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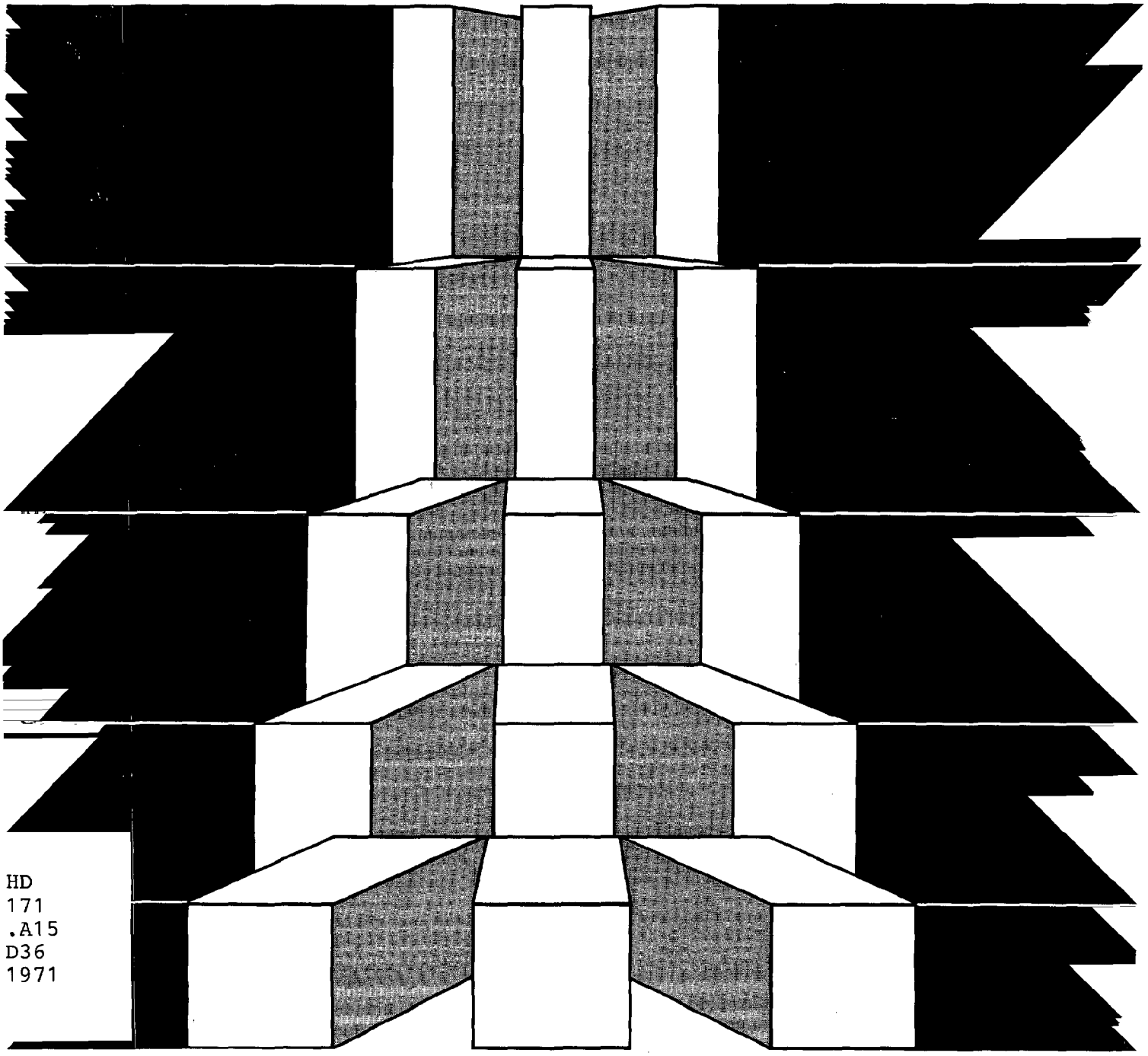

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DENSITY:
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A ULI SPECIAL REPORT

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ULI - the Urban Land Institute

about ULI—the Urban Land Institute

ULI—the Urban Land Institute is an independent, nonprofit research and educational organization incorporated on December 14, 1936 to improve the quality and standards of land use and development.

The Institute is committed to conduct practical research in the various fields of real estate knowledge; identify and interpret land use trends in relation to the changing economic, social and civic needs of the people; and disseminate pertinent information leading to orderly and more efficient use and development of land.

ULI receives its financial support from membership dues, sale of publications and contributions for research and panel services.

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FOREWORD

ULI-the Urban Land Institute conducted its Third Annual Land Use Symposium in New Orleans just as the results of the 1970 Census of Population began to report the changes in the dispersion of the nation's population during the last decade. The statistics are clear. We are more urban than rural, and more importantly, for the first time more suburban than urban. Since the density of population and the measure of intensity of other land uses are largely used to mark the distinction between urban and suburban, the Institute considered it important that a meeting of our membership examine in some depth *density* as it relates to the nation's growth patterns.

What are the patterns of growth and therefore of density? What should they be and how can they be directed by national policy? What are the constraints that prevent change in density patterns, if such change is desirable?

From April 21 through April 24, 1971, some 450 members of the Institute, including leading developers, home builders, financiers, planners and corporate real estate officers, listened and responded to the thoughtful remarks of speakers of varied expertise all addressing themselves to density—the ratio of people to space. Following, in this Special Report, are four papers presented at the Symposium.

In addition, this Special Report includes a newly completed study that provides a comparative analysis of density in the United States and Japan. It will, in our estimation, contribute another perspective to increase our understanding of density as it relates to existing and potential growth patterns in the United States.

This Special Report does not necessarily represent the views or policies of ULI-the Urban Land Institute, and is not intended to provide definitive treatment of the subject of density. Rather, it offers the considered opinions of five individuals with experience and authority in this field of study. A listing of additional materials on density is provided in the bibliography of the Report. Also, an in-depth perspective will be provided by the forthcoming report of ULI's Special Task Force on Density. In short, density will remain a topic of prime consideration in land use for many years to come.

Robert E. Boley
Executive Director

AN OVERVIEW OF THE PROBLEMS OF DENSITY

CONRAD TAEUBER

An overview of the changes in density of the population in the United States in the past decade must recognize a number of sharp contrasts. The nation's population increased by 13.3 percent; hence, the average number of persons per square mile increased by the same percentage. Such a gross statement does not convey an accurate picture, however. Three states, North Dakota, South Dakota, and West Virginia, experienced a loss in population during the last decade and, hence, a decline in the overall density of settlement. In addition, seven states—Iowa, Kansas, Maine, Mississippi, Montana, Pennsylvania and Wyoming—gained less than 5 percent during the decade, while Alabama and Nebraska were just above that figure. At the other extreme is Nevada with its increase of 71.3 percent, followed by Florida and Arizona with gains of 37 and 36 percent, respectively. However, the total increase for Nevada brings the average density for that state to only about 3.5 persons per square mile. Even Florida's increase leaves its overall population density at about 125 persons per square mile.

There are major differences in the population changes by counties. About 1,367, or more than two-fifths of the counties, lost population. Another 995 counties gained at a rate less than the national average, and only 773 counties gained at more than the national average. Areas which were already large in terms of population, and which have gained at relatively rapid rates, include Orange County, California, with a gain of 102 percent, Prince Georges County, Maryland, with a gain of 85 percent and Broward County, Florida, with a gain of 86 percent. Orange County, with a population of 704,000 in 1960, had a density of 900 persons per square mile varying from more than 5,000 persons per square mile in one of its cities, to less than 10 in one of the open country divisions.

Gains and losses were unevenly distributed. In Louisiana 20 of the 64 parishes lost population during the decade of the 1960s and another 20 gained at or above the state's average rate which stood at 11.8 percent. Seven of the rapid gainers were Standard Metropolitan Statistical Area (SMSA) parishes. The only SMSA parish which registered a loss was the city of New Orleans, which declined by about 5 percent, but nearby Jefferson, St. Bernard, and St. Tammany parishes increased by about 60 percent.

For about two-thirds of the counties which lost population during the decade of the 1960s, this was a continuation of a trend which had also been observed during the 1950s and 1940s. In fact there is a considerable number of counties which have had population declines for four, five, and more decades. Since county boundaries are subject to very little change, it is fair to conclude that in

Conrad Taeuber is associate director in charge of demographic fields for Bureau of the Census. He has been with Bureau of the Census since 1951 and directs statistical activities relating to population, agriculture, and housing. He previously worked for the U.S. Department of Agriculture and is an expert on agriculture and population problems.

Dr. Taeuber is the author of two major works, *Rural Migration in the United States* (with C. E. Lively) and *The Changing Population of the United States* (with Irene B. Taeuber).

Born in Hosmer, South Dakota, Dr. Taeuber studied at the University of Minnesota where he was awarded his doctorate for an analysis of internal migration in Germany, developed while at the University of Heidelberg.

a substantial number of counties, covering a rather large land area, there have been declines in density in the last decade. Within some of these counties the declines have not been uniform. The number of open country residents has declined, while many of the small towns and cities have held their own or gained slightly.

Nearly 85 percent of the total U.S. population increase occurred in the 243 SMSAs which are now recognized. Within those SMSAs, about 80 percent of the gain took place outside the central cities. In fact, many of the central cities lost population, while their suburban areas gained in numbers. The pattern of gain or loss in the large cities is complicated by the fact that some of the gains undoubtedly are the result of annexations. In three instances—Indianapolis, Jacksonville, and Nashville—they reflect a consolidation of county and city governments, with the result that the city now includes most or all of the area which formerly was identified as the county.

Within the cities themselves there have been changes in the distribution of the population, with some poverty areas losing population to the more favored areas within the city. There have, of course, also been changes, as when one program for reconstruction of a city's housing led to removal of high density units and replacement by units which provide space for a smaller number of persons than before.

At the writing of this article, 1970 Census data by census tracts and blocks are not available and, therefore, only some indications of shifts within the major cities and metropolitan areas are possible. One indicator shows that in the years between 1960 and 1968 there was a significant movement of families out of the sections of the city which had been defined as poverty areas within SMSAs of 250,000 or over. These poverty areas had been delineated on the basis of 1960 Census data, showing concentrations of a number of poverty-linked characteristics: low family income, children in broken homes, persons with low educational attainment, large proportions of men in unskilled jobs, and substandard housing.

A total of 4.8 million families was living in such areas in 1960—about 20 percent of all families in the SMSAs. By 1968, these same areas housed only 4.1 million families and this was about 15 percent of the total number of families in the same SMSAs. There were declines in the number of white and black families in these areas, but the decline for the white families was double that of the decline for the black families. The declines were somewhat more rapid in the metropolitan areas of 1 million or more than in those with populations in 1960 between 250,000 and 1 million. Of course, not all families living in the areas so designated were classified as in poverty (only about one-seventh of the white families and one-third of the black families living in these areas in 1968 were classified as in poverty).

These areas tend to be congested, however, and the fact that the number of residents there decreased between 1960 and 1968 suggests some reduction in the amount of crowding per unit of land area. More detailed study would be required to draw more specific conclusions—for these areas are also the ones with deteriorating and abandoned buildings, and some of them have experienced a considerable amount of demolition during the years in question. Nonetheless, the movement away from the poverty areas within the large SMSAs is a part of the same type of movement which had led to the more rapid growth of the sections which are outside the central city but within the metropolitan area.

Shifts within cities can also be illustrated by development in New York City. The two most densely settled boroughs each lost population, with the greatest loss in Manhattan itself. On the other hand there were some increases in the Bronx, Queens, and Richmond Counties.

If density is viewed from the standpoint of the number of occupants per unit of housing space, the finding would be that there has been a decrease in density. In all states the number of housing units increased more rapidly than the number of persons. Even in the three states which experienced a decline in population, there was an increase in the number of housing units. The average number of

persons per household declined from 3.31 to 3.11 between 1960 and 1970. The number of housing units with more than one person per room dropped by about 900,000, and the percentage of all housing units in this condition stands at 8.2, which is more than 3 percentage points below the comparable figure for 1960. At the same time, the number of one-person households has increased more rapidly than the numbers of households of any other size.

Increases in density, where they occurred, were the result of an increase in the number of housing units per unit of land. In the last five years 41 percent of all newly constructed housing units, excluding mobile homes, were in multi-unit structures. The very large increase of young adults in the next 10 to 15 years suggests that there will continue to be a high demand for rental housing—much of which will be in multi-unit structures.

URBAN AND RURAL POPULATION

In census usage, the population is divided into rural and urban components. The urban consists of all persons living in incorporated or unincorporated places of 2,500 or more and the residents of "urbanized areas." An urbanized area generally consists of a city of 50,000 or over, plus the residents of the closely built-up areas adjoining the city, whether they are incorporated or not. The delineation is primarily in terms of the density of the population of the areas outside the central city.

The transformation of the United States from a rural to an urban nation is well known. Starting with about 5 percent of the population in urban areas at the time of the first census, the urban areas grew more rapidly during each of the decades as marked by the census. The half-way mark was crossed about the time of World War I. The 1970 Census shows that the urban portion now includes almost three fourths (73.5 percent) of the total population. It had been 69.9 percent in 1960. It could be said that in 1960 about 70 percent of the total population lived on about 1 percent of the land area. The relationship may not have changed much since 1960. The boundaries of an urbanized area expand as the built-up area itself expands. Area measurements of the additions to the 1960 urbanized areas are not yet available.

In absolute numbers there was virtually no change in the total rural population between 1960 and 1970. Places of 1,000-2,500 in 1970 had almost the same number of persons as in 1960, and the number of persons living in smaller towns and in the open country also showed little change during the decade. Virtually all of the growth in the nation during the 1960s can be credited to the urbanized areas; that is, the cities of 50,000 and over, plus their adjoining built-up areas. These areas, including those which grew above the cut-off level during the 1960s, increased by nearly 24 percent during the decade. The other urban population, living in places of 2,500-50,000, increased by only 5 percent.

Dependence on corporate boundaries as criteria for the delineation of urban and rural areas has shortcomings which have been evident for many years. The Census Bureau has tried a number of alternatives for the proper classification of rural and urban areas. At one time certain areas, especially in New England, were classified as "urban under special rule," for they had the attributes of urban areas even though they lacked the formality of special incorporation. Beginning in 1950, the concept of "urbanized areas" has been used. Their delineation now is based on the land use and the density pattern as revealed by the current census.

In recent years a somewhat different problem has come to the fore. A number of cities have annexed and thus brought into their legal boundaries a considerable amount of land which is not densely settled. Moreover, the three cities which have consolidated their governmental structure with that of the county in which they are located have brought within the limits of their corporate boundaries territory which under any other circumstances would have been classified as rural. In fact, they now include substantial areas of farm land within their corporate boundaries. To take this new situation into account, the Bureau of the Census has recognized what it calls extended cities, and within them has designated certain lightly settled sections as "rural under special rule." This has been done in 59 cities. The people living in those sectors of the affected cities are classified as rural for purposes of rural-urban differentiation. However, they are included in the official population totals for the city.

STANDARD METROPOLITAN STATISTICAL AREAS (SMSAs)

More than two-thirds (69 percent) of Americans live in SMSAs. These areas were recognized for statistical purposes because it had been evident for some time that the number of persons inside the corporate boundaries of the cities was not necessarily the measure of the social and economic structure which was centered in the city. Such an area consists of a central city of 50,000 or over, plus the county in which it is located. In New England the definition is in terms of towns. In addition to the central county, other counties are added to the SMSA if they meet the criteria of metropolitan character and close economic and social ties to the central city. The number of SMSAs changes as new cities reach a population size which qualifies them. The composition of an SMSA can change as new information becomes available showing that one or another adjoining county should be included. The 1970 Census recognized 243 such areas, an increase of 31 since 1960. Outside New England the number of counties (or county equivalents) included in SMSAs increased from 335 to 452. The number of New England towns included in such areas increased from 265 to 311.

Throughout this century the SMSAs have increased their populations more rapidly than the national average. For the nation as a whole, the population in 1970 was about 2.7 times what it had been in 1900. However, for the SMSAs as a whole it was about four times the total in 1900; and for the suburban areas it was about six times what it had been in 1900. The central cities had grown somewhat less than the suburban areas, but they too increased more rapidly than the country as a whole. From 1900 to 1920 the central cities were growing more rapidly than the remainder of the areas. Since 1920, however, it has been the sections outside the central cities, often called suburbs, which have had the more rapid growth. The differential in rates of growth has widened since 1940. During the 1960s the central cities as a whole increased by 6.4 percent, which is slightly less than the rate of increase for all of that part of the country which is not included in any SMSA, but the rate of growth for the sections outside the central cities was 26.7 percent. As a result of this rapid growth, the central cities now have fewer inhabitants than the surrounding suburban areas. There are some 76 million persons in the suburban areas, 64 million in the central cities themselves, and 63 million outside any metropolitan area. The growing importance of the SMSAs in the life of the nation is illustrated by the fact that there is at least one SMSA in every state except three: Alaska, Vermont, and Wyoming. In California 93 percent of the total population is included within SMSAs.

The black population is now more heavily involved in these metropolitan areas than the white (74 percent of the black population, but only 68 percent of the white population are living in SMSAs). Even in the South, more than half of the Blacks are now living in SMSAs. Within the SMSAs the distribution of white and black populations differs markedly —nearly 80 percent of the black population, but only about two-fifths of the white population in these areas live within the central cities.

Central cities vary widely in size, economic specialization, and other characteristics. The suburban areas, that is, areas within the SMSA but outside the central city, also vary widely, ranging from cities which would qualify as central cities of another SMSA if they were not overshadowed by the larger city identified as the central city, to the outer reaches of a large county which may be very thinly settled.

A LOOK AHEAD

There is no reason to assume that the growth of metropolitan areas will not continue into the near future. The SMSAs identified in 1960 increased their share of the total population from about 40 percent in 1900 to a little more than 60 percent in 1960. With 69 percent of the population now living in metropolitan areas, these areas will be contributing the bulk of the excess of births over deaths for the nation. Their growth is likely even if there should be a substantial reduction of migration from rural to urban, and especially metropolitan areas. It seems entirely likely that the United States can look forward to continued increase in the proportion of the population which is living in metropolitan areas.

Projecting the rate of growth for the nation involves assumptions concerning the future rate of births and deaths, as well as the net migration into the country. Projecting rates of growth for metropolitan areas involves an additional set of assumptions in relation to the migration within the country. Rates of migration can vary widely in response to variations in local conditions and in response to changes in general conditions over time. Nonetheless, some outlines of likely future developments can be stated.

For the nation as a whole, a major feature of the development of population in the near future is the large number of people who will be reaching marriage and childbearing age through the 1970s and into the early 1980s. There are now about 42 million persons between 20 and 34 years old. By 1980 that number will have gone up to 58 million, an increase of more than one-third in ten years. The increase in young marrieds is the basis for the expectation that even with somewhat lower birth rates than those of recent years, the number of children under 5 in 1980 will be greater than it is at present.

The history of birth rates in the United States clearly shows that they can change rapidly. With increased knowledge of control and increased effectiveness of the methods which are available, changes may come more rapidly and be more marked than they were in the past. The availability of the birth control pill and the IUD (intrauterine device) may also result in some differences in the timing of first and subsequent births of children. The liberalization of abortion laws in many states may also reduce the number of children born. This has been the experience in other countries which have made abortions relatively easy to secure. The fact that more effective contraceptives and abortions are more readily available does not in itself presage a decline in the number of births. These are the means to an end, rather than ends in themselves. The important question in relation to future trends deals with the motivations of the people who will be contributing the bulk of children. Controlled birth rates are not a new development in the American scene. Techniques have changed, but control of fertility is not new. Women who are not yet married will contribute about 80 percent of the babies born in the next ten years. Their attitudes toward family size and spacing of children will play a very large role in determining population growth during that period and beyond.

