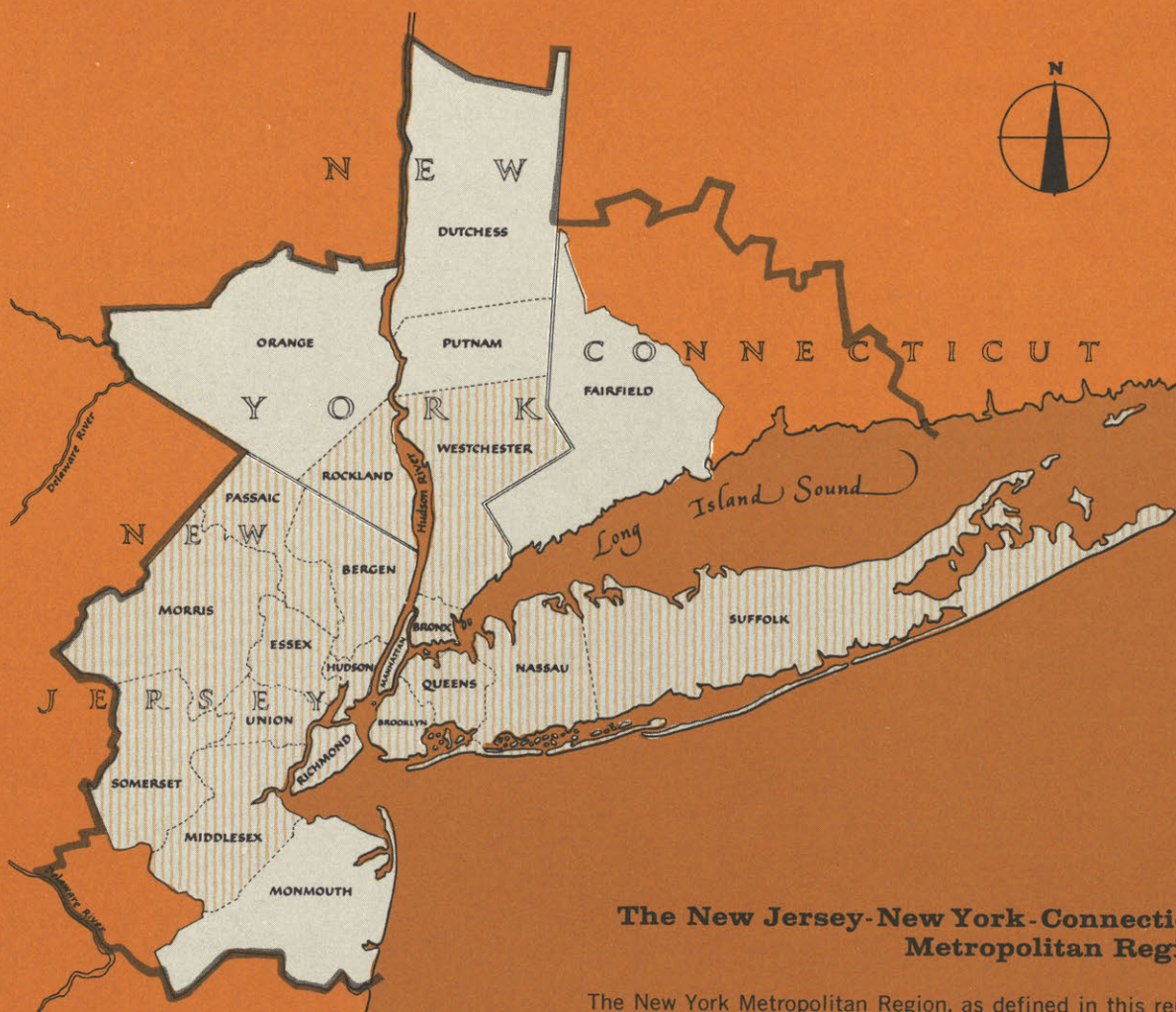1960
1985

SPREAD CITY

Projections of Development Trends and the Issues They Pose:
The Tri-State New York Metropolitan Region, 1960-1985

N

NEW

DUTCHESS

ORANGE

PUTNAM

YORK

FAIRFIELD

CONNECTICUT

WESTCHESTER

ROCKLAND

PASSAIC

NEW

Delaware River

BERGEN

Long Island Sound

Hudson River

MORRIS

ESSEX

BRONX

SUFFOLK

HUDSON

MANHATTAN

JERSEY

QUEENS

NASSAU

UNION

BROOKLYN

SOMERSET

RICHMOND

MIDDLESEX

MONMOUTH

Raritan River

SCALE 0 5 10 15 20 25 30 MILES

The New Jersey-New York-Connecticut Metropolitan Region

The New York Metropolitan Region, as defined in this report, extends roughly fifty miles from Times Square. The Region was identifed in 1922 for the purpose of research studies leading to the **Regional Plan of New York and its Environs** and has been the basis since then for economic, population and land planning research by the **REGIONAL PLAN ASSOCIATION.** The Region's land area is 6,907 square miles (of which New York City's 5 counties cover 320 square miles). Its 22 counties, in parts of 3 states, contain 551 municipalities. The Region's 1960 population was 16,139,000.

METROPOLITAN REGIONAL COUNCIL, a forum of the top elected officials of the Region's counties and its larger cities and towns, draws its membership from the same area.

TRI-STATE TRANSPORTATION COMMITTEE, composed of representatives of the federal government, the three states and the City of New York, is studying an area of 7,989 square miles with a 1960 population of 17,104,000.

STANDARD CONSOLIDATED AREA, defined by the United States Bureau of the Budget for the statistics gathering purposes of the Bureau of the Census and other agencies, covers 17 counties with 3,918 square miles of land. The SCA had a population of 14,761,000 in 1960.

SPREAD CITY

**Projections of Development Trends and the Issues They Pose:
The Tri-State New York Metropolitan Region, 1960-1985**

Introduction and Summary

Introduction. This 100th Bulletin of the Regional Plan Association sketches the way the New York Metropolitan Region will look in 1985 if present economic trends, popular taste and public and corporate policies continue. The economic trends are based on the New York Metropolitan Region Study ("Harvard Study") which was conducted for the Regional Plan by the Harvard Graduate School of Public Administration under the direction of Raymond Vernon. The research for this publication was financed by The Ford Foundation, the Rockefeller Brothers Fund and the Taconic Foundation.

What follows is *not* a prediction. Its purpose is to alert the Region to the total effects of current development decisions — mainly the decisions of municipalities but also those of other local governments, individuals, corporations, the three states and several federal agencies operating in the Region. The policies and apparent preferences that are fashioning the Region's development have been added together and their total impact on our future projected.

Regional Plan Association does not think that the events projected here will necessarily take place. Our function is to present the facts to be used by the Region's citizens in guiding the metropolis to the rich future that its natural beauty, economic strength, historic greatness, and cultural and intellectual leadership could provide — if we do not continue to drift from these foundations.

The next steps in taking hold of the Region's destiny are to (1) pose alternatives to the present development, (2) consider the meaning of the alternatives for the way we want to live and the efficiency of our business, (3) investigate how policies produce different kinds of development, and (4) choose the Region we want and the policies to reach it. The current program of the Regional Plan Association is to prepare alternatives to the pattern projected here and to initiate wide public discussion of ways to achieve the regional plan we want.

Summary. Between 1960 and 1985, six million people will be added to the 16 million now living in the New York Metropolitan Region. This is a conservative estimate based on national population projections and the relative strength of the Region's economy in the nation.

Most of the six million will be our own children. In-migration is expected to drop below out-migration by 1975.

Not until the mid-1970's will we feel the impact of the population boom on the housing market and on the demand for living space. The usual ages for home buying are 30-34. Recently the number of 30-34 year-olds — depression babies — has declined. But by 1975, babies born in the boom that began in 1946-47 will be looking for houses.

Jobs in this metropolis have been unusually centralized because the economy is based on activities requiring continuous complex interaction such as finance, insurance, corporate headquarters, communications, international trade, wholesaling, apparel, printing, electronics and nonprofit organizations. We can therefore expect business to seek most of its new sites as close to the center as possible, though many jobs will locate in the Region's periphery.

Since most people try to live near their jobs, homebuyers will be pulled toward the center. Present policies for the use of vacant land, however, will push most families with children far from the Core, gradually lengthening trips to work.

The most important element in the Region's land policy is the composite of 509

municipal zoning ordinances (of a total of 551 municipalities in the Region). These local laws call for a much larger residential lot size than ever before. The average lot size in tracts subdivided in the past decade has been rising fast, but the average lot size required on the remaining vacant land in the Region is even higher. Each one-family home to be built on the Region's vacant land will be on a lot averaging two-thirds of an acre under present zoning.

Present trends suggest that families with children will not prefer to live in the older cities. In the past decade, well over 1½ million persons left the Region's Core (Manhattan, Bronx, Brooklyn, Queens and Hudson Counties and Newark). Barring major changes in the livability of the Core or in popular attitudes toward it, we can expect nearly a half-million more Core residents to join the six million new residents of the Region seeking houses on vacant land.

The 6½ million will about double the built-up area of the Region, urbanizing in the next 25 years as much land as we have in the last 300. All the land out to Riverhead, Long Island; Danbury, Connecticut; Lake Hopatcong and Lakewood, New Jersey will be built up by 1985, according to present trends.

Recent and projected development follows an entirely new pattern which Regional Plan has called "spread-city." It is not a true city because it lacks centers, nor a suburb because it is not a satellite of any city, nor is it truly rural because it is loosely covered with houses and urban facilities.

In the spread-city decreed by present zoning, people will be living and working too far from each other to use public transportation or to walk to most places they want to go, or even to car-pool. This adds to the spread by increasing the roads and highways needed. It also limits everyone to one transportation mode and increases the time and cost of bringing people together.

Choice of housing types and lot sizes also is restricted by present zoning. Young people starting adult life and older people whose children have grown cannot find suitable housing in suburbs restricted to one-family homes on large lots, where they may have lived most of their lives. Families in their middle years appear to prefer smaller lots than are allowed by present zoning.

Costs of spread-city, especially for transportation, will be much higher than costs of making full use of the older cities and building at higher densities with facilities better related. Though we will be able to afford these extra costs, the increase in local taxes due to spread development and due to sharply increasing numbers in schools and colleges will intensify the pressure on the property tax. Municipalities will be more than ever inclined to indulge in "fiscal zoning," trying to zone out tax users (families with children) and zone in tax providers (industry). Tax considerations, in short, will play an expanding role in land development decisions, weakening the chance of planning for the best possible use of the land, unless the sources of local government revenues are modified.

How the Region develops physically closely relates to how we live. Only concentrated centers in urban areas can stimulate and support the economic, cultural and commercial activities in which this Region specializes. Spread-city gives little support to the older centers though its economy remains tied to it. A declining percentage of the population has ready access to the cities. At the same time, a decreasing percentage has easy access to the countryside. By spreading and scattering rather than concentrating jobs, goods, services and homes, we fail to build communities, and we have poorer access to and so less choice of jobs, friends, recreation, goods, services, types of housing and modes of travel.

The Region's new form, in sum, will give most of us neither the benefits of the city nor the pleasures of the countryside — *if present policies and trends continue.*

Chart 1
The Region's Share of the Nation's Population
(percent)

9.5 1930
9.5 1940
9.3 1950
9.0 1960
8.6 1920
8.4 1975
8.3 1910
7.8 1985
7.5 2000
7.3 1900
6.5 1890
6.3 1880
6.2 1870
6.1 1860

Source: U.S. Census and R.P.A.
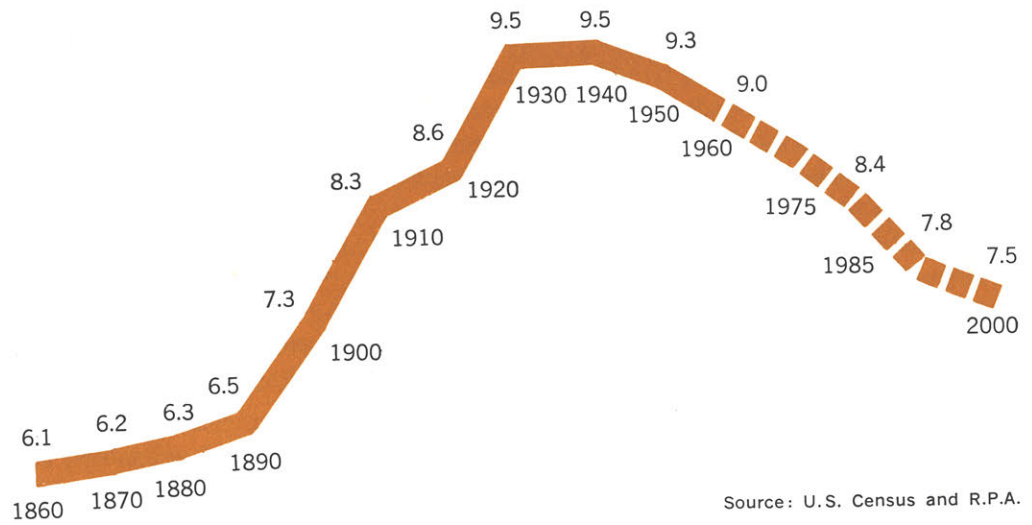
Chart 2
Age Distribution of the Region's Population, 1960 and 1985

85 +
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5-9
0-4

1960
1985

0   200   400   600   800   1000   1200   1400   1600   1800   2000   2200   2400
thousands of people

Source: U.S. Census and R.P.A.
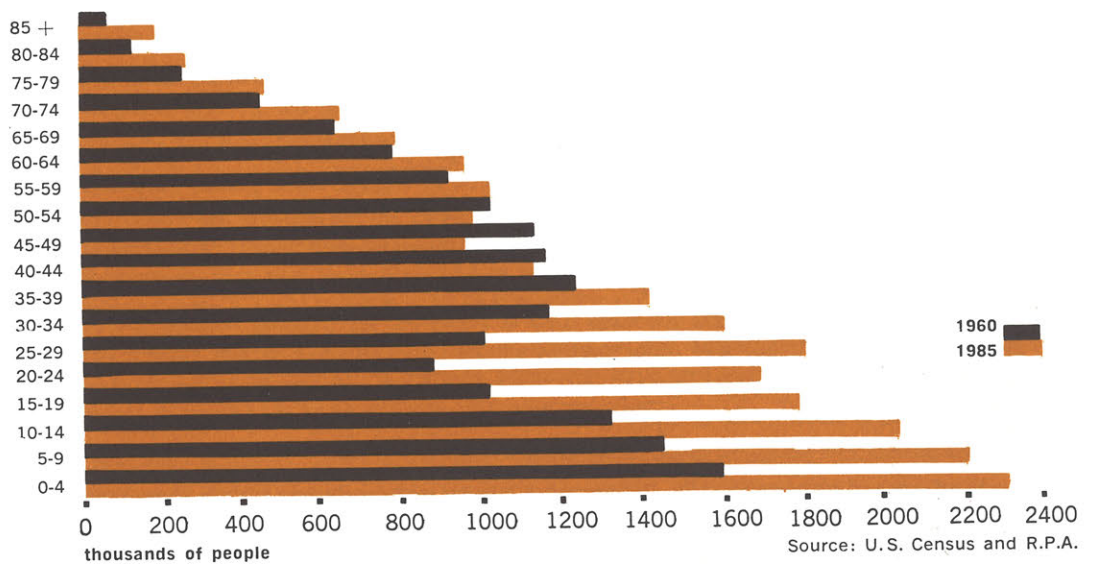
Chart 3
The House-buying Age Group in the Region, 1960 to 1985

1600
1500
1400
1300
1200
1100
1000
900

thousands of people age 30-34

1960   1965   1970   1975   1980   1985

Source: U.S. Census and R.P.A.

(Table 6)

4
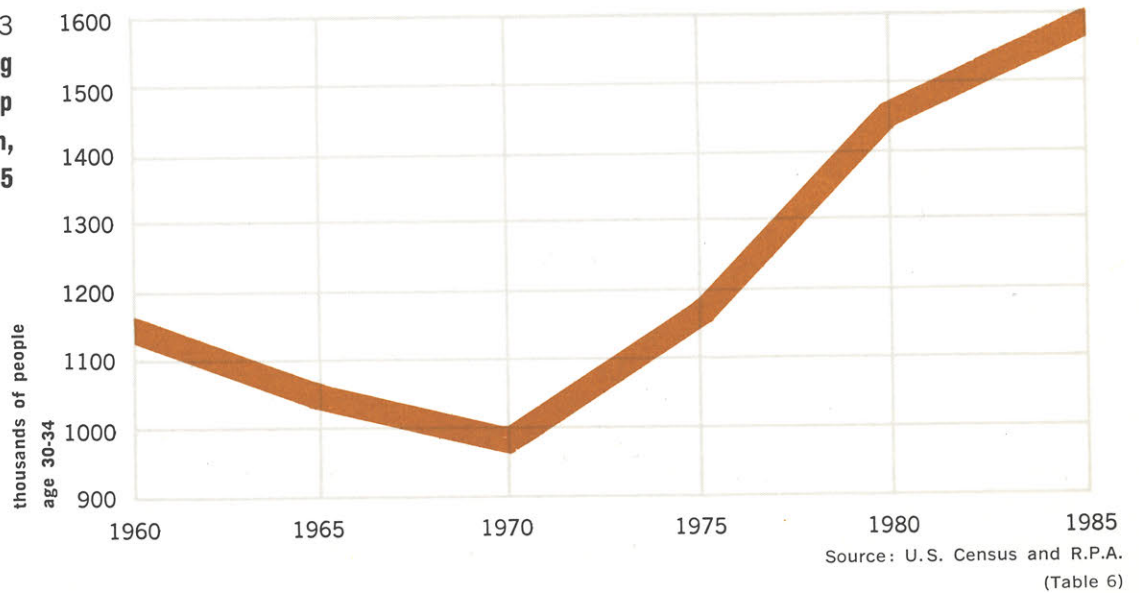
The Next Six Million 1

The increase in population and jobs. In 1960 there were 16 million people in the New York Metropolitan Region. By 1985 there will probably be 22 million. In twenty-five years we will add nearly the equivalent of the present population of the Los Angeles area, our second largest metropolis. Further indications point to an additional 4 million by the year 2000, or 10 million more people in forty years.

Why should we anticipate such growth? Aren't we big enough? The Harvard Study showed that the Region is sufficiently attuned to changing times and technology to attract economic activity which will push its 1960 employment of 6.7 million to 8.9 million in 1985. Deliberate efforts to limit metropolitan growth in other countries have failed in the face of similar attractions of the metropolis for business and for residence.

Moreover, the population increase will be mainly our own children. Virtually all of the next six million will result from the excess of births over deaths. In fact, by about 1975, out-migration will exceed in-migration for the first time.

In the light of the nation's expected growth of over 100 million in the next twenty-five years, the forecast of an additional six million for the New York Region is conservative. It would mean a steadily declining share of the nation's population (Chart 1) and slower growth than is projected for most other large metropolitan areas. It is lower than National Planning Association studies suggest.

But even if the Region does not hit the 22 million mark precisely in 1985, we must look forward to that order of growth. Whether the next six million arrive by 1980 or 1990 does not alter the need to plan for them now.

	16 million	22 million	26 million

6 MILLION

| 1960 | 1985 | 2000 |

The Region's changing age distribution. We must also prepare for sharp changes in age distribution, which will have a marked impact on the Region's investment and development needs and their timing. Chart 2 shows that the number of children will increase faster than the older age groups by 1985. While total population rises by 37 percent and the number of people of working age by only 17 percent from 1960 to 1985, the number of school-age children is likely to increase by 55 percent and the college-age population, 94 percent (see Table 6). This will stem the long-term decline in average household size at its present 3.1 for the Region as a whole. Although household size in the Core and the inner suburbs is expected to decline further, it will rise in the rapidly growing outer areas.

Chart 3 shows that the dearth of depression babies is causing an absolute decline at present in the 30 to 34 age group, the age when a family is sufficiently established to purchase a home. This temporary decline is a major reason for the present slump in single-family home building.

