning Ordinance, initially adopted in the 1940's, provides for the review of residential site plans to ensure all public health and safety standards are met. The ordinance also contains a flood plain control section which places restrictions on the kind and amount of development which can take place in the fifty year flood plain as determined by the United States Army Corps of Engineers. The Lansing Subdivision Regulations, as supported by the state legislation, provides for the review of proposed residential developments by the appropriate municipal, county, or state officials as it regards the adequacy of soils, sanitary and storm sewers, and the ability to supply other necessary public services. These tools enable some measure of pre-construction control and evaluation, but they do not provide for analysis of post-construction conditions. Perhaps, by carefully analyzing the performance of zoning and subdivision ordinances as they directly affect environmental quality, it would be possible to structure the controls in a manner which would indicate a more positive environmental approach. As expressed by Ian L. McHarg:

> It is unfortunate that the information we have on cost-benefit ratios of specific interventions to natural process is inadequate. However, certain generalized relationships have been shown and presumptions advanced as the basis for judgement. It seems clear that the laws pertaining to land use and development need to be elaborated to reflect the public costs and consequences of private action. Present land use regulations neither recognize natural processes--the public good in terms of flood, drought, water quality, agriculture, amenity or recreational potential--nor allocate responsibility to the acts of land owner or developer.[22]

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[22]Ian L. McHarg, Design With Nature (Garden City, N.Y.: Doubleday/Natural History Press, 1971), p. 65.

What are the most important factors to consider in developing a set of environmental indicators for application in residential land development? Certainly the three categories of soil, air and water qualify as the major parameters in the formulation of such indicators. For purposes of this thesis, however, air quality was not considered a logical way to measure the impact of residential land use. This was true for two reasons; air pollution in the Lansing area is not at levels dangerous to the general population, and the residential developments under study are not located in areas where air quality would be considered a problem, (i.e., they are not close to major heavy industrial complexes or other land uses which could have a negative impact on air quality). The general categories of soil and water do provide a wide range of opportunities which certain meaningful measurements may be undertaken. The following items were considered to be indicators which would, not only yield constructive data about the development, but which could be efficiently collected and qualitatively judged:

1. Soil suitability - In any land development situation, careful consideration should be given to the type of soil located at the construction site. In the study of soil classification, scientists account for the layering over the bedrock material, the texturing of the layers into gravel, sand, silt, and clay, the presence of minerals, and the kind and amounts of salts or alkali. Information is also obtained on the compaction and internal stability of the layers, and the ability of the soil to retain

water. With this knowledge, soil scientists are able to make predictions as to the suitability of various kinds of soil for a wide range of land uses. Based on the work of C. F. Marbut, the United States Department of Agriculture in the 1920's was able to expand research into soil morphology, soil genesis, and soil classification in the United States.[23] This effort has enabled the Department of Agriculture to provide soils information to the general public, as well as governmental agencies, developers, or engineers. This information will identify soil conditions as it pertains to soil slippage, potential quality of bearing material, road subgrade soil quality, and septic tank potential. The soil analysis applies to the natural condition of the material and does not relate to areas that are altered by cut or fill activities. The limitations as defined by the USDA interpretation sheets are broken down into the four following categories:[24]

- Very Severe Limitation--Extreme measures are needed to overcome the limitations and usage generally is unsound or not practical.

- Severe--Limitations are severe enough to make use questionable.

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[23]U.S. Department of Agriculture and U.S. Department of Housing and Urban Development, Soil, Water and Suburbia (Washington, D.C.: Government Printing Office, 1967), p. 42.

[24]U.S. Department of Agriculture, Soil Conservation Service, Degree of Limitations of Soils for Various Uses (Lincoln, Nebr.: Soil Conservation Service, 1967).

- Moderate--Limitations need to be recognized, but can be overcome with good management and careful design.
- Slight--Relatively free of limitations or limitations are easily overcome.

The USDA soil interpretation sheets are reviewed for each of the thirteen developments being rated in this thesis. If the majority of the soils on the site (greater than 50 percent) were in the slight or moderate category, then a rating of "2" was given. If the majority of soils were severe, a rating of "1" was given. If the majority were very severe, a rating of "0" was given.

2. Vegetation - Good vegetative cover is sound protection against the erosion capabilities of water movement. Runoff of water, and its resultant movement of soil particles, is counteracted by the cover given by the vegetative canopy and by the root systems of the vegetation. The energy of the rainfall is dispersed by the covering of the vegetation and the root system counters the erosion factors associated with movement of large quantities of water. It becomes imperative, therefore, to maintain or replace as much of the natural vegetative cover as possible on a construction site. If all vegetation is stripped away, and a heavy rainfall ensues, tremendous amounts of valuable topsoil will be lost from the site. As explained by Ian L. McHarg:

> Where present (vegetative cover), improves micro-climate and it exercises a major balancing effect upon the water regimen--diminishing erosion,

> sedimentation, flood and drought. The scenic role of woodlands is apparent, as is their provision of a habitat for game, their recreational potential is among the highest for all categories. In addition, the forest is a low maintenance, self-perspecting landscape.[25]

To rate each of the thirteen developments in terms of the amount of vegetative cover which was displaced by residential construction, it was necessary to refer back to issues of the topographic maps for the geographic areas involved. The topographic maps, as maintained by the Lansing Public Service Department, will portray the original condition of the vegetative cover on the site before any cutting or filling activities began. By analyzing the original site conditions, it will be possible to determine if the major vegetative stands were utilized by the developer. If the existing major vegetation was not used, or not replaced, it could be assumed that the developer was not taking advantage of the natural features of the site, and was in fact, putting the soil stability of the site in jeopardy. For purposes of the rating system, it was determined that a rating of "2" would be given if the development demonstrated that it did not disturb more than 25 percent of the vegetative cover, or that such cover did not exist, or that an equal amount of cover was replaced in

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[25]Ian L. McHarg, Design With Nature (Garden City, N.Y.: Doubleday/Natural History Press, 1971), p. 61.

a more appropriate location. A rating of "1" was given if the development demonstrated that it did not disturb more than 50 percent of such cover, or that an equal amount of such cover was replaced in a more appropriate location. A rating of "0" was given if the development disturbed more than 50 percent of the existing vegetative cover.

3. Flood Plain - Through a long series of natural storm runoff situations, a stream will have created a high water or overflow channel which is adjacent to the main water course. This natural occurrence is referred to as a flood plain, principally because it is an area of minimal topographic relief. The U.S. Geological survey has data which asserts that every two years, on an average basis, rivers overflow their banks. If development occurs in the flood plain, therefore, it is logical that flood damage will eventually take place, or that flood control devices must be constructed, or that development take place in non-flood plain areas. The City of Lansing utilizes the fifty (50) year frequency flood as the basis for its flood plain limits. The fifty year frequency flood is defined as:

> That portion of the flood plain of the Grand River, Red Cedar River and Sycamore Creek that would be inundated by the limits established for a hypothetical flood having a recurrence frequency of once in about

> fifty years, as determined by the U.S. Corps of Engineers and the Michigan Water Resources Commission.[26]

To check the location of each of the thirteen developments against the fifty year frequency flood boundary, the topographic maps depicting the flood plain elevations were researched.[27] If a particular development was found 25 percent to 100 percent within flood plain boundaries, it was considered to be a completely negative situation from a land development standpoint and a rating of "0" was given. If an area of the development, from 1 to 25 percent, was within the flood plain, a rating of "1" was given. A rating of "2" was awarded if none of the residential developments was located within flood plain boundaries.