Unless women now entering family formation and childbearing ages depart sharply from the patterns which have been set by young people throughout the last decade and a half, the number of births will continue to increase for some years to come. Under these circumstances, a zero growth rate is not likely in the short-run. Even if women now entering the childbearing period should stop having children beyond the numbers needed for replacement (about 2,110 children per 1,000 women), our population will continue to increase well into the next century. One computation shows that we might then reach stability in numbers by the year 2037, when our population would have reached 276 million. The post-war baby boom was not a return to the large families of our pioneer ancestors. It reflected rather a significant increase in the number and proportion of women who took part in childbearing. Compared to even a generation ago, there have been important changes in American patterns of family formation and childbearing. A larger proportion of women marry and they are marrying at a younger age. A larger proportion of women are having children and

they are completing their childbearing within a shorter period of time. The no-child or the one-child family of the thirties has given way to the two- or three-child family. Fashions and practices in these matters are subject to change, as they have changed during the last generation. Surveys in which women of childbearing age are asked how many children they expect to have regularly report two or three as the preferred number. If women average only two children we would cease to grow, except as immigration would make up the deficit. If women average three children, which is near the number which young married women say they expect to have, then we would grow at a rapid rate.

How many people will we have in 1985? How many in the year 2000? The uncertainty about 1985 relates to the number and distribution of the persons who will then be under 15. All the others are here, except for the immigrants who may come to join us. Projecting the number who will be over 15 by 1985 is largely a matter of arithmetic. In that time mortality rates are not likely to drop below their already low level. There is more uncertainty regarding the population of the year 2000. About half the population in that year—that is, all the persons who will then be under 30—are still to be born, and some of them will already have had most of the children they are likely to have.

As pointed out earlier, in the next years a large number of persons will be reaching the age of family formation—the result of the relatively large number of babies born between 1947 and 1961. In 1954 we first reached 4 million babies in a year. Those babies have grown up and will be 17 years old this year (1971), and they will soon be ready to establish their own families. In 1961 we had 4.3 million births. These babies will have reached 24 years of age by 1985 and many of them will have entered into family relationships then and will have begun contributing to the number of children. The number of marriages and the number of new families has been increasing for some years now, and during the seventies and well into the eighties, we can expect that this number will continue at a high level.

The Bureau of the Census issued a series of population projections. Assuming that after 1970 young women who are of childbearing age stay with the replacement average of 2,110 children per 1,000 women, our population would be 237 million by 1985 and 266 million by the year 2000. If, however, we continue at the rates which have prevailed in recent years, the size of our population in 1985 would be 241 million and by the year 2000 we would have reached 281 million. The effect of these differences in the assumed fertility rates is 4 million by the year 1985, but 15 million by the year 2000. Small differences in birth rates, if they persist for a long period of time, obviously have significant effects on the total number of persons in the population at the later date. Perhaps the potential contributions of the young women now entering on childbearing could best be visualized if one assumes that they duplicate the rates which young women had in the late 1950s. If that were the case, the population by 1985 would number 257 million, and it would reach 321 million by the year 2000.

It is clear that the young women who are now entering the childbearing years and will be doing so in the next years have the possibility of greatly modifying the size of our population at any of the future dates on which attention might be fixed.

There have been major changes in American society since the days when a family of ten or more children was considered desirable. We have become a predominantly urban society; our educational levels have increased substantially both for men and for women; and we have become a more prosperous society. All of these have served to reduce the size of families and birth rates. There are still some differences in the birth rates of several groups in our population. Urban rates are below those of the rural population; the higher the educational level of the woman, the lower her reproductive rate; and on the whole the higher the family income, the lower the reproductive rate. There is every reason to believe that we will continue to become even more urban; that we still continue to increase the proportion of women and men who finish high school and college, and that family incomes will increase. One common estimate is that the median income of families and unrelated individuals is expected to rise from about $7,400 in 1968 to $13,500 in 1985. However, recent experience has shown

that the fact that we grow more urban, better educated, and more wealthy suggests, but does not in itself assure, that birth rates will decline.

Continued growth of the population of the metropolitan areas in the future seems clearly indicated. Even if migration into these areas were to be reduced below the levels of the 1960s, there would be substantial growth in their population because of the excess of births over deaths. The metropolitan areas include about two-thirds of the population, and they are likely to continue to have their share of the excess of births over deaths. Although birth rates tend to be lower in urban and suburban areas than in the more rural areas, the metropolitan areas have a relatively large proportion of young people. The Negro population of these areas is particularly youthful, with many children who will be of reproductive age in the next two decades. Unless one were to postulate a large and unprecedented movement out of the metropolitan areas, one would necessarily assume continued population growth, and at a rate no less than that of the nation as a whole. Most of the analysts who have ventured into this field assume that the metropolitan areas will continue to grow more rapidly than the national rate, and that their share of the national total will continue to increase.

For purposes of discussion one might assume that by the year 2000 we will have added about 75 million people to our present population. This assumption will be true if we continue our present annual rate of growth to the end of the century.

Where would these additional people live? If present trends continue, at least 55 million of them would be added to our metropolitan areas. Even though the bulk of this increase would be in the suburban sections, such an increase would add serious problems to those which the metropolitan areas are facing today.

The National Committee on Urban Growth Policy in 1969 proposed that the Government take an active role in planning where and how development take place. Specifically, it suggested that in the next 30 years the United States create 100 cities of 100,000 each and 10 cities of about 1 million each. If we were to carry out such a program, this would provide for about 20 million of the total expected growth, leaving 35 million to be added to the existing metropolitan areas. Or to put it another way, accommodating the expected growth of the population without increasing the present metropolitan areas would require the development of the equivalent of two cities of 75,000 every month between now and the year 2000.

A review of what has been accomplished in recent years in developing new cities suggests that efforts need to be increased substantially to meet such an ambitious goal. The Department of Housing and Urban Development has recently issued a list which shows 63 new communities or large developments completed or under construction since 1947. Of these, 49 are new communities, located for the most part in metropolitan areas and predominantly commuting and residential in character. Three of these projects were designed for a population of 250,000 or over; two others were to have a population of 100,000 to 150,000. All of the others were to provide for less than 100,000 each, and one was intended for only 4,000 persons. The experience of more than 20 years clearly indicates how difficult it has been to establish new communities. These difficulties are illustrated in an announcement from the Department of Housing and Urban Development early in 1971 in which it designated a planned community as the first to receive assistance under the present federal program to stimulate the development of new cities. This community, Jonathan, is to be located 20 miles southwest of Minneapolis; it is to house approximately 50,000 people in 20 years. Unless we can establish new towns and cities much more rapidly, the existing metropolitan areas are almost certain to continue to absorb more than their share of the national growth in population.

Not the least of the problems in developing new towns or cities is the fragmented character of much of our local government. The Commission on Urban Problems comments that "our crisis in urban growth springs from using 19th century controls and attitudes in an attempt to mold and contain 20th century cities faced with 21st century problems." It states that in the next 30 years some 18 million acres of land will come into urban use for the first time and points to the necessity of providing more effective controls than have been applied to the conversion of land to urban uses in the past. An important element in providing more effective controls would be the need to rationalize our fragmented system of local government. In 1967, the 228 metropolitan areas included 406 counties, which were governed by 20,754 local governmental units.

In some discussions of the problems of population distribution, it is suggested that serious efforts be made to reduce the number of people in the large metropolitan concentrations and spread them over larger areas. In this way, it is argued, many of the problems of contemporary civilization would be eased, if not solved. Most large counties have extensive areas of thinly settled land. The development of these areas appears desirable from several points of view. However, getting confirmed urbanites to move into the country has never been easy.

If the best assumption about the future is that observed trends are likely to continue without major modification, then one would conclude that our present metropolitan areas will continue to grow, and some places which do not now qualify as metropolitan areas will grow enough to merit that classification.

The National Planning Association has recently issued some projections. They conclude that by 1985 the metropolitan areas which were recognized in 1960 will include 74 percent of the population, have 75 percent of the employment, and a slightly higher proportion of personal income. According to their projections, the New York area in 1985 would have a population of 21 million; an increase of 43 percent. These projections assume that the Washington, D.C., area would double its population in that time and then have a total of more than 4 million. Chicago and Los Angeles areas are assumed to grow by 45 percent and have approximately 10 million each by 1985.

Dr. Jerome P. Pickard, writing for the Urban Land Institute, carried projections to the year 2000.[1] The grouping of metropolitan areas which he calls "Atlantic" included about 37 million people in 1960, about one-fifth (20.9 percent) of the national total. His projection for this group to the year 2000 is a total of 64 million, slightly more than one-fifth of the national total projected for the year 2000. He projects a great increase in the number of urbanized areas with a population of 1 million or more so that the number of urbanized areas would total 43 in the year 2000 and half of the population will be living in such conglomerates. He forecasts also an accelerated urbanization in outlying areas of the South and West. His projections for the California metropolitan areas carry their numbers to 43 million in the year 2000, about three times their 1960 total. All but 4 percent of the total regional population would then be encompassed in these metropolitan areas.

These projections may not describe precisely what will develop in the next 15 or 30 years, but they indicate that with a continuation of present trends we can expect very large increases in our urban population. In looking ahead, it seems safest to assume that the American desire to live in metropolitan areas will continue to assert itself in the future. Whether this carries with it also a continuation of residential segregation by race and income may be open to question, but it is clear that there is a growing tendency for Blacks and other minority groups to concentrate in the central cities, and the white population to concentrate more and more in the suburbs. Between 1960 and 1970 the proportion of Blacks in the central cities increased from 16 to 21 percent, and the percentage was higher in the cities of 1 million or over.

1. Dr. Jerome P. Pickard, *Dimensions of Metropolitanism* and *Appendixes to Dimensions of Metropolitanism* Research Monographs 14, 14-A (Washington, D.C.: ULI—the Urban Land Institute, 1967, 1968).

The problems generated by continued rural decline and continued growth in the metropolitan areas have caused national concern, as the wide variety of urban and rural development programs testify. Congress, passing the Housing and Urban Development Act of 1970, expressed the need for a national growth policy:

> The Congress finds that the rapid growth of urban population and uneven expansion of urban development in the United States together with a decline in farm population, slower growth in rural areas, and migration to the cities, has created an imbalance between the Nation's needs and seriously threatens our physical environment, and that the economic and social development of the Nation, the proper conservation of our natural resources and the achievement of satisfactory living standards depend upon the sound, orderly, and more balanced development of all areas of the Nation.

Implementation of this Act would bring about a break in our long evolution to an essentially metropolitan population. Only once before, during the depression years of the 1930s, was there much serious talk of a back-to-the-land movement. Even in that period the major effect of depression conditions was to hold in the rural areas those persons who would have moved out if they had felt they had an opportunity to do so. There was also some movement of people away from the most severely depressed areas.

The actual shift from a predominantly rural to a predominantly urban and metropolitan nation has taken place in relatively recent times. Nostalgic views of rural life seem to persist for a long time and may underlie the fact that public opinion polls reveal a large proportion of persons who say they would prefer to live on a farm or in some rural area. Increasing affluence may continue to make it possible for some urban dwellers to maintain a second home in more rural surroundings, but this is quite different from any emigration from the cities to the rural areas. What seems most likely is further development of the metropolitan areas, along with their enlargement. The high degree of concentration in the central cities is likely to continue to give way to a greater flexibility of location and activity within the metropolitan areas. Growth of population is likely to intensify concentration within the metropolitan areas, and at the same time to reduce concentration within one segment of these areas, namely the older central cities.

CONCLUSION

Our population has recently crossed the 200-million mark and by the year 2000 it may be approaching the 300-million mark. The babies of the early post-war baby boom are reaching marriage age and consequently we can expect an increase in marriage and new families through the 1970s. These families will increase demand for services and facilities which have become important elements in our ever-rising standard of living.

For the most part, the new families will be suburban or small city residents rather than big city or rural residents. Their schooling will be greater than that of previous generations.

Major changes lie ahead. How we meet them, how we adjust our social arrangements to deal with the problems generated by increased numbers and increased concentration of our population in our urban and, especially, in our metropolitan areas will have long-term consequences for the quality of life in the United States.

DENSITY IN THE URBAN FRINGE AREA

PAUL N. YLVISAKER

The dynamics of our population and its needs presently exceed the capacity of our political structures to provide guidance for intelligent growth. To my mind, the crisis now concerns the ability of this country to rise fast above its past record and achieve the things that must be done for its people in the year the people need them done. The nations of Scandinavia, Japan, Holland, and Canada have been quicker than we to recognize the need for urban growth policies. Canada, for example, has analyzed its urban system on a national basis and knows that by the year 2000 it is likely to have well over half its population concentrated in three metropolitan areas. Quite obviously this would mean a traumatic change for that country, but how much more traumatic is change that is not expected or planned for?

In the growing attempts in this country to formulate a national growth policy, we are being forced to recognize the humanistic imperative of urban life: provide within the reach of each man the whole range of experience he requires, from a job to a movie theatre to green and open space. One of the foremost proponents of this ideal is the designer, Paolo Soleri. While he presents truly extreme remedies in densities and structural designs that I dislike, his basic tenet is unassailable—and fortunately taking hold at the highest political levels. Witness the concept of utility corridors which has been suggested to President Nixon as an alternative to overcrowding in the urban fringe areas.

Utility corridors would allow us to begin at least to allocate what resources remain to the preparation and maintenance of urban land. The most recent generation of development in this country provided the urban fringe area with mass transit, water, and sewage, but did so in a haphazard fashion, controlled by different agencies and dispensed with absolutely no plan whatsoever. Development proceeded then with a kind of frontier spirit that held if you, the market in your area, and your political influence were strong enough, you would somehow be able to get that water grant, that 701 grant or whatever other aid you might need. We see the fallibility of that belief all around us today.

The utility corridor concept could propel America into a new period of development for its urban fringe areas. The idea, simply put, is to encourage development to follow a dominating physical pattern of the land, as we did before with canals, railroads, highways, and airports. Utilities and services would be concentrated in "corridors" linking settlements. The first utility corridors could be placed between the settlement patterns into which we have lately gravitated, those along the coast with wedges driven into the Great Lakes area and other regions such as Atlanta and Denver. In this way, utility corridors would help to spread and thin our urban population in a linear fashion. At the same time, populations we have expected to concentrate in the urban fringe areas could cluster all along the utility corridors in pockets of higher density than the land has supported to date, a better solution by far than the half-serviced incremental development suffered by the outskirting open land of our cities.

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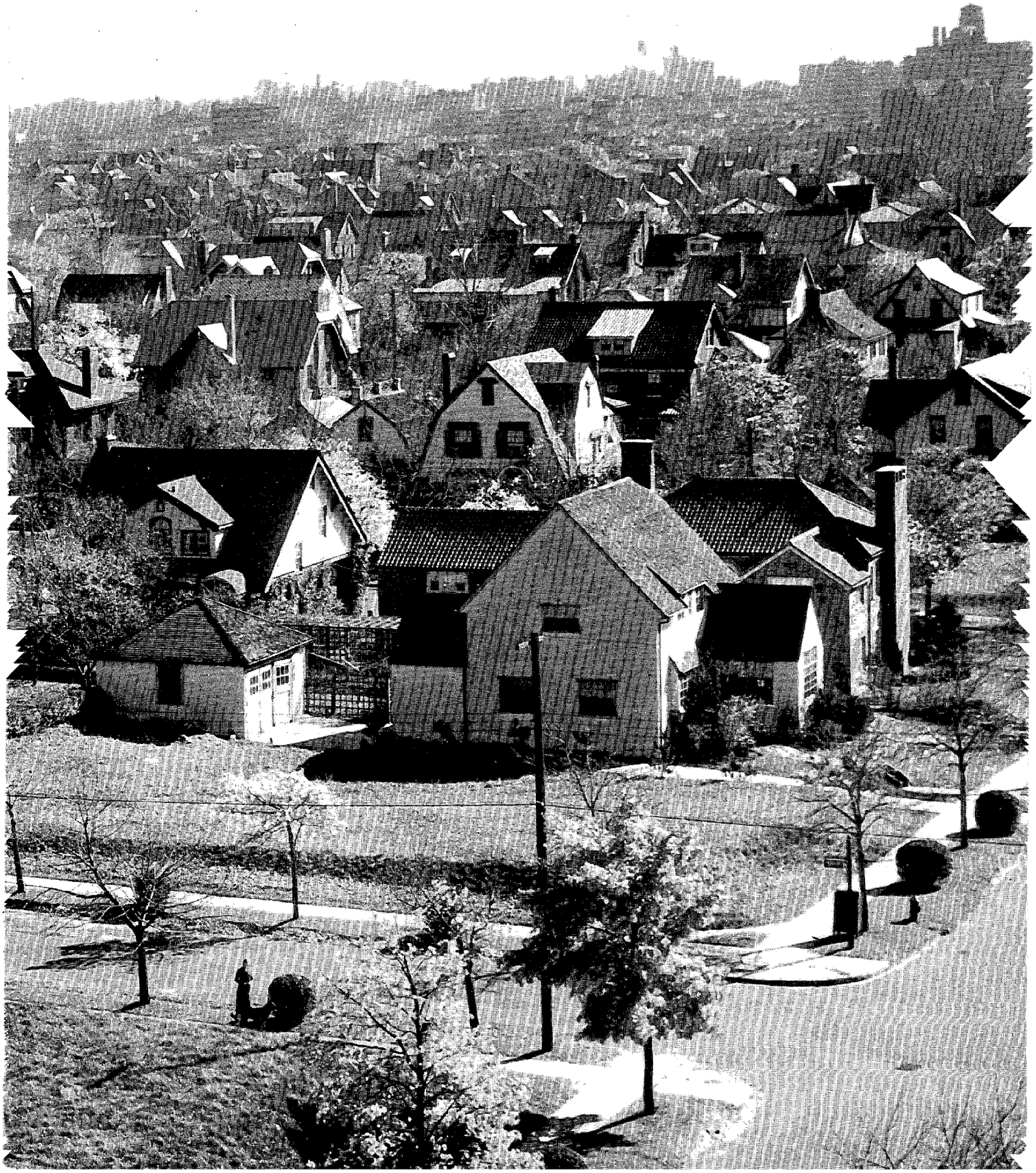
After earning his Bachelor of Science degree at Mankato State College (Minn.), Ylvisaker received his Master's degree in public affairs and subsequently his Ph.D. from Harvard University.

In addition to writing numerous articles, Ylvisaker is the author of *Natural Cement Controversy, Intergovernmental Relations at the Grassroots,* and *Battle of Blue Earth County.*



Another part of the answer to our needs is going to come, I think, from large Planned Unit Developments and even new towns. I regard Columbia, Maryland, as a prototype of what will be an important solution to the problem across the country. Columbia and Reston, Virginia, however, are essentially upper-middle-income communities. The mass of the American public who cannot afford housing in that kind of community must look to other solutions.

I see in the South and Southwest an explosion of mobile home communities, some extraordinarily attractive, others pretty dismal. Four hundred thousand mobile homes were sold in 1970, about 20-25 percent of the nation's housing starts. I predict that in five years you won't see suburban mayors telling blacks in the central city to stay out. However, you'll also find projects promoted by suede-shoe opportunists who will walk into central cities promising, "For $1099 (put the decimal point where you will), you can get a downpayment in my place" and it may be for a mobile home or its equivalent in industrialized housing. We should be alert to the possibility that by removing some of the now rigid obstacles to housing and development, we could become vulnerable to new forms of exploitation of our landscape and perhaps our public morals.

Housing has been subjected to a long list of formidable constraints, from prejudice to the property tax. As a result, supply has lagged behind both need and demand. But my guess is that the situation will not last, and that we will shortly see a housing boom. Certain constraints will ease; the parameters of housing supply will change. At first, discriminatory zoning will be outlawed, if not everywhere broken up. The courts are beginning to speak out, and under growing judicial and industrial pressure, so will the President, state governors, and legislators. Simultaneously, costs that have burdened housing through the local property taxes are going to be carried up to state and federal levels and transferred to personal income taxation. We will see welfare and health paid for nationally, and education paid for at the state level. And then we are going to see increasing infrastructure costs provided through government stepping up how much we will give for water and sewage and other services. The last thing we are going to see are urban development corporations moving into every state in the nation, possibly because a state will be required to depend on such bodies to provide housing and community development programs that qualify for revenue sharing.

It might well be that President Nixon will finally turn to housing construction as a last resort to revitalize the economy. He could employ the 50,000 engineers now out of work to start design of utility and urban growth corridors, thus preparing the groundwork services for planned community development on a large scale. At that stage, many large firms which have accumulated land against inflation for either speculation or new town sites would be triggered into development. The parameters of costs would have shifted in their favor.