As the large post-World War II baby crop grows to house-buying age (about 1975), development pressures will mount to new heights. Some solace can be taken from the fact that the need to create new jobs, homes, communities — indeed, a new region — for the post-war babies has not come upon us as suddenly as rearing and educating them. There is still time to plan for the next wave of development.
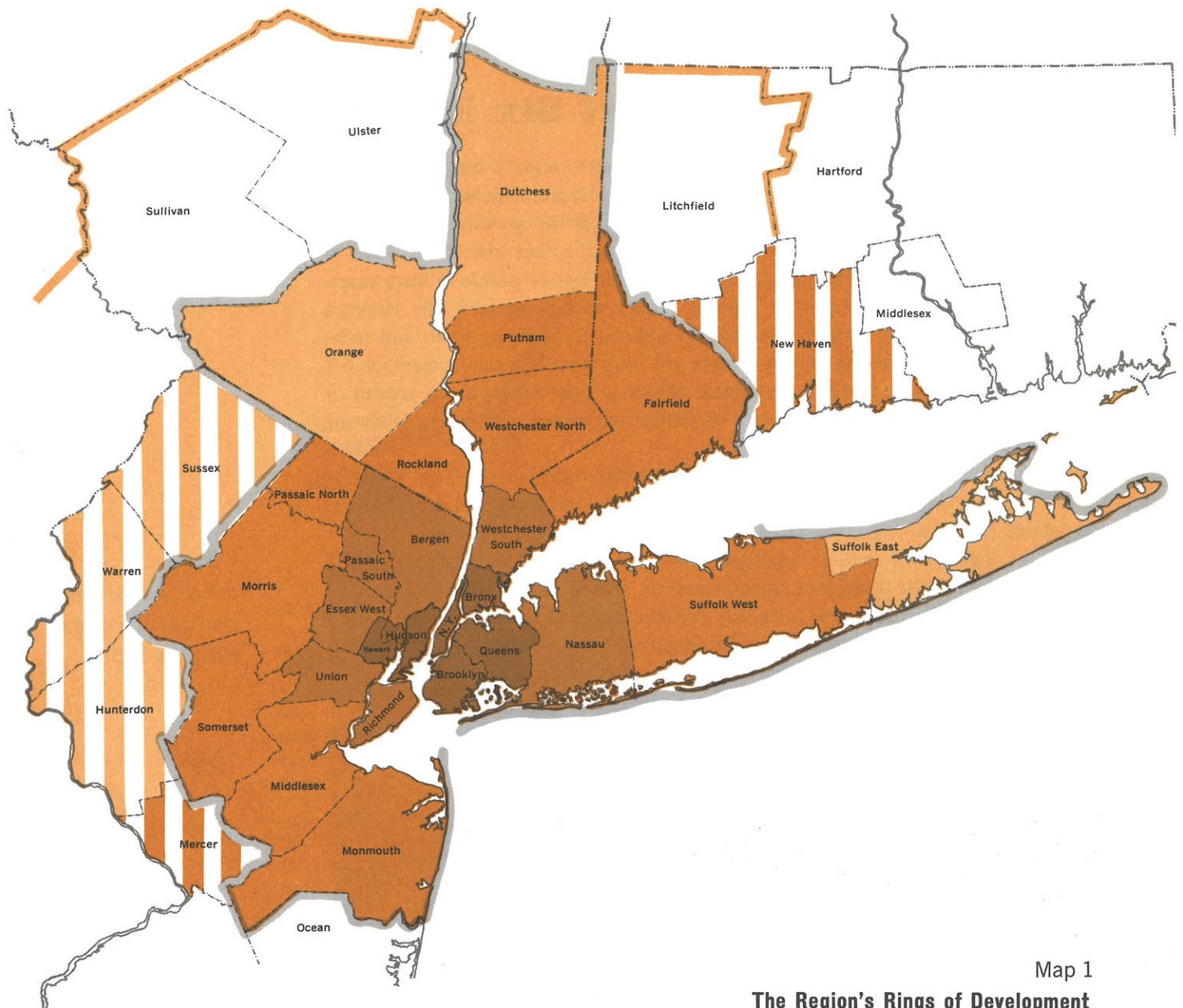
Map 1

The Region's Rings of Development

References will be made in this report to the four rings of development. These are modifications of the three rings introduced in Regional Plan Association's Bulletin 87, **People, Jobs and Land, 1955-1975**, which were adopted by the Harvard Study.

CORE: Bronx, Brooklyn, Hudson, Manhattan, Queens and the City of Newark
    10 to 15 miles from Times Square; bulk of development occurred between 1890 and 1950; 1960 population 8.6 million at average density of 31,000 persons/sq. mi. of committed land (developed land and public open uses); has been losing population since 1950.

INNER RING:[1] Bergen, Essex West, Nassau, Passaic South, Richmond, Union, Westchester South
    15 to 25 miles from Times Square; bulk of development between 1920 and 1960; 1960 population 4.3 million at average density of 6,500 persons/sq. mi. of committed land; absorbed most of Region's population increase 1950 to 1960, but vacant land is nearly exhausted and rate of growth will decline sharply.

INTERMEDIATE RING:[1] Fairfield, Middlesex, Monmouth, Morris, Passaic North, Putnam, Rockland, Somerset, Suffolk West, Westchester North
    25 to 50 miles from Times Square; bulk of development since 1925; 1960 population 2.8 million, at average density of 2,300 persons/sq. mi. of committed land; rapid growth 1950 to 1960; will take the brunt of the Region's population expansion over next 25 years. The counties of Mercer and New Haven, while outside the Region as currently defined, have some characteristics common to the Intermediate Ring.

OUTER RING:[1] Dutchess, Orange, Suffolk East, (Hunterdon, Sussex, Warren)
    50 to 75 miles from Times Square; 1960 population 425,000 at average density of 1,500 persons/sq. mi. of committed land; subject to substantial overspill of population, including latter three counties which are not in the Region as currently defined.

Boundary of counties with major vacation, overnight recreation and water supply facilities used by the Region.

[1]For counties which are split by ring boundaries, their inner portions extend outward to include the following municipalities: Wayne Township in Passaic County, City of White Plains and towns of Greenburgh and Harrison in Westchester County, and Town of Brookhaven in Suffolk County. Essex West includes the entire county except Newark.

The Region We Are Drifting Into 2

If, as we believe, the most reasonable assumptions about future growth indicate a regional population increase of six million by 1985, the next question, and the question which is the paramount concern of this report, is how will these people and their activities arrange themselves within the Region? Where will people live and work? How will they travel to work, to shop, to recreation? How much land will their houses and activities occupy? What will it all cost?

This report will explore the regional pattern that will result if the economic forces shown by the Harvard Study continue and if the Region develops according to its only legally enforceable land use policy, the composite of local zoning.

The Harvard Study produced a distribution of population and jobs within the Region based on economic considerations. In addition to translating these economic factors into their physical and fiscal implications, this report revises the distribution of people and jobs projected by the Harvard team by adjusting it to present municipal zoning ordinances. In sum, the report sketches the kind of region which will result if present economic trends and public land development policies continue.

In reading these projections it must be borne in mind that the economic forces and zoning restrictions on which they are based can be modified by new private and public development policies. The region we are drifting into, described in this report, should not be accepted as inevitable.

Chart 4

The Region's Population by Ring, 1860 to 1985
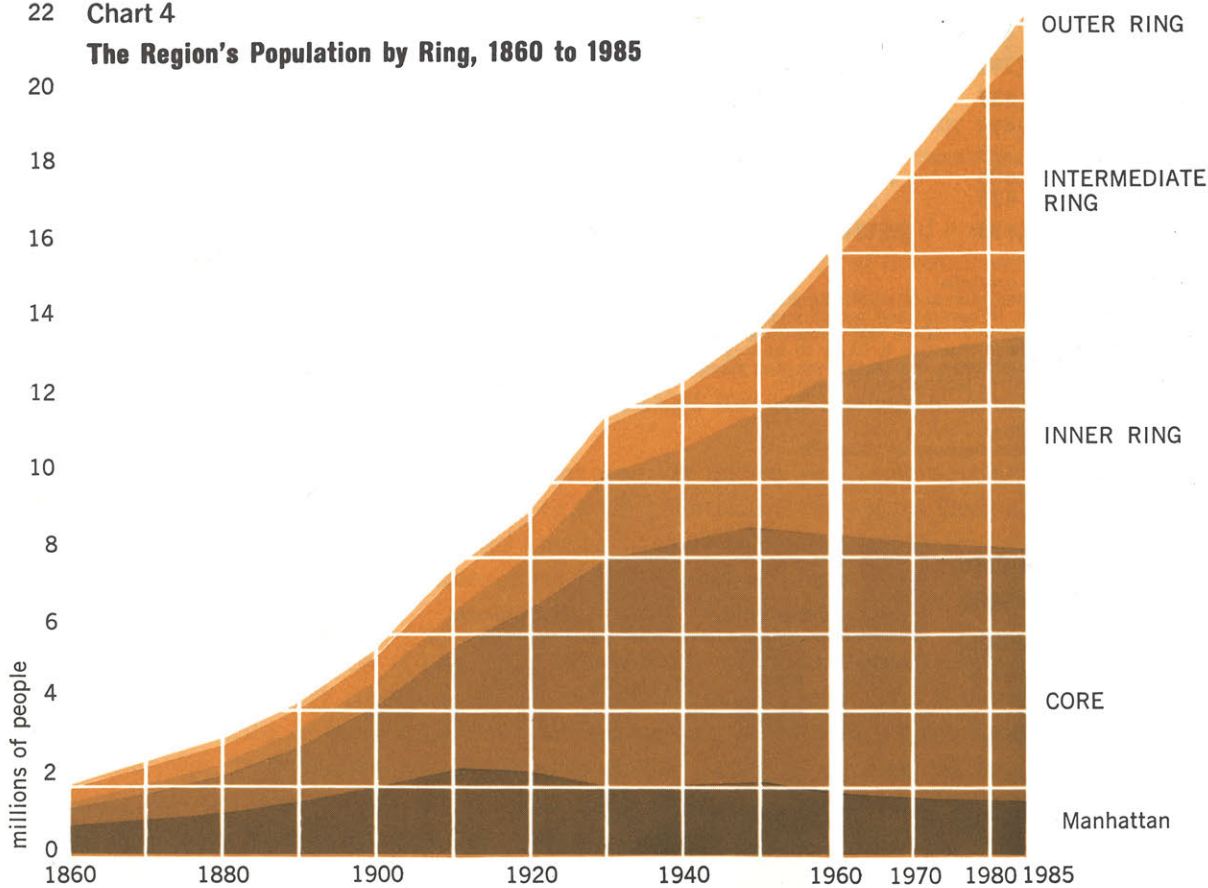
Source: U.S. Census and R.P.A.
(Tables 4 & 5)

Table 1

Population and Employment, 1960 and 1985[1], and Zoned Capacity of Vacant Land, 1960[2], by County (in thousands)

	Population 1960 (Census)	Population 1985	Population Increase 1960-1985	Population Capacity of Vacant Land Based on Zoning	Employment 1960	Employment 1985	Increase in Mfg. & Wholesale Employment 1960-1985[3]	Employment Capacity of Vacant Land Zoned for Industry[4]
Connecticut								
Fairfield	654	1,150	496	621	262	379	46	73
New Jersey	**4,399**	**7,315**	**2,916**	**3,149**	**1,645**	**2,653**	**413**	**1,132**
Bergen	780	1,110	330	295	233	395	86	137
Essex	924	1,010	86	108	421	478	26	36
Hudson	611	540	−71	17	278	314	23	153
Middlesex	434	1,020[5]	586	586	152	340	67	371
Monmouth	334	1,185[5]	851	851	82	230	31	83
Morris	262	880[5]	618	651	72	206	24	181
Passaic	407	570	163	259	162	268	63	53
Somerset	144	385[5]	241	297	45	104	20	97
Union	504	615	111	85	201	318	72	76
New York	**11,086**	**13,705**	**2,619**	**10,724**	**4,809**	**5,844**	**217**	**462**
Dutchess	176	350	174	2,543	64	125	34	33
Nassau	1,300	1,510	210	180	359	458	25	35
Orange	184	395	211	3,368	60	122	28	76
Putnam	32	135	103	562	8	24	4	25
Rockland	137	350	213	182	38	116	33	36
Suffolk	667	2,005	1,338	2,820	146	459	85	176
Westchester	809	1,235	426	539	258	384	40	17
N.Y. excl. N.Y.C.	**3,304**	**5,980**	**2,676**	**10,195**	**932**	**1,688**	**250**	**398**
Bronx	1,425	1,350	−75	n.c.	239	264	13	n.c.
Brooklyn	2,627	2,450	−177	n.c.	648	635	−14	n.c.
Manhattan	1,698	1,475	−223	n.c.	2,522	2,670	−71	n.c.
Queens	1,810	1,925	115	n.c.	428	480	13	n.c.
Richmond	222	525	303	530	41	107	25	65
New York City	**7,782**	**7,725**	**−57**	**n.c.**	**3,877**	**4,156**	**−33**	**n.c.**
Region excl. N.Y.C.	**8,357**	**14,445**	**6,088**	**13,965**	**2,839**	**4,720**	**709**	**1,603**
Core	8,576	8,130	−446	n.c.	4,415	4,651	−29	n.c.
Inner Ring	4,333	5,675	1,342	1,434	1,342	2,002	298	357
Intermediate Ring	2,805	7,420	4,615	5,829	828	1,934	330	938
Outer Ring	425	945	520	7,214	132	289	77	200
REGION TOTAL	**16,139**	**22,170**	**6,031**	**14,495[6]**	**6,716**	**8,876**	**676**	**1,667[6]**

1. If present trends and policies continue.
2. Derived principally from aerial photographs and zoning ordinances dated between 1959 and 1961.
3. Excludes employment changes in central and administrative offices.
4. Assumes 15 employees per acre in the Core and Inner Ring and 10 employees per acre in the Intermediate and Outer Rings.
5. The population pressure on these counties is likely to be alleviated by the overspill of approximately 400,000 into Hunterdon, Ocean, Sussex and Warren counties.
6. Does not include Bronx, Brooklyn, Manhattan or Queens.
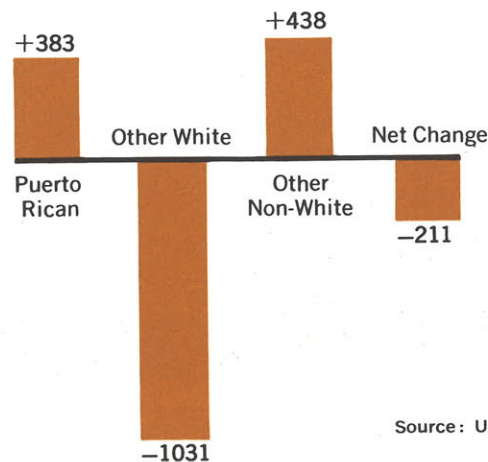n.c. Not computed.

SOURCE: Regional Plan Association
NOTE: Detail may not add to totals because of rounding.

Chart 5
Population Change in the Core, 1950 to 1960
(in thousands)

+383 Puerto Rican
−1031 Other White
+438 Other Non-White
−211 Net Change

Source: U.S. Census and R.P.A.

Not in the center. If present trends continue, there will be no population increase in the most heavily developed parts of the Region — the Core and the older suburbs of the Inner Ring (see Map 1).

The Core is already declining in population. Its central county, Manhattan, began losing population before 1920. Between 1950 and 1960 the Bronx, Brooklyn, Manhattan, Hudson County and the City of Newark also lost population. Together with Manhattan they had a net decline of 469,000 people during the decade. The remaining Core county, Queens, gained 259,000, cutting the net loss for the whole Core to 210,000, shown in Chart 5.

To show how many people actually left the Core, Chart 5 gives the net change for three major groups — Negroes, Puerto Ricans and whites other than Puerto Ricans. The net loss of 210,000 for the Core is made up of a net gain in the first two groups of 821,000 and a net loss in the latter group of 1,031,000. But even more than this number actually moved out of the Core. Table 2 shows a net out-migration of white non-Puerto Ricans (as opposed to a net change in numbers) of 1.5 million when the excess of births over deaths is included. This is still short of the total out-movement. Some Negroes and Puerto Ricans also left the Core and are doing so in increasing numbers as the level of income, education and racial mobility mounts. Moreover, since a significant number of whites moved into the Core, the actual exodus would have to show an equivalent number going out.

The population loss in the Core was not accompanied by corresponding housing vacancies; there was actually a net *increase* of over 200,000 housing units in the Core between 1950 and 1960. Those who left the Core were mainly families with children, while a large percentage of those who stayed or moved in were members of small one- and two-person households. This is borne out by the drop in average household size in the Core from 3.2 to 2.9 between 1950 and 1960.

If present trends continue, the Core will clearly not take any part of the next six million. On the contrary, barring major policy or taste changes, we expect the Core to decline by about 450,000 more persons by 1985.

Will the already developed suburbs take any of the six million? Again, *if present trends continue,* they will take very few, if any. Some intensification of development is occurring on scarce vacant parcels or on sites with values justifying a higher density. But, with few exceptions, current apartment construction in the older Inner Ring suburbs is not attracting families with children and is taking place in communities with an aging population, a declining household size and a relatively stable total population.
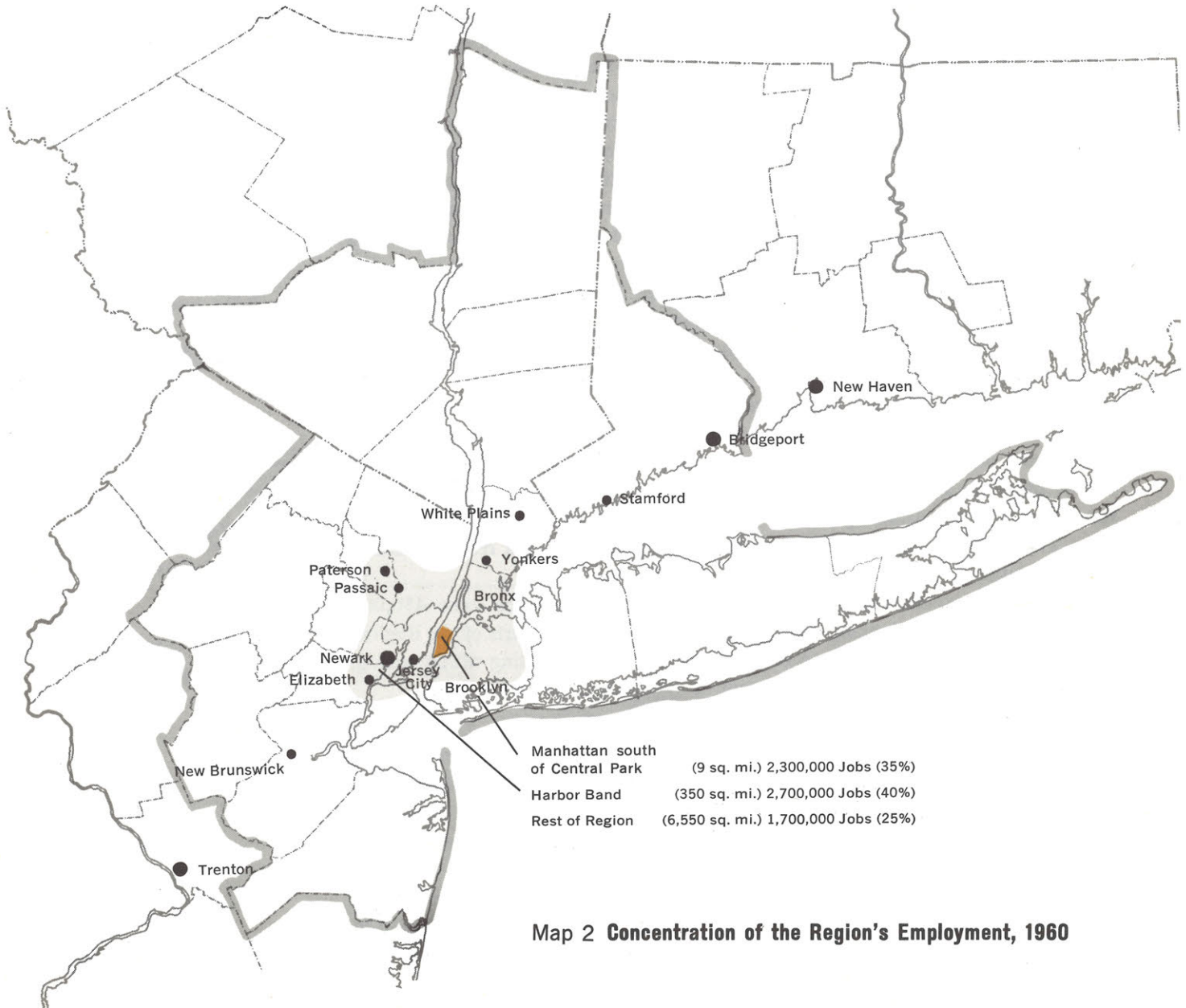
If present trends continue, therefore, the next six million plus some 450,000 leaving the Core will be looking for housing in the undeveloped parts of the Region. Since people generally try to keep the time and cost of commuting within reason, the location of jobs is a major determinant of where they will look.