Summary

The preceding pages have presented a methodology for the preparation of indicators to measure housing quality. The forthcoming chapter will apply each of these indicators to the thirteen residential developments previously described. After this application has been accomplished, each development will be analyzed to determine the relative significance of indicator measurement.

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[26]City of Lansing, Lansing, Michigan Zoning Ordinance, Section 36-60 (Lansing, Michigan: Municipal Code Corporation, 1969), p. 648.4.

[27]U.S. Army Corps of Engineers, Flood Plain Information - Grand River, Red Cedar River and Sycamore Creek (Detroit, Michigan: U.S. Corps of Engineers, 1970).

CHAPTER V

APPLICATION OF HOUSING QUALITY INDICATORS

The following pages have taken each of the five indicators described in the previous chapter and applied them to each of the thirteen developments and their respective neighborhoods. The result of this application will be a numeric rating indication of the positive, minimal, or negative impact of these residential developments. An upcoming chapter will make a basic analysis of this information.

Indicator No. 1--Educational Cost/Revenue

This indicator compares K-12 educational costs and property tax educational revenue for each of the developments and their respective neighborhoods.

Neighborhood 23 (Contains Developments No. 1, 3, 7, and 11)

Neighborhood 23 has the following characteristics:

--3555 students enrolled in the K-12 program

--Average cost per student = $1320 (Lansing School District estimate)

--Total K-12 educational costs = $4,692,600

--Revenue from property tax for K-12 education = $1,101,956

--Total population = 10,500

The educational cost-revenue benefit for Neighborhood 23 would be calculated as follows:

--Total property tax revenue minus (-) total educational costs = -$3,590,644

--The educational benefit per capita (negative) for Neighborhood 23 would be -$3,590,644 ÷ 10,500 = -$341.96

--Therefore, -$341.96 represents the negative per capita educational benefit the educational cost of 3555 students in Neighborhood 23.

Development 1.--Development 1, located within Neighborhood 23, has the following characteristics:

--212 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $279,840

--Revenue from property tax for K-12 education = $46,191

--Total population = 843

The educational cost-revenue benefit for Development 1 would be calculated as follows:

--Total Tax revenue minus (-) total educational costs = -$233,649

--The educational benefit per capita for Development 1 would be -$233,649 ÷ 843 = -$277.16

--Therefore, -$277.16 represents the negative per capita educational benefit toward the educational cost of 212 students in Development 1.

Rating.--The relationship between the educational benefit of Neighborhood 23 (-$341.96) and Development 1 (-$277.16) portrays a situation where the development and the neighborhood are proportionally contributing a similar amount (the difference is less than 25 percent). The rating for Development 1 would be "1".

Development 3.--Development 3, located within Neighborhood 23, has the following characteristics:

--200 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $264,000

--Revenue from property tax for K-12 education = $17,932

--Total population = 406

The educational cost-revenue benefit for Development 3 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$246,068

--The educational benefit per capita for Development 3 would be -$246,068 ÷ 406 = -$606.08

--In this case, -$606.08 represents the negative per capita educational benefit towards the educational cost of students in Development 3.

Rating.--The relationship between the educational benefit (negative) in Neighborhood 23 (-$341.96) and Development 3 (-$606.08) portrays a situation where the development is proportionally contributing far less than the neighborhood. The rating for Development 3 would be "0".

Development 7.--Development 7, located within Neighborhood 23, has the following characteristics:

--119 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $157,080

--Revenue from property tax for K-12 education = $26,296

The educational cost-revenue benefit for Development 7 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$130,784

--The educational benefit per capita for Development 7 would be -$130,784 ÷ 476 = -$274.75

--Therefore, -$274.75 represents the negative per capita educational benefit towards the educational costs of 119 students in Development 7.

Rating.--The relationship between the educational benefit (negative) in Neighborhood 23 (-$341.96) and Development 7 (-$274.75) portrays a situation where the development and the neighborhood are proportionally contributing a similar amount. The rating for Development 7 would be "1".

Development 11.--Development 11, located within Neighborhood 23, has the following characteristics:

--225 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $297,000

--Revenue from property tax for K-12 education = $32,733

--Total population = 525

The educational cost-revenue benefit for Development 11 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$264,267

--The educational benefit per capita for Development 11 would be -$264,267 ÷ 525 = -$503.36

--Therefore, -$503.36 represents the negative per capita educational benefit towards the educational cost of 225 students in Development 11.

Rating.--The relationship between the educational benefit (negative) in Neighborhood 23 (-$341.96) and Development 11 (-$503.36) portrays a situation where the development is proportionally contributing far less than the neighborhood. The rating for Development 11 would be "0".

Neighborhood 30 (Contains Developments No. 2, 5, and 10)

Neighborhood 30 has the following characteristics:

--748 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $987,360

--Revenue from the property tax for K-12 education = $495,200

--Total population = 3681

The educational cost-revenue benefit for Neighborhood 30 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$492,160

--The educational benefit per capita (negative) for Neighborhood 30 would be -$492,160 ÷ 3681 = -$133.70

--Therefore, -$133.70 represents the negative per capita educational benefit toward the educational cost of 748 students in Neighborhood 30.

Development 2.--Development 2, located within Neighborhood 30, has the following characteristics:

--379 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $500,280

--Revenue from the property tax for K-12 education = $70,457

--Total population = 1081

The educational cost-revenue benefit from Development 2 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$429,822

--The educational benefit per capita for Development 2 would be -$429,822 ÷ 1081 = -$397.61

--Therefore, -$397.61 represents the negative per capita educational benefit toward the educational cost of 379 students in Development 2.

Rating.--The relationship between the educational benefit of Neighborhood 30 (-$133.70) and Development 2 (-$397.61) portrays a situation where the development is proportionally contributing far less than the neighborhood. The rating for Development 2 would be "0".

Development 5.--Development 5, located within Neighborhood 30, has the following characteristics:

--271 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $357,720

--Revenue from the property tax for K-12 education = $94,001

--Total population = 1449

The educational cost-revenue benefit from Development 5 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = $263,719

--The educational benefit per capita for Development 5 would be -$263,719 ÷ 1449 = -$182.00

--Therefore, -$182.00 represents the negative per capita educational benefit toward the educational cost of 379 students in Development 5.