Before we can implement this agenda for the future, however, a good deal of friendly persuasion needs to be done at the grass roots. The trouble is that there are two separate movements going on in the United States: the lower-income groups committed to solving social problems, and the middle and upper classes fiercely involved with ecology problems. Although the two concerns are not mutually exclusive, one would think so judging from their spokesmen. These groups have not as yet been able to join forces, but they must if we are to avoid making solutions a permanent impossibility.

Density, for example, has always been a matter of interpretation in this country. The same phenomenon can be dreadful to one group, acceptable and even exciting to another. Density can be regarded in three ways: first, just in terms of numbers, how many people should live in one place; second, as a measure of the gap between our poor and affluent cultures, and the barrier it raises to mobility for the disadvantaged class; third, as a national insensitivity—how dense can we be in allowing problems to compound so terribly without solution?

As far as density in numbers is concerned, I cannot add much to what has already been established by the population experts. I agree that we are witnessing two simultaneous trends, a long-run reduction in residential densities apparent in the 1970 Census, and at the same time, among certain age groups in our population, a move to redensify. The psychology of the first trend is understandable because historically our country's people have always wanted more elbow and ego room. This traditional need appears to have

intensified with the pressures and pace of contemporary life. I am intrigued by behavioral studies which prove that animals establish distance zones of self-protection, "retreat" and "attack" thresholds. At one point in the distance zone, the animal will simply retreat; further encroachment and the animal will turn and attack. Evidence indicates that human beings are no different, and part of the resistance we encounter to higher densities today is due to this reflex mechanism which reflects our expanding need for privacy.

In contradistinction to this trend for lower physical densities, we have a movement toward redensification of the American population, brought about by new cultural patterns. For certain age groups, the relative isolation of the suburbs has created, not cancelled pressures. In 1971, for example, three-quarters of the million mothers whose last child reached 18 years of age went to work. Younger wives, too, are pouring into the labor force. Now when both parents in a suburban family become commuters, the house in suburbia becomes a home only in name. For the suburb to regain its prime function for these segments of the population, it must be connected with a concentration of services comparable to those available closer-in to the city, from group transportation to day care centers.

The New York Regional Planning Association has proposed one means of redensifying population in order to counteract "spread city". It suggests nodular development of population settlements, which would cluster higher density areas within an overall lower density region.

Another instance of redensifying appears to be taking place by default, if Newark, New Jersey, can be considered a gauge. There I have discovered that many young adults who grew up in the city and left it at the first opportunity to establish families in the suburbs had returned to their old neighborhoods. Housing costs have risen so sharply, these people were forced to choose between housing that was beyond their means or rundown housing. In opting for the latter, they have decided they might as well live close to grandparents who can look after the children.

In connection with this phenomenon, I want to talk about density as a barrier to social mobility. We have an older, urban culture with densities from 10-50 thousand people per square mile. Newark, for example, falls generally within that range. On the other hand, my own town, Cranbury, New Jersey, has one-acre zoning which provides a net density of about 1,500 to 2,000 people for a square mile of single-family homes on one-acre lots. But that density figure won't survive in the face of rising costs, exclusionary zoning notwithstanding. It will move up much more closely to five to ten thousand people per square mile. The other day I found a ready example of the light years' difference that prevails between America's urban cultures. Twenty minutes away from downtown Newark is the Newark watershed, 55 square miles of the most beautiful land in New Jersey and owned by the city of Newark; this is unknown to most of Newark's citizens who live in the older urban culture. Thanks to the measure of legalized prejudice that exists today, that distance might as well be 55,000 miles.

The proof of this was found by Norman Williams, a researcher who analyzed all 10,000 zoning decisions in the United States and found that they comprised a devastating commentary on the zoning game. For example, his study of four principal growth counties in New Jersey revealed only one-half of one percent of 450,000 acres zoned residential allowed multi-family construction. In that pathetically small percentage of permissible multi-family housing, 83 percent of the building was further restricted to a maximum of one and two bedrooms per family. In addition, design requirements made certain that the additional bedrooms would be too cramped for larger families.

Now let's go further with Norman Williams' statistics. It isn't snob zoning that produces the problem in New Jersey. The snob zoning of three acres or more happens to be in the northern, less buildable areas, the "horse country" of Morris and Somerset Counties. In those areas it isn't wise to build low-income housing anyway because it is far from highways and blue-collar employment. The really devilish arrangements that are freezing the market and blocking the movement out of overcrowded areas are one-acre zoning, 1200 square feet building minimum, and 200 front feet on a highway. Put those three together—as most of our suburban towns are doing—and you have ruled out practically all of the land for housing within the economic reach of 80 percent of New Jersey's population.

Not a single one of those four counties studied by Norman Williams allows mobile homes,

A few mobile home parks sneaked in before restrictions were imposed, but they are for the most part marginal communities only minimally satisfying the massive need for moderately priced housing. As a result of this kind of zoning (and the property tax system that begets it), housing in New Jersey is now a limping industry. The state should be building at the rate of 100,000 units a year, but the actual starts have dropped below 40,000 units. The home building industry has been slashed and new life styles have been forced upon young families who had expected to follow the home-owning pattern of their parents. Their parents, however, found low cost mortgages through FHA, VA, and others, and they were able to get out to the land with less expense and less resistance from suburban governments.

Newark, New Jersey, can be regarded as a dramatic microcosm of what is happening in urban America today. It warrants a close look and since I have been involved in its problems for a number of years, I will go into its situation a little further.

Just before the riots of 1967, Governor Hughes deputized me as commissioner of the Department of Community Affairs in the State of New Jersey, and assigned me and others the task of determining how our problems could be met in the short run by adaptations in our governmental and social institutions.

During that period we scored more successes than we had a right to expect. One of those was the establishment of the New Jersey Meadowlands Commission, a development commission with jurisdiction over 18,000 acres of land only a few miles from Manhattan. It is potentially about the most valuable land in the world, ranking with Manhattan and the Ginza section of Tokyo. Land values currently range from $50 to $150,000 an acre. The commission for this land has powers of planning, zoning, building regulations, and development. It can issue revenue bonds, condemn, purchase, lease, sell, operate, and develop. It can be, if necessary, the urban renewal agency. That commission is under terrific political and economic pressure, ranging all the way from the mob to legitimate development interests.

The commission intends to produce lower overall density, but to concentrate residential developments within that lower density. The residential component in the first sketch plan for the Meadowlands includes about 70,000 units with about 3.7 people per unit: roughly 250,000-300,000, occupying 18,000 acres just across the Hudson River from Manhattan. Overall, this is a much lower density than either Manhattan or the suburbs which surround the Meadowlands.

Those residential units would be concentrated in high-density highrise housing built as "total communities" along the river's edge as soon as that area again becomes livable. This brings up a new and different perspective on environmental issues. The Meadowlands is not now a livable human environment. Practically no one is living there now, and because there are no resident interests to answer to, every week the land suffers indiscriminate dumping of about 30,000 tons of solid waste, and the Hackensack River flows with pollution equivalent to that produced by a city of 500,000. Environmentalists who are unaware of the problem call urban development of this "lovely land" a "horrible prospect." Clearly, however, the interposition of people into this particular natural environment would be in the best interests of conservation.

There is also some talk now about extending Manhattan's 48th Street subway over the Hudson River and ringing it around the Meadowlands in much the same design as the San Francisco Bay Area Rapid Transit System. This would encourage development nodes along the transit path and reinforce the pattern of residential clusters occupying smaller percentages of available land.

While the picture looks bright for the Meadowlands, the battles for better urban life in the rest of the state are not so easily won. I must mention here an important failure of mine, one that is unfortunately all too typical across the country. Since land use controls, particularly zoning, are inextricably tied to the quality of urban development, I decided last year, against a lot of political advice, to introduce into the state legislature a new statement of land use regulation for New Jersey. We proposed, in effect, that no master plan would be validated unless it took into account the housing and employment problems of that area. Neither zoning nor building regulations would be allowed for exclusionary practices, socially or economically. We had on our side a strange coalition of interests: real estate interests, home builders, minority groups and individuals discriminated against by the zoning games in this country. As you might expect, the suggestion was dynamite,

and exploded into a political disaster. It was just too early a statement to be politically viable.

This brings me to a discussion of the third kind of density—the painful absence at political levels of the social intelligence we need to provide a domestic housing and community development policy. I agree that we ought to achieve lower overall densities, but with access and social mobility so that people can move to housing of their choice in a setting where they can get the services they demand and need. This means a reallocation of certain responsibilities and certain social costs. Now I don't think the initiative for that is going to come from government bureaucrats. The state of New Jersey, for example, has, in a Neanderthal fashion, refused to levy an income tax. It is the last state to hold out, but it cannot preserve that dubious honor for long. The odds are that we will soon get an income tax and in the process take most of our school costs off the local property tax.

Across the country we have hosts of suburban governments with bitter memories of their 1950s' half-serviced developments, and today they are not going to let any developer in unless he is paying for everything they can think of plus a bonus for schools and general goodwill, if the courts let them get away with it.

There is, of course, some exceptional governmental leadership: Congressman Wilbur Mills makes sense when he calls for national assumption of welfare costs, which would scrape another layer off the costs of housing, and he also makes sense when he asks for income maintenance, which moves in the direction of effective consumer demand and free choice.

Governor Milliken of Michigan makes sense when he calls for state assumption of educational costs, lifting yet another burden off property and housing, especially when he connects it with a shift from property tax to income tax for revenue.

What I am really beginning to take hope from in the United States is that in the last ten years dramatic social changes have occurred. The American people are much more aware today of the game of political patronage and dispensation of governmental funds. They have also become more sophisticated consumers. As a result they will ask tougher questions and perhaps also help to provide the right answers. I have a feeling that part of the solution to our social problems is for government to get out of the way. It has to begin in any case to ease away from some of those restrictions and frictions in the housing market that it alone has begun to cause. Yet that cannot happen unless government acts to repair some of its imperfections.

Another part of the solution will have to be devised and executed by government. If we take from suburbia its zoning and property law leverage, we must still provide the means for the proper questions to be asked. Suburban mayors who have become so sharp at asking questions intended to keep out the poor should not be made powerless to ask developers about ecology changes and best use of land.

What we require is a paradoxical solution. We must maximize on the one hand, in the areas of national urban growth policies and financial mechanisms. And we must miniaturize on the other hand—decentralize administration of services so that they can be more sensitive and accessible to local needs. It is vital for our kind of economy that we recognize and act according to the ratios of relative power in our society. For example, Richard Babcock has proposed that Newark decentralize zoning power to local neighborhoods. I am not convinced that is a good idea, but it accurately reflects the fact that I, in Cranbury, New Jersey, am one of 2,500 exercising zoning power, while a citizen of Newark is one of 400,000, and a resident of New York City is one of 7 million. There is no question that we must begin to develop local forms of administration within the requirements of national and state systems of financing.

I do not think that this give-and-take of responsibility is going to come easily. We are going through a process of dialectic right now. In all I have suggested for our urban fringe areas we will have to engage in social bargaining. None of us will ever assemble enough power or money to order housing into existence or dictate immediate purification of air, land, and water. To obtain large-scale housing sites, we will have to trade with local mayors; provide for their communities the infrastructures that would otherwise overload local taxes and receive in exchange flexible zoning and balanced planning. The same kind of compromises will have to be made for environmental interests. I simply hope we will be as shrewd in trading for the public interest as we have been in bargaining for our own.

A DENSITY IMPACT ZONING MODEL

LENARD L. WOLFFE

The subject at hand is the question of density and zoning. What I want to do first is to look at it historically. Edward M. Bassett, the real father of all of our zoning laws, derived from New York of the 1920s certain ideas about density which he put into effect.

Bassett had witnessed the peak flow of immigrants into New York City. They settled and created slums, and it was perfectly obvious then to Bassett that the more people you had on a given plot of ground, the closer you got to a slum. If you think back to some of the very realistic photographs of New York City during that era, by Louis Hein and others, you would have to agree with Bassett.

Bassett wrote much about the problems of public garages and livery stables in residential neighborhoods, increasing urbanization, and trolley cars.

Some years ago, a good friend of mine who is of a scholarly bent traced the idea of zoning directly to the increase in public transportation by electric trolley cars. He found that once one could live away from one's place of work, the idea came about that we ought to have some sort of separation of land uses. And so, given the impetus of that background, we came to Bassett's proposal for zoning. While a very sound idea at the time, it was essentially a negativistic one. It was to prohibit and to exercise strictures on certain ways of life.

Zoning advocates attempted to couch their program in fair terms. They would share light, and air, and space; and nobody's property value would go down. However, even the examples that Bassett used in his original articles have been found in hindsight to be not particularly valid. A zoning concept based on numbers of people per piece of ground obviously falls apart on mature reflection. If it did work, then Park Avenue, one of the most densely populated sections of New York, would be classified a slum. And so would the Philadelphia Rittenhouse Square area, because the density factors there approach 500 families per acre, which is simply phenomenal. It is, in fact, our highest rent district. The Gold Coast in Chicago would also fall into the slum category.

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He has authored numerous articles and books on approaches to zoning, including ULI Technical Bulletin 62, *New Zoning Landmarks in Planned Unit Development.*

If density is to be used as a measure of the quality of living, it has to be refined beyond raw numbers to consider the amount of habitable square space available to each inhabitant, and the quality of services.

Those of us who have seen the vast immigration of the poor, displaced blacks from the rural south to the great northern cities have witnessed much the same settlement pattern as Bassett observed in the immigration of poor Europeans in the early part of the century.

Our suburban communities were determined to preserve what they characteristically considered their own kind of territory, and their own way of life. They adopted zoning on an extensive scale, and used it as a sociological tool to homogenize the community. For a long time the courts cooperated with community homogenization, keeping everything much the same. Vast tracts of ground were given over to housing and other facilities of a cost range that practically guaranteed very much the same class of residents. The classic American pattern of upward mobility posed no problem. As a person made more money, and perhaps bypassed his neighbors' income levels, he simply traded his house in, and bought another in a more affluent development.

This pattern seemed to work for a while. It produced our typical suburban subdivisions and developments, built in the main after World War II, and based upon pre-war patterns. It gradually became apparent that a large segment of our population who would prefer to move out to the suburbs just could not manage it. In reaction to this fact, the idea grew that the community would over-respond to pressure for diversification, which is indeed the usual response of local political people. Most of us have been through zoning fights where this occurs. Local residents resolved to zone bigger and bigger and bigger until we obtained what was, in a sense, the height of the zoning crisis, a series of zoning decisions dictating no more than one family per four acres.

Because we tend to conquer problems on a rather slow and piecemeal basis, it took some time before we came to a series of really solid court tests. There are four of them that I want to discuss because they set up the background for the appalling situation we now have.

Two of the cases are from Pennsylvania—the Girsch[1] and Kit-Mar[2] cases, which came down together in 1970. Prior to this point, Pennsylvania had outlawed four-acre zoning, stating that it was beyond the scope of the police power of any community. That decision was made in the National Land and Development case (1965).[3] Along came Girsch and Kit-Mar, and in Girsch, most interestingly, the court said that where a community does not have any apartments it cannot zone out apartment users. This is what it branded "exclusionary zoning." And while the court was talking about illegality of excluding apartment dwellers, I suggest to you that it was talking about a lot more. The Kit-Mar case refused to permit a community to zone less densely than one family per net acre.

When these two cases are read together, it becomes clear that essentially what the court is saying to the suburban communities ringing large cities, and even elsewhere, is that they cannot zone out certain people to keep their populations homogenous. They cannot keep out apartment dwellers, the poor, the blacks. They will just have to take down the barriers. If they don't have the sewers, they are going to have to build them, and the same goes for schools, roads, and transportation.

I think it is characteristic of America that we neglect a situation until it gets really bad; finally somebody over-responds, and a series of corrective actions follow, a kind of feedback mechanism. Shortly after the Girsch and Kit-Mar cases came the Shannon case (1970).[4] The Federal Court of Appeals told HUD it could no longer ghettoize its projects. The court in this case used a lot of language which indicates its objection to forcing all of public housing into one particular sector and not integrating it.

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1. Appeal of Girsch. 263 A. 2d 395 (70). April 13, 1970.
2. Appeal of Concord Township (Kit-Mar). 765 A. 2d 275 (70). February 24, 1970.
3. National Land and Development Company vs. Easttown Township. 215 A. 2d 597 (65). November 9, 1965.
4. Shannon vs. U.S. Dept. of Housing and Urban Development. 436 F. 2d 809 (70). December 30, 1970.

In the fourth case, Kennedy Park Homes versus the City of Lackawanna (1970),[5] the Second Circuit Court of Appeals in New York stated that the community simply can no longer use zoning as a tool to keep out various groups of people, or to keep them confined to a particular quadrant within that community.

Given this background of legal decisions, I am going to venture a few predictions. Obviously the courts know that zoning powers and this so-called "density factor" have been abused. They have been monumentally abused by local communities in efforts to keep what they call the "tone of the community." I believe that the courts, with these four decisions now behind them, are increasingly going to curb misuse of zoning. The communities are now going to attempt to respond. My experience in private practice has been that communities have gotten much tougher because they don't know where they are going and they are frightened. Sooner or later, they and we are going to have to justify the density we want. I suggest to you, however, that we find an alternative to the concept of density in this argument, because raw numbers in density can be meaningless in terms of the impact upon community.

If you build a luxury high-rise building with a density of 250 units per acre, you have imposed one kind of burden on a community; if you build 250 units of public housing, you have imposed an entirely different kind of burden on a community. If you construct 250 units which are studio apartments to be inhabited largely by singles, or an occasional married couple, you have a third problem entirely different from the first two. The density levels in raw numbers may be the same.

Having suggested to you that density in itself is meaningless, I propose that what we need is a rationalization of the numbers, a system that dismisses questions of density *qua* density and use *qua* use and concentrates on a single fact. What is going to be the impact on a given piece of land?

For two years I have been working with a group of land planners, Rahenkamp, Sachs, Wells, and Associates on an "impact zoning" model. Every use or non-use of land has an impact on the community. Non-use, where land is rationally necessary for human or economic needs, may have just as adverse an effect as improper use. In either event, the community (local, regional, and national) must pay for this in some manner. It is a social cost. The goal which we should strive to obtain is optimum impact based upon as many of the relevant factors as possible.

We now know many of the factors which must be considered and we know the broad legal constraints under which we must operate in our system. For example, we know a number of things about erosion, permeability, water tables, soil types, slopes, climatic conditions, vegetation, and a host of other factors. These are, in reality, natural or physical determinants.

In addition, there are determinants which are created by the existing or necessary man-made systems: water, sewers, power, roads, and transportation have a measurable use and capacity as do the operative limitations in the public services: schools, police, fire, cultural, and economic elements.

By assigning a numerical value to all of these factors, one can measure the probable range of impact of any development. Since the procurement or elimination of almost all of them can be translated into dollars, it is theoretically possible to ascertain in advance the amount of dollar cost of almost any given development to both the public and private sectors. This information system can be most efficiently implemented through relatively unsophisticated computers.

The conclusion through this system might, for example, read: "This land can stand an impact of 7." Seven could mean two stores, fourteen apartments, and nine single-family dwellings. Whatever the conclusion, it will have been removed from the orbit of emotionalism and determined rationally.

5. Kennedy Park Homes vs. City of Lackawanna. 436 F. 2d 108 (70). December 7, 1970.

We have further refined the optimum development impact model so that ultimately it can be used for two purposes. We could begin by using the model as a planning tool. It will enable a developer or community to say, "Well, this land can be zoned for this, that, or another use." We then took the potential for this model one step further and decided that conventional zoning is no longer necessary. Anybody can sit down, get this information, run it off the computer and say, "The impact number is this. Therefore I am entitled to this variety of alternatives." And a developer is justified in moving within that range because he can offer the community a truthful picture of how much impact will be imposed upon a particular piece of land.

The concept of "degrees of freedom" then replaces rigid zoning. Suppose, for example, the impact number comes up a little too high, and extra sewering would be needed, the impact number for which, incidentally, can be translated into dollars. Say the extra sewering will cost approximately $100,000. As a developer, it may be worth it to me to subsidize the community to the tune of $100,000. That is a rational decision. The community gets its benefit, the builder gets his benefit, and the level of impact remains roughly the same.