The concentrating effect of jobs. The Harvard Study demonstrated that employment in the New York Region is greatly concentrated in the center. Map 2 shows that three-fourths of the Region's 6.7 million jobs are located in a tight band around New York Harbor, which comprises only 5 percent of the Region's land area. Half the Region's jobs are within 5 miles of Times Square, but it takes a 10-mile radius to encompass half the Region's residents. Jobs will continue to be relatively concentrated (see page 17), creating a demand for housing in close-in parts of the Region as people resist longer, more expensive journeys to work.

Table 2 Net In- and Out-Movement of Core Population, 1950 to 1960

1950	Core population	8,800,000
1950-1960	Natural increase	+ 800,000
		9,600,000
1950-1960	Net in-migration of Negroes and Puerto Ricans	+ 500,000
		10,100,000
1960	Core population	−8,600,000
1950-1960	**Net out-migration of whites**	**1,500,000**

New Haven

Bridgeport

Stamford

White Plains

Yonkers

Paterson
Passaic

Bronx

Newark

Jersey City

Elizabeth

Brooklyn

New Brunswick

Trenton

Manhattan south
of Central Park   (9 sq. mi.) 2,300,000 Jobs (35%)

Harbor Band   (350 sq. mi.) 2,700,000 Jobs (40%)

Rest of Region   (6,550 sq. mi.) 1,700,000 Jobs (25%)

Map 2 Concentration of the Region's Employment, 1960

The spreading effect of zoning. The Region's individual local zoning ordinances, while not the only public policy influencing the urban pattern, are crucial because together they constitute the Region's only deliberate guide to land development. To the extent that federal and state policies can be inferred from highway, mortgage insurance and other programs, they are not in conflict with local zoning, although recent urban mass transportation and open space legislation begin to suggest some change. How does local zoning policy in the Region fit the economic facts projected by the Harvard Study?

As of July, 1962, there were 551 municipalities in the Region and 509 had zoning. Of the 42 which did not, 38 were in the Outer Ring in Dutchess and Orange Counties. Vacant land in the 509 municipalities with zoning covers 3,400 square miles of the Region's 4,500 square miles of vacant land. (The Region's total land area is 6,900 square miles.)

To assess the combined impact of these separate land regulations, we measured all the vacant land in the Region, applying to it more than 100 variations of lot size and use established in the Region's 509 zoning laws. Where vacant land was not zoned, we estimated its capacity on the basis of zoning in the rest of that county. The procedure and measurements are described in detail in the Appendix. The results are summarized in Table 1, Charts 6 and 7 and Map 8 in the centerfold.

To determine the capacity of vacant land to absorb population under present zoning, the 6½ million who will be seeking homes outside the Core by 1985 were divided into households and the vacant land divided into lots — allowing extra land ("oversize") for lots that will be larger than required (following the pattern of recent subdivisions) and land for streets, schools, churches, local parks and institutions.

Chart 6 shows that two-thirds of all the vacant land zoned for residence in the Region is zoned for half-acre lots or larger; nearly half for one-acre lots or larger. If the land were filled to capacity following the present zoning pattern, allowing for oversize, streets and community uses, 39 percent of new dwelling units would be on half-acre lots or larger and 21 percent on one-acre lots or larger.

Zoning varies considerably among the counties of the Region. Fairfield, Monmouth, Morris, Somerset, Rockland and Westchester Counties each has over 87 percent of its vacant land zoned for half-acre lots or larger; Suffolk has only 27 percent and Union 34 percent (see Table 11). No county outside the Core is zoned for a significant number of apartment dwellers except Westchester, with 25 percent of its vacant land population capacity scheduled for multi-family homes, Bergen with 20 percent and Middlesex, 14 percent. At the other extreme, Monmouth, Nassau, Orange, Putnam, Rockland and Suffolk Counties have less than 2 percent of their zoned population capacity in multi-family housing.

If all the Region's residentially-zoned vacant land were developed exactly as it is zoned, that is at the minimum lot size, the average lot in the Region would be 24,000 square feet (a half-acre is 21,780 square feet). If the lots were developed at the same rate of oversize (excess over the zoned minimum) as they are currently, the average actual lot size would rise to 29,000 square feet. When the essential streets and community uses are added at present rates of land consumption, the gross land area needed per household would average 35,000 square feet, or over three-fourths of an acre.

As Table 13 (next-to-last column) shows, the average combines very large lot sizes in Somerset (averaging 66,000 square feet), Fairfield (59,000) and Westchester (52,000) and relatively small lots in Suffolk (17,000) and Union (16,000).

Chart 6

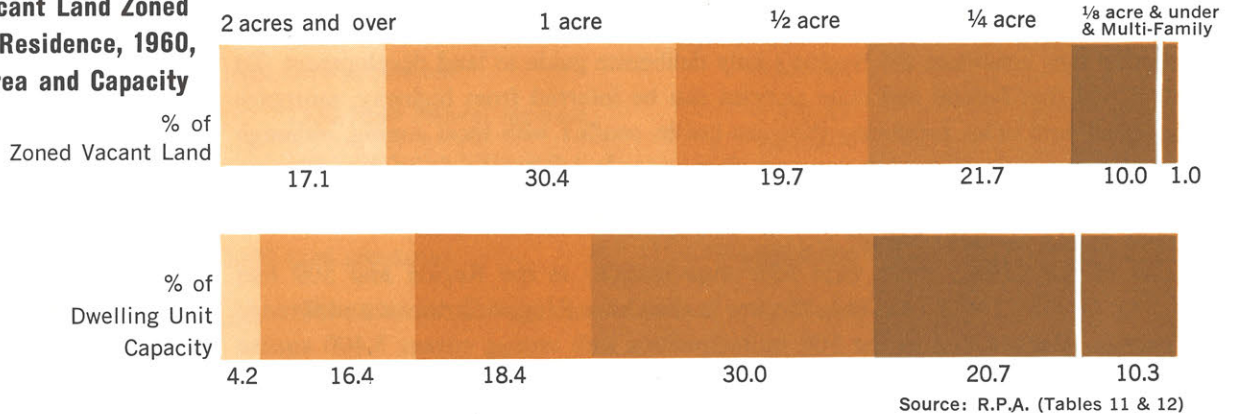**Lot Size of Vacant Land Zoned for Residence, 1960, by Area and Capacity**

2 acres and over	1 acre	½ acre	¼ acre	⅛ acre & under & Multi-Family

% of Zoned Vacant Land

17.1	30.4	19.7	21.7	10.0	1.0

% of Dwelling Unit Capacity

4.2	16.4	18.4	30.0	20.7	10.3

Source: R.P.A. (Tables 11 & 12)

Chart 7

Population Increase, 1960 to 1985 vs. Zoned Capacity. 1960, by Ring (in thousands)

■ Population Increase   ■ Zoned Capacity

New Jersey

Inner Ring: 609 / 548
Intermediate Ring: 2,392 / 2,582

New York and Connecticut

Inner Ring: 732 / 886
Intermediate Ring: 2,222 / 3,246
Outer Ring: 520 / 7,214

Source: U.S. Census and R.P.A. (Table 1)
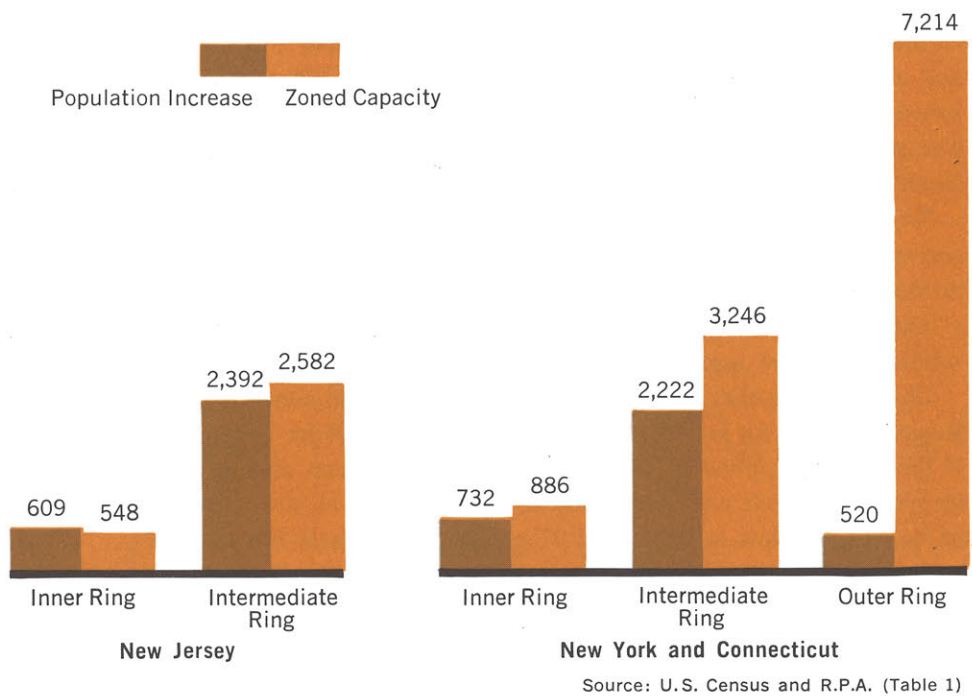
Chart 8

Single Family vs. Multi-Family Dwelling Units Authorized by Building Permit, 1957 to 1961, by Ring

	Core	Inner Ring	Intermediate Ring	Outer Ring	Region	Nation
Single Family	6%	63%	88%	92%	46%	81%
Multi-Family	94%	37%	12%	8%	54%	19%

■ Single Family
■ Multi-Family

Source: U.S. Census and R.P.A. New Homes series.

12
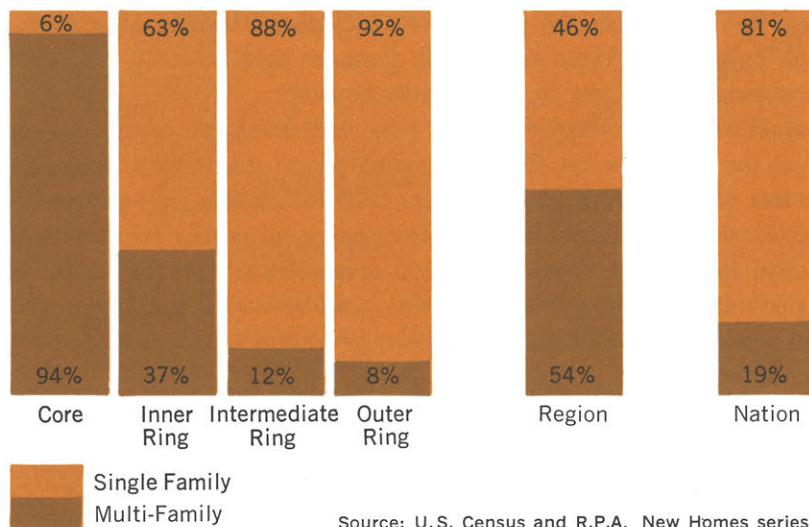
This is far more land than has been allocated to dwelling units in the past. The average actual lot size of 29,000 square feet called for by present zoning would mean 1½ households per net acre of lot area. Levittown, Long Island, built in the late 1940's, has 6,000 square-foot lots or 7 households to the net acre. Two-family houses and garden apartments range from 10 to 50 dwellings per net acre. Going back to the turn of the century, the typical new residential building was a tenement which housed from 200 to 500 dwelling units per net acre.
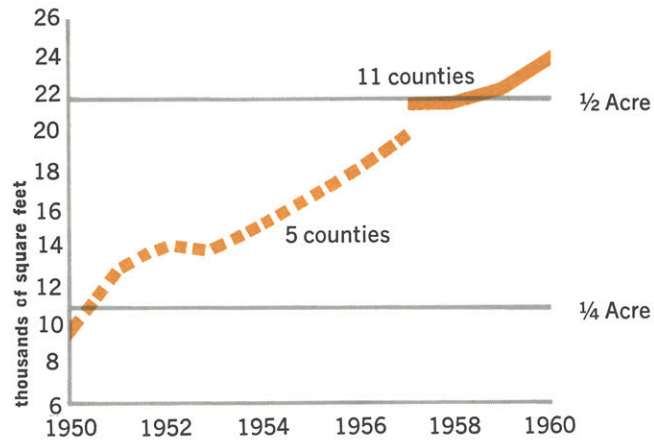
Where would the population live if it settled according to the present zoning pattern? Chart 7 shows, by ring, the relationship of the theoretical population capacity of zoned vacant land (based on gross area per lot, that is, lot size plus streets and community facilities) and the population projection assumed in this report. The population projection for each county, as explained in the Appendix, derives mainly from the using up of zoned capacity outward from the center, modified by considerations of job location and accessibility. Based on these factors, land was allocated until the six million total population increase plus the 450,000 exodus from the Core were distributed. This pattern would absorb 94 percent of the vacant land capacity of the Inner Ring, 79 percent of the Intermediate Ring and 7 percent of the Outer Ring. If the New Jersey counties develop as zoned, some of the new population will have to spill over into a tier of counties not now considered part of the Region: Sussex, Warren, Hunterdon, Mercer and Ocean.

An important phenomenon affecting development is the incidence of smaller-lot zoning in the far reaches of the Region. Map 8 shows how two-acre zoning and higher is located relatively close in with denser zoning beyond. This pattern is especially evident on Long Island and in the northern sector. It would be further accentuated if those communities in Orange and Dutchess Counties which have zoning were shown. (They were not mapped since they constitute a minority of the municipalities in those counties.) Table 12 points up the contrast between the small-lot zoning farther out and the large-lot zoning close in: 83 percent of the zoned capacity of the Outer Ring, 41 percent of the Intermediate Ring and only 32 percent of the Inner Ring is in single-family lots of a quarter-acre or less.

We may conclude that the effect of the mosaic of the Region's local zoning ordinances is to spread the population far from the present and projected jobs which are likely to be relatively concentrated toward the center. First, because vacant land is zoned for such large lots that the cumulative effect of developing these lots would be to consume vast areas, hence to push residences great distances outward. Second, because the small lots zoned for the outer fringes of the Region are likely to attract people who cannot afford or do not like large lots.
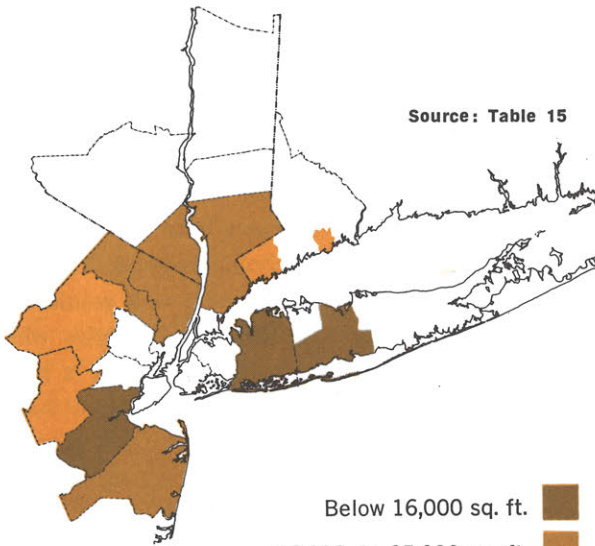
Recent development trends. Though the recent trend toward apartment construction may appear to be the Region's response to large-lot zoning and centralized industry, it really is not. It is mainly a function of the age of the population (coupled with a rush to build apartments in New York City between the passage of the new zoning ordinance and its enforcement in December, 1961). Most of the apartments are occupied by one- and two-person families — young people out of school but without a family of their own and older people whose children have grown. Both groups have been increasing in number and, in this Region, they characteristically live in apartments. It is this increased demand for apartments and the simultaneous decrease in demand for one-family houses that dramatically raised the percentage of building permits issued for multi-family housing units from 36 percent in 1957 to 67 percent in 1961. The fact that three-fourths of the apartments were built in the Core between 1957 and 1961 (Chart 8) at the same time as the Core was

Chart 9
**Average Lot Size in Subdivisions,
1950 to 1960, in
Selected Counties in the Region**

26
24
22
20
18
16
14
12
10
8
6

thousands of square feet

11 counties

½ Acre

5 counties

¼ Acre

1950   1952   1954   1956   1958   1960

Source: Table 15

Map 3
**Average Lot Size in Subdivisions,
1957 to 1960, by County**

Source: Table 15

Below 16,000 sq. ft.

16,000 to 25,000 sq. ft.

Over 25,000 sq. ft.

Map 4
**Zoned Average Lot Size
on Vacant Land,
1960, by County**
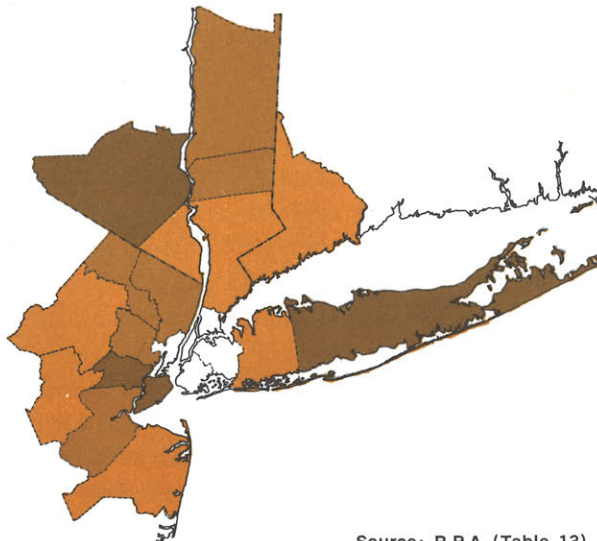
Source: R.P.A. (Table 13)

14

losing population underscores the failure of the apartment boom to slow the outward spread of population.

It is the housing demand of families with children which will primarily determine the shape and spread of the Region. Indications are that the present housing demand of this group is for single-family homes. Therefore, the current trend in lot size of one-family houses provides the only glimpse of the emerging settlement pattern.

Table 15 presents the average lot size in new subdivisions by county; it shows a range in the 1958 to 1960 period from an average in Somerset County of 39,000 square feet down to Middlesex, Nassau and Suffolk's 10,000 to 12,000 square-foot average.

Chart 9 indicates that the average rose steadily from 1950 to 1960. On the other hand, an examination of Maps 3 and 4 and Chart 10 shows that subdividers have most often chosen the smallest available lots. Out of all the lots subdivided between 1958 and 1960 in counties for which we have data, three-fourths were a quarter-acre or less in size, whereas out of all the lots that might have been subdivided on the vacant land in these same counties, only half are this small.

The data show that the supply of vacant land close to the center which is zoned for lots of half-acre or smaller is being consumed first. It is virtually exhausted. The big question is, what will happen when the only choices people have are large lots in "spread-city" pattern within manageable distance of jobs or more manageable size lots (more economical in up-keep time and nearer to schools and shops) which are quite far from jobs. These will be the choices *if present trends and policies continue*. The real test of their adequacy will come when housing demand by families with children, which is currently at about half the level of the early 'fifties, makes its sudden jump a few years from today.