Rating.--The relationship between the educational benefit of Neighborhood 30 (-$133.70) and Development 5 (-$182.00) portrays a situation where the development is proportionally contributing less than the neighborhood. The rating for Development 5 would be "0".

Development 10.--Development 10, located in Neighborhood 30, has the following characteristics:

--120 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $158,400

--Revenue from the property tax for K-12 education = $36,588

--Total population = 280

The educational cost-revenue benefit from Development 10 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$131,812

--The educational benefit per capita for Development 10 would be -$121,812 ÷ 280 = -$435.00

--Therefore, -$435.00 represents the negative per capita educational benefit toward the educational cost of 120 students in Development 10.

Rating.--The relationship between the educational benefit of Neighborhood 30 (-$133.70) and Development 10 (-$435.00) portrays a situation where the development is proportionally contributing far less than the neighborhood. The rating for Development 10 would be "0".

Neighborhood 34 (Contains Development No. 6)

Neighborhood 34 has the following characteristics:

--179 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $236,280

--Revenue from the property tax for K-12 education = $283,896

--Total population = 498

The educational cost-revenue benefit for Neighborhood 34 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = $47,616

--The educational benefit per capita for Neighborhood 30 would be $47,616 ÷ 498 = $95.61

--Therefore, $95.61 represents the positive per capita educational benefit toward the educational cost of 179 students in Neighborhood 34.

Development 6.--Development 6, located within Neighborhood 34, has the following characteristics:

--64 students enrolled in the K-12 program

--Total educational cost = $1320

--Total K-12 educational costs = $84,480

--Revenue from the property tax for K-12 education = $39,032

--Total population = 490

The educational cost-revenue benefit from Development 6 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$45,448

--The educational benefit per capita for Development 6 would be -$45,448 ÷ 490 = -$92.75

--Therefore, -$92.75 represents the negative per capita educational benefit toward the educational cost of 64 students in Development 6.

Rating.--The relationship between the educational benefit for Neighborhood 34 ($95.61) and Development 6 (-$92.75) portrays a situation where the development is proportionally contributing far less than the neighborhood. The rating for Development 6 would be "0".

Neighborhood 32 (Contains Development No. 12)

Neighborhood 32 has the following characteristics:

--681 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $898,920

--Revenue from the property tax for K-12 education = $151,344

--Total population = 1053

The educational cost-revenue benefit for Neighborhood 32 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$747,576

--The educational benefit per capita (negative) for Neighborhood 32 would be -$747,576 ÷ 1053 = -$709.94

--Therefore, -$709.94 represents the negative per capita educational benefit toward the educational cost of 681 students in Neighborhood 32.

Development 12.--Development 12, located in Neighborhood 32, has the following characteristics:

--204 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $269,280

--Revenue from the property tax for K-12 education = $26,434

--Total population = 476

The educational cost-revenue benefit for Development 12 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$242,846

--The educational benefit per capita for Development 12 would be -$242,846 ÷ 476 = -$510.18

--Therefore, -$510.18 represents the negative per capita educational benefit toward the educational cost of 204 students in Development 12.

Rating.--The relationship between the educational benefit in Neighborhood 32 (-$709.94) and Development 12 (-$510.18) portrays a situation where the development is proportionally contributing slightly more than the neighborhood. The rating for Development 12 would be "2".

Neighborhood 29 (Contains Development No. 13)

Neighborhood 29 has the following characteristics:

--1046 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $1,380,720

--Revenue from the property tax for K-12 education = $563,661

--Total population = 3681

The educational cost-revenue benefit for Neighborhood 29 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$817, 059

--The educational benefit per capita (negative) for Neighborhood 29 would be -$817,059 ÷ 3681 = -$221.96

--Therefore, -$221.96 represents the negative per capita educational benefit towards the educational cost of 1046 students in Neighborhood 29.

Development 13.--Development 13, located in Neighborhood 29, has the following characteristics:

--0 students enrolled in the K-12 program

--Average cost per student = $1320

--0 educational costs

--Revenue from property taxes for K-12 education = $24,094

--Total population = 250

The educational cost-revenue benefit for Development 13 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = $24,094

--The educational benefit per capita for Development 13 would be $24,094 ÷ 250 = $96.37

--Therefore, $96.37 represents the positive per capita educational contribution in Development 13.

Rating.--The relationship between the educational benefit of Neighborhood 29 (-$221.96) and Development 13 ($96.37) portrays a situation where the development is contributing far more than the neighborhood. The rating for Development 13 would be "2".

Neighborhood 24 (Contains Development No. 4)

Neighborhood 24 has the following characteristics:

--2720 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $3,590,400

--Revenue from the property tax for K-12 education = $920,390

--Total population = 6801

The educational cost-revenue benefit for Neighborhood 24 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$2,670,010

--The educational benefit per capita (negative) for Neighborhood 24 would be -$2,670,010 ÷ 5760 = -$463.54

--Therefore, -$463.54 represents the negative per capita educational benefit towards the educational cost of 2720 students in Neighborhood 24.

Development 4.--Development 4, located in Neighborhood 24, has the following characteristics:

--71 students are enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $93,720

--Revenue from property tax for K-12 education = $10,429

--Total population = 196

The educational cost-revenue benefit for Development 4 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$83,291

--The educational benefit per capita for Development 4 would be -$83,291 ÷ 196 = -$424.95

--Therefore, -$424.95 represents the negative per capita educational cost of 71 students in Development 4.

Rating.--The relationship between the educational benefit of Neighborhood 24 (-$463.54) and Development 4 (-$424.95) portrays a situation where the development and the neighborhood are proportionally contributing a similar amount. The rating for Development 4 would be "1".

Neighborhood 15 (Contains Development No. 9)

Neighborhood 15 has the following characteristics:

--2267 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $2,992,440

--Revenue from the property tax for K-12 education = $1,539,090

--Total population = 5760

The educational cost-revenue benefit for Neighborhood 15 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$1,463,350

--The educational benefit per capita (negative) for Neighborhood 15 would be -$1,463,350 ÷ 5760 = -$254.05

--Therefore, -$254.05 represents the negative educational benefit (per capita) towards the educational cost of 2267 students in Neighborhood 15.

Development 9.--Development 9, located in Neighborhood 15, has the following characteristics:

--15 students are enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $19,800

--Revenue from property tax for K-12 education = $8,467.32

--Total population = 200

The educational cost-revenue benefit for Development 9 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$11,332.68

--The educational benefit per capita for Development 9 would be -$11,332.68 ÷ 200 = -$56.66

--Therefore, -$56.66 represents the negative per capita educational cost of 15 students in Development 9.

Rating.--The relationship between the educational benefit in Neighborhood 15 (-$254.05) and Development 9 (-$56.66) portrays a situation where the development is proportionally contributing

far more than the neighborhood. The rating for Development 9 would be "2".