Secondly, the community can use this tool before the courts to say, "We can absorb a population of 3,000 below X level of income, because each one of those families costs us Y dollars. Our tax base is this. We have to hold it at this point before we go bankrupt." The courts in turn can use the method to prove to a community that its zoning is out of line, that it must come up with an alternative.

The optimum development impact model can also be used as a straight zoning tool. It can also be used by a builder to compute what his costs would be, or by the community to negotiate with a builder. For example, the community could very easily say, "We're going to raise the impact number on your particular piece of ground from 7 to 9, but in order for you to build a 9, you'll require a subsidy of $250,000, which we will take over by way of bonds. Therefore, we want you to build to a 9 standard rather than a 7, and you'll come up with this." Thus, the method will enable people to see a rationale in the development process.

I don't know that this particular system will be adopted. Surprising as it may seem, it makes the best sense for both the governing body (public sector) and the private sector. Instead of imposing irrational constraints and threats of coercion on both, it encourages sound, economic development where it is most needed. In theory it is much like "test flying" a newly designed aircraft by measuring its performance from the engineering data before it is built. We are now experimenting with this ordinance in a number of existing developments to see how they correlate to the known and measurable factors.

We believe that such an ordinance will be sustained by the courts. It is not a radical departure from existing law. The courts have established certain parameters which do not depend nearly so much upon form as most laymen believe. The substance of land use controls can generally be said to operate between certain baselines; one, for example, is that land cannot be confiscated by excessive restriction, but that on the other hand, there is a paramount right of the sovereign to control the use of land to prevent injury to the "health, safety, morals, and general welfare" of the community. The law would probably favor an ordinance which was structured to give a more uniform treatment to landowners and the community since the present system frequently produces excessive economic discrimination by up-zoning and down-zoning for which there is no legal redress. It is also frequently haphazard. Since this development model ordinance builds in safeguards to the community for its "health, safety, morals and general welfare," protects its economic base, and strengthens the constitutional safeguards, there seems to be no reason for legal rejection.

Several caveats must be added. In "test flying" this ordinance with municipal officials we have noted their tendency to impose on new construction a large share of the cost of correcting environmental abuses. They are reluctant to see these costs as items for the capital budget. This appears to us to be an unfair decision. They state, in effect, that the "toll" to developers for crossing the bridge to new construction includes the cost of paying for the shortsightedness of their predecessors. On the other hand, private developers seek to avoid the social cost by using as "precedent" existing conditions which should not be perpetuated. They, in effect, are seeking to obtain a subsidy for creating the bridge in terms of either greater profit or easier marketability. This too, it seems to us, is unfair. The model provides a way out of this dilemma.

The location of people on the land, the introduction of higher densities to our suburbs, the allotment of different land uses is an extremely delicate operation. It requires facts, not guesswork, about the outcome. And it demands sensitivity to the needs of our varied population. Our past and present applications of zoning to the problem have been akin to attempting brain surgery with a meat cleaver.

It is ultimately the private sector which will or will not solve the housing problems of the country, and it can do so only with the aid and assistance of government incentives, because it certainly is not going to do so under strictures set up in terms of police power. Authority is too fractured; there are too many variables, and too little information.

Needless to say, we do not consider the optimum development impact model to be an "ultimate" solution in any sense and if this system finds acceptance there undoubtedly will be further refinements. However, this appears to be our direction today, and following its lead, I hope, will help us to meet the test tomorrow.

TOWARD A NATIONAL GROWTH POLICY: NEW DIRECTIONS

FLOYD H. HYDE

There is clearly a growing interest in the subject of "A National Growth Policy." It will require much discussion and serious thought in the near future.

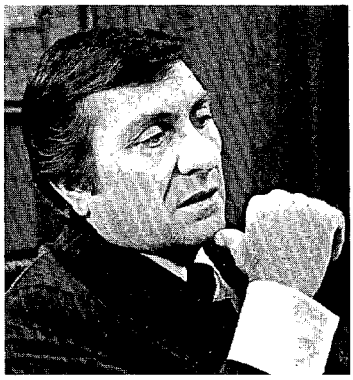
I know you, as members of the Urban Land Institute, have been concerned for some time with the need for a national growth policy. I wonder if you have fully addressed the complexities involved in developing such a strategy? The President, recognizing the many diverse factors and issues affecting our national growth has offered a series of programs which, taken as a whole, form the basis for such a strategy. In so doing, he has offered a challenge. I hope you will take advantage of this opportunity and will meet his challenge.

I will discuss the strategy for national growth and the President's challenge. In particular, I want to:

1. discuss the central importance of a national growth policy;
2. define some of the issues that I believe will give rise to significant and healthy discussion on the subject; and
3. define the bold new initiatives that the federal government is proposing to carry us forward towards a national growth policy.

From this discussion, your role, and the challenge ahead should become apparent.

The expanding interest in a national growth policy grows out of our increasing awareness of the relationships between major problems that have been confronting this nation. In particular, I want to single out three problems that need little elaboration before this group. First there is the "urban problem," which in an oversimplified form is characterized by center city decay and suburban sprawl. Second, there is the "rural problem," characterized by rural poverty and the migration of the young and healthy from rural areas. Third, there is the "environmental problem" about which we are hearing so much these days—the problem of polluted rivers and lakes; air and noise pollution; and roadside auto graveyards.



Floyd H. Hyde is assistant secretary for Community Development, U.S. Department of Housing and Urban Development. Programs under his jurisdiction include model cities, urban renewal, water and sewer grants, rehabilitation loans, neighborhood facilities, and open space and public facilities loans. From 1969 until March 1971 he was assistant secretary for Model Cities.

From 1965 through 1968, Hyde was mayor of the city of Fresno, California, a city noted for its physical and human redevelopment programs. Fresno won the *Look* magazine award for "All-America Cities" in 1968.

A graduate of Fresno State College, Hyde received his J.D. degree from the University of California in 1949 and subsequently engaged in law practice in Fresno. He has also been vice-president of the National League of Cities, a member of the National Advisory Board of the U.S. Conference of Mayors, and a founding member of the National Urban Coalition.

All of these problems are entwined—all relate to the distribution and movement of people. In part, these problems derive from the migration of people from rural to urban areas, the migration from the central city to the suburbs by the more affluent white populations of our metropolitan areas, and by the concentration of population in these metropolitan areas at densities where wastes are produced and discharged at a rate beyond the "carrying capacity" of the natural environment.

Given this perspective, a national growth policy can provide a framework within which urban and rural development and the improvement of the quality of the environment can be assessed. Given this perspective, a national growth policy is not just a land use and physical development policy, it must also be concerned with environmental protection, the provision of public services, the allocation of public resources, and the very structure of government itself. National growth policy must be concerned with the quality of life—with how people live as well as where they live. President Nixon has stated that the goal of a national growth policy will be "to find those means by which federal, state and local government can influence the course of urban settlement and growth so as positively to affect the quality of American life."

It is far easier to recognize the need for a national growth policy than it is to specify what a national growth policy should be. We are all burdened by myths and conflicting beliefs that must be dealt with in evolving a national growth policy. Let me briefly indicate some of the dimensions to this problem.

We, as a nation, have long viewed population growth as a source of national strength and economic growth. We now see population growth associated with congestion, pollution, and perhaps even social conflict. There are those among us now arguing for a zero population growth policy. Should population growth be controlled? If so, to what extent, and by what means?

Some would argue that the problem is not the size of the population, but rather the distribution of the population. For example, is not overcrowding, rather than density, the problem? Some might point out that as a nation we have room for many more. They might note that only 3 percent of this nation's land is used for urban and transportation functions, and that the entire population of the United States could live within walking distance of the Pacific Ocean in medium density housing. At the same time that the population is becoming more and more concentrated within certain metropolitan areas, much of the land remains unoccupied and under-utilized.

For those who decry the conversion of agricultural land to urban use, others would answer that each year twice as much land (about 1 million acres) is converted to wilderness, park, recreation, and wildlife use, as is converted to urban development (about 420,000 acres). Nevertheless, one could note that the conversion of land to urban use occurs primarily in areas adjacent to existing urban development, whereas the new open space uses are occurring primarily in areas distant from existing population centers.

The question of economic growth is also closely associated with a national growth policy. After all, it is economic growth and prosperity that contributes to industrial air, water, and noise pollution. It is economic growth that produces the products that consumers enjoy—and discard: the more than 20 billion glass containers each year, or the less numerous, but more noticeable half million or more abandoned automobiles each year. But economic growth also contributes to reduction in poverty and unemployment, and increases the national wealth and consumption which we still do seem to desire. How do these conflicting forces become reconciled, and what does this mean for a national growth policy?

Finally there is the environmental debate, though its terms may be changing. Malthus offered a proposition that is still debated. He saw lack of resources as a major constraint to growth. It just is not that clear how large a population in the United States, or perhaps in the world, can be supported by the land, food supply, and power sources. For the moment at least, there is a clear capacity in the United States to meet, at least in the aggregate, land, food, clothing, shelter, and energy needs.

These days we may be witnessing an interesting change in the Malthusian debate. It is beginning to appear as though the environmental constraint may not be in terms of inadequate resource inputs, but rather the problem may be in terms of too much input, resulting in more waste products than the environment can absorb. Thus we have pollution of rivers, eutrophication—or "dying" of lakes, air pollution, and no place to dispose of used cars, garbage, and radioactive waste.

Also, we are finding the environment to be more complex and interdependent than we had realized, so that exploitation of one part of the environment produces unintended and undesirable effects in other parts of the environment. A dramatic large-scale example of this is the Aswan Dam which was built primarily to generate electric power, but which resulted in reducing the fish population in the Mediterranean, increasing the numbers of disease-bearing aquatic snails, and lowering the fertility of the Nile Valley. We are beginning to recognize the need for changing some basic attitudes toward our natural resources, and to recognize that we cannot approach these resources as subjects for exploitation, but rather we must be much more sensitive and wiser in managing our resources to accommodate the inter-dependencies of our natural and man-made environments.

The complexities in giving shape to a national growth policy are abundantly clear. It is, therefore, with a certain amount of humility that I would now like to discuss a strategy for the development of a national growth policy.

First, though, I would like to place this discussion within the perspective that I think is well represented in the report prepared by the National Goals Research Staff, established in the White House by the President. I would like to quote from that report:

> The idea of national growth policies is not new. There have always been policies aimed at more specific objectives, but with important implications for national growth. Encouragement of immigration to populate a new land, incentives to settle the West, and the economic policies of the last two decades are clear examples. But there is a difference about the present initiative. Previous policies have dealt in a largely independent fashion with specific objectives in their own context. We wished to get settlers onto the plains, to promote agricultural productivity, to have more education, and to have more people and business in each of our cities each year. All these were measures of progress. We are now moving into a new formulation of growth policies that carries us from these various modes of independent development toward a more appropriate mode of interdependent development. We are seeking to understand how things relate to one another, and how in turn relate to furthering the quality of life for all Americans presently as well as in the future.
>
> Therefore pursuit of a national growth policy may be characterized as both a search for coherence among the many activities of our society, and a search for actions supportive of the human values and qualities which we would hope to further.

Where can this coherence among the many activities of our society take place, you might ask. Who determines those human values and qualities to be pursued? The basic principles in the urban growth strategy of this administration flow from the answers to these questions.

In setting a tone here, I would like to quote from the President's State of the Union Message:

> The time has now come to reverse the flow of power and resources from the States and communities to Washington, and start power and resources flowing back from Washington to the States and communities, and more important, to the people. . . .

Most of the critical decisions affecting growth and development are made at the state and local levels. Therefore, one of the first tasks in preparing to deal with national growth must be to strengthen the capacities of those governments which will plan and carry out the policies and programs which affect the course of growth and development.

I would now like to outline five building blocks, proposed by this administration, that could provide a strong basis for the development and implementation of national growth policy.

The first major building block is the provision of financial and technical assistance to increase the capacity of state and local governments to plan comprehensively and adequately for growth. Two important programs are designed to contribute to this end. As part of the President's program for a Better Environment, he proposed legislation "to establish a National Land Use Policy which will encourage the states, in cooperation with local governments, to plan for and regulate major developments affecting growth and the use of critical land areas." Twenty million dollars a year in new funds are being requested to help states develop land use plans.

To strengthen state and local planning and management capacities even further, the President has requested Congress to authorize a HUD-administered Planning and Management Assistance program to assist states, areawide agencies, and localities. One hundred million dollars is requested for the first year of this program.

The second major building block is assistance to states and local communities in the implementation of their plans through general and special revenue sharing—and in particular, through Special Revenue Sharing for Urban Community Development and Rural Community Development. General and special revenue funds will replace and add to funds now available through numerous narrow categorical programs. The provision of funds through these revenue sharing programs should enhance the authority of state and local general purpose governments, liberate the managers of the traditional categorical programs at the state and local levels from the heavy hand of the federal government, and permit these federal assistance funds to be spent flexibly, and in a manner consistent with defined needs and priorities.

The provision of general and special revenue sharing funds to state and local governments should significantly assist their growth strategies.

Although the planning assistance and revenue sharing programs are the key building blocks in developing an effective national growth policy, there are other important changes taking place in the federal government that should provide additional support to a program of directed national growth.

The federal government has been reviewing and is now changing the policies and procedures by which it manages its own resources. There is now a far greater capacity in the federal government for assuring that federal resources are managed in a manner supportive of state and local growth policies and programs. Two broad changes should be noted.

First, federal public lands comprise nearly one-third of the nation's land area. Review of the monumental study by the Public Land Law Review Commission and the establishment of the Property Review Board reflect the growing interest in the role of federal land management in support of state and local growth and development programs. Second, changes in site selection criteria for new federal installations now permit new federal installations to be located in a manner supportive of state and local growth policies as they evolve. The strategic placement of major federal installations can provide a powerful shaping force in national growth patterns.

In addition, substantial increases are being requested for federal assistance programs that can have an important shaping influence on state and local growth. In particular, the President has requested for the "Legacy of Parks" and "Land and Water Conservation Fund" programs, $200 million and $380 million for the acquisition of open space. The New Communities program should also be functioning on a significant scale in the next year or two. These programs, if properly coordinated, can be used by states and local communities as major tools for guiding the pattern of growth.

Finally, steps are being taken to assure that a broad range of categorical federal assistance programs are provided to state and local governments in a manner consistent with state and local plans and environmental concerns. In particular, the Environmental Protection Act has resulted in the use of procedures by which federally assisted development activities are reviewed and assessed for their potential impact on the environment.

In addition, the Office of Management and Budget has recently strengthened procedures by which federal assistance proposals must be reviewed by areawide and state review authorities to examine consistency with local and state plans. These review mechanisms have great potential for state and local governments as means for coordinating the full array of federal assistance programs.

I have now defined five building blocks which, if taken together, can provide a solid foundation for the development and implementation of a growth policy. In summary, these are:

1. planning assistance, to increase capacity to develop growth policies;
2. general and special revenue sharing, to increase capacity to implement growth policies and provide more flexibility in the use of those funds;
3. federal resource management, to increase the coordination so that federal land and development resources support state and local growth policies;
4. federal assistance for open space and new communities programs, which provide state and local governments with powerful shaping tools in implementing growth policies; and
5. review procedures, which increase the capacity of state and local governments to orchestrate the entire array of categorical federal assistance programs in support of growth policies.

The building blocks that I have just defined represent important evidence of the "New American Revolution" about which the President has spoken. They reflect a strong effort to reform American government, to forge, in the words of the President, "a new partnership between the Federal Government and the States and localities—a partnership in which we entrust the States and localities with a larger share of the Nation's responsibilities, and in which we share our Federal revenues with them so that they can meet those responsibilities." These changes are essential to strengthen state and local government. They are necessary elements in the development and implementation of national growth policies.

If, however, the President's proposals are to meet their fullest potential, each of you must recognize the opportunity the President is offering. I cannot over-emphasize the importance of placing responsibility on state and local public officials and those who elect them. I cannot over-emphasize the importance of planning at the state and local level as the key to the future. What the President is offering is flexibility, a shift from dictation in Washington to assistance at the local level —a shift from "second-guessing" by remote experts in Washington to responsibility at the state and local level.

Will you meet this challenge? I have seen, both as a mayor and more recently in my position in Washington, that planning is the key to the future. But, I have also seen that planning means different things to many people. I hope you as professionals, and those interested in the future pattern in our country, will maximize the opportunity the President has offered and not take the most expeditious path in developing plans and projects. I hope you will utilize to the fullest the planning and development opportunities offered and plan for a future that will most benefit the environment, the community, and above all, the people. In this way, you too will benefit. This is not a one-way street. It can be, but that is not the administration's intent nor, I am sure, yours. The President has offered a challenge. The Urban Land Institute can greatly influence whether that challenge is accepted or rejected—whether it is used or not to benefit the future of America.

Let me conclude by noting that what I have been describing is really only a blueprint for what might be. There is yet a monumental job ahead for each of us. Congress must act upon the new legislation that is being proposed. The executive branch must exercise great wisdom and energy if the potential for these various building blocks I have described is to be truly fulfilled in achieving a national growth policy. Finally, and most importantly, state and local governments, professionals and citizens—you at the local level—must rise to the challenge and opportunity to forge national growth policies and channel the nation's great energy and wealth toward a higher quality of life for all.

Note: A number of changes in legislation and funding amounts have occurred since this address was delivered. The first biennial report on national growth was transmitted to the Congress February 1972 by President Richard M. Nixon.

URBAN DENSITIES IN THE U.S. AND JAPAN

BYRON R. HANKE

Comparative Analysis Suggests Changes in U.S. Practices

Adapted and expanded from *Housing and Urban Development in Japan,* International Brief No. 6, U.S. Department of Housing and Urban Development (HUD).

INTRODUCTION

Density problems similar to, and even more severe than ours in American cities, have been met in other parts of the world with solutions we might well wish to employ, or adapt to our own needs. This is nowhere more true than in Japan, a highly industrialized island nation which, like the U.S., has concentrated half its population on about one-fiftieth of all the land. However, the thrust of the comparative analysis which follows does not depend upon the many and well-known parallels in the two countries but upon an important difference: Japan has moved much faster and further than we in coping with the housing crisis and soaring costs of urban land. To offer just one example, Japan is providing approximately 1.6 million housing units per year for its hundred million people, while the U.S. is building some 2 million units for roughly double Japan's population. Although the public and private organizations of Japan do not claim that their answers are complete, those solutions do represent one enormous advantage over theory, policy, or planning: reality. They are tangible, visible, and fully operative with that always difficult-to-predict factor, the human population.

Byron R. Hanke was the planning member of the six-man HUD team that visited Japan in December 1970 under the leadership of Quinton R. Wells, assistant commissioner for Technical and Credit Standards, Housing Production and Mortgage Credit (HUD-HPMC). Mr. Hanke is chief of the Land and Environment Staff at HUD-HPMC. He is a member of the American Institute of Planners, the American Society of Landscape Architects and the Lambda Alpha International Fraternity for Land Economics.

Mr. Hanke, who also consults on innovative programs for large-scale production of moderate-income homes in improved environments, is the principal author of *Planned-unit Development with a Homes Association* (HUD-81F), *Land-use Intensity* (HUD-FHA-LP 7) and *The Homes Association Handbook* (ULI—the Urban Land Institute, TB 50).

The densitometer featured here is one of Mr. Hanke's original contributions.

原宿・渋谷・目黒・品川
方面
FOR HARAJUKU, SHIBUYA, MEGURO
& SHINAGAWA
8

The Japanese people live very close together quite successfully. Their residential concentrations suggest the possibility of higher density as an answer to U.S. problems of high land costs and housing site scarcities.

For its hundred million people, Japan is quite short of usable land. In contrast, the U.S. populace of two hundred million has an abundance of land. But the underlying cause of the land problem is the same in Japan and in the U.S. It is the unbalanced distribution of the people on the land, and, especially, the non-use or under-use of much of the usable land in urbanized areas and in the broader urban regions.

Japan's new communities have relatively high densities, 13 to 18 living units per gross acre, and prospectively much higher. In the U. S., densities in new communities are very much lower, averaging only 2 to 3 living units per gross acre. U.S. practice should be modified by building new communities at substantially higher densities—but not at the extremely high densities of some Japanese and U.S. housing projects.

Very high density can create more problems than it solves. Even in Japan's more favorable conditions, it has produced major disadvantages and increasing difficulties. In both countries, the land problem can be better solved by new community development, tax changes, and land readjustment.