Chart 10

Lot Size in Current Subdivisions vs. Zoned Lot Size on Vacant Land,

for Selected Counties in the Region[1]   (square feet)
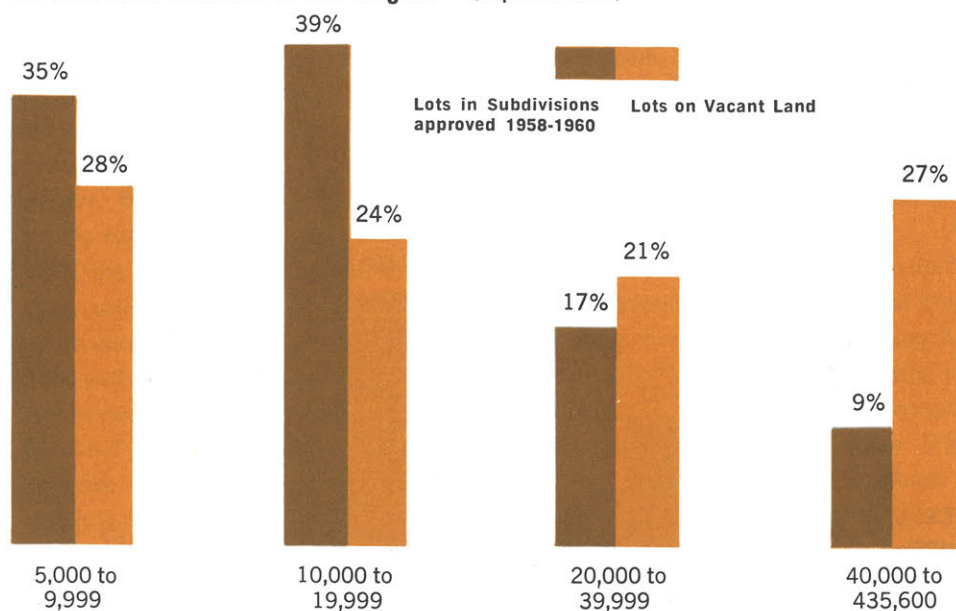
1. For same 11 countries as Table 15.
2. Includes less than 1% of lots under 5,000 sq. ft.
Source: R.P.A.

15

Chart 11
Employment in the Region, 1960 and 1985, by Ring

2.0%
12.3%
20.0%
65.7%

3.3%   Outer Ring
21.8%   Intermediate Ring

22.6%   Inner Ring

52.3%

Core

Source: R.P.A.

1960   **1985**
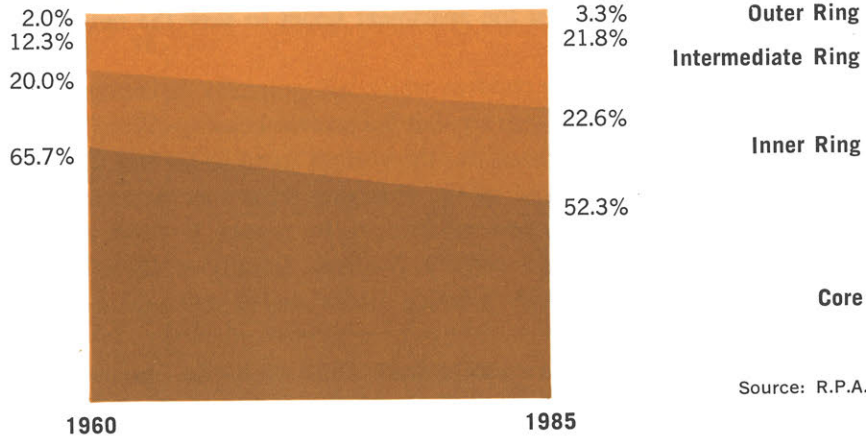
Chart 12
Industrial Employment Increase, 1960 to 1985 vs. Zoned Industrial Capacity, 1960, by Ring
(in thousands)

Employment Increase in   Zoned Industrial Capacity
Manufacturing and Wholesaling

704

228   256

155

70   101

171   235

77   200

Inner Ring   Intermediate Ring

New Jersey

Inner Ring   Intermediate Ring   Outer Ring

New York and Connecticut
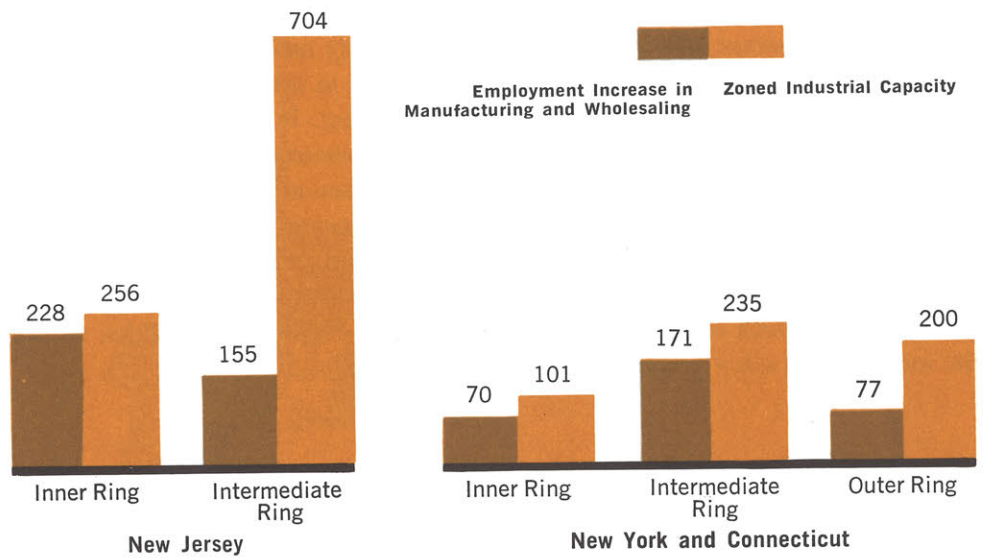
Source: R.P.A.   (Table 1)

Chart 13
The Growing Separation of Home and Workplace

Increase in Employment,   Increase in Resident
1960-1985   Labor Force, 1960-1985
(in thousands)

1,606

1,106

660

412

236

0

157   200

Core   Inner Ring   Intermediate Ring   Outer Ring
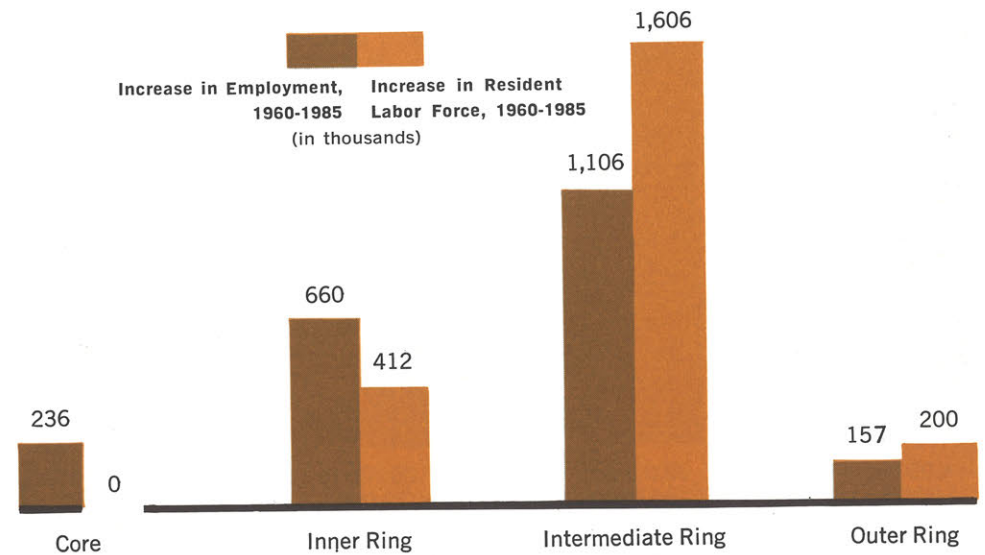
Source: R.P.A.

Between 1960 and 1985 the Region's employment is expected to rise by 2.2 million over its present 6.7 million. In contrast to the population projections, the county employment distribution is based more on economic forces than on zoning. This is because zoning is more readily changed to accommodate the needs of job location than of housing. This trend is assumed to continue. The economic forces are those identified by the Harvard Study, whose method of distributing jobs is closely followed in this report and is described in the Appendix, accompanied by Tables 7, 8 and 9. The employment figures are summarized in Table 1, page 8.

The employment pattern of the New York Region is remarkably concentrated at the center. Most of the activities in which the Region plays a dominant national role — such as finance, insurance, corporate headquarters, communications, international trade, wholesaling, apparel, printing and nonprofit organizations — are the kind that locate primarily in the center. By contrast, the national market activities of many other metropolitan areas are of a sort that locate in a dispersed fashion: for example, aircraft in Los Angeles, steel in Pittsburgh, autos in Detroit, metals and food processing in Chicago.

The locational factors associated with each type of industry (see Appendix) suggest that this Region's key industries will continue to want to stay in or close to the center. This is not to say, by any means, that there will not be substantial increases in economic activity away from the center. While industries like those listed in the preceding paragraph will continue to expand in the Core, other important industries in the Region, such as chemicals, drugs, electronics, auto assembly and scientific research, which will also increase in employment in the Region, are not tied to a central location. There are also numerous service and other jobs which are directly related to where people live and these will follow the population into the outer areas if it goes there. The net result will be a significant jump in Intermediate and Outer Ring jobs, shown in Chart 11, but a still faster increase in population in those rings (Chart 13). *If present trends and policies continue,* only about half of all new jobs in the Region will locate in the Intermediate and Outer Rings, but these rings will get 85 percent of the population increase.

One important attribute of our Region's relatively concentrated economic activity is that it helps make possible a broad array of cultural activities which are enjoyed by the whole Region. It produces a more unified Region. A strong core area means that the outlying parts of the Region are closely linked to the center, even if the links are often indirect. This greatly limits the "leapfrogging" of patches of intensive development which is found in metropolitan areas with more tenuous ties to their centers. While we are getting a spread pattern due to large house lots, it is not greatly extended by discontinuous development.

Of the total rise in the Region's employment, 672,000 jobs are estimated to be in manufacturing and wholesaling. For economic efficiency, about 300,000 of these goods-handling jobs should locate in the Inner Ring. Local zoning in this ring has allocated enough land for industry to employ some 360,000 (Chart 12 and Table 1). But in two Inner Ring counties, Nassau and Westchester, the industrial employment potential far exceeds industrial zoned capacity. In the New Jersey Inner Ring counties a great deal of the vacant land zoned for industry is marshland, much of which is either unsuitable for this sort of development in the absence of large-scale public measures or attracts primarily warehousing and other distributive activities with low employment density. As Chart 12 suggests, the Intermediate and Outer Rings have sufficient land zoned for industry, but the Inner Ring counties will be hard pressed to change their zoning to accommodate their share of such jobs.

Map 5
The Changing Density Pattern,
by County

1920
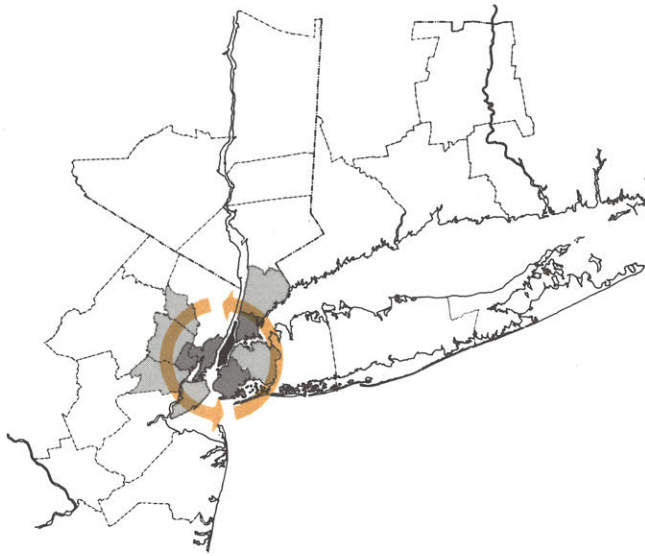
1960
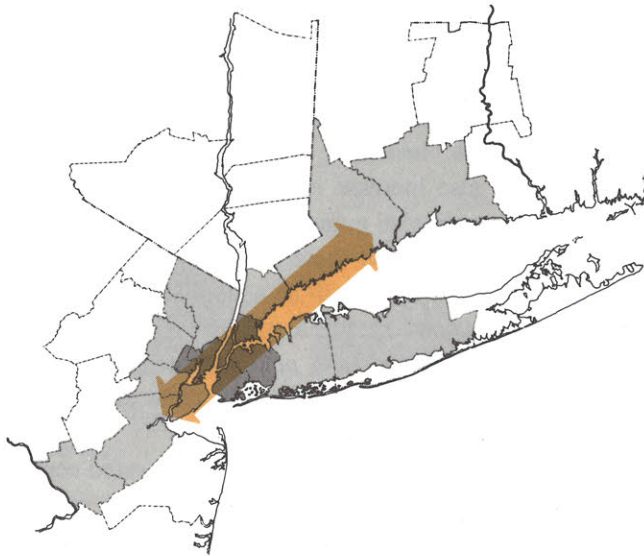
1985

Persons per square mile

Over 100,000

10,000 to 100,000

1,000 to 10,000

Under 1,000

Source: U.S. Census and R.P.A.

More leisure time, rising real incomes and an expanding highway system are likely to lead to rapid increases in car ownership. It is expected that these factors will stimulate an increase in the number of motor vehicles in the Region from 4½ million in 1960 to 8 million in 1985. So while population goes up by 38 percent, automobiles will increase by 78 percent.

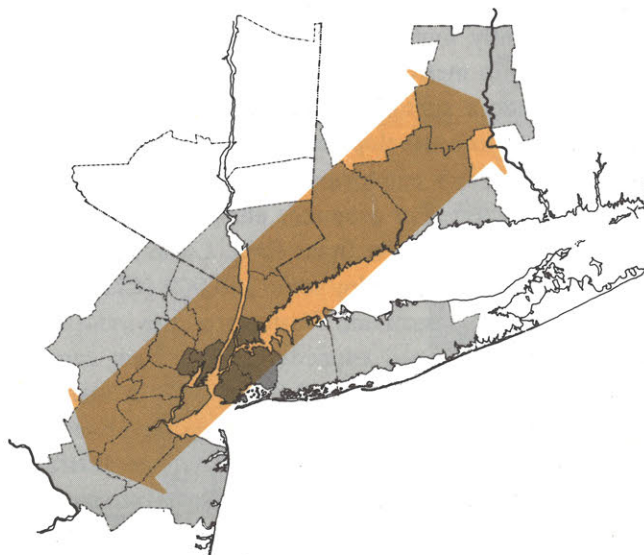However, the rise in auto ownership does not necessarily reflect future travel patterns and the amount of car miles travelled. These will be determined by the way the Region is developed — by the relationship between jobs and residences and by the density of residential development. The widening separation of home and work-place, shown in Chart 13, and the low densities which are reflected in the Region's residential zoning would greatly increase the reliance on travel by automobile. Public transportation cannot serve a "spread-city."
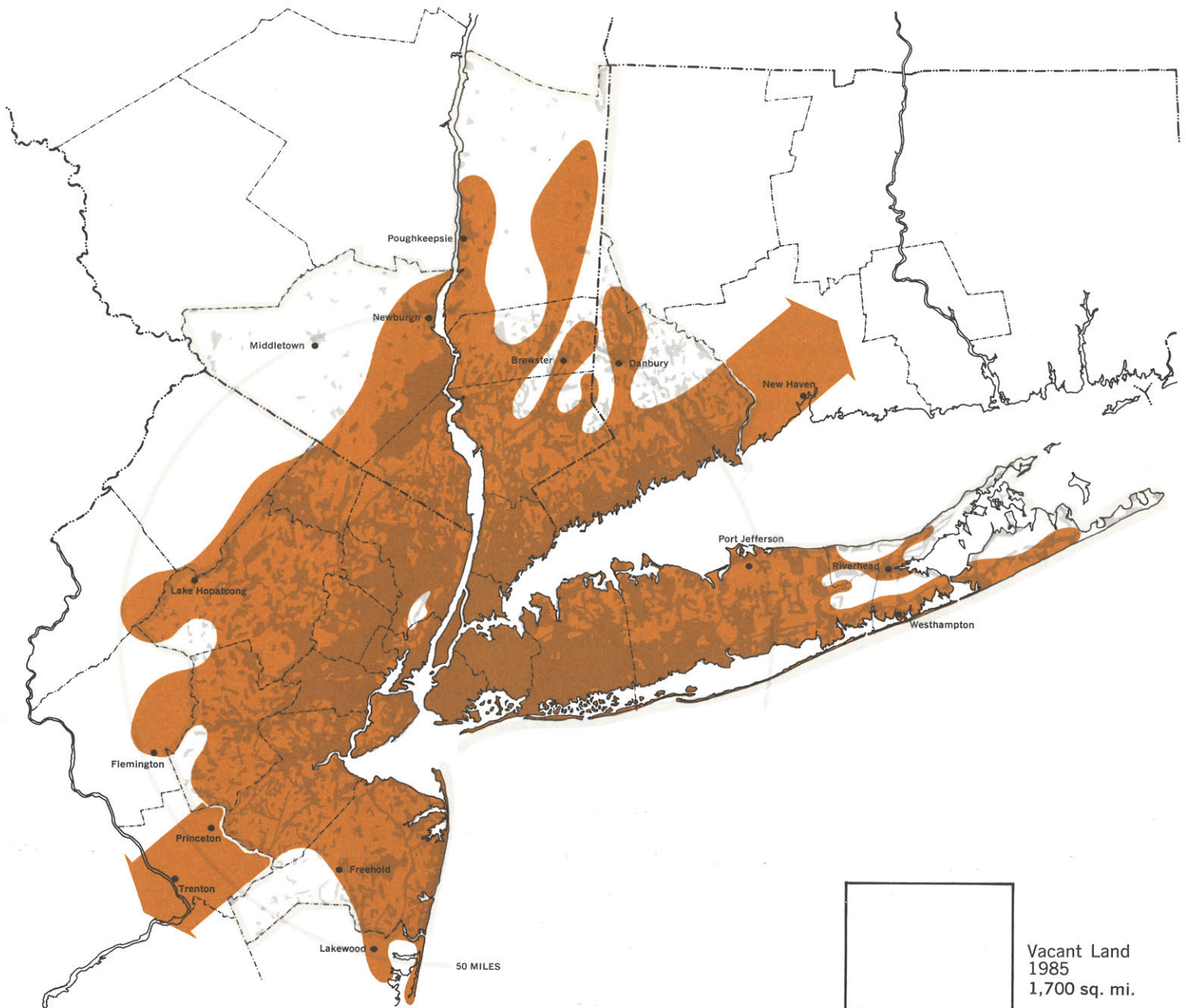
The journey to work. While the decline in population and the increase in employment in the Core (especially white collar jobs) assure a continuing and perhaps expanded demand for public transportation to work at the Region's center, work trips in the newly-developed portion of the Region will be virtually all by auto and over relatively long distances. The great rise in the labor force living in the Intermediate Ring, which will receive the bulk of the Region's new population, contrasts with its smaller share of the Region's new jobs. This means considerable journey-to-work movement inward.

It is true that today's population already spreads outward farther than jobs. But the prospect for 1985 indicates far greater separation of jobs and workers. This is only partly demonstrated by a comparison of numbers of workers and jobs in each ring, as in Chart 13. The Inner and Intermediate Rings are very large (1,000 and 3,600 square miles, respectively), so that movement *within* the rings can also mean substantial separation between home and work. The lower the job density, the fewer persons can live near them. When the 1985 employment projection is applied to the rings, the gross employment densities are 15,000 jobs per square mile in the Core, 2,000 in the Inner Ring and only 500 in the Intermediate Ring. While jobs will not be located in every part of each ring, these gross densities are indicative of the comparative spread of employment.

Because both residences and jobs will be highly dispersed, the great amount of inter-county commuting and many of the journeys to work within the same county will have to be by car and most often only by the driver. It is estimated that the Region we are drifting into would require at least a doubling of the Region's 960 miles of limited-access highways now in use or under construction, or at least half again as much as the 630 miles of expressways that are in the published plans of the Region's highway agencies.

Chart 13 implies a theoretical measure of transportation needs if all the jobs in each county are held by residents of that county and only the excess labor force works elsewhere. But we know that there is a good deal of cross commuting. Even today, tens of thousands of Core residents who work in the suburbs pass tens of thousands of suburbanites coming to work in the opposite direction each morning.