Neighborhood 3 (Contains Development No. 8)

Neighborhood 3 has the following characteristics:

--1676 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $2,212,320

--Revenue from the property tax for K-12 education = $4,074,536

--Total population = 5815

The educational cost-revenue benefit for Neighborhood 3 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = $1,862,216

--The educational benefit per capita for Neighborhood 3 would be $1,862,216 ÷ 5815 = $320.24

--Therefore, $320.24 represents the positive educational benefit (per capita) towards the educational cost of 1676 students in Neighborhood 3.

Development 8.--Development 8, located in Neighborhood 3, has the following characteristics:

--100 students enrolled in the K-12 program

--Average cost per student = $1320

--Total K-12 educational costs = $132,000

--Revenue from property tax for K-12 education = $11,117

--Total population = 224

The educational cost-revenue benefit for Development 8 would be calculated as follows:

--Total tax revenue minus (-) total educational costs = -$120,883

--The educational benefit per capita for Development 7 would be -$120,883 ÷ 224 = -$539.65

--Therefore, -$539.65 represents the negative per capita educational cost of 100 students in Development 8. This portrays a situation where the development is proportionally contributing far less than the neighborhood. The rating for Development 8 would be "0".

Indicator No. 2--Density

Based on the rating scale developed in Chapter IV, the application of the density indicator is intended to demonstrate the comparative demand on public services and utilities between the development and the neighborhood.

Development 1: 14 units/net acre

Neighborhood 23: 3.86 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 2: 11.88 units/net acre

Neighborhood 30: 2.11 units/net acre

Rating: "0" (exceeding neighborhood by more than 100 percent)

Development 3: 12.88 units/net acre

Neighborhood 23: 3.86 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 4: 8.88 units/net acre

Neighborhood 24: 2.74 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 5: 9.62 units/net acre

Neighborhood 30: 2.11 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 6: 14.7 units/net acre

Neighborhood 34: .39 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 7: 15.79 units/net acre

Neighborhood 23: 3.86 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 8: 7.43 units/net acre

Neighborhood 3: 2.38 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 9: 98 units/net acre

Neighborhood 15: 5.62 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 10: 11.6 units/net acre

Neighborhood 30: 2.11 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Development 11: 7.26 units/net acre

Neighborhood 23: 3.86 units/net acre

Rating: "1" (did not exceed 100 percent of neighborhood density)

Development 12: 14.6 units/net acre

Neighborhood 32: .62 units/net acre

Rating: "0" (exceeded neighborhood by more than 100 percent)

Indicator No. 3--Vacancy Rate

Based on the material developed in Chapter IV, the application of the vacancy indicator to each development and neighborhood intends to compare the market preformance of the development units against similar units in the same neighborhood.

Development No. 1: 3 percent vacancy rate

Neighborhood 23: 21.94 percent vacancy rate

Rating: "2" (less than neighborhood vacancy rate for similar structures)

Development No. 2: 6 percent vacancy rate

Neighborhood 30: 1 percent vacancy rate

Rating: "0" (greater than neighborhood vacancy rate for similar structures)

Development No. 3: 7 percent vacancy rate

Neighborhood 23: 21.94 percent vacancy rate

Rating: "2" (less than the neighborhood vacancy rate for similar structures)

Development No. 4: 23 percent vacancy rate

Neighborhood 24: 2.7 percent vacancy rate

Rating: "0" (greater than the neighborhood vacancy rate for similar structures)

Development No. 5: 5 percent vacancy rate

Neighborhood 30: 15.16 percent vacancy rate

Rating: "2" (less than the neighborhood vacancy rate for similar structures)

Development No. 6: 9 percent vacancy rate

Neighborhood 34: 15 percent vacancy rate

Rating: "2" (less than the neighborhood vacancy rate for similar structures)

Development No. 7: 9 percent vacancy rate

Neighborhood 23: 21.94 percent vacancy rate

Rating: "2" (less than the neighborhood vacancy rate for similar structures)

Development No. 8: 0 percent vacancy rate

Neighborhood 3: 16.57 percent vacancy rate

Rating: "2" (less than the neighborhood vacancy rate for similar structures)

Development No. 9: 12 percent vacancy rate

Neighborhood 15: 13.43 percent vacancy rate

Rating: "0" (exceeds 10 percent standard vacancy rate range)

Development No. 10: 9 percent vacancy rate

Neighborhood 30: 15.16 percent vacancy rate

Rating: "2" (less than the neighborhood vacancy rate for similar structures)

Development No. 11: 20 percent vacancy rate

Neighborhood 23: 21.94 percent vacancy rate

Rating: "0" (exceeds 10 percent standard vacancy rate range)

Development No. 12: 21 percent vacancy rate

Neighborhood 32: 26 percent vacancy rate

Rating: "0" (exceeds 10 percent standard vacancy rate range)

Development No. 13: 10 percent vacancy rate

Neighborhood 29: 10 percent vacancy rate

Rating: "1" (equals neighborhood rate for similar structures)

Indicator No. 4--Recreational Acreage

Based on the material developed in Chapter IV, the application of the recreational land indicator to each development and neighborhood is intended to show the demand placed on neighborhood recreational acreage by the development.

Development No. 1: .09 recreational acres/100 persons

Neighborhood 23: .22 recreational acres/100 persons

Rating: "0" (development is below the standard .41 acres/100 persons)

Development No. 2: 2.8 recreational acres/100 persons

Neighborhood 30: 1.6 recreational acres/100 persons

Rating: "2" (development exceeded the neighborhood figure)

Development No. 3: 4 recreational acres/100 persons

Neighborhood 23: .22 recreational acres/100 persons

Rating: "2" (development exceeded the neighborhood figure)

Development No. 4: 0 recreational acres/100 persons

Neighborhood 24: .30 recreational acres/100 persons

Rating: "0" (development is below the standard .41 acres/100 persons)

Development No. 5: .39 recreational acres/100 persons

Neighborhood 30: 1.6 recreational acres/100 persons

Rating: "1" (development is below the standard .41 acres/100 persons)

Development No. 6: 0 recreational acres/100 persons

Neighborhood 34: 0 recreational acres/100 persons

Rating: "0"

Development No. 7: 0 recreational acres/100 persons

Neighborhood 23: .22 recreational acres/100 persons

Rating: "0"

Development No. 8: .02 recreational acres/100 persons

Neighborhood 3: .75 recreational acres/100 persons

Rating: "0" (development is below the standard .41 acres/100 persons)

Development No. 9: 0 recreational acres/100 persons

Neighborhood 15: .05 recreational acres/100 persons

Rating: "0"

Development No. 10: 1.8 recreational acres/100 persons

Neighborhood 30: 1.6 recreational acres/100 persons

Rating: "2" (development exceeded the neighborhood figure)

Development No. 11: 5 recreational acres/100 persons

Neighborhood 23: .22 recreational acres/100 persons

Rating: "2" (development exceeded the neighborhood figure)

Development No. 12: .43 recreational acres/100 persons

Neighborhood 32: .60 recreational acres/100 persons

Rating: "0" (development is below the neighborhood figure by more than 10 percent)

Development No. 13: .10 recreational acres/100 persons

Neighborhood 29: 1.05 recreational acres/100 persons

Rating: "0" (development is below the standard .41 acres/100 persons)

Indicator No. 5--
Environmental Impact

Based on the rating scales developed in Chapter IV, the application of the environmental indicators to each development will be performed individually for soils, vegetation, and flood plain.