These conclusions are reached from a comparative analysis of residential densities in the U.S. and Japan, based upon present and projected conditions. The analyzed density data span the full range from overall national density to housing project density. For the first time, this full range of density data is converted to a uniform base and displayed on a single scale like a thermometer; it is called more exactly a "densitometer" (see Figure 1, Population Densities in the U.S. and Japan). The uniform data base of the densitometer is the number of living units per gross acre (lu/ga).

The Land Problem. The price of residential land in urban districts in Japan increased twelve times from 1955 to 1969 while wholesale prices held almost unchanged.

In the Tokyo metropolitan area, which supports a population of over 11 million people, the price of most residential land within 6 to 12 miles of the central Tokyo rapid transit station was $10 to $20 per square foot in 1968. Beyond this area, prices gradually decrease to $3 per square foot in a few locations 25 miles out.

In Osaka, with more than 3 million people in the city and 7 million in the prefecture, residential land prices are nearly as high as in the Tokyo area. For example, the Heiwadai private development inspected by the HUD team on a Minoo hillside in suburban Osaka has improved sites of 1,940 square feet for detached homes at $18,400 per site or about $10 per square foot. In Japan the building site often accounts for 60 percent of the cost of an individual home property.

These figures are striking when compared with a typical 1970 U. S. suburban lot with a HUD-FHA insured mortgage; $4500 for a 7,600 square foot lot, $0.57 per square foot and 19 percent of the total property value.

The average income of the Japanese city-worker is low by U.S. standards, but is increasing, having doubled from 1960 to 1967. The income increase, while impressive, is not nearly as rapid as the rise in land prices in Japan. In 1967 Japanese city-worker household income averaged $200 per month; the income of the middle two-thirds of city-worker households was between $120 and $340 per month. However, copious fringe benefits paid by employers for health, education, transportation, and housing raise the city-worker's total income the equivalent of another $200-$300 per month. Yet, on the average, only 12 percent of income in Japan is earmarked for housing expenses. In the U.S. it is 22 percent of income.

Like most Americans, the Japanese prefer single-family homes on privately owned land, even a small piece. But Japan's land prices drive the price of a single-family house beyond the reach of all but a very few. This unfortunate squeeze is developing in the continental U.S. and is already far advanced in Hawaii.

Land Supply. Japan's overall population density is 730 persons per square mile, fifth highest density in the world after the Netherlands, Taiwan, Belgium, and the Republic of Korea. Despite this density in Japan the population distribution is very uneven; half the population is concentrated in urbanized areas comprising only 2 percent of all the land. Mountains and the sea sharply limit the total supply of usable land. Due to national policy and farmers' traditions in Japan, moreover, residential land use has very severe competition from agricultural land use. This is in addition to the usual competition from industry and commerce for urban land. National policy limitations on conversion of agricultural use to urban use are enforced in Japan both through zoning and taxation of farm land in urban areas at only $\frac{1}{500}$ of building land.

Land Demand. Population growth in Japan is now down to 1.2 percent per year. However, strong rural-to-urban migration, decreasing family size, and the housing backlog produce a tremendous demand for new housing and the land to put it on.

Smaller family size demands more housing units, with less stringent requirements on unit size. Average family size in Japan was down to 3.7 persons in 1970; it was 3.1 persons per family in the U.S. In Japan a living unit for four or more persons has to be only 432 square feet to meet the standard size used to determine dire need. However, actual size averages 712 square feet and Japan aims to upgrade this to 972 square feet by 1985. These smaller unit sizes, compared to the typical U.S. unit size of 1,100 to 1,500 square feet, result in either somewhat less land demand per living unit, or somewhat higher living-unit density with comparable open space.

One-sixth of Japan's households, 3,600,000 families, were in dire need of housing in 1968, down from one-fifth, or 4,300,000 families, five years earlier. The housing deficiency in four-fifths of these cases of dire need is the substandard size of the units rather than such typical U.S. deficiencies as dilapidation or inadequate facilities.

"DENSITOMETER"

FIGURE 1.

Population Densities in the U.S. and Japan, in Living Units Per Gross Acre.

Data No.	United States conterminous 48 and D.C.	Living Units per Gross Acre (lu/ga)	Japan 4 main islands	Data No.
		150		
25	Park City, Forest Hills, N.Y. 16 st., LUI 7.7 (P)		142 JHC 11-14 story project, Oshima, Tokyo (P)	69
		100		
			73 JHC 4-11 story project, Senri Takemidai, Osaka (P)	68
			44 Toshima ward, Tokyo, 1970 (A)	67
24	Manhattan Borough, New York City, 1970 (A) 32		37 JHC 5 story project, Machida-shi, Tokyo (P)	66
23	Park Lane Towers, Miami, Fla. 6 st., LUI 6.4 (P) 31			
			11-33 New Town Law of 1963 (C)	65
22	Fresh Meadows, Queens, N.Y. 2, 3, 13, 21 st.: PUD (C) 21		21 Tokyo city, 1970 (A)	64
			18 Hishino & Tokadai, new towns, Aichi (C)	63
			12-20 Tokyo, built-up inner & intermediate res., 1955 (A)	62
21	New York City, New York, 1970 (A) 13		15 Heiwadai Detached House Subdivision, Minoo, Osaka (P)	61
20	Pomeroy Green, Santa Clara, Cal. 2 st., PUD, LUI 4.8 (P) 11		13 Senri, new town, Osaka. FAR 0.16; LUI 3.7 (C)	60
		10	10 Tokyo city, 1955 (A)	59
19	Forest Hills Gardens, Queens, N.Y. 2-8 st., PUD (C) 8.2		7.5 Urbanized areas, 1970. 1/2 pop., 1/50 land (A)	58
18	9 Largest and most dense cities, excluding NYC, 1970 (A) 6.4-8.5		6.5 Nagoya area, 1970 (A)	57
17	4 HUD-insured projects over $1,000,000, Title X (C) 2.6-9.8		5.8 Tokyo-to Prefecture (metro, district), 1970 (R)	56
16	Radburn, N.J. (C) 5.1		4.8 Academic City, proposed new town, Tokyo (C)	55
15	Timberlane, Seattle (C) 4.7		4.5 Osaka Prefecture, 1970 (R)	54
14	Montgomery Village, Montgomery County, Md. (C) 4.1			
13	Reston & Cardinal Forest, Fairfax County, Va. (C) 3.5			
12	Sun City, Phoenix, Ariz. (C) 3.0			
11	5 HUD-guaranteed new communities, Titles IV & VII (C) 1.9-4.3			
10	Columbia, Howard County, Md. (C) 2.5			
9	60 Large developments, 1947-1969 (C) 2.4			
8	268 Urbanized Areas, 1960. 54% pop., 0.8% land (A) 2.0			
7	291 Urbanized Areas, 2000. 7/10 pop., 1/50 land (A) 1.8			
			1.6 Tokaido urban region, 1970. 48% pop., 9% land (R)	53
			1.5 All pop. on all non-mountainous land. 1/5 land (N)	52
6	New York Zone, Altantic Seaboard Region, 2000 (R) 1.0	1.0		
5	New York Zone, Atlantic Seaboard Region, 1960 (R) 0.7			
4	12 Large Urban Regions, 2000. 7/10 pop., 1/10 land (R) 0.35			
3	5 Major Urban Regions, 1960. 46% pop., 5% land (R) 0.27			
			0.3 All pop. on all land, 1970 (N)	51
		0.2		
2	All pop. on all land, 2000 (N) .05	.05		
1	All pop. on all land, 1970 (N) .03	.03		

CLASSES

(P) Housing Project

(C) New Communities (and Large Developments)

(A) Urban Areas (and Large Cities)

(R) Urban Regions

(N) National Areas

Notes on Figure 1.

In Figure 1, data on varied bases are synthesized for comparative purposes on a single scale like a thermometer or densitometer. The common scale is living units per gross acre (lu/ga). Population data have been converted to living units by using 3.7 as family size for Japan and 3.2 for the US, except as otherwise noted in items 59, 64 and 67.

The lu/ga scale is logarithmic in order to facilitate the presentation and analysis of the data. Equal distances anywhere on the scale represent equal rates of increase or decrease in density.

Sources of data are as follows, referring to the data numbers in the chart:

1. Sigmund Shapiro, Economic and Market Analysis Division, HUD-HPMC (FHA)
2. 203 million 1970 population is projected to approx. 300 million population in year 2000.
3. Jerome P. Pickard. Dimensions of New Metropolitanism. Research Monograph 14. Urban Land Institute. 1967. Table III-3.
4. Jerome P. Pickard. "Trends and Projections of Future Population Growth in the United States, with Special Data on Large Urban Regions and Major Metropolitan Areas, for the Period 1970-2000." Technical Paper No. 4; Office of Deputy Under Secretary, HUD. Presented to the Ad Hoc Subcommittee on Urban Growth, Committee on Banking and Currency, U.S. House of Representatives, Washington, D.C., July 22, 1969. Table 5.
5. 3 above.
6. 3 above.
7. 3 above. Table V-1.
8. 3 above. Table S-4.
9. "HUD Survey and Analysis of Large Developments and New Communities" in Urban Land, January 1970.
10. Thomas G. Harris, Jr., Director of Planning, Howard County, Md.
11. Edward Wise, Office of New Communities Development, HUD-CPM.
12. Byron R. Hanke, and others, The Homes Association Hankbook. Technical Bulletin 50. Urban Land Institute. 1966. Pages 118 to 121.
13. James D. Pammel, Director, Div. of Land Use Administration, County of Fairfax, Va.
14. Lewis Elston, Chief Planner, Maryland National Capital Park and Planning Commission, Silver Spring, Md.
15. Byron R. Hanke. Housing Economies Through Innovative Land Development. Summary of Slide Presentation at NAHB Seminar, St. Louis, Missouri, April 1971. HUD-HPMC (FHA).
16. 12 above. Pages 73 to 76.
17. Land Development Branch, Office of Unsubsidized Insured Housing Programs, HUD-HPMC (FHA).
18. Figure 4. U.S. Bureau of the Census.
19. 12 above. Pages 49 to 51.
20. HUD-FHA. Planned-unit Development with a Homes Association. HUD-81-F 1970. Pages 9, 40, 43 and 49. Also 23 below, pages 480 and 481.
21. 7.9 million people on 300 square miles. U.S. Bureau of the Census sources as in Figure 4.
22. Robert D. Katz. Intensity of Development and Livability of Multifamily Housing Projects. TS 7.14. HUD-FHA 1963. Page 83.
23. HUD-FHA. Minimum Property Standards for Multifamily Housing. FHA 2600. 1969. Pages 482-483.
24. Figure 4. U.S. Bureau of the Census.
25. 23 above. Pages 484 and 485.
51. The Japan of Today. Ministry of Foreign Affairs, 1970. Page 77.
52. 51 above. Page 6.
53. Minoru Tachi, Head of Research Institute of Population Problems, Ministry of Welfare. Area on Figure 3. Population from 54 below.
54. Statistical Handbook of Japan, 1971. Bureau of Statistics, Office of the Prime Minister.
55. '70 Outline of the Japan Housing Corporation. Japan Housing Corporation. Page 27.
56. 54 above.
57. Hiroshi Ueno, Director, Dept. of Building Administration, Aichi Prefectural Government. 12/7/70 conference in Nagoya.
58. 57 above.
59. 7.0 million people on 202 square miles; 5.0 family size. Hisashi Irisawa, "Study of the Location and Development Pattern of Housing Estates in the Metropolitan Area" in Report of the Building Research Institute, Ministry of Construction, November 1959; Table 7.9.
60. Senri New Town; Public Enterprise Bureau, Osaka Prefecture; pages 1 and 2. Also Yosiaki Ioroi, Chief, Development Division, Public Enterprise Bureau, Osaka at 12/5/70 conference in Osaka.
61. Mr. Ioroi; 60 above.
62. 59 above. Page 71.
63. 57 above.
64. 8.8 million people on 222 square miles. 3.0 family size. Ku-area of 23 self-governing wards. 54 above and An Administrative Perspective of Tokyo, 1971, The Tokyo Metropolitan Government.
65. K. Minohara, Urban Building Division, Housing Bureau, Ministry of Construction, 12/9/70 conference in Tokyo.
66. 55 above. Pages 4 and 5.
67. Most dense of 23 wards in Tokyo city. 2.5 family size. An Administrative Prespective . . . . in 64 above.
68. 55 above. Pages 8 and 9.
69. Outline of Oshima 6 chome Housing Complex (Urban Dwelling). Jyoto Construction Office, Japan Housing Corporation.

Japan in 1971-1975 needs land for 9.5 million living units planned in its new program, a building volume reasonably related to recently demonstrated capability. For example, in 1970 Japan built 1.6 million units, a building rate of 16 living units per 1,000 people, the second highest building rate in the world. Forty percent of the programmed houses will have public aid.

Solutions. Japan attacks its land problem in five ways:

(1) Higher density, primarily in high-rise apartments for family living.

(2) New community development by public enterprise, making buildable tracts available to public and private builders in large quantities at lower prices.

(3) Tax changes to encourage the full use of all land in urban areas instead of holding urban land vacant for speculative profits.[1]

(4) Public announcement system for land prices, publishing current market prices at selected locations in urban areas for the information of purchasers.[2]

(5) Land readjustment, a quasi-public process for urban expansion and for rapid renewal of existing urban areas at moderate cost in time, money, and social dislocation.[3]

1. For discussion, see HUD International Brief No. 6, *Housing and Urban Development in Japan.* U.S. Government Printing Office, Washington, D.C. 20402. $.40.

2. See note 1 above.

3. See note 1 above.

COMPARATIVE ANALYSIS

The analysis which follows centers on the densitometer in Figure 1. References in the text to the various individual data lines on the densitometer are made by giving the data number in parentheses.

National Density. Total national population and total national land determine a basic lower limit of density. It is extremely low for the U.S., 68 persons per square mile, 30 acres for each living unit, or 0.03 living units per gross acre (lu/ga); see data number 1 on the divided lower segment of the scale in Figure 1. This includes the extensive and largely vacant deserts and mountains of the U.S. and most of the sparsely populated Great Plains area.

Japan's national density is ten times higher than the U.S. But it is nonetheless rather low, three acres for each household, or 0.3 lu/ga (51). If the total population were distributed on the non-mountainous one-fifth of the land, the density would still be relatively low, two-thirds of an acre per household, or 1.5 lu/ga (52). Japan's food requirements, however, demand much agricultural area, despite high crop yields, sea foods, and imported food stuffs. Even so, Japan is much less pressed on overall national density than would appear to be the case from its urbanized areas that support half the population on a fiftieth of the land, at about 8.0 lu/ga (58).

This points up the statement made earlier in this article—both in Japan and in the U.S., national density suggests that there is enough land but very poor distribution of the people in the nation.

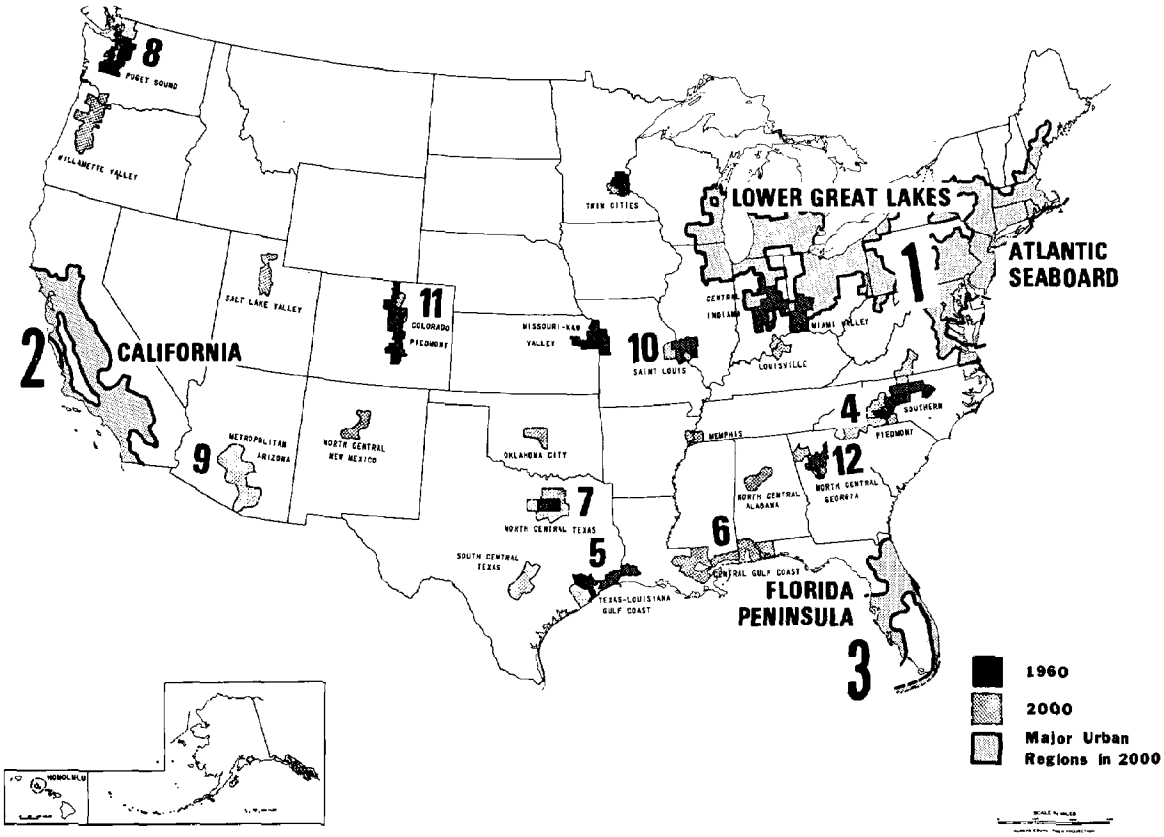
Urban Regions. Japan's national density of 3 acres per household, 0.3 lu/ga, is practically identical to the 1960 density of the five U.S. major urban regions having about half the U.S. population on one-twentieth of the land (3). Additionally, the density is practically identical to Dr. Jerome P. Pickard's[4] projection to the year 2000 of twelve large urban regions accommodating seven-tenths of the projected 305 million U.S. population on one-tenth of the land (4). Five-sixths of the hundred million population increase to the year 2000 is projected to locate in these twelve U.S. urban regions; see Figure 2.

4. Dr. Jerome P. Pickard, Consultant, Appalachian Regional Commission; formerly Director of Program Analysis and Evaluation, Office of the Deputy Under Secretary, HUD. See *Dimensions of Metropolitanism* and *Appendixes to the Dimensions of Metropolitanism,* Research Monographs 14 and 14-A by Jerome P. Pickard, ULI—the Urban Land Institute, Washington, D.C.

FIGURE 2.

Urban Regions, 2000.

The twelve future large urban regions of 2000 are numbered in order of their population size.