In large part, this is due to two anomalies. First, at the same time that a substantial number of plants with lower-paid jobs are settling farther out, the large-lot zoning in these places implies a price of housing which is not within reach of these workers. Since many Negroes and Puerto Ricans hold these jobs, there is often resistance for racial and ethnic reasons to permitting them to live near their work. The plants themselves are usually welcomed, however, because it is assumed they will contribute

Map labels:
Poughkeepsie
Newburgh
Middletown
Brewster
Danbury
New Haven
Lake Hopatcong
Port Jefferson
Riverhead
Flemington
Westhampton
Princeton
Freehold
Trenton
Lakewood
50 MILES

Square Miles		
1,400	Net Residential Lots	Multi-Family 20
		Single Family 1,380
270	Public Rights of Way	Local 210
		Regional (Freeways) 60
220	Industrial & Commercial	Manufacturing & Wholesaling 95
		Other 125
180	Community Facilities and Institutions	Local 90
		Regional 90
730	Parks & Recreation	Local 50
		Regional 680

Vacant Land
1985
1,700 sq. mi.

To Be Developed
1960-1985
2,800 sq. mi.

Developed To
1960
2,400 sq. mi.
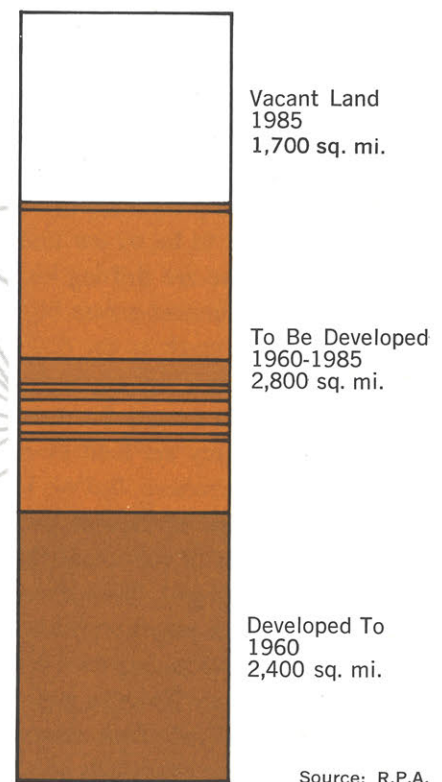
Source: R.P.A.

Map 6
Chart 14
Extent of Land Development in the Region, 1960 and 1985

to the relief of the local tax burden. Second, the higher-paid of the fast-growing office jobs in the Core draw larger numbers of people who prefer and can afford the kind of house and environment that today is only available far from their place of work.

Neighborhood trips. Local trips will also be affected by the development pattern. Under present zoning, the average lot is so large that the vast majority of residents necessarily will live beyond walking distance of schools, shopping, churches and friends. Trips for such everyday purposes will be predominantly by auto. In the new spread-city, pedestrians and school children on bicycles will be scarce indeed.

Trips for recreation. Leisure time activities, such as trips to the country and to major recreation areas, will also be affected by large-lot zoning. As residential lots get bigger, the countryside will get farther away and access to it will become more difficult and time-consuming. People seeking cultural and other activities special to the Core will also have to travel longer distances as residences spread farther outward.

The amount of land consumption. The total land area of the Region is 6,900 square miles, of which 2,400 were either developed or were permanently committed to parks or some other public use in 1960. Map 6 and Chart 14 show the committed land and also the 2,800 additional square miles of committed land which will be required by 1985 if the Region develops according to present zoning. This will be a continuous city about 100 miles across, covering everything as far as Riverhead, Long Island; Danbury, Connecticut; and Lake Hopatcong and Lakewood, New Jersey. We would use up in the next twenty-five years more land than we have developed in the 336 years since Manhattan was purchased from the Indians.

We have discussed previously the land that will be used by residences, jobs and community facilities related to residences. To this total must be added land for regional uses which locate irrespective of zoning, such as major parks, expressways and public institutions.

Table 3 distributes the principal urban uses of land in those parts of the Region for which data are available. Since the data cover nearly half the Region's committed land and come from a cross-section of high density and low density communities, the table is fairly representative of the entire Region.

Land development implications

Table 3
The Use of Developed Land in Selected Areas of the Region

	Resi-dential	Public Rights-of-way	Com-mercial	Trans-por-tation	+Indus-trial	Institu-tional	+Park	Total
50 Municipalities	37.9%	16.4%	2.6%	10.7%		32.4%		100.0%
Monmouth County (part)	44.8	21.8	3.8	4.2		25.4		100.0
Somerset County	50.0	19.1[1]	3.9	11.6		15.4		100.0
Nassau County	58.2	16.3	3.0	3.7		18.8		100.0
Rockland County (part)	32.4	13.3	5.6	4.0		44.7		100.0
Suffolk County	35.3	22.1	2.0	1.8	+2.7	19.5	+16.6	100.0
Average excluding N.Y.C.	**42.9**	**18.6**	**2.9**	**6.3**		**29.3**		**100.0**
New York City[2]	28.5	36.9[3]	2.5[4]	5.8	+3.0	7.4	+15.9	100.0
Average including N.Y.C.	**39.8**	**22.6**	**2.8**	**6.8**		**28.0**		**100.0**

1. Includes utilities.
2. Excludes land under water in N.Y.C. Department of City Planning data.
3. Includes mapped streets on vacant land.
4. Excludes ground-floor use in predominantly non-commercial structures.
SOURCE:
Recent planning reports of 50 municipalities in the Region, Monmouth Coastal Region Report #5, 1960; 1961 Annual Report of the Somerset County Planning Board; Nassau County Planning Commission, Progress Report, 1955; Rockland County Transportation Study and Highway Plan, 1960; Reports on Suffolk County Land Use, January 1962; Newsletter, New York City Department of City Planning, April 1962.

Map 7
The Region's Topography

Steep Slopes
Hills
Relatively Flat
Glacial Moraine
Wetlands
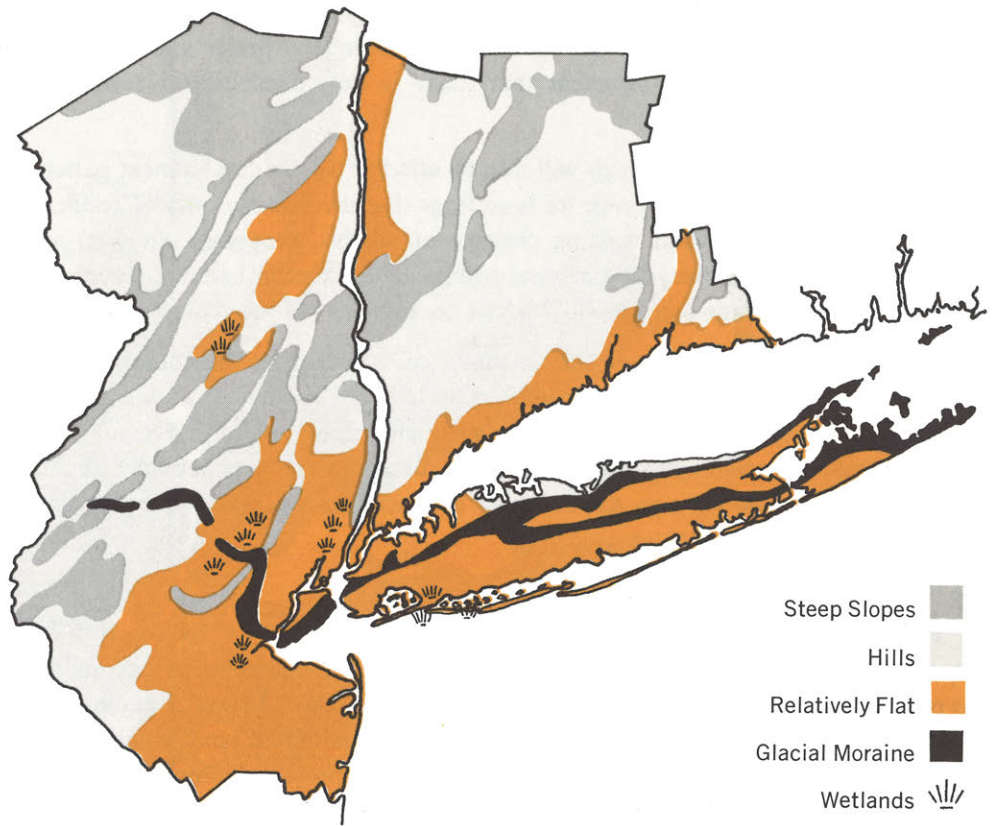
Source: U.S.G.S. and R.P.A.

Chart 15
**Density Profile
of the Region,
1920, 1960 and 1985**

West of Hudson River

East of Hudson River

100,000

10,000

1,000

persons per square mile
(log scale)

100

0

1985
1960
1920

Hudson River

75 65 55 45 35 25 15 5 0 5 15 25 35 45 55 65 75

miles

Source: U.S. Census and R.P.A.

22
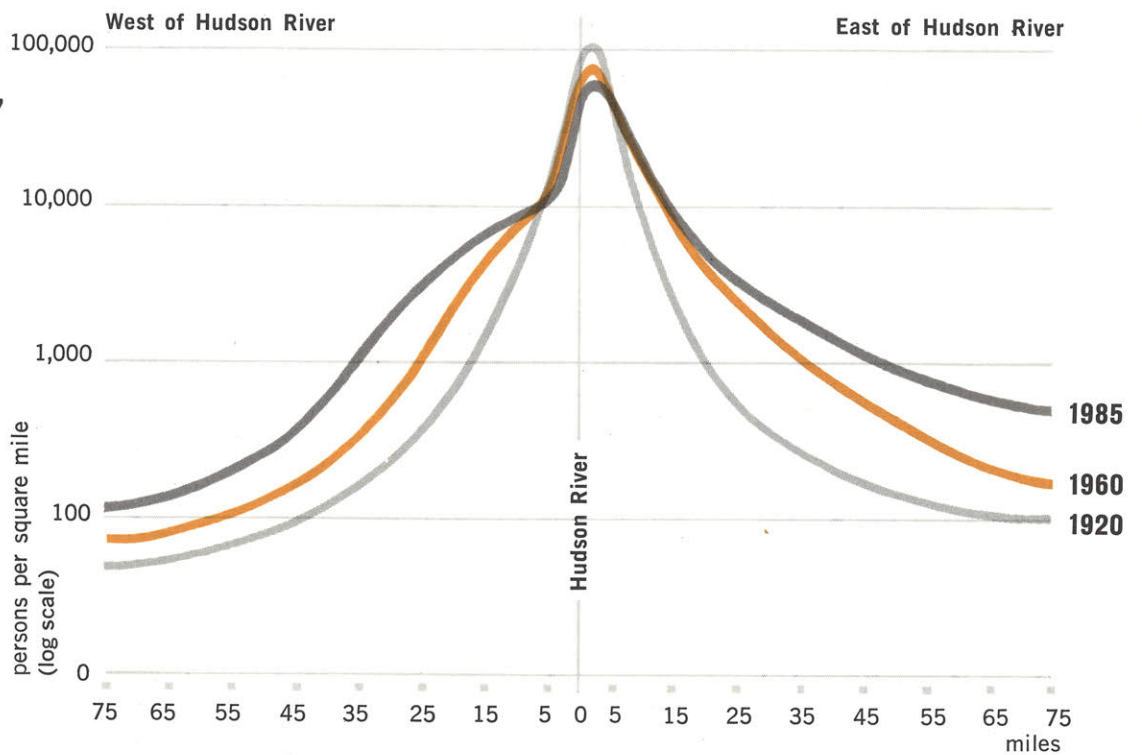
For all these places, an average of 40 percent of the developed land was used for houses and yards. Because this percentage rises as density declines, the Region's future residential lots, zoned as they are for low density, would comprise at least 50 percent of the future land consumption. This is derived from an analysis of land consumption trends in each use and is described in the Appendix. In general, the analysis shows a marked increase in per capita land needs for all uses, as exemplified by spread-out factories and shopping centers with a great deal of parking space, wider expressway rights-of-way and expanded park acquisition. But the most dramatic and by far the most significant increase remains that for residential development. Lot size per household is the crucial factor.

The direction of development. In addition to the extent of land development, it is important to consider its configuration. The pattern of urbanization within the Region is greatly influenced by its geography, which is sketched in Map 7. Water bodies are the most obvious limitation on the direction of development. The Atlantic Ocean, Long Island Sound, New York Harbor and the Hudson River can be said to take up one-third of the Region. To the north of the ocean, development is further inhibited by the results of glacial action. A terminal moraine — the end of the most recent glaciation — divides the flat, sandy, easy-to-build-on terrain nearer the ocean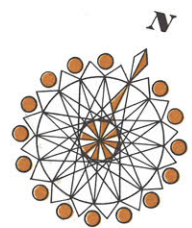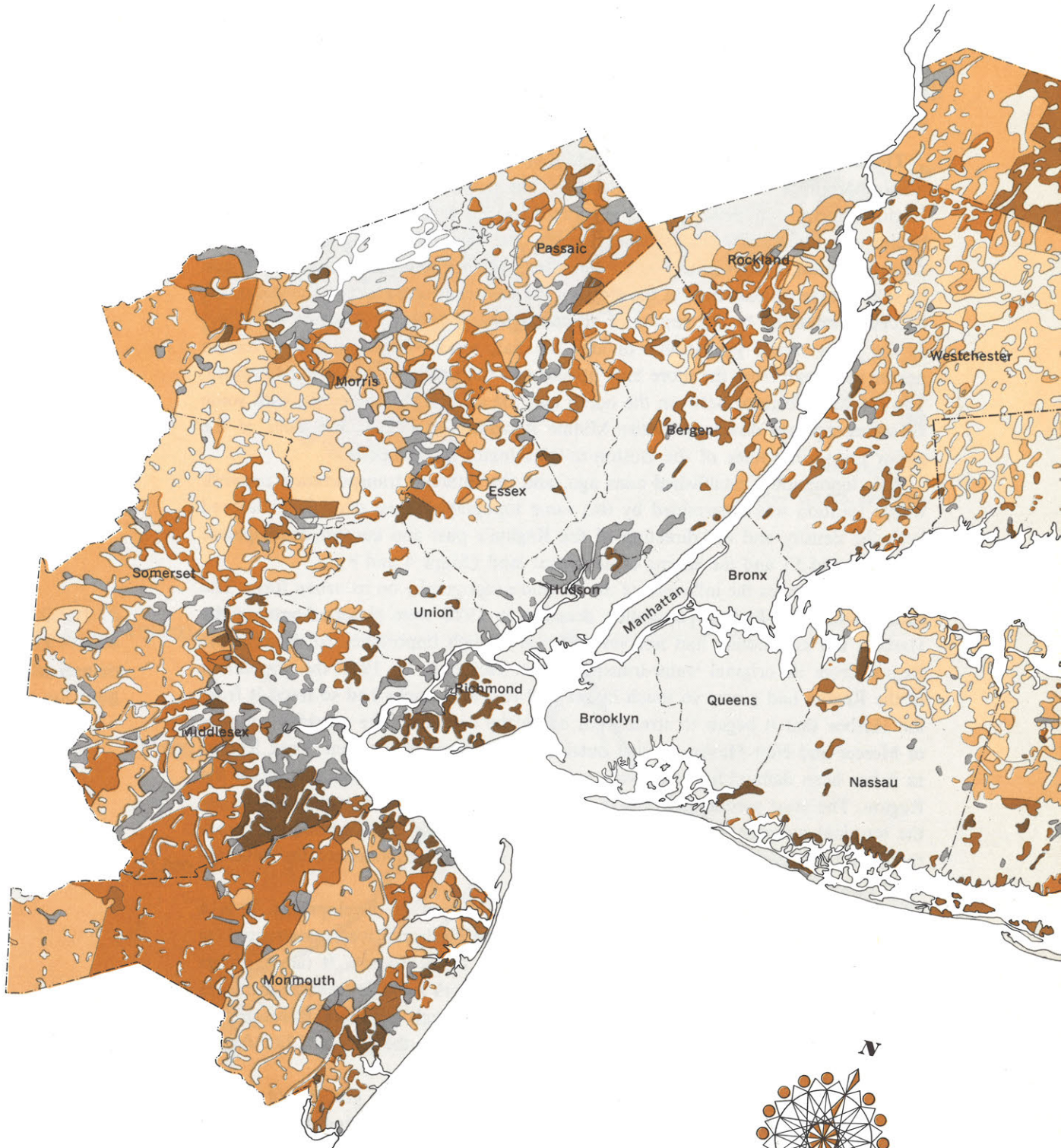 from the more hilly upland and the rugged Appalachians beyond. The resulting corridor between the ocean and the steeper slopes occurs, with some variation, up and down the entire Middle Atlantic Coast. It is the locus of the major transport routes of the Boston-to-Washington Megalopolis.

This topography, established eons ago, and the intercity transportation network whose location was determined by this same topography have strongly influenced both the density and the direction of the Region's past and current development (Maps 3 and 5) and the zoning of its vacant land (Maps 4 and 8).

Map 5 illustrates the influence of the Region's topography on its urban form. The counties with the highest population densities in 1920 were clustered around the Harbor; the automobile had not yet achieved enough importance to disperse the Region from its original water-transport base. However, by 1960 the population of the Region had grown so much bigger and cars and trucks had so freed it from the Harbor that it began to stretch out along the corridor. The corridor counties of Mercer and New Haven, though outside the influence of the New York Region as it has been defined hitherto, were growing faster than most counties inside the Region. The most spectacular growth was on the sandy soils of Long Island, below the terminal moraine. It is anticipated that the corridor's easy-to-build-on topography and intensive transportation system will continue to dominate the development pattern of the Region.

Chart 15 shows another aspect of the Region's form of development. It is a profile of population densities east and west of the Hudson River, constructed by averaging the densities of points equidistant from Times Square. It demonstrates that population growth has been greater on the New York side for the same distances and that the New Jersey part of the metropolis, though probably increasing in population as much as the New York side, will not close the gap by 1985 due to less favorable topography and access.