Soils--Composition of material on the majority of the site.

Development No. 1: Celina Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Development No. 2: Colwood Loam, severe limitation

Rating: "1" (residential use questionable, can be corrected by design)

Development No. 3: Conover Loam, severe limitation

Rating: "1" (residential use questionable, can be corrected by design)

Development No. 4: Celina Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Development No. 5: Locke Sandy Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Development No. 6: Owosso-Miami Sandy Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Development No. 7: Conover Loam, severe limitation

Rating: "1" (residential use questionable, can be corrected by design)

Development No. 8: Lenawee Silty Clay Loam, severe limitation

Rating: "1" (residential use questionable, can be corrected by design)

Development No. 9: Locke Sandy Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Development No. 10: Locke Sandy Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Development No. 11: Celina Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Development No. 12: Conover Loam, severe limitation

Rating: "1" (residential use questionable, can be corrected by design)

Development No. 13: Owosso-Miami Sandy Loam, slight-moderate limitation

Rating: "2" (no limitation to residential construction)

Vegetation--Utilization or replacement of vegetative cover on the site.

Development No. 1: Minimal amount existed prior to construction

Rating: "2"

Development No. 2: Minimal amount existed prior to construction

Rating: "2"

Development No. 3: Removed large tree stands on the site

Rating: "1" (more than 50 percent remains)

Development No. 4: Removed tree stands and vegetative cover

Rating: "0" (removed more than 50 percent)

Development No. 5: Removed vegetative cover

Rating: "1" (more than 50 percent remains)

Development No. 6: Minimal amount existed prior to construction

Rating: "2"

Development No. 7: Large tree stand removed

Rating: "0" (more than 50 percent and not replaced)

Development No. 8: Minimal amount existed prior to construction

Rating: "2"

Development No. 9: Minimal amount existed prior to construction

Rating: "2"

Development No. 10: Minimal amount existed prior to construction

Rating: "2"

Development No. 11: Vegetative cover removed, erosion from run-off around parking lots and street stubs

Rating: "1" (more than 50 percent remains)

Development No. 12: Minimal amount existed prior to construction

Rating: "2"

Development No. 13: Tree and shrub stands removed

Rating: "1" (more than 50 percent remains)

Flood Plains--Location within 50 year frequency flood plain.

Note: Not any portion of Developments 1 through 13 were located in the 50 year flood plain. Therefore, all developments received a rating of "2".

CHAPTER VI

ANALYSIS OF THE APPLICATION OF HOUSING QUALITY INDICATORS

As demonstrated in Chapter V, qualitative indicators have been applied to thirteen federally sponsored residential developments within Lansing, Michigan. This application has resulted in a comparative matrix which aligns each indicator with every residential development. The matrix, very simply, reveals the numeric rating (on a three point scale) of each development against the qualitative indicators which were applied to them. The distribution of the numeric ratings are shown in Table 11.

TABLE 11

HOUSING QUALITY INDICATOR APPLICATION MATRIX

Developments	Education Cost/Revenue	Density	Vacancy Rate	Recreational Acreage	Soils	Vegetation	Flood Plain
1	1	0	2	0	2	2	2
2	0	0	0	2	1	2	2
3	0	0	2	2	1	1	2
4	1	0	0	0	2	0	2
5	0	0	2	0	2	1	2
6	0	0	2	0	2	2	2
7	1	0	2	0	1	0	2
8	0	0	2	0	1	2	2
9	2	0	0	0	2	2	2
10	0	0	2	2	2	2	2
11	0	1	0	2	2	1	2
12	2	0	0	0	1	2	2
13	2	0	1	0	2	1	2

There existed a mathematical possibility of fourteen maximum points in each of the seven categories. Upon reviewing Table 11, it is obvious that none of the developments earned the maximum allowable points. The following rankings were revealed when the individual point totals were summed:

Ten Points	(71 percent of maximum)	Development No. 10
Nine Points	(64 percent of maximum)	Development No. 1
Eight Points	(57 percent of maximum)	Developments No. 3,6,9,11, & 13
Seven Points	(50 percent of maximum)	Developments No. 2,5,8, & 12
Six Points	(42 percent of maximum)	Development No. 7
Five Points	(36 percent of maximum)	Development No. 4

Although ten points is not a relatively high ranking when considering the total number of points possible, the important consideration for this research is not the relative position of all developments on the scale, but rather the performance of individual indicators. In this way, it becomes specifically apparent what made one project rank higher than another. What is being said, in essence, is that there is something inherently better about Development No. 10 than Development No. 4. The question is, better for whom? Better for the investor; a higher rate of return because the project performs better in the market place? Better for the neighborhood residents; the project does not place a heavy demand on neighborhood facilities? Better for the local governmental budget; new public capital improvements are not necessary to offset residential pressure? It is true that Development No. 10 does not possess all positive

attributes nor does Development No. 4 lack them, but there is a distinct difference in the way they impact the community. The degree of that difference, as postulated in this thesis, can be further defined by the application of certain key indicators. In order to address this issue further, it is necessary to analyze the application of each qualitative indicator and determine the information that is generated.

Individual Indicator Impact

The distribution of each of the indicators within the three point ranking scale is portrayed in Table 12.

TABLE 12

PERCENTAGE DISTRIBUTION OF INDICATOR RANKINGS

Rating	Education Cost/Revenue	Den- sity	Vacancy Rate	Recreational Acreage	Soils	Vegeta- tion	Flood Plain
Negative Impact (0)	54%	92%	38%	69%	0%	15%	0%
Minimal Impact (1)	23%	8%	8%	0%	38%	31%	0%
Positive Impact (2)	23%	0%	54%	31%	62%	54%	100%

The material contained in Table 12 describes the number of occurrences of positive, negative, or minimal impact for each of the indicators applied. The following material discusses the performance of each indicator and makes recommendations on the resultant findings.

Indicator No. 1: Educational Cost/Revenue

It has been a constantly debatable issue at local public meetings concerning land-use changes that multiple family developments generate huge numbers of school age children and, therefore, are a burden to the facilities of that school district and the local school board's budget. It has been stated previously within this thesis that educational costs and revenues vary significantly with different types of land uses. Zoning decisions in the City of Lansing concerning high density versus low density residential development have consistently favored the higher density residential developments. These decisions, according to municipal officials, are based primarily on the fact that such developments generate more property tax revenue. What such decisions have ignored, however, is that while on the one hand high density means high return of the tax dollar, it also means a high demand on a wide range of public services and utilities. One of the most costly of these services is education. Educational service, however, lends itself to meaningful cost-benefit measurement because it is possible to identify who is paying for the service and who is receiving such service. The

Educational Cost/Revenue Indicator was designed to show which residential developments were making a positive dollar contribution toward educational costs, which developments were at the breakeven point of cost and revenues, and which developments were making negative dollar contributions.