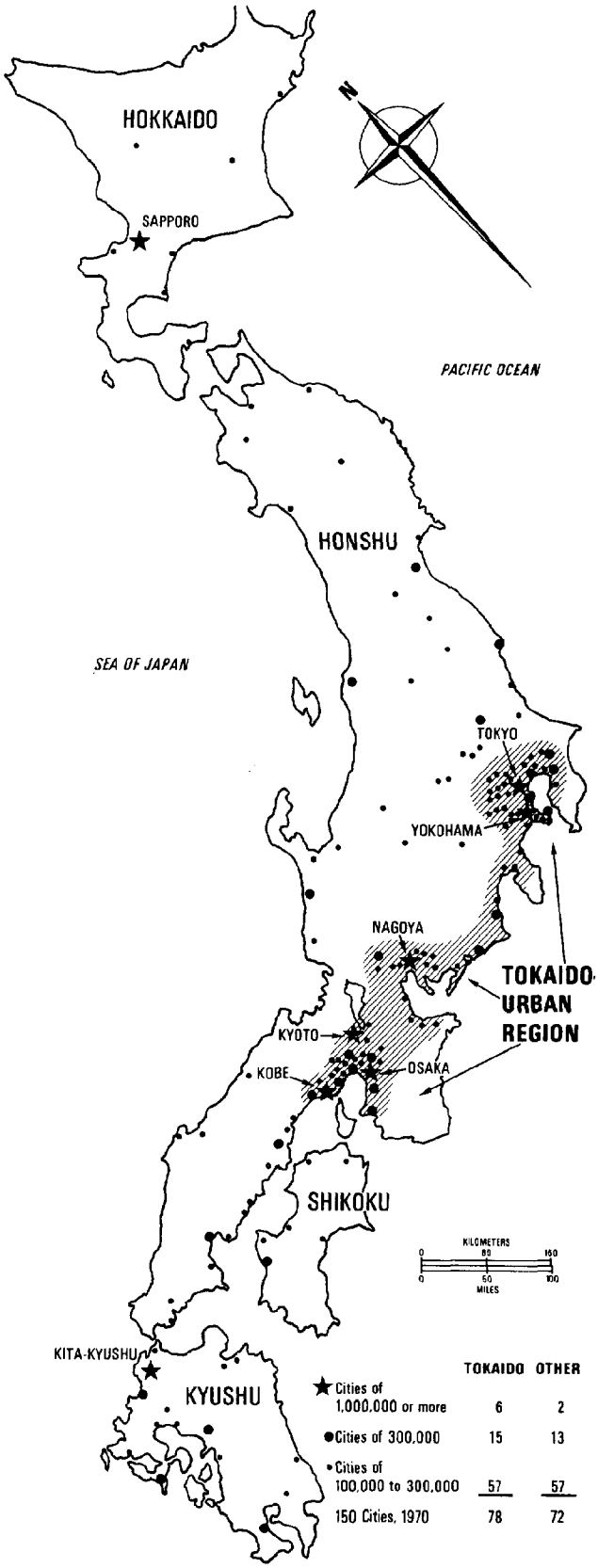
Source: Pickard, J. P. *Dimensions of Metropolitanism.* Urban Land Institute, 1967.

These twelve U.S. regions are predominantly urban in character in terms of population and economic activity because of urban centers clustered within them. Today most of the land area in such regions is still in non-urban uses, but is so located geographically that it could be brought into urban use in close relation with the existing urbanized areas of the region.

The densest zone of any large U.S. urban region, the New York Zone of the Atlantic Seaboard region, had a density of only 0.7 lu/ga in 1960 and is projected at only 1.0 lu/ga in the year 2000 (5 and 6). Stretching from Boston to Washington, that region is remarkably similar in its total length and its projected 2000 year population to Japan's Tokaido urban region today, except that Tokaido has about double the density, 1.6 lu/ga (53). The Tokaido urban region stretches from Tokyo-Yokohama through Nagoya to Osaka-Kobe; see Figure 3. It now has half of Japan's total population on one-tenth of the land, and it accounts for three-quarters of total national production.

FIGURE 3.

Large Cities of Japan.



As with national density, the conclusion on urban regional density in the U.S. is that there is plenty of land, three acres per living unit on the average in urban areas and an acre per household in the densest New York zone. Again, the U.S. land problem in urban regions is not a shortage of existing land, but rather it is its non-use or under-use for urban purposes.

In Japan, however, the more limited total land (51), the severely limited non-mountainous land (52), and agricultural requirements indicate a less ample supply of land at the urban regional level. It is not surprising that the Tokaido urban region at 1.6 lu/ga (53) is five times the density of U.S. urban regions at 0.3 lu/ga (3 and 4) and nearly as dense as concentrated urbanized areas in the U.S. at 2.0 lu/ga (8).

Urbanized Areas and Large Cities. Both in Japan and in the U.S. a look at the milling crowds and concentrated construction in transportation corridors and centers gives the impression of relatively high density throughout urbanized areas and even urban regions. The impression is false and misleading.

The 268 urbanized areas in the U.S. in 1960 had over half the total population and used only one percent of the land. Yet, the density was no more than a half acre per living unit (8). For the year 2000, Pickard projects a population of 305 million, with seven-tenths of it

on only one-fiftieth of the land. And the projected density is only 1.8 lu/ga, more than a half-acre per household on the average in the urbanized areas (7). The areas for these data are the U.S. Census' urbanized areas, and constitute the cities of 50,000 population plus their contiguous urban fringe areas, including enumeration districts in unincorporated territory with a density of at least 1,000 persons per square mile (0.5 lu/ga).

Japan's urbanized areas have similar relationships. Half of Japan's population is on only 2 percent of its land. However, consistent with its higher national density, the density of Japan's urbanized areas is three times higher than ours, about 7.5 lu/ga (58). Japan's urbanized area density of ⅛ acre per household honestly reflects the land shortage factors mentioned in the discussions of land supply and national density.

While Tokyo's density has doubled in the last fifteen years (59 and 64), the trend in the largest and densest U.S. cities is strongly to lower over-all density. Data on U.S. cities having a 1960 population of 100,000 or more and a 1960 density of 7 or more lu/ga suggest some pragmatic upper limits of density in U.S. urbanized areas and large cities; see Figure 4. Excluding the boroughs of New York City, the 1970 densities of the nine U.S. cities in the 100,000 population—7 lu/ga category have a range from 6.4 to only 8.4 lu/ga (18). Significantly, eight of the nine cities have lost population and density in the last decade; population loss has been as great as 8.3 percent. Among the total of thirteen largest and densest U.S. cities including New York's boroughs, the greatest loss occurred in the densest, Manhattan, with a 1970 density of 32 lu/ga (24).

New York City and Tokyo, each the largest and densest city of its nation, are relatively close on the densitometer, 13 lu/ga and 21 lu/ga respectively (21 and 64). In each, the densest borough or ward is more than double the density of its city as a whole; Manhattan is 32 lu/ga (24); Toshima is 44 lu/ga (67). In each case, the related metropolitan district, prefecture, or zone of the urban region is at substantially lower density: 0.7 lu/ga for New York (5) and 5.8 lu/ga for Tokyo (56).

Despite the extremes of our largest and densest cities, the density data on urbanized areas in the U.S. show clearly that there is enough land, a half-acre per U.S. household in urbanized areas (7 and 8), with much unneeded reserve in large urban regions, 3 acres per household (3 and 4). This abundance of existing land in U.S. urbanized areas contradicts our soaring land prices and the site shortage we experience at almost any time for practically any specific use, such as urban housing.[5] Actually the contradiction points to the root of the U.S. land problem: the artificial restraints on availability of land rather than the lack of existence of enough land. Our solutions will be found in tax policy, land use policy, and community development, rather than in great increases in density on constricted urban lands.

FIGURE 4.

Largest and Most Dense Cities in the U.S.:
1970 Data on Cities Having 1960 Population of 100,000 or More and 1960 Density of 7 Living Units per Gross Acres (1440 persons per square mile) or More.

City	% Pop. Change 1960-70	1970 Density lu/ga	1970 Population	Square Miles
Boston, Mass.	- 8.1	6.8	641,071	46
Cambridge, Mass.	- 6.8	8.2	100,361	6
Chicago, Ill.	- 5.2	7.4	3,366,957	222
Jersey City, N.J.	- 5.6	8.5	260,545	15
New York, N.Y.				
Bronx	+ 3.3	18.6	1,472,216	41
Brooklyn	- 1.0	18.2	2,601,852	70
Manhattan	-10.1	32.4	1,524,541	23
Queens	+ 9.1	8.9	1,973,708	108
Newark, N.J.	- 5.6	7.8	382,417	24
Patterson, N.J.	+ 0.8	7.9	144,824	9
Philadelphia, Pa.	- 2.7	7.4	1,948,609	129
San Francisco, Calif.	- 3.3	7.8	715,674	45
Trenton, N.J.	- 8.3	6.4	104,638	8

Sources: U. S. Bureau of the Census: Statistical Abstract of the United States: 1970 (91st Edition). 1970 Census of Population: Advance Report, PC VI Series.

5. Sylvan Kamm, "Curbing Inflation in Residential Land Prices," *Urban Land* 30, no. 8 (September 1971).

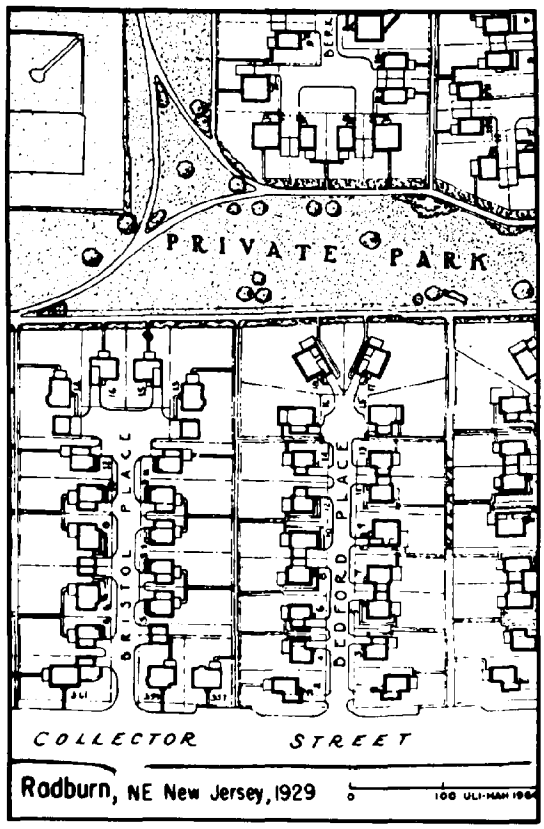
New Communities and Large Developments. These urban area conclusions and the cited density reversals in the largest and densest U.S. cities do not necessarily mean that the density of current urban development in the U.S. is too high. Actually, as we will see, it is too low, particularly in large developments and new communities.

The seasoned, world-renowned U.S. communities of Radburn, New Jersey (1929), and Forest Hills Gardens, New York (1913), have densities of 5.1 lu/ga and 8.2 lu/ga respectively (16 and 19); see Figures 5 and 6. However, the sixty largest developments and new communities recently completed or under construction in the U.S. have an average density of only 2.4 lu/ga, four-tenths acre per household (9). Similarly, HUD's five new communities guaranteed under Title IV and Title VII of the National Housing Act, and its four Title X land developments insured for over one million dollars, range from 2 lu/ga to 10 lu/ga, and are mostly at the lower densities of 2 lu/ga to 5 lu/ga (11 and 17). Such notable new communities as Columbia, Sun City, Reston, and Montgomery Village cluster in the narrow range of 2.5 lu/ga to 4.1 lu/ga (10, 12, 13 and 14); see Figure 7. Thus the new U.S. communities and large developments of over 1,000 acres typically have a density of only 2 or 3 lu/ga. While this is about ten times the density of large urban regions (3 and 4), it is only one-half greater density than the sprawling U.S. urbanized areas in general (7 and 8).

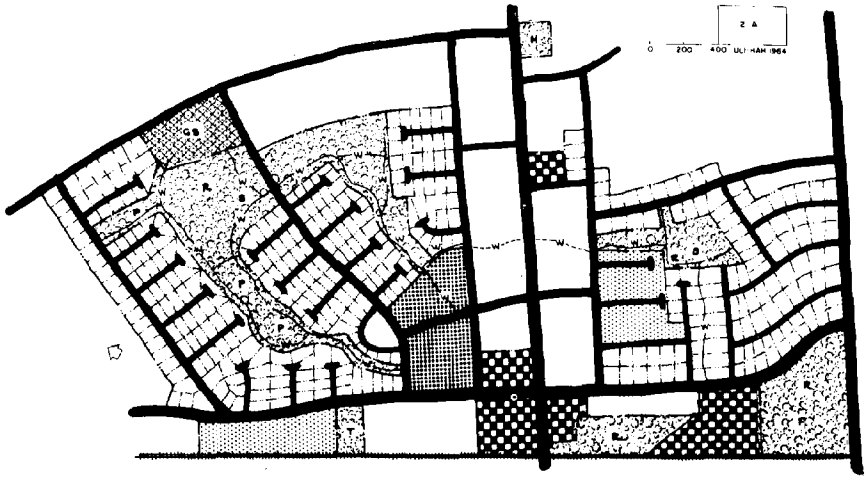
Japan's new communities are four or more times denser than typical U.S. new communities. Senri, for example, is 13 lu/ga (60); see Figure 8. Two new communities in the Nagoya area are 18 lu/ga (63). Japan's New Town Law of 1963 anticipates a range up to 33 lu/ga (65).

FIGURE 5.

Radburn, Fairlawn, New Jersey. 5.1 lu/ga



Radburn, NE New Jersey 1929
788 lu, 788 built, 638 single-family detached,
50 duplex units, 100 apartment units,
43'x85', 5.1 lu/ga
AHA, $110 lu/yr, 0.66 RSR for R, 0.55 RSR for P



As one might conclude from the above, Japanese housing officials now consider Senri's 13 lu/ga too low a density. Senri's open spaces do seem excessive, and apparently little used, especially when compared to the closeness and human liveliness of typical older Japanese urban areas. Largely, Senri's open spaces are the result of its extremely high proportion of living units in high-rise apartments. More productive than a large density increase might be a major shift to a better balance in housing types (many more single-family homes on the land: detached homes, couplets, row houses; and garden apartments). This could enhance environmental quality and prove more responsive to the deep-seated desire of the typical Japanese family for a home of its own on the land.

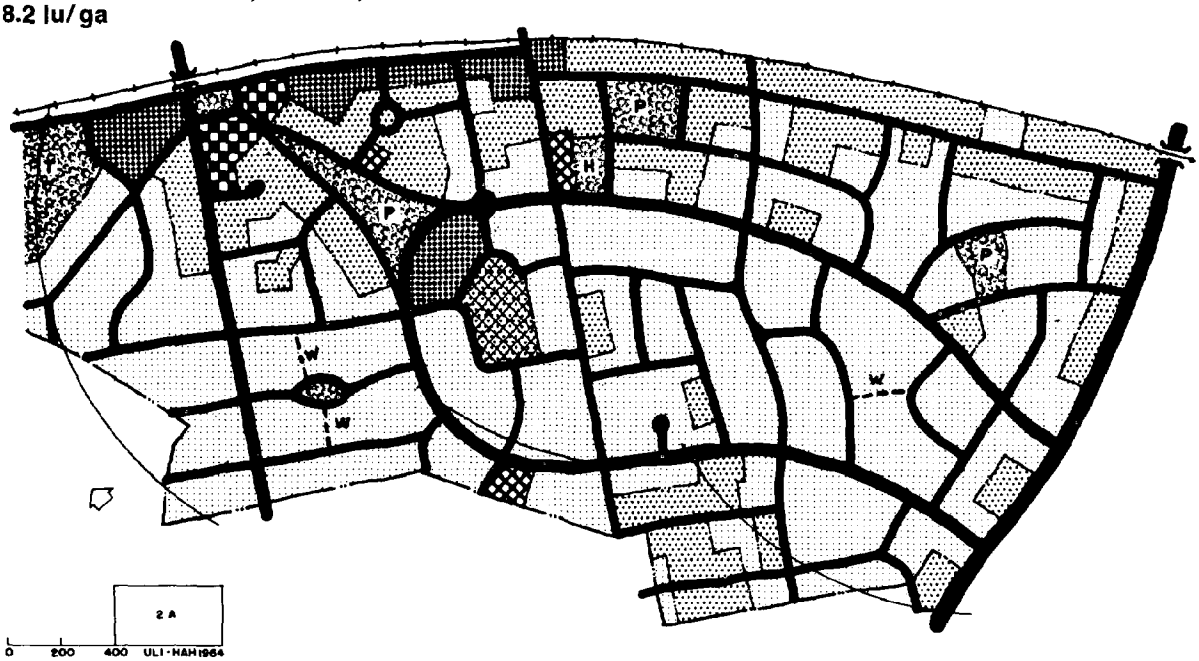
These densities of 11 to 33 lu/ga in Japan's new communities (65) are ten to twenty times the density of Japan's urban regions (52 and 53) and quite appropriate to Japan's needs.

Interestingly, U.S. new community densities, typically only 2 or 3 lu/ga, are, like Japan, at least ten times the density of our urban regions. Although such low density is in keeping with the abundance of urban land in the U.S., the Japanese experience and older U.S. planned communities like Radburn and Forest Hills (Figures 5 and 6) indicate the desirability of somewhat higher densities for new communities and large developments in the U.S. The present 2.4 lu/ga average (9), like Columbia at 2.5 (10), could be raised closer to a 5 lu/ga average, like Radburn at 5.1 (16). Quality environment, very adequate open space, and greater economy of environmental construction and operation are feasible at such densities. Building programs can be balanced with many single-family homes and townhouses, as well as garden apartments and some elevator apartments.

U.S. new communities need not go to the high densities of Japan's new communities ranging up to 33 lu/ga. As concluded earlier, the U.S. has very adequate land resources in its urban regions (3 and 4) and in its urbanized areas (7 and 8). The U.S. does need to bring much more of those land reserves into appropriate urban use at reasonable prices. New community development, tax changes, and land readjustment are promising approaches to accomplish this goal.

FIGURE 6.

Forest Hills Gardens, Queens, New York. 8.2 lu/ga



Forest Hills Gardens, New York 1913
1431 lu, 1431 built, 831 single detached and row, 600 apartments, 20'x100', 40'x100', 8.2 lu/ga
AHA, $.02 sq. ft./yr.

FIGURE 7.