The additional point in this chart is the flattening out of the gradient of density on both sides of the River. The 1985 curve is one way of expressing the decline of Core population and the filling up of vacant land at low densities and at even greater distances from the center — *if present trends and policies continue.*

Passaic

Rockland

Westchester

Morris

Bergen

Essex

Somerset

Hudson

Bronx

Union

Manhattan

Richmond

Queens

Brooklyn

Nassau

Middlesex

Monmouth

N

Map 8

Zoning of Vacant Land, 1960

Putnam

Fairfield

Suffolk

Residential

2 Acres and Over	16%
1 Acre	28%
½ Acre	18%
¼ Acre	20%
⅛ Acre and Under & Multi-Family	10%
Industrial & Commercial	8%
Developed Land	
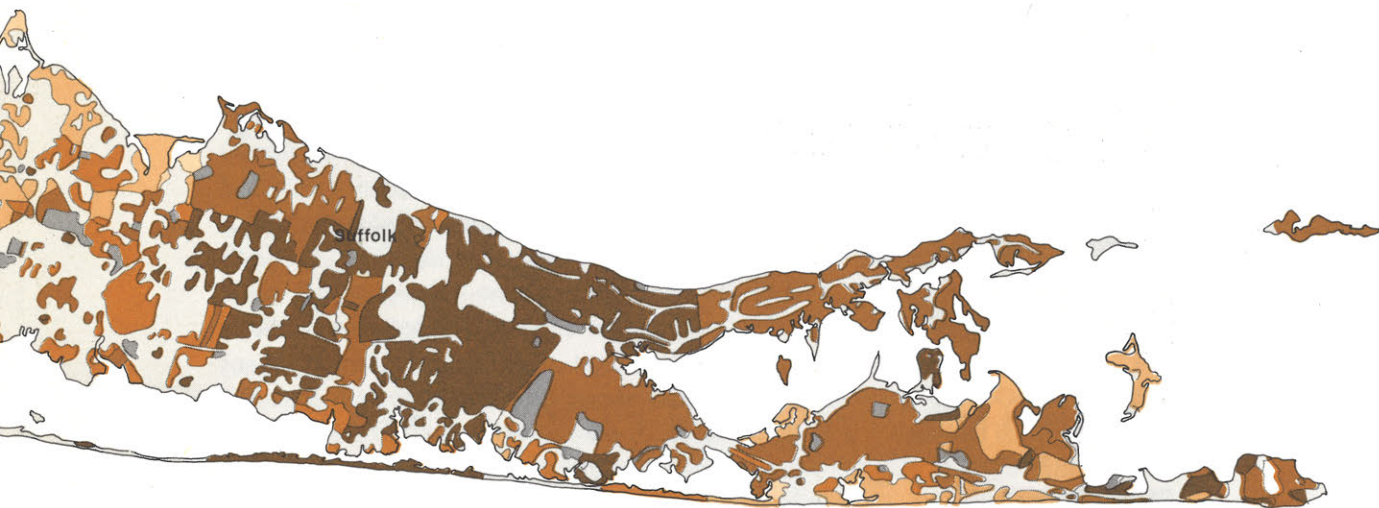
0   5   10   15   20 miles

Chart 16
**Infrastructure Costs
to Accommodate Growth,
1960 to 1985,
per Additional Household**

$7,350 Highways
(Limited Access, $5,150)   (Local Roads & Streets,
$2,200)

$2,950   Schools

$1,650   Colleges & Universities

$1,325   Water Supply & Sewerage

$1,000   Health & Welfare Activities

$ 375   Parks & Recreation

$2,200   All Other
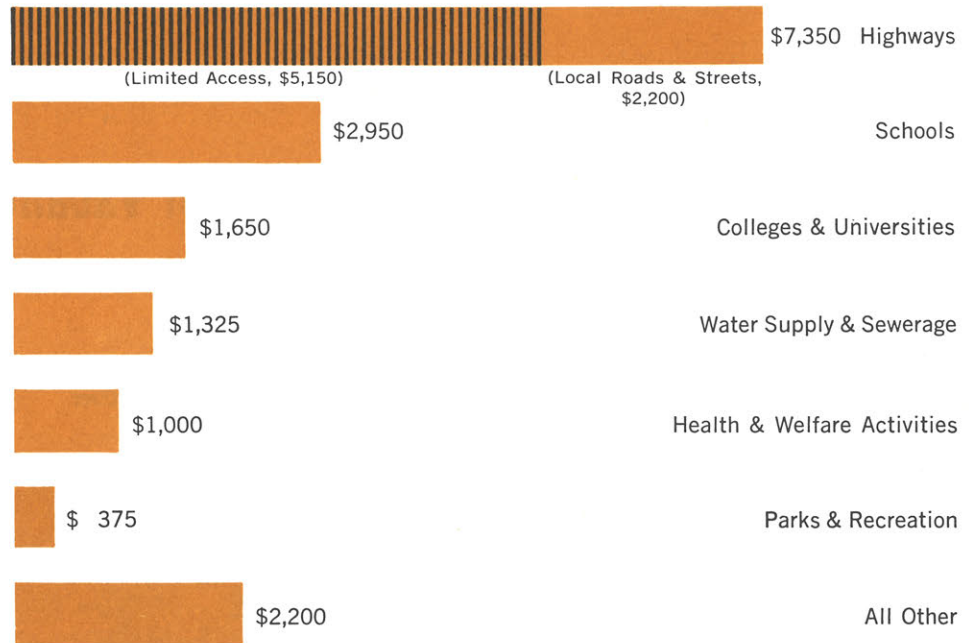
Source: R.P.A.

Chart 17
**Infrastructure Costs
of the Region, 1960 to 1985,
for Growth and Replacement**

Growth   Replacement

$14.7 billion
Highways
12.4   2.3

$ 4.2   Other Transportation
1.1   3.1

$13.1   Education
7.8   5.3

$ 4.2   Water Supply & Sewerage
2.2   2.0

$ 3.6   Health & Welfare Facilities
1.7   1.9

$ 2.7   Parks & Recreation
0.6   2.1

$ 4.2   Other Facilities
2.6   1.6
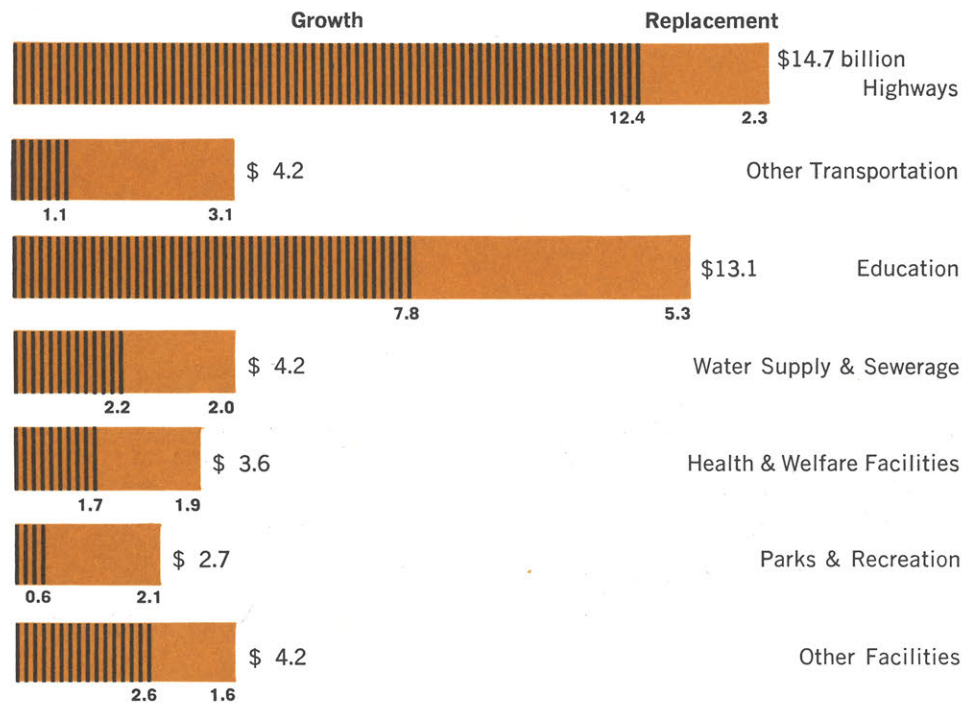
Source: R.P.A. (Table 19)

In the complex modern urban environment, a wide range of supporting facilities is needed to accommodate population and economic activity. This network of supporting facilities — known in the jargon of economic development as "infrastructure" — includes facilities for transportation and communications, water supply and sewerage, electric power and gas supply, education, health and welfare services, recreation, and all sorts of other public and quasi-public activities provided by governments, private utility companies, and religious, community and similar organizations.

The Region as a whole. Growth alone will entail heavy capital requirements for the Region no matter what development pattern is followed. But the way in which people and industries distribute themselves over the Region — the density at which they settle, the compactness or scatter of development, the extent to which growth occurs in new, outlying areas rather than by redevelopment of older areas — will affect the level and composition of capital requirements, especially for transportation facilities. From the standpoint of transportation costs alone it is clear that the capital costs of the spread-city type of Region present policies are building will be greater than they would be for other possible patterns of development.

The Region's capital requirements for the 1960-1985 period are described below. Their derivation, with a summary table, is presented in the Appendix. These calculations of capital requirements reflect the spread-city trends and policies, but very conservatively. They are the *minimum* capital outlays the Region will have to provide if it develops as it has been going in the recent past. This is in line with present programs, without radical improvements and without massive renewal of older areas. These investments would support six million more people in the Region, but not necessarily a more efficient Region or an attractive one in which to live and work.

Merely to handle growth itself in this kind of Region, ignoring for the moment all replacement and modernization costs, the Region will have to invest over the next twenty-five years about as much in infrastructure facilities for each additional household as in housing the added family: about $16,800 per added household (see Chart 16), not counting gas, electric and telephone utility investment which will add at least $3,000 more to the total.

Highways, including major bridges and tunnels, are by far the most expensive element of growth costs in the kind of Region suggested by present trends. The highway needs occasioned by a projected increase of more than 1.5 million families outside the older centers of the Region average out to about $7,350 per additional household, conservatively estimated, for a spread development pattern.

The multi-billion dollar totals for the Region's infrastructure needs (shown in Chart 17) highlight the expensive nature of projected transportation requirements. Total growth needs — transportation and all other facilities — are more than $28 billion. To this must be added replacement and modernization needs for schools, roads, hospitals and the like (excluding private utility costs) of more than $19 billion, projected in line with current standards for the most part. Over-all capital requirements of the Region between 1960 and 1985, for growth and for replacement and modernization, public and private, are estimated roughly at $175 billion:

for infrastructure needs	$47 billion	for housing	$75 billion
for private utilities	$12 billion	for business plant	$40 billion

Transportation requirements — including highways, suburban railroads, transit, airports and port facilities (shown separately in Table 19) — amounts to nearly $18 billion, almost 40 percent of the total and considerably more than the projected requirements for schools and colleges ($13 billion). Moreover, requirements for transportation are projected on a more conservative basis than other requirements.

Chart 18
Infrastructure Costs
of the Region, 1960 to 1985,
for Growth and Replacement,
by Ring

$17.4 billion

Replacement
3.8

Growth
13.6

8.3
8.2
0.1
Core

7.5
3.7
3.8
Inner Ring

11.9
2.2
9.7
Intermediate Ring

1.5
0.3
1.2
Outer Ring

Regional Facilities

Local Facilities
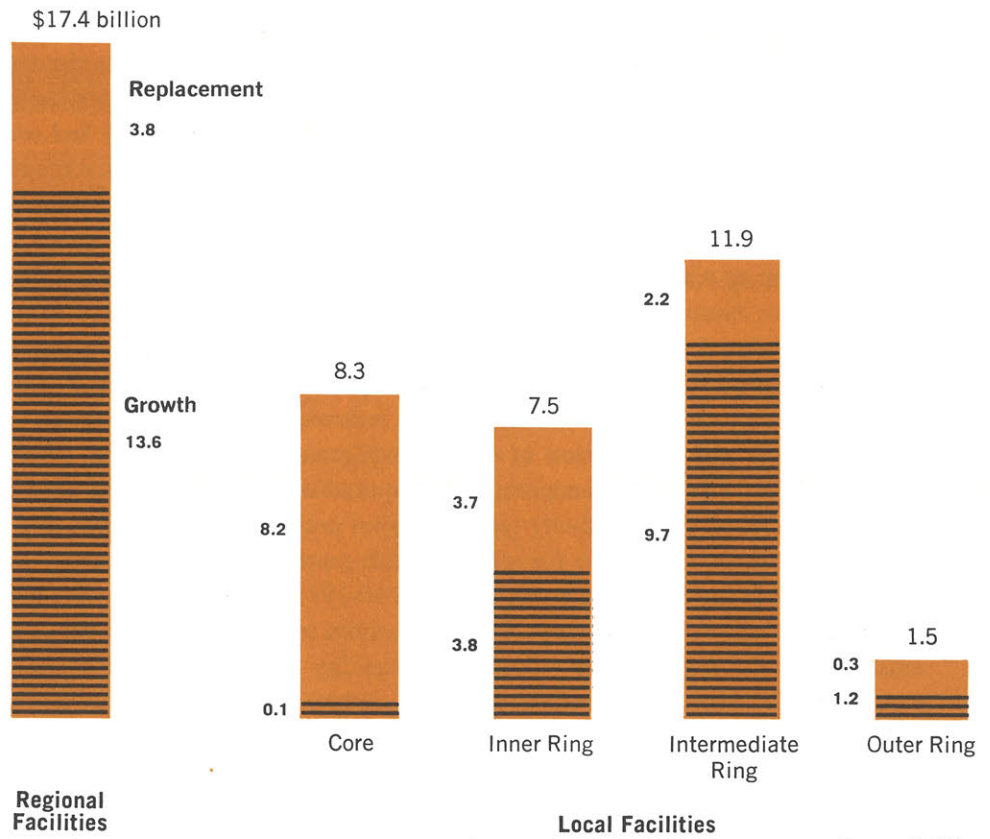
Source: R.P.A.

Chart 19
Future vs. Current
Annual Rates
of Government Expenditure
for Infrastructure, by Ring

$655 million
625

1960-1985 Needs

Current Rates

915
610
TOTAL

270 260
Core*

240 210
Inner Ring*

360
130
Intermediate Ring

45 10
Outer Ring

Regional Facilities

Local Facilities
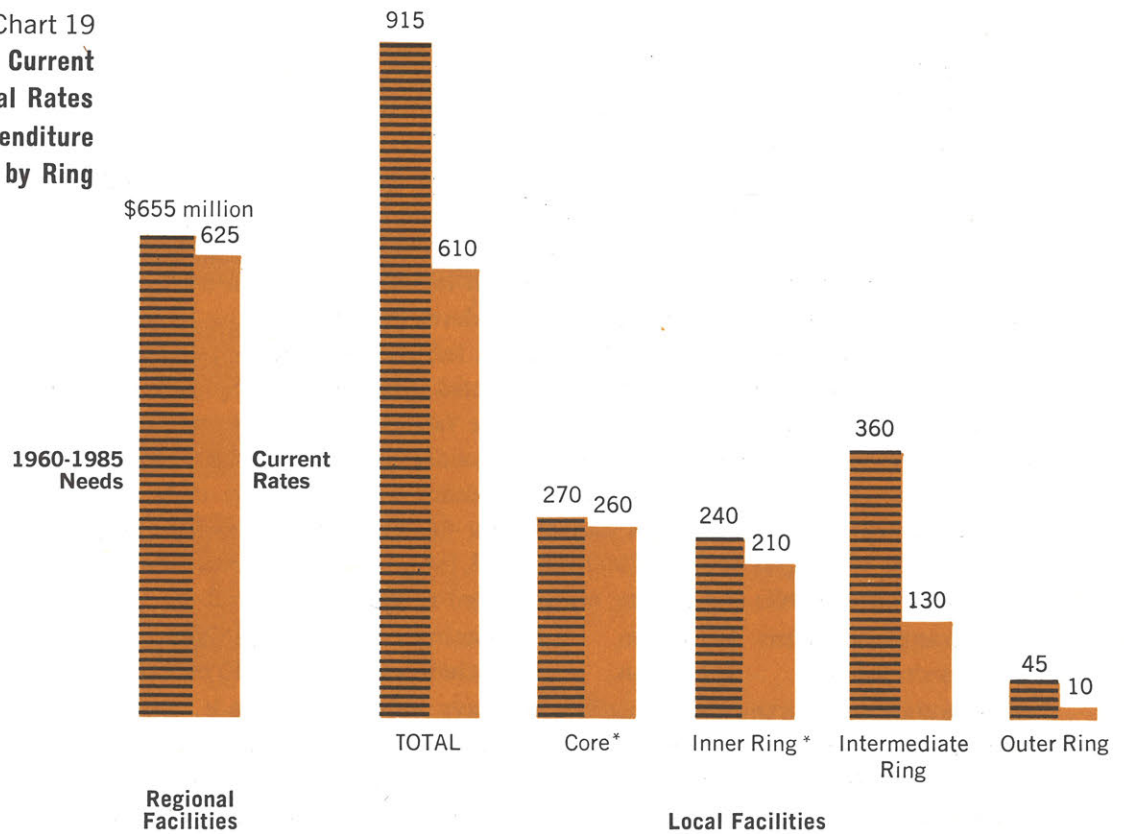
*Richmond included in core
Source: R.P.A.

28

Although this heavy expenditure for transportation requirements is in keeping with recent experience, in earlier periods investment in schools has been the most expensive element of the infrastructure costs which confront local governments and citizen groups. Also, investment in water supply and sewerage facilities, and hospitals and institutions was relatively more important in previous years.

Differences within the Region. Nearly two-thirds of the infrastructure requirements are accounted for by types of facilities commonly provided by county and local governments and local private organizations ("local facilities" in Charts 18 and 19). For these local facilities, the "mix" of growth and replacement needs differs markedly within the Region, being closely related to the community's age. Not unexpectedly, in the Region's Core growth needs account for only about 1 percent of infrastructure requirements. Instead, there are large needs for replacement and modernization of existing facilities, amounting to more than $8 billion or about $1,000 per capita of the average population between 1960 and 1985.

More surprising are the substantial replacement and modernization needs for the Inner Ring, where growth and replacement needs are about equal, totalling nearly $1,500 per capita and adding to more than $7 billion. The Inner Ring counties were growth areas in the post-war period, but in the next generation, while many Inner Ring communities will have substantial growth, others will take on many of the attributes of older areas. By 1985, they will be faced with the need for the replacement or modernization of the many facilities built to take care of their population growth in earlier decades.

In the Intermediate and Outer Rings, too, there will be some older areas with significant replacement needs, mostly for roads and schools, but these will amount to less than $500 per capita. Growth costs, however, will be huge — nearly $11 billion in the two rings (or almost $2,000 per capita), resulting in total per capita costs of nearly $2,500, far above those elsewhere in the Region.

How do these needs compare with the present rate of investment in infrastructure facilities in the Region? Because of gaps in the available data, the comparison must be limited to the 85 percent of the infrastructure needs supplied by governmental agencies. On the average over the next twenty-five years, the Region's state and local governments will need to spend nearly $1,600 million a year for infrastructure, compared to current governmental capital outlays for these purposes of about $1,200 million (Chart 19).

This estimated increase over present levels is serious when one considers that the recent rate of public capital expenditures has been very high in the perspective of the Region's fiscal history. There are all sorts of "crash programs" now under way, ranging from the Interstate Highway program to local school building and sewerage plants. Most of these are avowedly programs with fixed terminal dates; that is, a big push is needed in the next few years to accommodate recent growth and needs for years to come, after which presumably things will be easier. But the projections here suggest that these crash programs will *not* end in a few years, but will be needed almost indefinitely, and at an expanded level.

Local governments in the Region's Core, despite current high levels of capital outlays and lack of population growth, will continue to invest as much as or more than in recent years.

In the Inner Ring, although population growth will slow down, governments will have no respite. School capital costs may decline somewhat, but outlays for local roads will rise sharply. The critical factor here will be rising costs for replacement, modernization and catching up with past growth.

Chart 20
**Total Expenditures
by Local Governments
in the Region,
1957 to 1985**

$8.4

$6.4

Capital (Infrastructure)

$4.1 billion

Current Expenses

1957   **1970**   **1985**
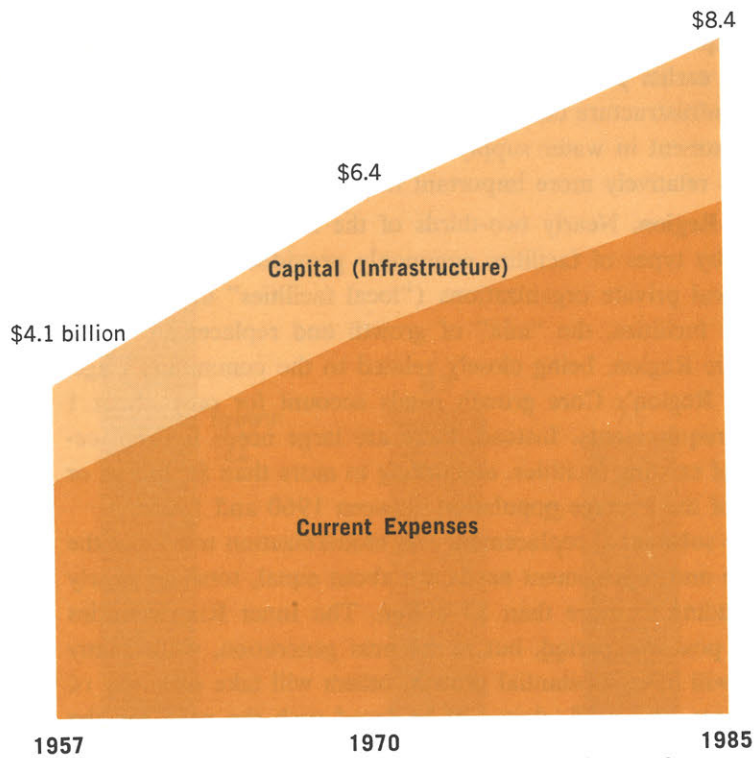
Source: U.S. Census of
Governments, 1957 and R.P.A.