Upon review of the statistics concerning the application of the Educational Cost/Revenue Indicator to the target group of thirteen residential developments, it was readily apparent that slightly over one-half (54 percent) of the developments were not generating as much property tax revenue as they were demanding in services. Only three of the developments (23 percent) were making positive contributions toward the educational costs, while the remaining three developments (23 percent) were at the cost-revenue breakeven point. It should be noted that one of the developments contributing more revenue than service costs (No. 13), was a project designed for elderly household use and, therefore, would put no demand on the K-12 educational system. In view of the fact that 33 percent of the dwelling units within the Lansing city limits are multiple units, it could be assumed that a high percentage of these units are not contributing their fair share of educational costs in the community. To prevent such economic discrepancies from happening in the future, the City of Lansing should seriously consider more strictly controlling the size of the student population within specific neighborhoods by limiting the total number of units or the bedroom compositions of proposed residential developments. In addition, the review process of the federal government for subsidized

housing developments (such as the thirteen projects just discussed) should more carefully research the impact of the proposed project against the educational economics of local school systems. Although the final approval for such development remains at the local level, the federal government has placed public dollars into the development and such investment should not arbitrarily place a financial burden on a unit of local or regional government. It appears, based on this research, that this is indeed happening in the majority of federally subsidized multiple family developments in Lansing, Michigan.

Specific Recommendations: In order to reduce the apparent conflict between a federal program providing housing and a local service providing education, it is recommended . .

--That the City of Lansing (primarily the Planning Board and the Lansing School District), through the use of land use controls (primarily zoning statutes), more carefully research the impact proposed residential developments have on the K-12 educational system. Such research should focus on per unit bedroom composition, utilization levels of existing educational facilities, per student costs, and local property tax rates.

--That the U.S. Department of Housing and Urban Development (HUD) (primarily the Detroit Area Office) more carefully coordinate their approvals on federal subsidies for residential construction with the local

unit of governments public educational capability. As demonstrated by this thesis, research can be performed which measures the physical and economic impact of residential land use on the educational system. Such research should be required by HUD in the approval process.

Indicator No. 2: Density

Obviously, there is a direct correlation between the number of K-12 students generated from a residential development and the number of dwelling units per net acre within that project. It was clear in the application of the Educational Cost/Revenue Indicator that the majority of the developments researched were not contributing their fair share of educational costs. Such developments contained high K-12 student populations and, in addition, contained significantly higher net densities than the surrounding neighborhood residential uses. A review of the application of the density indicator within all the developments studied, reveals that 12 of the projects (92 percent) had a negative impact on the neighborhoods in which they were located. This means, in effect, that 12 of the developments consistently had significantly higher densities than the surrounding residential land use in each neighborhood. When considering the internal construction of the density indicator, this is meaningful because in order to receive a negative rating, a development must exceed the existing neighborhood net residential density by more than 100 percent. Such consistently high residential

densities would place heavy demand on a multitude of public services and utilities and would result in a higher capital improvements cost to both the community and the individual tax payer. As in the case of the increased educational costs which were described in previous pages, the indication of an abnormally high density should raise the alarm that perhaps the proposed development is not economically beneficial to the community.

When considering the demand on public services and facilities of all types, the application of the density indicator would seem to be one of the key features in preliminary determination of drain on the local unit of governments capital improvements budget. If the indicator portrays a high density in relation to the neighborhood density, then further research should immediately be performed to study the relative magnitude of demand on the sanitary and storm sewer system, water system, traffic circulation system, parks and recreation system, solid waste removal system, and so forth. As mentioned previously, 92 percent of the developments researched, had a very high net density and subsequently were assumed to be placing heavy demands on numerous public services and utilities.

In addition to the general pressures of demand given by the density indicator, and the specific economic drain placed on the educational system, as evidenced by the cost-revenue data, one remaining indicator (recreational acreage) will measure the particular impact on an additional public service. When considering these indicators as a unit (density, educational cost-revenue, and

recreational acreage), and if both education and recreational show similar impacts, there is justification for utilizing the density indicator as a crude measure of demand, and to, more importantly, quantitatively break down the various components of that demand and measure their impact. It is obvious that, upon reviewing Table 12, there is a strong correlation between those developments having an extremely high density, and those developments showing negative ratings in the educational and recreational areas. The Density Indicator, therefore, seems an effective way to gauge the broad impact on selected public services and utilities.

Specific Recommendation: In order that proposed residential developments receive more efficient impact analysis at the local governmental level, it is recommended . .

--That the City of Lansing (primarily the Planning Board) develop within their zoning review procedures, the policy that the net density factor is to be used as a general indicator of public service demand, and that more definitive ways be adopted to measure the specific ramifications of that demand. At the present time, under the existing Lansing Zoning Ordinance, density is considered only as a yardstick by which supposedly different land use types are stratified. These stratifications, or zoning districts as they are called, all have varying regulations applied to them. These district regulations, however, often ignore the wide ranging

impacts of different density levels on the surrounding neighborhood. Exactly what does a proposed twenty-acre, ten dwelling unit per acre residential development mean to a neighborhood? This thesis contends that, after studying a group of thirteen federally sponsored developments, the recreational and educational indicators are two methods by which such impact can be measured. It would appear to be a very rational step to require, through the zoning review process, specific applications of individual indicators in order to measure the extent of that impact.

Indicator No. 3: Vacancy Rate

As stated previously within this material, vacancy rates are the economic yardstick by which the quality of a residential development is judged against the quality of all similar housing units in that local market. There are many factors which result in high vacancy rates (e.g., inadequate bedroom composition, high rental rates, proximity to convenience shopping facilities, proximity to public transportation, etc.). The internal cash flow within each development is dependent on a high percentage of dwelling units being occupied and returning rent revenue to pay operating expenses and reduce the amount of the project mortgage. If the developer has not specifically designed and located his project to take foremost advantage of the household demand in the local housing market, then he will pay the economic consequences. The community also suffers,

however, because high vacancy rates mean that public services and utilities provided (regardless of their quality) are under-utilized and, therefore, a waste of public dollars.

Review of the vacancy rate statistics for each of the thirteen developments revealed that vacancy rates ranged from complete rent up of one development to a 23 percent vacancy rate in one of the smaller townhouse projects. The application of the Vacancy Rate Indicator revealed that seven of the developments (54 percent) had a positive impact on the neighborhood. In other words, seven developments had significantly lower vacancy rates than similar structures in the same neighborhood. Only one development (8 percent) had a vacancy rate similar to that of the neighborhood. The remaining five developments (38 percent) had rates in excess of rates for similar structures within their respective neighborhoods. Of the five developments having negative impact, four were townhouse projects and one was a two story apartment building. It should also be noted that of these five developments, two are located in physically deteriorating neighborhoods. This may have an effect on the desirability of renting these building units.