Reston, Va. 3.5 lu/ga

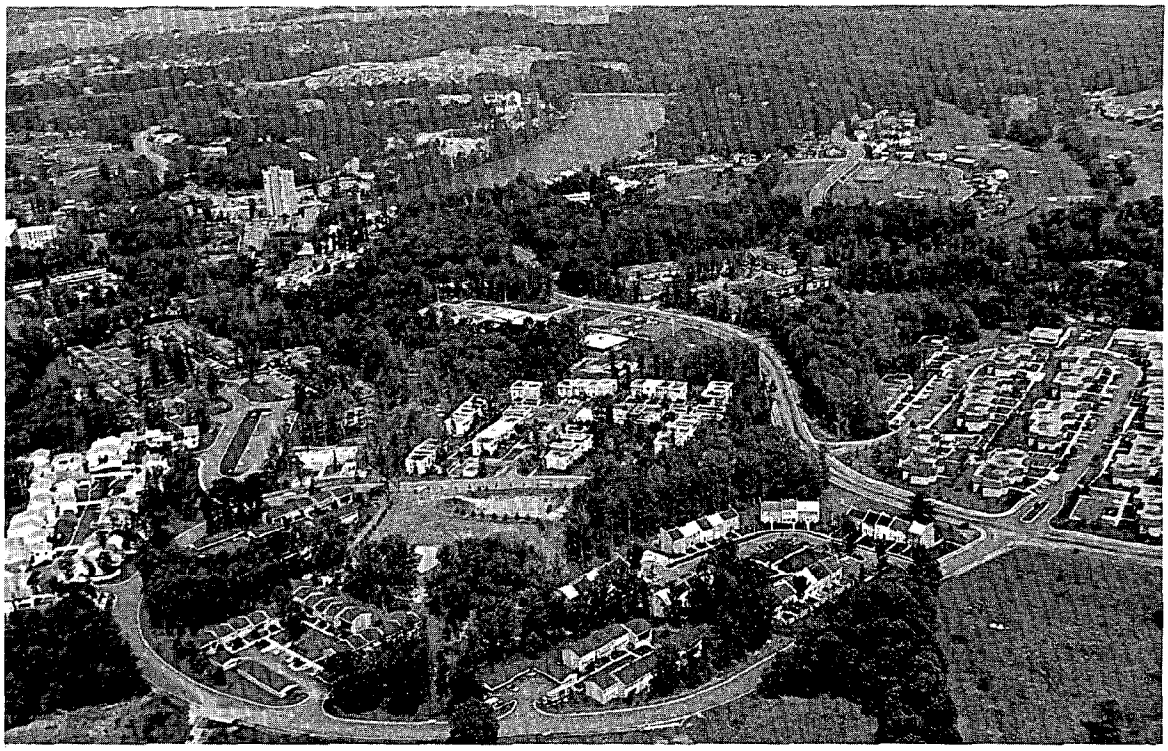
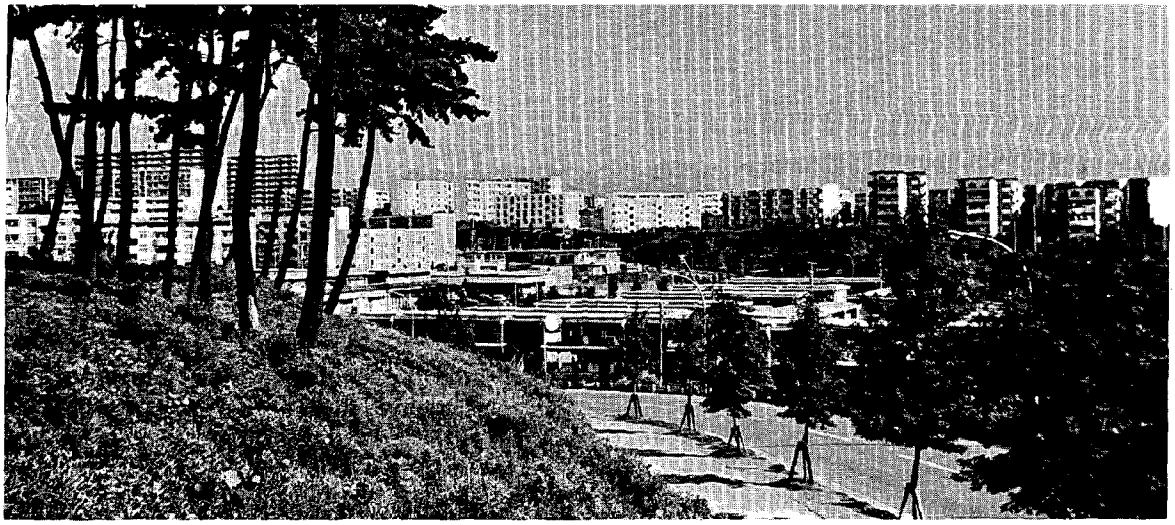
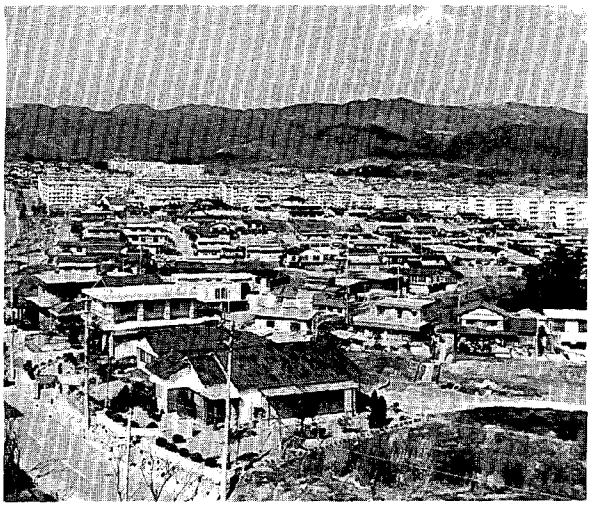
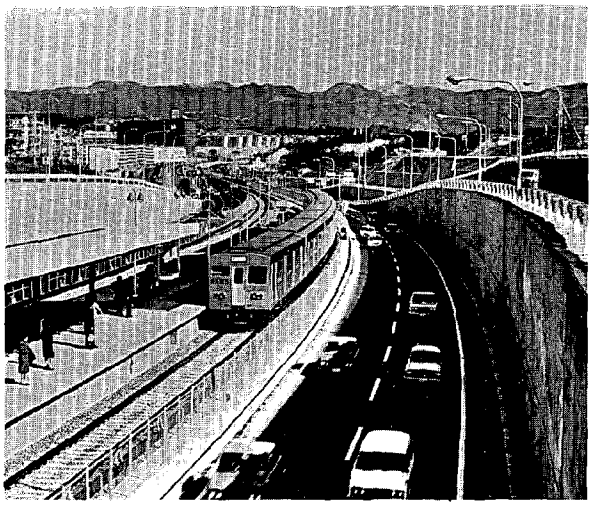


FIGURE 8.

Senri New Town, Osaka. 13 lu/ga







Housing Projects. Many of Japan's individual housing projects are very dense, even considering the relatively high density of its urbanized areas averaging 7.5 lu/ga (58) and its new communities at 11 to 33 lu/ga (65). Take, for example, the eight projects featured in the "70 Outline of the Japan Housing Corporation" (JHC), a 1970 report of Japan's largest housing producer. The JHC examples start with moderate densities of 37 lu/ga for a suburban Tokyo project of 4,220 units (66) and 40 lu/ga for Hanamigawa, the largest suburban complex of 7,081 units at Chiba; see Figure 9. These JHC projects range up to 138 lu/ga for Mataho, the smallest in-town project of 1,044 units in the city of Nagoya. Although lacking the size and geographic independence of new communities, these large housing projects do include such community facilities as assembly halls, branch offices of local government, post offices, schools, and shops. Massive, repetitive concrete apartment structures, 4- and 5-story walk-ups and 11- to 15-story elevators, are predominant. They are favored not only for their high density yield, but also for their fireproof and earthquake-proof characteristics.

FIGURE 9.

JHC 5-story Housing, Machida-shi, Tokyo. 37 lu/ga

Immediately after World War II, vandalism and other behavioral problems were experienced in Japan's very overcrowded urban housing. The problems have since become infrequent, but are beginning to increase again, particularly in large cities and in high-rise apartments. Key factors in the acceptance of high-density high-rise apartments for family living in Japan have been:

1. **Supply-demand ratio.** Japan's housing shortage makes high-density apartments very attractive in comparison with other available alternatives. Long waiting lists and selection by lottery are common. Occupants appreciate their modern accommodations, considering themselves lucky compared to other people still crowded in very small units in older buildings.
2. **Occupant screening.** Because of location and operational factors, public housing is limited to those who have a local job, are local inhabitants, have at least two persons in the household, and have an income of about $50 to $100 per month. The lowest income people live in older, small and congested private rented housing.
3. **Cultural patterns.** Religious roots and traditions of high-density living even in agricultural villages have produced strong cultural patterns of individual discipline, family honor, cleanliness, and respect for others. The Japanese also have the advantage of being a homogenous people without strong religious or racial divisions.

Some Japanese wonder whether their high-density high-rise living is really a success in the sense that they are free to choose it and are satisfied with it; it may rather be accepted as the only available escape from the acute housing shortage. In any case, both Japan and the U.S. are greatly in need of knowledge regarding optimum density for human living, the interaction of individual and environment, and other psycho-physiological factors in density.

FIGURE 9.
Continued

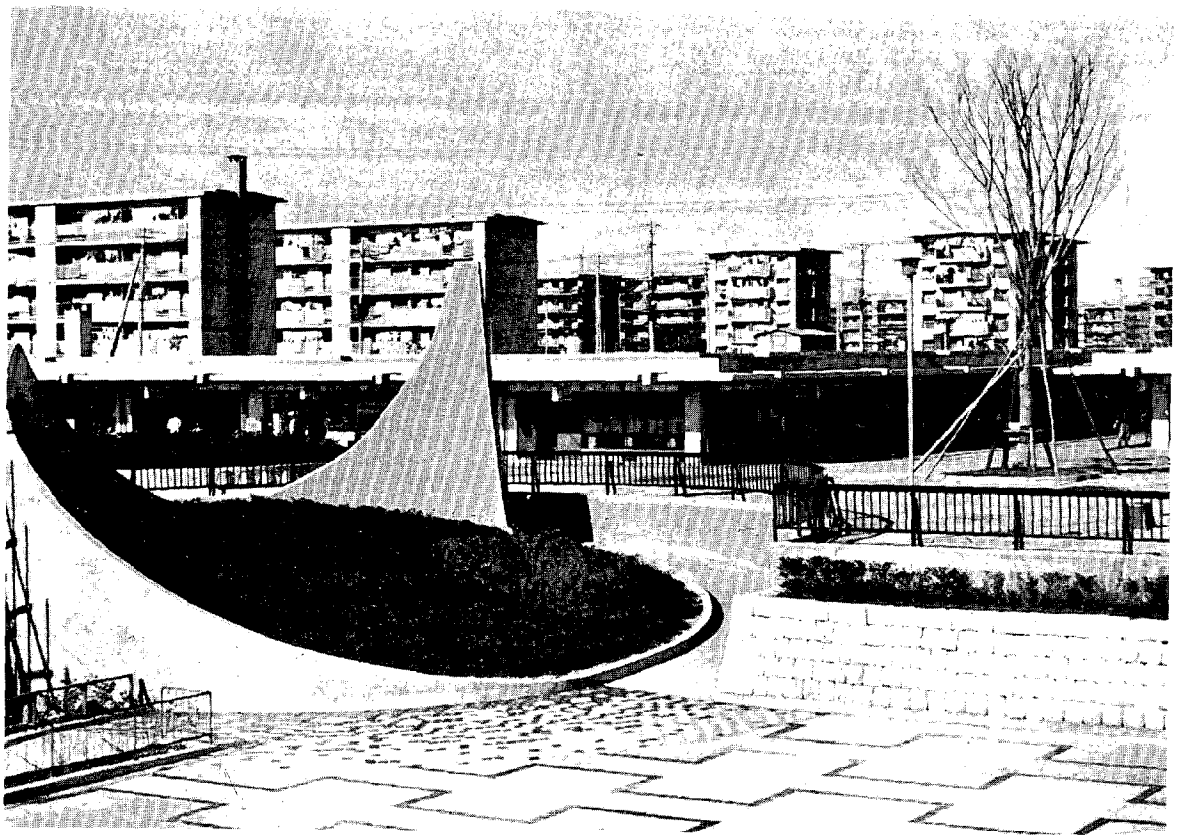
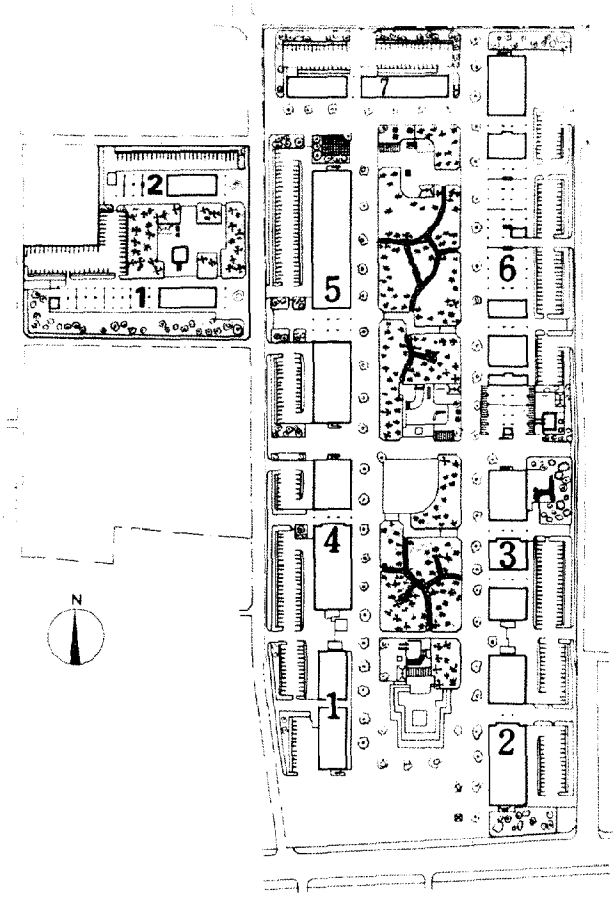


FIGURE 10.

JHC 11 to 14-story Housing, Oshima, Tokyo. 142 lu/ga



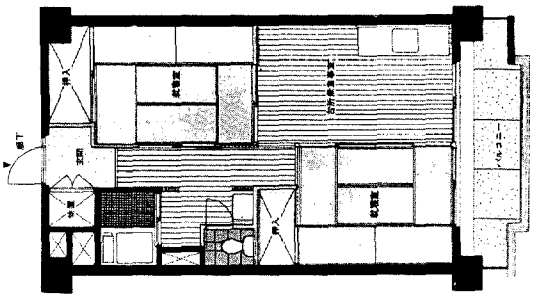
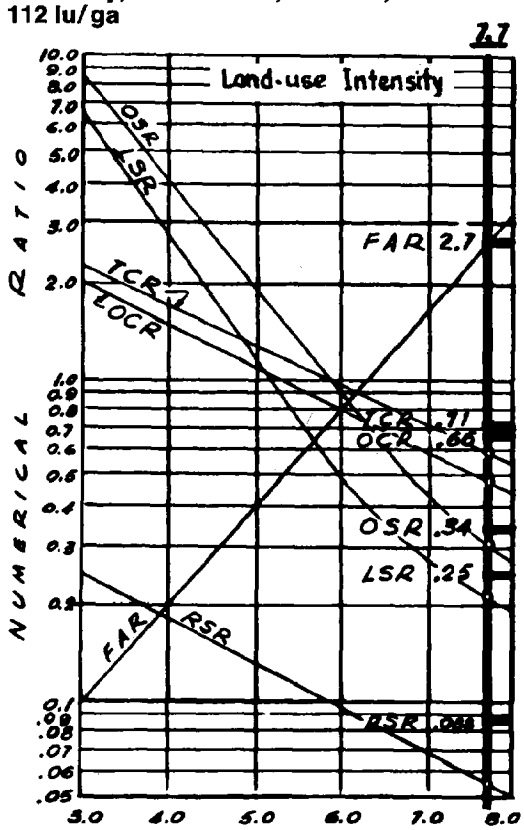


FIGURE 11.

Park City, Forest Hills, Queens, New York.
112 lu/ga



Density practices for medium-rise and high-rise buildings are generally similar in Japan and the U.S. For example, the 11-14-story Oshima project, built by the Japanese Housing Corporation (JHC) and visited by the HUD team, is 142 lu/ga (69); see Figure 10. This is the same general range as Park City, the 16-story project at Forest Hills, New York, that is a benchmark in the HUD Minimum Property Standards for Multifamily Housing (MPS). Park City is 112 lu/ga and 7.7 on the HUD land-use intensity scale (25); see Figures 11 and 15. A JHC 5-story project comes in at 37 lu/ga (66) in the same general range as the 31 lu/ga of Park Lane Towers, the 6-story Miami MPS benchmark project (23); see Figures 9 and 12.

16 stories, 1055 units
Typical 930 sq. ft. plus 84 sq. ft. balcony
Garage under central court
1960

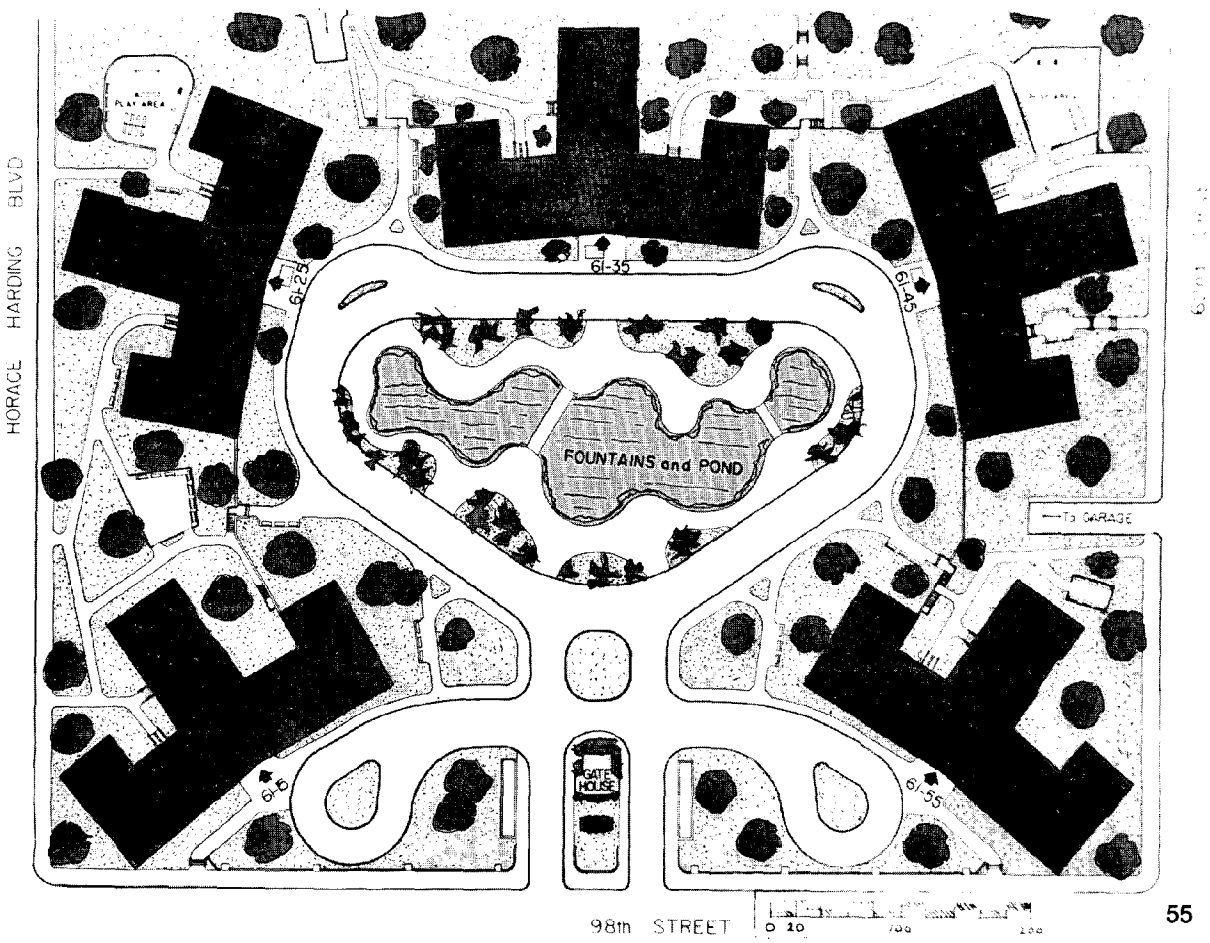
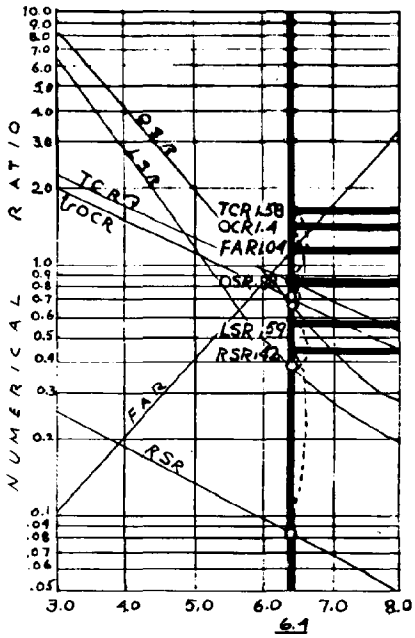


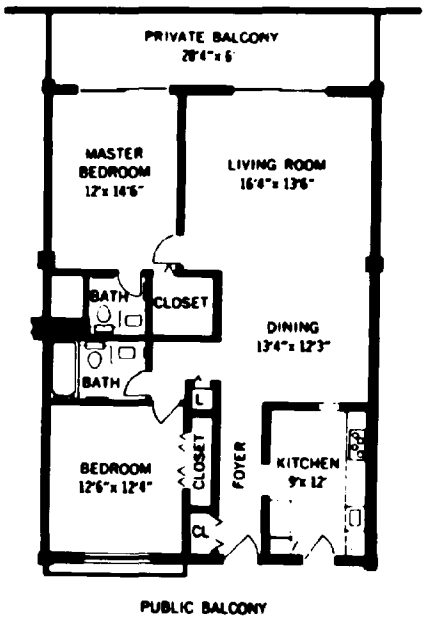
FIGURE 12.