Chart 21
**Sources of Revenue
for the Region's
Local Governments, 1957**

48%   Property
             Taxes

             Local Non-Property
13%   Taxes

21%   Other Local Sources

18%   State and Federal
             Aid

36%

19%

27%

18%

65%

2%

11%

22%

68%

8%

12%

12%

Region   **New York City**   **Rest of N.Y. &
                                               Connecticut**   **New Jersey**

Source: U.S. Census of
Governments, 1957

30
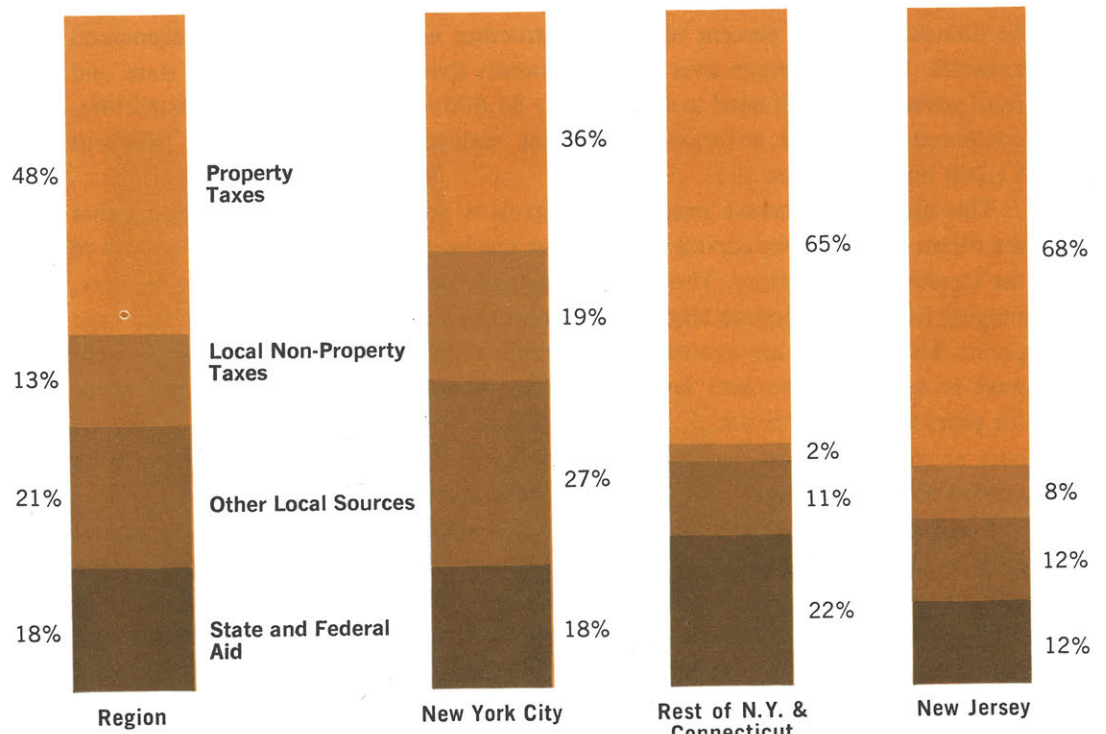
But local governments in the Intermediate Ring (and to a lesser extent, in the Outer Ring) will be most hard-pressed, due to the huge rise — more than 4½ million — in population. In the Intermediate Ring, average annual capital outlays are projected at $360 million, compared to about $130 million annually in the past four or five years. Some local governments in these counties may be spending as much as 50 percent more than at present on a per capita basis.

The state governments and regional authorities, such as the Port Authority (and the City of New York for its unique facilities with regional significance: transit, piers, Delaware water supply, etc.) will be spending, for regional facilities, at least as much as now, with a major increase in capital outlays for state higher education.

Current fiscal strains will not ease significantly in the older and more slowly growing parts of the Region and will become immeasurably worse in the newer parts — *if present trends continue.*

Taxes and development. The rise in current operating costs of the Region's 1400 local governments, especially for the public schools, will be even more burdensome in the next generation than the costs of infrastructure facilities already discussed. A conservative estimate (shown in Chart 20) is that total local government expenditures will double, from $4.1 billion in 1957 to $8.4 billion in 1985, assuming away any degree of inflation. The Harvard Study projections for the Region suggest that total income will mount much less rapidly, that tax revenues cannot be relied upon to rise painlessly and automatically to take care of the needs.

Currently, local property taxes provide the largest single source of local government revenues, nearly half the total for the Region and about two-thirds for local governments other than New York City (Chart 21). The remainder comes from local nonproperty taxes (chiefly in New York City), non-tax sources (water revenues, subway fares, toll collections, traffic fines, and other fees and charges), and state and federal aid (principally the former and mainly for school purposes).

If the rising costs of local government services are met mainly by increasing property tax rates, as in the past decade, there can be serious implications for the pattern of the Region's development.

"Fiscal zoning" is often aimed at producing rateables while limiting infrastructure costs, such as the number of school seats. High-priced houses on large lots yield relatively high revenues and tend to be accompanied by few public school pupils for a given land area. Industrial land use scores even better on both counts. In sharp contrast are the child-filled moderate-priced houses on small lots of the employees of these desired industries. Thus, competition for industry and large-lot residential zoning, both stimulated by fiscal pressures, can distort the Region's growth. Factories may locate in places where over-all costs — to the public and to the corporation combined — are not the lowest, tax considerations aside, and factory workers may have to live at great distances from their jobs, increasing the need for highways.

In effect, by zoning for fiscal ends, individual communities "export" some of their costs to the rest of the Region. They create added transportation costs by encouraging the scatter of industry and the wider separation of jobs and the houses of job holders. But transportation costs are borne mainly by the state governments, regional authorities, other large local governments, and, of course, the users of transport facilities themselves. Wherever the initial impact falls however, the Region as a whole ultimately pays, through higher state and federal taxes and highway-user charges to finance, for example, the huge volume of highway capital costs projected here, and through a less efficient pattern of living and doing business.

3 Issues and Challenges

As we move toward 1985, we can expect to have more wealth and leisure. Our children will have interests expanded beyond our own through school, books, television and travel. Will spread-city encircling aging suburbs and thinning-out cities satisfy us in 1985? Will it enhance or inhibit the fullest enjoyment of our wealth, free time and education? Will we be able to make the most of the metropolis — of the city's opportunities for jobs, intellectual stimulation, culture, variety, rare goods, informal and formal associations, wide choice of friends; of the countryside's natural beauty and outdoor recreation potential?

The people of the Region will choose, consciously or by indifference, the values the new region will foster. By conscious planning, they can get the pattern of settlement they want.

The Core. How important are the values attaching to the old cities of the Core, its variety, culture and other specialties? Can the Region's many business activities that depend upon face-to-face relations of shifting teams of experts and small interrelated shops continue to operate in cities of declining population and importance in the Region? If not, will the Region lose its primacy in these basic activities? Do we care about the cost of underusing the old cities and building anew in spread-city? Should we be concerned about the social and moral questions raised by the abandonment of the cities to the disinherited, with everyone else escaping as he can? Is it important to provide a sense of community in city neighborhoods? Is the physical scale of the city, especially its recent residential structures, too big to satisfy human needs?

If we do not want to stand by while the Core declines, either because of its intrinsic value or because decline in the Core means added spread around the edges, how can we arrange the cities so they can attract families with children? Can we provide not only the new housing but also the needed schools and such amenities as more comfortable public transportation, more outdoor play space, safety on the streets, depolluted rivers and other water bodies for wider recreation use, less air pollution and noise? Can we mold the city into neighborhoods that mean something both to neighbors and to political leaders, and that will foster a real pride of place?

The Suburbs. Americans chose the suburbs to get the best of both worlds—the jobs and opportunities of the central city plus the open countryside. Now the suburban residents are threatened with the worst of both worlds, on the one side cities that are losing their magnetism, on the other spread-city separating the suburbs from natural open space. What happens to the Region affect suburban dwellers as much as anyone.

Even within their own zoning walls, suburbanites face important value questions. Does the row-on-row of similar houses allow for enough variety? Are we callous in failing to zone for small housing units for the young who have just left their families and the older people whose children have just left them — requiring that they leave the community in which they may have lived for many years? Will we be willing to pay the taxes of one-family-house, no-industry suburbs? Will we be willing to accept the highways crossing the Inner Ring which will be needed to carry people from every direction to jobs in every other direction. Will we find increasing dependence on the automobile tolerable?

Spread-city. The prime value of spread-city is privacy; the second is comfort. Privacy is assured because large lots and little real community allow few happenstance meetings — over the back-fence, at the neighborhood grocery or playground, downtown, at work. Comfort is available because every place is accessible to the automobile and the automobile is always at hand. Are these values overriding? Or are the values spread-city will not provide even more important: variety, choice, community? Will the 6½ million who will look for new homes on now undeveloped land be able to afford the large lots of spread-city? Will we be willing to pay the cost in money and land and visual impact of the highway network needed to tie spread-city together?

The issues we must face if we do not want spread-city begin with local taxes because taxes seem the strongest cause of ubiquitous large-lot zoning. We also must consider whether dollar costs to the individual and to government and the other social disadvantages of scattered job sites outweigh the short-term advantage to some businesses.

Tastes and social needs. American tastes often change quickly and sharply, but the Region can be changed only very slowly. This argues for a metropolitan form that allows for many tastes. So do the varied backgrounds of the residents of the New York Region.

Many of the decisions that shape the Region will depend upon taste. For example, the metropolitan pattern that caters to outdoor recreation, gardening or the arts as the major leisure activity might be quite different. All of these tastes could be accommodated easily in a planned region; but the unplanned region might be molded to a shape suitable only for the dominant interest.

Other tastes that will affect development are: our willingness to walk — how far or how many stories up; our willingness to use public transportation at different levels of speed and comfort; our concern for social status; our concern for costs; our sensitivity to beauty and to nature; our discomfort with different kinds of people or, contrarily, boredom with everyone "of our own kind;" our need for face-to-face meetings or willingness to view life through a television tube; our satisfaction with family togetherness quite separated from the community or our interest in community participation; our reliance on grass roots civic action or preference for political decision-making on a broader, less personal scale.

Technology. Technical advancement will change tastes as well as other elements that shape the Region: the speed of transporation, increased productivity and the resulting reduction of work hours, the space that activities require (for example, vertical take-off of aircraft would greatly reduce airport space needs), the substitutes for face-to-face relations (television and facsimile transmission and computers). We must not only anticipate inevitable changes brought by technology but we should also consider priorities for such advances.

Conclusion. What happens to the land of the New York Metropolitan Region will affect our whole lives, and the way the land is used will be determined primarily by the kinds of housing available to and desired by families with children.

In the consideration of the values and issues of the Region's development, Regional Plan Association will present alternatives to spread-city — proposals and plans which will emphasize maximum choice for all and the greatest adaptability to the mercurial changes that mark our age.

Basis for population and employment projections

Population and Employment for the Region as a Whole

Late in 1960, the projections of population and employment made by the Harvard Study of the New York Metropolitan Region were published in the Study's summary volume, *Metropolis 1985,* by Raymond Vernon. The Harvard Study projections had been made before any data from the 1960 Census were available, but preliminary population counts were released by the Census Bureau just before the publication of *Metropolis 1985*. As Dr. Vernon indicated in last minute footnotes, these Census counts suggested that the Study's projections for 1985 might be too high, and that the forces making for a slow growth rate for the Region as a whole and its older parts in particular, might be even more powerful than the Study implied.

Consequently, Regional Plan's staff, together with members of the Harvard Study team, re-examined in some detail the economic model which produced the projections shown in *Metropolis 1985*. A small number of apparent anomalies were uncovered. For the most part, these related to factors for which new basic benchmark data or alternative estimates (such as data from the 1958 Census of Manufactures and Census of Business) had been developed too late for use in the course of the Harvard Study. Changes suggested by this research worked in the direction of reducing projected employment and population totals for the Region.

After making these changes, the economic model of the Region (which is described by Barbara R. Berman in Part I of *Projection of a Metropolis,* Technical Supplement to the Harvard Study) was re-run on the computer. Based on this re-run, revised projections of employment and population were developed; these were below those shown in *Metropolis 1985* by the following amounts and percentages:

	Employment		Population	
	Amount	%	Amount	%
1965	244,000	3.4	853,000	4.7
1975	385,000	4.6	1,110,000	5.3
1985	586,000	6.2	1,542,000	6.5

The main change in the recomputation was a new estimate of changes over time in productivity in industries primarily serving local markets in the Region — principally services, trade, transportation and communications, and the local component of financial activities. Productivity estimates are important in the Harvard Study model because the model's initial product is a set of projections of the output (in dollar terms) of every industry and these output figures are converted into employment projections by dividing by output per man-year. Population projections, in turn, are derived from the employment figures by using a set of estimates of labor force participation rates (which are expected to change very little in this Region).

In the revision, the productivity estimates developed by

the National Planning Association recently, in connection with its National Economic Projections Series, formed the basis for output per man-year estimates for the New York Region, in lieu of the estimates originally used. The new figures were significantly higher than the original ones, thus output divided by higher output per man-year figures resulted in lower employment figures for the Region's local market industries. A partial offset occurred because higher productivity implies higher per capita income and this in turn leads to greater demand for the products of local market firms, which tends to increase their employment. But, on balance, this change substantially lowered the projections of total employment and population.

The other changes made were quantitatively much less important. The employment projections for a few manufacturing industries were revised somewhat downward on the basis of new evidence, mainly trends in the last few years. The projections of local government employment had originally been made on the basis of a series of formulas which, taken together with the revisions, produced rather volatile results. That is, local government employment proved to be exaggeratedly sensitive to population change under these formulas, and therefore they were altered. Finally, a very few inadvertent errors in the original model, related to the construction and service industries, were corrected.

All changes considered, the revision resulted in total employment projections for manufacturing industries (including those serving local rather than national markets) which are approximately 10 percent below those in the Harvard Study (about 300,000 fewer employees in 1985) and projections for other industries which are slightly higher than those in the Harvard Study until 1975 but about 4 percent (or 280,000) lower in 1985. The individual classifications which account for the bulk of the difference in the two sets of employment projections for 1985 are: textiles and apparel manufacturing, metals and metal products manufacturing, construction, government and transportation. Employment in consumer trades and services is projected at a higher figure than in the Harvard Study, and there is little difference for wholesale trade, finance and business services.

The distribution of the new 1985 population and employment totals for the Region is discussed below.

Population by County

Three major criteria were used in allocating the projected population increment among the Region's 22 counties: accessibility to employment (both present and future), local development conditions and zoned capacity of vacant land. An underlying assumption — explained in the text — was that no over-all increase in population would occur

in the built-up Core so that the Region's population increase plus the outmigrants from the Core would have to be absorbed on vacant land. Accessibility to employment (the "employment potential" of the county) was chosen as a key factor since it is closely related to population density and land development in the Region.

An accessibility index was computed for 33 areas, namely the 22 counties of the Region, but with Westchester, Suffolk, Passaic and Essex each divided into two parts (see Map 1), and 7 counties outside the Region as currently defined. The time-distance from the centroid of each area to the centroid of every other area was determined; then time-distance to each influenced area, raised to the power of 1.5, was divided into the employment of each influencing area, and the quotients for each influenced area summed up as follows:

$$A_j = \sum_{i=1}^{i=33} \frac{E_i}{t_{ij}^{1.5}}$$

where A_j = Accessibility index of influenced area.

E_i = Employment of influencing area.

t_{ij} = Average time-distance between centroids of the influencing and the influenced areas.

1.5 = exponent of the time-distance factor.

Sets of accessibility indices were computed for 1950, 1960 and 1985, using different sets of employment estimates and time-distance matrices, the latter taking into account both transportation improvements (mostly new freeways and bridges) and rising intra-county travel times in areas of increasing density. Average travel times were derived from railroad schedules, Transit Authority running times (both including a substantial allowance for terminal time), existing highway speed-and-delay studies, 1956 journey-to-work data from the Harvard Study, and personal experience. The resulting figures were an approximation of the average door-to-door journey to work during rush hours. Since interaction between places of work and residence is not in direct inverse proportion to time-distance, it was necessary to formulate this relationship. Exponents which have been used in traffic studies in other areas were not sufficiently relevant, so a series of computations was made for sets of time-distance matrices with exponents ranging from 0.9 to 2.0, and the exponent 1.5 was chosen because the accessibility index based on it yielded the highest correlation with population density, the key variable in our population allocation. With 1.5 as an exponent of travel time, the correlation coefficients for log density on the accessibility index were $r = .893$ for 1950 and $r = .887$ for 1960, meaning that in 1950, 79.7 percent and in 1960, 78.6 percent of the variation in density between counties in the Region could be explained by accessibility to employment, as here defined, alone. It can be noted parenthetically that with the other values of the exponent tested the correlations were only slightly lower.

With accessibility indices determined, a scatter diagram was drawn relating them to the logarithm of population density on which the position of each county area was represented by two dots, one for 1950 and one for 1960. Regression equations for the two dates were computed and regression lines drawn. The difference in slope between the 1950 and 1960 lines was the basis for an assumed 1985 regression line, which, in conjunction with the 1985 accessibility indices, yielded reasonable expected densities by county for 1985. Since observed densities in 1950 and 1960 vary substantially from expected densities represented by the regression line, due to local development conditions (primarily terrain and social characteristics of the area), the first approximation of 1985 densities by county was arrived at by locating the dots on the scatter diagram at distances from the 1985 regression line similar to those for 1950 and 1960, taking into account relative shifts in position during the past decade. The first approximation of 1985 density by county was then adjusted to yield a total population increase of six million, and the resulting 1985 densities were compared with densities suggested by the Harvard Study and those allowed by zoning.

For counties in the Core, the accessibility model itself suggested declining population densities because of lower relative accessibility to employment; however, the specific magnitude of the population decline was taken from the Harvard projections. For most counties in the Inner Ring, the model suggested much higher densities than those permitted by zoning; these counties were either filled to zoned capacity or in some cases the zoned capacity was slightly exceeded. In the outer counties, zoned capacity was far greater than the projected population increase, and these counties were filled to an extent suggested by their accessibility indices. In allocating population between the county areas of the Intermediate and Outer Rings, two auxiliary correlations were used: that relating the employment potential (or accessibility index) to percent of land developed for urban use ("committed" land) and that relating population density to geometric distance from Manhattan. In particular, these methods were helpful in estimating the magnitude of the probable overspill of population beyond the boundaries of the Region as currently defined by Regional Plan.

While the data used in these calculations were adequate for the generalized purposes of this Bulletin, a detailed population allocation would require more accurate time-distances (precluded here by the absence of a comprehensive and accurate trip-to-work survey), shorter distances between centroids of the assignment zones (precluded by the absence of employment data for small areas), a quantification of development factors other than accessibility, and finally a feedback into the process of accessibility indices adjusted on the basis of the first resulting population estimate. For the present study, iteration was found unnecessary, since adjusted employment data for 1985 did not yield significantly different accessibility indices.