Since the developments studied received financial assistance from the U.S. Department of Housing and Urban Development, those containing abnormally high vacancy rates must be suspect as to their present and future economic vitality within the community. What internal or external factors caused the rates to be so high for those particular developments? While four of the five developments (with

high rates) had very high net densities, no distinct correlation could be found with any of the remaining indicators. Based on the review of the Lansing housing market as performed in Chapter III of this thesis, it is evident that strong household demand exists in the small household and elderly household categories. It is further apparent that a large percentage of the developments were aimed at this housing subgroup. Public dollars were invested to provide decent, safe and sanitary shelter for low and middle income households. But many of these developments, as contrasted with privately financed similar developments in the same neighborhood, contain dwelling units which are vacant. This thesis postulated that measures of effectiveness were needed to judge the quality of federally subsidized housing developments. It appears that some of the units built in Lansing are not effective in meeting a real household demand, or are ineffective in providing the necessary amenities the market demands.

Specific Recommendations: In view of the fact that 38 percent of the developments researched had very high vacancy rates, it is recommended . .

--That the U.S. Department of Housing and Urban Development (Detroit Area Office) conduct a housing market analysis of the Lansing area to determine the specific demand characteristics of the local market. This market analysis should focus on household demand by income range and bedroom composition. Hopefully, this material will assist

the HUD administrators in making rational decisions on future developments proposed for the Lansing area.

--The local organizations responsible for managing those developments with high rates should collectively retain a private research consultant to design, apply, and analyze an attitudinal survey of the residents of those projects. This survey should probe the residents detailed likes and dislikes about the development, with the intent of obtaining useful data in relation to the issue of poor performance in the market. If possible, action should then be taken to correct the deficiencies.

Indicator No. 4: Recreational Acreage

The recreational indicator was designed to compare the amount of recreational acreage in the development with the amount in the surrounding neighborhood. The intent was to show the pressure, based on certain population characteristics, generated by each development on the neighborhood recreational system. Review of the statistics for each of the thirteen developments studied revealed that nine of the projects (69 percent) had a negative impact on the recreational acreage in the neighborhood. What this means, in short, is that because of the size of the population within each development, and because of the lack of recreational space provided on the development site, the residents must utilize the recreational opportunities found within the neighborhood. This demand, therefore, decreases

recreational opportunities for all residents of the neighborhood by increasing the utilization of the available recreational lands and facilities. In some of the neighborhoods researched, this did not appear to be a problem since adequate acreage existed for the resident population (e.g., in excess of the calculated standard per 100 persons for the neighborhood). Such neighborhoods could absorb additional recreational demand from new residential construction. Many neighborhoods, however, did not have sufficient recreational land to meet the needs of their existing residents, not counting the increased pressure from new housing units. It should be noted that four of the subsidized developments (31 percent), did supply additional recreational acreage and consequently were rated as having a positive impact on the neighborhood. Returning to the previously discussed point concerning the ramifications of high density residential developments and the demand for public services and utilities, it becomes apparent that the two specific components of service-utility demand (i.e., education and recreation) have demonstrated that the majority of the thirteen residential developments, comprising 2,156 dwelling units and subsidized by public tax dollars, are definitely placing a heavy burden on two public services within the City of Lansing. Two additional questions must be raised; does this burden exist for other utilities and services, and do privately financed residential developments have a similar negative impact? Unfortunately, this thesis will not address those questions, but it is hoped that the application of the education, density and recreation indicators have pointed out the need during the approval

procedure for more careful consideration of residential impact by both federal and local units of government.

Specific Recommendations: Since approximately 70 percent of the developments researched did not provide, either on the site or in the neighborhood, adequate recreational space for the residents, it is recommended . .

--That the Lansing Parks Board determine, in a more detailed form, the apparent recreational deficiencies in Developments 1, 4, 5, 6, 7, 8, 9, 11, 12 and 13. Such deficiencies should then be corrected in conformance with the standards of the Lansing Recreation Plan and the budgeting requirements of the Capital Improvements Program.

--That the platting and site plan approval process for new residential construction, within the City of Lansing, be more sensitive to the recreational needs of the potential tenants as well as those of the existing neighborhood residents. As discussed within the Density Indicator, the Lansing Subdivision Regulations or the Zoning Code might be the appropriate regulatory vehicle to meet this need. Revision of state enabling legislation might be necessary so as to enable these regulatory tools to require certain recreational standards.

Indicator No. 5: Environmental Impact

Impact of manmade developments on the physical environment covers numerous factors ranging from air and noise pollution to the degree of contamination of the ground water supply. It should be recognized that all development will have some impact on those natural conditions found on the site. The degree of that impact, both positively and negatively, will be a direct result of the decisions made by the developer and the local unit of government in the planning and implementation phases of the project. Unless both parties (the developer and the local governmental unit) assume responsibilities for environmental protection and enhancement, the proper utilization of renewable and non-renewable resources will not occur. The three environmental indicators formulated and applied within the context of this thesis were intended to do the following:

1. To determine the suitability of the soils on the site for residential development.
2. To determine the amount of vegetative cover remaining on the site after construction so as to measure erosion potential.
3. To determine potential hazardous site locations in the flood plain of the Grand or Red Cedar Rivers.

Soils.--Application of the Soils Indicator on the thirteen developments studied, revealed that eight of the projects (62 percent) had positive impact and were constructed on soils which were well suited for residential buildings. Five of the developments

(38 percent), based on indicator application, were considered to have minimal impact on the desirability for residential construction. Such minimal impact, as it relates to the quality of soil on the site, was considered to be easily correctable through careful site preparation. None of the developments studied had negative impact on the sites, in terms of soil suitability. It is clearly evident that the developers of these federally subsidized residential projects were very careful about selecting sites which did not restrict location or significantly add to the project construction costs. Additionally it should be noted that the rezoning procedure for the City of Lansing contains a site plan review process which requires analysis of soil suitability. Based on the thirteen developments studied, it appears that the builders' reluctance to develop on a site requiring higher construction costs, and the communities' application of local land-use regulations governing site location and design, results in sites not suited for residential use being effectively eliminated from consideration.

Vegetation.--Seven of the federally subsidized developments researched (54 percent) were given a positive rating in terms of the amount of vegetative cover remaining on the site after construction. These developments were considered to not have disturbed a significant amount of vegetative cover on the site, or that an equal amount of cover was replaced in a more appropriate location. Four of the developments (31 percent), were awarded a minimal rating because they disturbed a small amount of vegetative cover during the

building process. Lastly, two of the developments (15 percent), disturbed enough major existing vegetative cover so as to place the soil stability of the site in question.