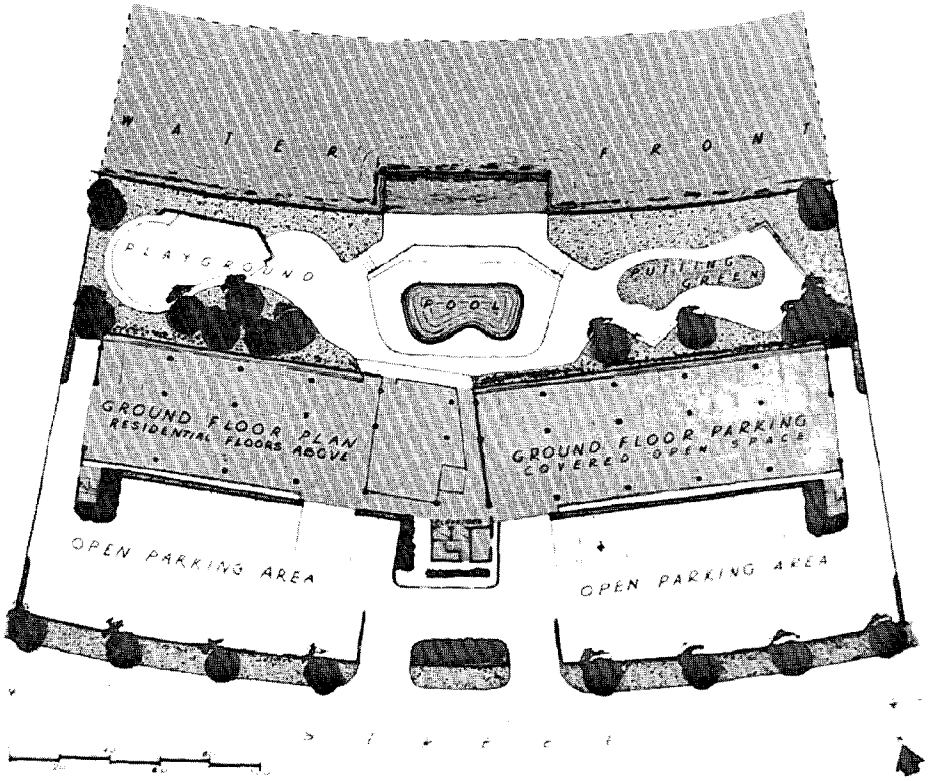
Park Lane Towers, Miami, Florida. 31 lu/ga

Land-use Intensity

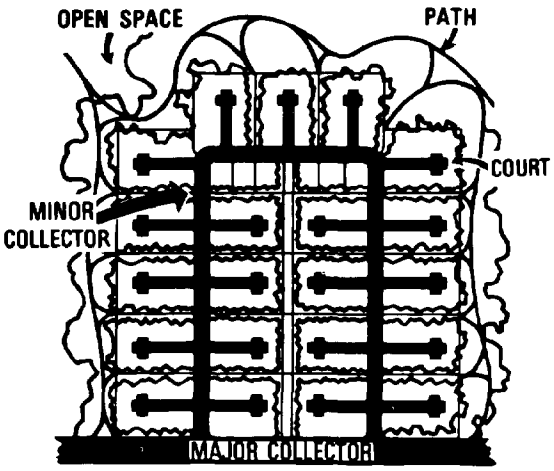


6 stories, 60 units
Typical 1105 sq. ft. plus 170 sq. ft. balcony
1963

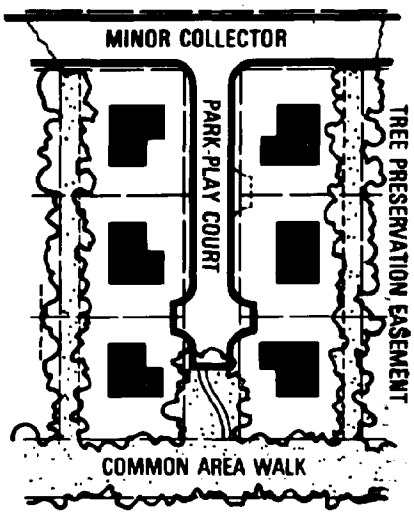




Japan uses low buildings, however, at very much higher densities than the U.S. does. Although the Timberlane plan in Seattle works very well, it is considered very high density in the U.S. for one-story single-family detached homes; see Figure 13. Timberlane is 4.7 lu/ga (15), but the density of Japan's Heiwadai detached house subdivision inspected by the HUD team in the Osaka suburbs (61) is three times greater than Timberlane.



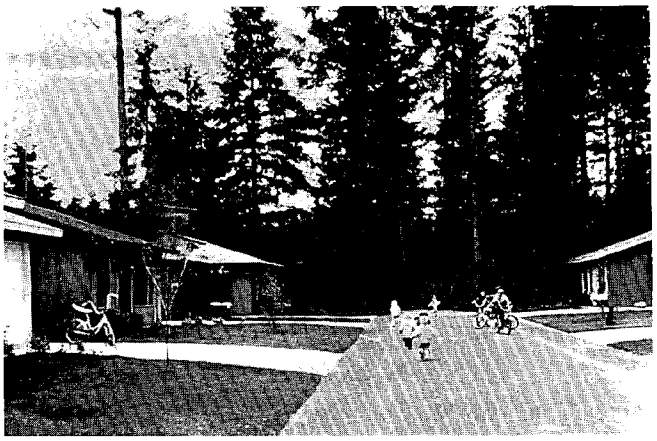
Mini-Neighborhood made up of park-play courts



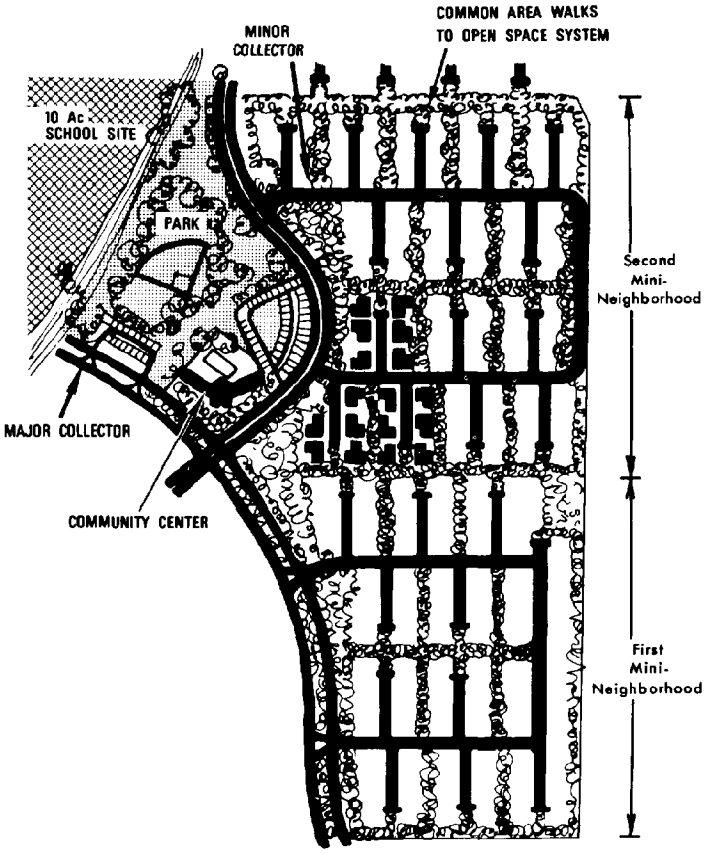
This development is basically a series of loop-street neighborhoods using a basic module of park-play court. Existing wooded areas preserved as a hallmark feature.

FIGURE 13.

Timberlane, Seattle, Washington. 4.7 lu/ga



Quality environment from club to park-play court to home.



898 1-story detached
65'x80' lot
9 mini-neighborhoods
1968

Japanese skill in the design and use of small-scale open areas might be adapted in the U.S. to produce satisfactory environments with detached houses, couplets, and townhouses at substantially higher densities than is now customary in the U.S. This could bring the desired ownership of land and home within the economic reach of many U.S. families now forced to rent in multifamily quarters. In return, the U.S. might lend Japan its skills in planned unit development (PUD) with townhouses on the green. PUD design could bring ownership of land and home to many more Japanese. Japan might build environmentally desirable PUDs at higher densities than the 11 lu/ga exemplified by Pomeroy Green in California (20); see Figure 14.

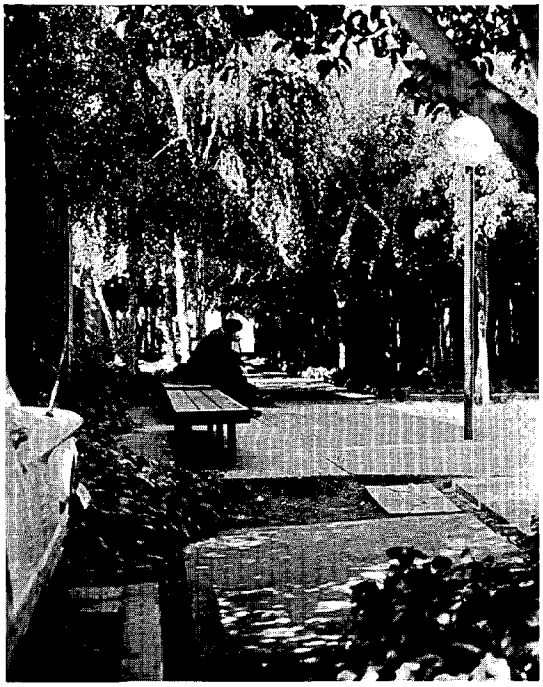
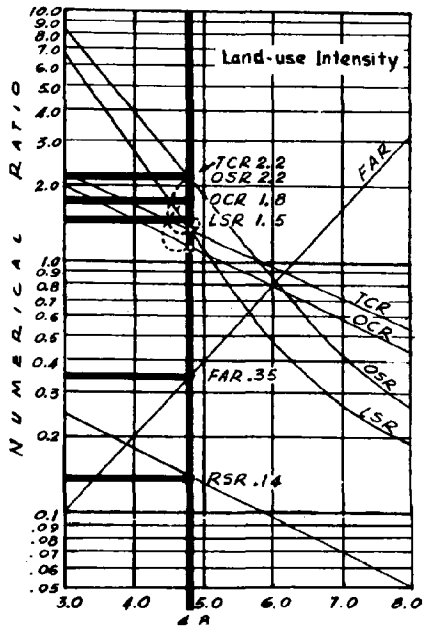
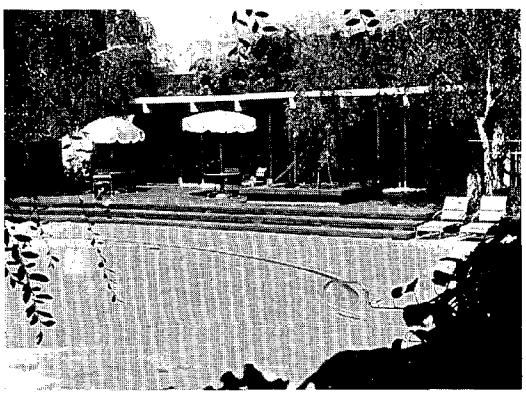
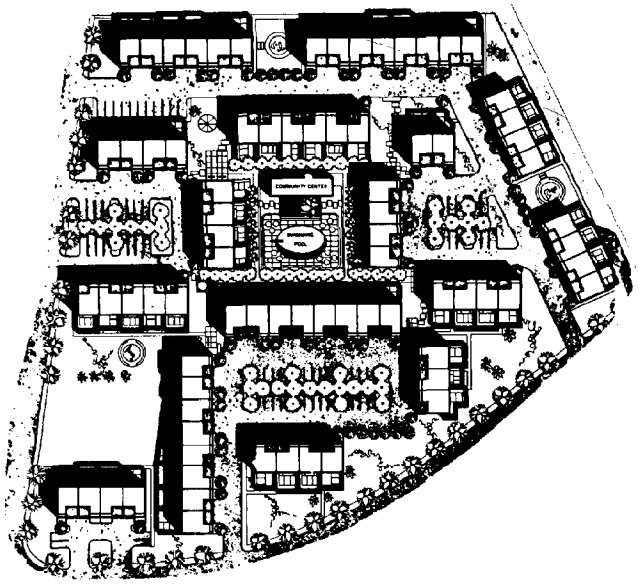


FIGURE 14.

Pomeroy Green, Santa Clara, Calif. 11.0 lu/ga
78 2-story townhouses
24′ w. x 32′ d.; 1570 sq. ft.
1962







Land-Use Intensity. Like the U.S., Japan exhibits great concern for density in its regulations, its design standards, and its measures of environmental quality. Both countries use the concept of floor area ratio. Japan, however, does not yet use the more meaningful measurement concepts of the HUD land-use intensity system, which includes open space ratio, living space ratio, and recreation space ratio; nor does Japan use a floor area ratio based on gross land area rather than arbitrary net site area; see Figure 15. If Japan, the U.S., and other countries were to adopt a single comprehensive measurement system for physical characteristics of housing, such as HUD's land-use intensity system, technical work in all countries would be benefited. Meaningful comparative analyses of many aspects of housing and urban development could be performed accurately and readily, instead of being limited as they are now by tedious and approximate conversions of limited data such as those required for the densitometer in Figure 1.

The HUD-FHA land-use intensity system could be extended, refined, and adopted to serve as the necessary starting point for urban problem definition and solution. This should receive early priority consideration since the critical path from pressing urban problems to workable environmental solutions starts with an adequate and universally-used measurement system for data collection and concept testing.

LUI RATIO CHART

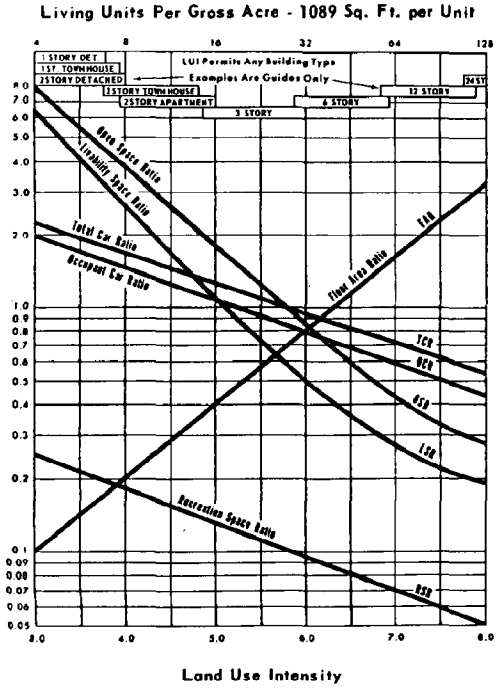


FIGURE 15.

HUD-FHA Measurement System for Land Use Intensity.

LUI RATIO TABLE

LUI	FAR	OSR	LSR	RSR	OCR	TCR	LUI
3.0	.100	8.0	6.5	.25	2.0	2.2	3.0
3.1	.107	7.4	5.8	.24	1.9	2.1	3.1
3.2	.115	6.9	5.2	.23	1.9	2.1	3.2
3.3	.123	6.4	4.7	.23	1.8	2.0	3.3
3.4	.132	5.9	4.2	.22	1.7	1.9	3.4
3.5	.141	5.5	3.8	.21	1.7	1.9	3.5
3.6	.152	5.1	3.5	.20	1.6	1.8	3.6
3.7	.162	4.8	3.3	.20	1.6	1.8	3.7
3.8	.174	4.4	3.0	.19	1.5	1.7	3.8
3.9	.187	4.2	2.8	.19	1.5	1.7	3.9
4.0	.200	3.8	2.6	.18	1.4	1.6	4.0
4.1	.214	3.6	2.4	.18	1.4	1.6	4.1
4.2	.230	3.3	2.2	.17	1.4	1.5	4.2
4.3	.246	3.0	2.0	.16	1.3	1.5	4.3
4.4	.264	2.8	1.8	.16	1.3	1.5	4.4
4.5	.283	2.6	1.7	.15	1.2	1.4	4.5
4.6	.303	2.4	1.5	.15	1.2	1.4	4.6
4.7	.325	2.2	1.4	.14	1.2	1.3	4.7
4.8	.348	2.1	1.3	.14	1.1	1.3	4.8
4.9	.373	1.9	1.2	.14	1.1	1.3	4.9
5.0	.400	1.8	1.1	.13	1.1	1.2	5.0
5.1	.429	1.7	1.0	.13	1.0	1.2	5.1
5.2	.459	1.6	.91	.12	1.0	1.2	5.2
5.3	.492	1.5	.84	.12	.99	1.1	5.3
5.4	.528	1.4	.77	.12	.96	1.1	5.4
5.5	.566	1.3	.71	.11	.93	1.1	5.5
5.6	.606	1.2	.66	.11	.90	1.0	5.6
5.7	.650	1.1	.61	.10	.87	1.0	5.7
5.8	.696	1.0	.57	.10	.84	.99	5.8
5.9	.746	.91	.53	.10	.82	.96	5.9
6.0	.800	.85	.50	.10	.79	.93	6.0
6.1	.857	.80	.46	.09	.77	.90	6.1
6.2	.919	.74	.43	.09	.74	.87	6.2
6.3	.985	.70	.40	.09	.72	.85	6.3
6.4	1.06	.65	.38	.08	.70	.83	6.4
6.5	1.13	.60	.36	.08	.68	.81	6.5
6.6	1.21	.56	.34	.08	.66	.79	6.6
6.7	1.30	.52	.32	.08	.64	.77	6.7
6.8	1.39	.49	.30	.07	.62	.75	6.8
6.9	1.49	.46	.29	.07	.60	.73	6.9
7.0	1.60	.43	.27	.07	.58	.71	7.0
7.1	1.72	.40	.26	.07	.57	.69	7.1
7.2	1.84	.38	.25	.06	.56	.67	7.2
7.3	1.97	.36	.24	.06	.54	.65	7.3
7.4	2.11	.34	.23	.06	.52	.63	7.4
7.5	2.26	.32	.22	.06	.50	.61	7.5
7.6	2.42	.31	.21	.06	.49	.60	7.6
7.7	2.60	.30	.20	.06	.47	.58	7.7
7.8	2.79	.29	.20	.05	.46	.56	7.8
7.9	2.99	.28	.19	.05	.45	.55	7.9
8.0	3.20	.27	.19	.05	.44	.54	8.0

LAND-USE INTENSITY RATIOS

FAR Floor Area Ratio. . . . . is square footage of total floor area for each square foot of land area.

OSR Open Space Ratio. . . . . is square footage of open space for each square foot of floor area.

LSR Living Space Ratio. . . . . is square footage of non-vehicular outdoor space for each square foot of floor area.

RSR Recreation Space Ratio. . . . . is square footage of recreation space for each square foot of floor area.

OCR Occupant Car Ratio. . . . . is number of parking spaces without parking-time limits for each living unit.

TCR Total Car Ratio. . . . . is minimum number of parking spaces for each living unit.

LAND USE SUGGESTIONS FOR THE UNITED STATES

Like philosophy and religion, policies and practices of urban growth and land use tend to be both pervasively intriguing and factually elusive, even for people centrally concerned with housing and urban development. Concerned persons, be they landowners, developers, design professionals, builders, lenders, government regulators, realtors, or critics, may glean differing insights and implications from the data analyzed here. For the author (but not necessarily reflecting an official HUD position), this analysis logically leads to the following suggestions for consideration in the U.S.

We in the U.S. need to understand basically that our urban regions have an abundance of existing land and that this land abundance makes it possible to create much better living environments for the American people. With these facts clearly understood, we need to adopt and implement policies and practices to make enough land available at reasonable prices for needed urban growth and to achieve a balance of environmental quality with economy of development, maintenance, and operation. Specifically, we need to:

- Create new communities and other orderly urban development in much greater volume, a volume adequate to meet the nation's needs for housing sites with quality environments.
- Plan new communities and large developments at higher densities than the present average of 2.4 living units per gross acre, creating varied urban environments with ample open space systems, instead of a continuum of shapeless urban diffusion.
- Use higher densities for single-family detached homes and couplets in cluster housing projects and planned unit developments, instead of suburban sprawl now averaging about 3 living units per gross acre.
- Discourage very high density housing because of its high costs and low environmental quality for family living, accepting it only for special purposes in special locations.
- Use the density data and benchmark projects in the densitometer for reference points in technical studies and operative decisions.
- Develop the HUD land-use intensity system for more effective measurement of urbanization; and use it widely for urban research as well as for basic guidance to create quality environments in new housing.
- Change tax policy and practices to induce the full use of all urbanized land instead of unproductive, speculative non-use or under-use of serviced land.[6]
- Adapt Japan's land readjustment process to meet U.S. needs for orderly development of new urban areas, and for rapid renewal of existing urban areas at moderate costs in time, money, and social dislocation.[7]

6. For discussion, see *Housing and Urban Development in Japan* HUD International Brief No. 6 (Washington, D.C.: U.S. Government Printing Office, 1972), $.40.
7. See note 6 above.

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