In reality, while it can be said that a negative impact of only 15 percent is not a high percentage, the point should be made that the majority of the 13 sites studied did not have significant amounts of existing vegetative cover. In most cases, the cover was in the form of natural grasses and not mature tree stands. Therefore, the sites in question would not visibly demonstrate a drastic lack of vegetation. On the other hand, the residential construction approval process in the City of Lansing, based on discussion with municipal officials, does not go into detail in calculating the amount of run-off generated from proposed developments as contrasted with the same run-off from undeveloped parcels. To be sure, storm sewer capacities are based on average rainfall data per square foot of paved or covered area on the site, but this development approach tends to remove water from the site, through the storm sewer system, to the main drainage way, and out of the local watershed. Vegetative cover retains natural moisture on the site and allows it to more readily recharge the groundwater supply. Since the City of Lansing, as well as surrounding local governments in the tri-county area, depend on groundwater for the basic water supply, it is essential that the capacity for recharge not be significantly diminished. One of the primary ways to provide recharge areas, as previously discussed, is to ensure that the natural features of any potential building site are disturbed as minimally as possible. As just

demonstrated, the application of the Vegetation Indicator is a very basic way in which to measure such environmental impact.

Flood Plains.--Interestingly enough, after plotting the location of each of the thirteen developments against the location of the 50 year flood plain of the Grand River, Red Cedar River, and Sycamore Creek, not one of the developments fell within, or close to, the flood plain boundaries. All developments were, therefore, given the highest rating. It is significant because of the 700 buildings in Lansing which were damaged by severe flood waters during April, 1975, that none of the developments studied were placed in a potentially hazardous position. This result speaks well for the normal approval procedures, in relation to residential site location, of the City of Lansing and the U.S. Department of Housing and Urban Development. If such care were taken in other areas of planning and implementation, more high quality residential developments could be expected.

Specific Recommendations: When considering the three types of environmental indicators applied, it is obvious that the majority of developments researched did not have negative impact. Only two developments had negative ratings, and only eight developments received minimal impact ratings. The soils and vegetation indicators seemed to have the lowest ratings of the three categories researched. Since they are closely linked in their impact on erosion and soil sedimentation, the following recommendations are made . .

--That the City of Lansing adopt, within the review process of the Subdivision Regulations and Zoning Code, measures to reduce the amount of soil erosion and soil sedimentation resulting from proposed residential projects. Such measures, as required by the "Soil Erosion and Sedimentation Control Act of 1972, Public Act 347," should address:

1. Review of any earth change activities as reflected in site plan documents as required by the Lansing Zoning Code. Any proposed earth change activity should be referred to the Ingham County Drain Commissioner, the enforcing agent under the legislation, for analysis.
2. Review of any proposed soil erosion and sedimentation control plans and structures by the City of Lansing and Ingham County.
3. On site inspection of soil erosion and sedimentation control measures during and after the construction process.

CHAPTER VII

SUMMARY AND CONCLUSIONS

This thesis postulated that measures of effectiveness of federally sponsored housing programs were needed in order to adequately assess the overall quality of these programs at the local level. Based on this postulate, and the research performed, the following summary and concluding statements are made:

1. The application of the five qualitative housing indicators has demonstrated the feasibility of taking any residential development, located within any definable residential neighborhood, and developing and applying an evaluative mechanism which generally rates how that development impacts that neighborhood. The mechanism used is relatively uncomplicated, utilizes readily available public data, and indicates those critical areas in which more fundamental research is required to solve the problem, or where legislative action is required to provide public safeguards.
2. Such qualitative indicators can readily assist certain agencies and organizations in their review of proposed or existing residential developments. Based on the

physical, social, and economic ramifications of residential development (regardless of private sector or public sector sponsorship), impact analysis should receive more attention in the approval process. Examples of such agencies and organizations who could apply and utilize such information are . .

--municipalities

--regional planning agencies

--state agencies (planning, housing, etc.)

--federal agencies (specifically, HUD)

--financial institutions

--building associations

--realtors

--landlord and tenant groups

--residential management firms

3. Regarding the practical application of the research, the following recommendations are made . .

--The Lansing Planning Board (through the zoning and subdivision regulations) and the Lansing School District should more carefully consider the impact proposed residential development has on the economics of the local school system.

--The variations in net residential density within a neighborhood be closely monitored so that excess

demand is not placed on existing public services and utilities.

--The U.S. Department of Housing and Urban Development should conduct an up-to-date housing market analysis in the Lansing area to determine the current household demand by bedroom size.

--The respective management firms for the thirteen subsidized developments should conduct an attitudinal survey of their residents to determine the reasons for high vacancy rates in certain developments.

--The Lansing Parks Board should seek to correct the apparent recreational deficiencies in ten of the thirteen developments researched.

--The City of Lansing, fundamentally through the zoning and subdivision regulations, should seek to require from proposed residential developments adequate recreational acreage.

--The adoption and enforcement at the municipal level of regulatory tools for the prevention of soil erosion and soil sedimentation problems in the development process.

4. Referring specifically to the thirteen federally sponsored projects researched, the following conclusive factors were identified via indicator application . .

--Seven of the thirteen developments (54 percent), were demanding more in elementary school services than they were supporting through property tax revenues.

--Twelve of the thirteen developments (92 percent) had net residential densities which exceeded net densities within the neighborhood by more than 100 percent.

--Five of the developments (38 percent) had vacancy rates which exceeded vacancy rates for similar structures in the neighborhood by more than 50 percent. Seven developments (54 percent) on the other hand, had low vacancy rates and were similar to the existing rates within their respective neighborhoods.

--Ten of the thirteen developments (69 percent) did not supply sufficient recreational acreage on their respective sites, and were dependent on facilities within the neighborhood to meet their recreational needs. The remaining three developments contained sufficient acreage.

--All of the developments researched were constructed on soil types which were suitable for residential development.

--Only two developments (15 percent) disturbed significant amounts of vegetation and consequently contributed to soil erosion problems.

5. Based on review of the material covered by the indicators, there appears to be an obvious gap in determining what household income levels are taking advantage of these housing programs. Are the households occupying the dwelling units within the income ranges permitted by the legislation? Use of this particular indicator was considered for this thesis, but household income data is very difficult to obtain. Needless to say, further inquiry is needed in this area to ascertain whether these housing programs are meeting a housing need within the appropriate income levels.

The majority of residential units supplied for Lansing through the three federal housing programs previously discussed are occupied and appear to be meeting a real housing need in the community. The household population in Lansing, specifically in the low and middle income ranges, has greatly benefited from this supply of decent, safe, and sanitary housing. The research performed within this document has demonstrated, however, that significant numbers of these dwellings are standing vacant and that there appears to be a physical and financial strain on the supportive public services and utilities at the neighborhood level. It is apparent that all levels of local, state, and federal government need to be more cognizant of and responsive to the application of impact analysis as it relates to the ramifications of planning, implementing,

and servicing residential development. This thesis has presented one approach in the determination of such qualitative measures of impact.

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