Table 4. The Region's Population, 1860 to 1960, by County (in thousands)

	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960
Connecticut											
Fairfield	77.5	95.3	112.0	150.1	184.2	245.3	320.9	386.7	418.4	504.3	653.6
New Jersey	**370.9**	**549.2**	**724.9**	**969.3**	**1,338.0**	**1,866.9**	**2,349.2**	**3,031.6**	**3,115.2**	**3,581.4**	**4,399.2**
Bergen	21.6	30.1	36.8	47.2	78.4	138.0	210.7	365.0	409.6	539.1	780.3
Essex	98.9	143.8	189.9	256.1	359.1	512.9	652.1	833.5	837.3	905.9	923.5
Hudson	62.7	129.1	187.9	275.1	386.0	537.2	629.2	690.7	652.0	647.4	610.7
Middlesex	34.8	45.0	52.3	61.8	79.8	114.4	162.3	212.2	217.1	264.9	433.9
Monmouth	39.3	46.2	55.5	69.1	82.1	94.7	104.9	147.2	161.2	225.3	334.4
Morris	34.7	43.1	50.9	54.1	65.2	74.7	82.7	110.4	125.7	164.4	261.6
Passaic	29.0	46.4	68.9	105.0	155.2	215.9	259.2	302.1	309.4	337.1	406.6
Somerset	22.1	23.5	27.2	28.3	32.9	38.8	48.0	65.1	74.4	99.1	143.9
Union	27.8	41.9	55.6	72.5	99.4	140.2	200.2	305.2	328.3	398.1	504.3
New York	**1,483.7**	**1,842.9**	**2,308.5**	**2,968.6**	**3,992.1**	**5,495.2**	**6,468.8**	**8,224.7**	**8,984.1**	**9,865.3**	**11,086.1**
Dutchess	64.9	74.0	79.2	77.9	81.7	87.7	91.7	105.1	120.5	136.8	176.0
Nassau	24.5	28.3	34.0	41.0	55.4	83.9	126.1	303.1	406.7	672.8	1,300.2
Orange	63.8	80.9	88.2	97.9	103.9	116.0	119.8	130.4	140.1	152.3	183.7
Putnam	14.0	15.4	15.2	14.8	13.8	14.7	10.8	13.7	16.6	20.3	31.7
Rockland	22.5	25.2	27.7	35.2	38.3	46.9	45.5	59.6	74.3	89.3	136.8
Suffolk	43.3	46.9	53.9	62.5	77.6	96.1	110.2	161.1	197.4	276.1	666.8
Westchester	75.9	94.0	98.6	131.9	184.3	283.1	344.4	520.9	573.6	625.8	808.9
N. Y. excl. N. Y. C.	**308.9**	**364.8**	**396.8**	**461.2**	**554.9**	**728.3**	**848.7**	**1,294.2**	**1,529.1**	**1,973.3**	**3,304.1**
Bronx	23.6	37.4	52.0	88.9	200.5	431.0	732.0	1,265.3	1,394.7	1,451.3	1,424.8
Brooklyn	279.1	419.9	599.5	838.5	1,166.6	1,634.4	2,018.4	2,560.4	2,698.3	2,738.2	2,627.3
Manhattan	813.7	942.3	1,164.7	1,441.2	1,850.1	2,331.5	2,284.1	1,867.3	1,889.9	1,960.1	1,698.3
Queens	32.9	45.5	56.6	87.1	153.0	284.0	469.0	1,079.1	1,297.6	1,550.8	1,809.6
Richmond	25.5	33.0	39.0	51.7	67.0	86.0	116.5	158.3	174.4	191.6	222.0
New York City	**1,174.8**	**1,478.1**	**1,911.7**	**2,507.4**	**3,437.2**	**4,766.9**	**5,620.0**	**6,930.4**	**7,455.0**	**7,892.0**	**7,782.0**
Region excl. N. Y. C.	**757.3**	**1,009.2**	**1,233.8**	**1,580.5**	**2,077.1**	**2,840.5**	**3,518.9**	**4,712.5**	**5,062.7**	**6,059.0**	**8,356.9**
Core	1,283.9	1,679.2	2,197.2	2,912.7	4,002.3	5,565.6	6,547.2	7,905.2	8,362.4	8,786.6	8,575.9
Inner Ring	188.8	266.6	338.3	472.9	694.7	1,040.4	1,421.1	2,243.6	2,495.4	3,099.5	4,333.2
Intermediate Ring	312.1	367.3	421.9	503.4	603.9	764.8	925.7	1,215.5	1,355.2	1,729.8	2,804.9
Outer Ring	147.2	174.3	188.2	199.0	213.5	236.6	245.0	278.7	304.7	335.1	424.8
REGION TOTAL	**1,932.1**	**2,487.3**	**3,145.5**	**4,088.0**	**5,514.3**	**7,607.4**	**9,138.9**	**11,642.9**	**12,517.7**	**13,951.0**	**16,138.9**

SOURCE: U. S. Census
NOTE: Detail may not add to totals because of rounding.

Table 5. The Region's Projected Population, 1965 to 1985, by County (in thousands)

	Census	RPA Projection					Harvard Study Projection[1]
	1960	1965	1970	1975	1980	1985	1985
Connecticut							
Fairfield	654	745	855	965	1,055	1,150	1,420
New Jersey	**4,399**	**4,870**	**5,490**	**6,140**	**6,775**	**7,315**	**8,740**
Bergen	780	900	980	1,050	1,080	1,110	1,469
Essex	924	940	960	985	1,000	1,010	1,486
Hudson	611	590	575	560	550	540	600
Middlesex	434	545	685	835	960	1,020[2]	1,175
Monmouth	334	410	570	760	975	1,185[2]	1,157
Morris	262	335	450	570	720	880[2]	667
Passaic	407	445	490	525	555	570	728
Somerset	144	175	220	270	335	385[2]	562
Union	504	530	560	585	600	615	896
New York	**11,086**	**11,565**	**12,075**	**12,595**	**13,120**	**13,705**	**13,552**
Dutchess	176	200	230	265	305	350	481
Nassau	1,300	1,400	1,450	1,480	1,500	1,510	1,515
Orange	184	205	235	270	310	395	540
Putnam	32	40	60	80	110	135	58
Rockland	137	170	245	310	340	350	409
Suffolk	667	910	1,160	1,420	1,685	2,005	1,340
Westchester	809	890	995	1,085	1,170	1,235	1,524
N. Y. excl. N. Y. C.	**3,304**	**3,815**	**4,375**	**4,910**	**5,420**	**5,980**	**5,867**
Bronx	1,425	1,400	1,375	1,350	1,350	1,350	1,350
Brooklyn	2,627	2,600	2,550	2,510	2,475	2,450	2,350
Manhattan	1,698	1,625	1,575	1,525	1,500	1,475	1,600
Queens	1,810	1,875	1,900	1,925	1,925	1,925	1,910
Richmond	222	250	300	375	450	525	475
New York City	**7,782**	**7,750**	**7,700**	**7,685**	**7,700**	**7,725**	**7,685**
Region excl. N. Y. C.	**8,357**	**9,430**	**10,720**	**12,015**	**13,250**	**14,445**	**16,027**
Core	8,576	8,485	8,365	8,260	8,190	8,130	n.c.
Inner Ring	4,333	4,705	5,010	5,295	5,500	5,675	n.c.
Intermediate Ring	2,805	3,510	4,490	5,500	6,510	7,420	n.c.
Outer Ring	425	480	555	645	750	945	n.c.
REGION TOTAL	**16,139**	**17,180**	**18,420**	**19,700**	**20,950**	**22,170**	**23,712**

1. Raymond Vernon, **Metropolis 1985**, Harvard University Press, 1960, p. 239.
2. The population pressure on these counties is likely to be alleviated by the overspill of approximately 400,000 into Hunterdon, Ocean, Sussex and Warren counties.
n.c. Not computed.

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

Table 6. Age Distribution of the Region's Population, 1960 to 1985 (in thousands)

	Census		RPA Projection			
	1960	1965	1970	1975	1980	1985
Under 5 years	1,584	1,565	1,745	1,970	2,140	2,315
5-17 (School age)	3,439	4,000	4,295	4,590	4,945	5,315
18-24 (College age)	1,219	1,535	1,975	2,170	2,325	2,370
25-64 (Working age)	8,356	8,330	8,465	8,855	9,275	9,815
65 and over	1,541	1,750	1,940	2,115	2,265	2,355
Total Population	**16,139**	**17,180**	**18,420**	**19,700**	**20,950**	**22,170**
30-34 (House-buying age)	1,156	1,045	990	1,170	1,450	1,590

Employment by County

In Part II of *Projection of a Metropolis,* the Technical Supplement to the Harvard Study, Benjamin Chinitz describes the methods used by the Harvard Study in projecting employment for the counties of the Region. Regional Plan projections in this report rely on the same methods.

The first step was to take the employment projections for the Region as a whole by industry and re-group the industries into categories which have common characteristics with respect to the location of economic activity. For example, the major communications-oriented manufacturing industries which tend to cluster together or locate close-by other activities were isolated — apparel, electronics, printing and publishing. Manufacturing industries oriented to water transportation, those with heavy raw materials requirements, those usually carried on in large space-using plants, and those oriented to supplying local market consumers, were similarly distinguished.

Employment in each of these groups was then distributed by county on the basis of an analysis of changing locational requirements, with due regard for the existing pattern of employment concentrations for each of the industry groups. Thus, for example, national market manufacturing industries with heavy space requirements were counted as locating their additional facilities in the less developed parts of the Region where their space needs can be satisfied, and, in addition, as shifting some of their present activities from the Region's Core to the outer areas. Similarly, employment in consumer trade and services was projected to follow population movements outward from the Core. Nevertheless, Manhattan, Newark and downtown Brooklyn were expected to remain large and growing — albeit slowly — centers of consumer-oriented employment.

Why new Regional Plan county projections? New employment projections by county (shown in Tables 1, 7 and 8) were necessary for three reasons. First, new regional projections of employment in each industry had been developed, as described earlier. Since each county has a different "mix" of industries and since the regional totals for each industry in the revision changed by different percentages and amounts, total employment in each county necessarily had to change.

Second, Regional Plan's vacant land study, described below, revealed that vacant land zoned for industry was not available for the heavy space-using activities in every county in the proportions implied by the Harvard Study projections for these industries. Third, the new county distribution of population, revealed by the revised projections discussed previously, required a new distribution of employment in the population-serving activities, principally consumer trade, services, local market financial establishments, local government, and so on.

The new projections take all three factors into account: the revised prospect for each industry in the Region as a whole, the availability of vacant land zoned for industry in each county, and the new projections of the distribution of the Region's population. In addition, developments in employment in each county between 1956 and the present, not available to the Harvard Study, were analyzed and considered in the revision of the employment projections. Finally, Regional Plan's employment estimates for 1960 by county — the platform upon which the new projections were constructed — are not strictly comparable to the 1956 Harvard Study industry estimates. In most cases, the differences are trivial.

The 1960 county estimates. There is no simple, ready-made set of figures which presents all-inclusive totals of the number of persons at work in a given county, broken down by industry. The principal official source of current data on employment by county and industry is the information collected by the state governments on employees covered by state unemployment insurance programs. A considerable number of employed persons are not covered by these programs. Among the excluded groups are the self-employed, domestic workers, and employees of most nonprofit organizations, government agencies, railroads (covered by a separate federal program) and, in New Jersey and Connecticut, firms with fewer than four employees. Further complicating the picture for our purposes is the fact that, in New York State, coverage of unemployment insurance was extended to firms with fewer than three employees between 1956, the date used in the Harvard Study as its point of departure, and 1960.

Based on the unemployment insurance data, the state agencies have developed estimates, both published and unpublished, of *total* employment, but these are not distributed by industry and in some cases they have been prepared only for groups of counties. Periodically, the U.S. Department of Commerce and the Bureau of Old Age and Survivors Insurance jointly publish, in *County*

Table 7. Employment in Manufacturing and Wholesale Trade in the Region, 1960 and 1985, by County (in thousands)

	1960 Estimates			1985 RPA Projection		
	Manufacturing and Wholesale Trade[1]	Other	Total	Manufacturing and Wholesale Trade[1]	Other	Total
Connecticut						
Fairfield	123	139	262	169	210	379
New Jersey	**709**	**936**	**1,645**	**1,122**	**1,531**	**2,653**
Bergen	99	134	233	185	210	395
Essex	162	260	421	188	290	478
Hudson	135	144	278	158	156	314
Middlesex	75	77	152	142	198	340
Monmouth	19	63	82	50	180	230
Morris	25	46	72	49	157	206
Passaic	83	79	162	146	122	268
Somerset	20	25	45	40	64	104
Union	92	109	201	164	154	318
New York	**1,485**	**3,324**	**4,809**	**1,702**	**4,142**	**5,844**
Dutchess	25	40	64	59	66	125
Nassau	103	256	359	128	330	458
Orange	19	41	60	47	75	122
Putnam	1	7	8	5	19	24
Rockland	13	25	38	46	70	116
Suffolk	42	104	146	127	332	459
Westchester	70	188	258	110	274	384
N.Y. excl. N.Y.C.	**272**	**660**	**932**	**522**	**1,166**	**1,688**
Bronx	67	172	239	80	184	264
Brooklyn	264	384	648	250	385	635
Manhattan	711	1,811	2,522	640	2,030	2,670
Queens	162	266	428	175	305	480
Richmond	10	30	41	35	72	107
New York City	**1,213**	**2,664**	**3,877**	**1,180**	**2,976**	**4,156**
Region excl. N.Y.C.	**1,104**	**1,735**	**2,839**	**1,813**	**2,907**	**4,720**
Core	1,443	2,972	4,415	1,414	3,237	4,651
Inner Ring	501	840	1,342	799	1,203	2,002
Intermediate Ring	327	501	828	657	1,277	1,934
Outer Ring	46	86	132	123	166	289
REGION TOTAL	**2,317**	**4,399**	**6,716**	**2,993**	**5,883**	**8,876**

1. Employment in central and administrative offices included in "Other."
SOURCE: Regional Plan Association, See p. 34
NOTE: Detail may not add to totals because of rounding.

Table 8. Projected Employment in the Region, 1965 to 1985, by County (in thousands)

	Harvard Study Estimates[1] 1956	RPA Estimates 1960	RPA Projection 1965	1970	1975	1980	1985	Harvard Study Projection[1] 1985
Connecticut								
Fairfield	241	262	275	300	325	351	379	428
New Jersey	**1,532**	**1,645**	**1,765**	**1,988**	**2,228**	**2,458**	**2,653**	**2,971**
Bergen	208	233	266	302	339	367	395	470
Essex	402	421	425	438	451	464	478	569
Hudson	279	278	280	294	302	309	314	305
Middlesex	131	152	182	225	273	315	340	348
Monmouth	66	82	92	121	155	193	230	234
Morris	58	72	84	110	138	171	206	172
Passaic	161	162	170	191	217	248	268	343
Somerset	35	45	49	65	82	94	104	135
Union	191	201	217	242	271	297	318	395
New York	**4,630**	**4,809**	**4,918**	**5,134**	**5,369**	**5,606**	**5,844**	**6,063**
Dutchess	54	64	76	89	102	113	125	147
Nassau	274	359	386	411	431	446	458	461
Orange	50	60	65	78	93	105	122	136
Putnam	6	8	9	11	14	19	24	11
Rockland	30	38	50	70	92	107	116	98
Suffolk	106	146	178	238	304	374	459	327
Westchester	217	258	283	308	336	362	384	478
N.Y. excluding N.Y.C.	**735**	**932**	**1,047**	**1,205**	**1,372**	**1,526**	**1,688**	**1,656**
Bronx	n.c.	239	245	253	258	262	264	n.c.
Brooklyn	n.c.	648	645	637	634	634	635	n.c.
Manhattan	n.c.	2,522	2,497	2,529	2,568	2,620	2,670	n.c.
Queens	n.c.	428	440	455	468	475	480	n.c.
Richmond	n.c.	41	44	55	69	89	107	n.c.
New York City	**3,895**	**3,877**	**3,871**	**3,929**	**3,997**	**4,080**	**4,156**	**4,407**
Region excluding N.Y.C.	**2,508**	**2,839**	**3,087**	**3,493**	**3,925**	**4,335**	**4,720**	**5,056**
Core	4,460	4,415	4,396	4,455	4,517	4,587	4,651	5,058
Inner Ring	1,112	1,342	1,455	1,596	1,744	1,884	2,002	2,218
Intermediate Ring	722	828	955	1,189	1,445	1,697	1,934	1,874
Outer Ring	109	132	152	182	216	247	289	312
REGION TOTAL	**6,403**	**6,716**	**6,958**	**7,422**	**7,922**	**8,415**	**8,876**	**9,462**

1. Richmond included in Core instead of Inner Ring in Harvard Study estimates and projections.
n.c. Not computed.
SOURCE: Raymond Vernon, **Metropolis 1985**, Harvard University Press, 1960, pp. 234 and 237 and Regional Plan Association, see p. 34
NOTE: Detail may not add to totals because of rounding.

Table 9. Alternative Measures of Employment, 1956 and 1960, by County (in thousands)

	1956		1959	1960	
	Covered Employment	Harvard Study Estimates	County Business Patterns	Covered Employment	RPA Estimates
Connecticut					
Fairfield	189	241	194	195[1]	262
New Jersey	**1,180**	**1,532**	**1,235**	**1,193**	**1,645**
Bergen	160	208	174	171	233
Essex	306	402	324	306	421
Hudson	218	279	211	196	278
Middlesex	102	131	107	111	152
Monmouth	44	66	50	48	82
Morris	41	58	52	50	72
Passaic	129	161	129	126	162
Somerset	27	35	32	31	45
Union	153	191	156	155	201
New York	**3,393**	**4,630**	**3,594**	**3,535**	**4,809**
Dutchess	37	54	41	40	64
Nassau	195	274	239	251	359
Orange	34	50	37	37	60
Putnam	3	3	3	3	8
Rockland	21	30	23	25	38
Suffolk	76	106	87	100	146
Westchester	150	217	176	182	258
N.Y. excl. N.Y.C.	**515**	**735**	**606**	**637**	**932**
Bronx	n.c.	n.c.	n.c.	166	239
Brooklyn	n.c.	n.c.	n.c.	471	648
Manhattan	n.c.	n.c.	n.c.	1,922	2,522
Queens	n.c.	n.c.	n.c.	336	428
Richmond	n.c.	n.c.	n.c.	23	41
New York City	**2,878**	**3,895**	**2,989**	**2,919**	**3,877**
REGION TOTAL	**4,762**	**6,403**	**5,024**	**4,943**	**6,716**

1. 1959 data.
n.c. Not computed.
SOURCE: Federal and State agencies, Harvard Study and Regional Plan Association, see p. 37.
NOTE: Detail may not add to totals because of rounding.

Business Patterns, employment data based on the coverage of federal Old Age and Survivors Insurance. The OASI program covers some but not all of the groups excluded from coverage by state unemployment insurance.

All these sets of data and estimates refer to the number of jobs held, not the number of persons employed. There is a difference in these two concepts, occasioned by those persons who hold more than one job. The 1960 Census of Population provides information on the number of persons employed, by place of residence. It also provides sample information on place of work in connection with its journey-to-work questionnaire. Using the two sets of information, estimates of the total number of persons working in individual counties can be developed.

In March, 1960, about 6.5 million of the New York Metropolitan Region's residents were employed, according to the 1960 Census. No more than 1 percent of these employed residents worked outside the Region while a somewhat smaller number of people living outside the Region probably worked in it. For practical purposes it can be assumed that 6.5 million people held jobs — not all of which were full-time — in the Region at that time.

These job holders held more than 6.5 million jobs, however. According to published and unpublished estimates of the State Departments of Labor of New Jersey, New York and Connecticut, the Middle Atlantic Regional Office of the Bureau of Labor Statistics and other federal agencies, the total number of jobs in the Region was about 7.2 million in March, 1960, including full- and part-time wage and salary positions, self-employed positions, and a relatively small number of unpaid jobs of family workers. This suggests that about 10 percent of the Region's 6.5 million employed residents held more than one job or had an additional source of income from self-employment, unless these estimates are far more in error than there is any reason to believe.

The figures for employed residents and total employment differ from the estimates of employment for the Region and its counties for 1956 in the Harvard Study and for 1960 by the Regional Plan staff. In both cases, the measure of employment has been restricted to the jobs and self-employment (but not unpaid family workers) that could be reasonably classified by industry in the county of employment. This hopefully includes just about all of the full-time employment and a portion of the part-time employment. Regional Plan's 1960 estimates are based on: (1) *County Business Patterns,* First Quarter 1959, updated to September, 1960 largely on the basis of changes in covered employment during this period, (2) estimates from other government sources for employment not covered by OASI, and (3) data of the Department of City Planning, New York City, for employment by county in New York City. To develop the ring subtotals shown in Table 8 on a basis consistent with the ring definitions used in this Bulletin, the Regional Plan staff apportioned the Harvard Study figures for counties split between two rings.

Thus, it must be emphasized that the employment figures for 1960 shown in the tables in this Bulletin do not correspond to those for 1960 in any other published report. Table 9 compares employment covered by state unemployment insurance programs for September, 1956 and September, 1960, OASI data appearing in *County Business Patterns* for the first quarter 1959, and the more comprehensive estimates of the Harvard Study for March, 1956 and Regional Plan for September, 1960.

There is one final complication. Between 1956 and 1960, there was a general revision of the federal Standard Industrial Classification system, which is used for classifying by industry all federal and most state government statistics (as well as some private statistics). The Harvard Study industry employment statistics are on the basis of the old industrial classification system, while current (including 1960) employment statistics are on the new basis. This change does not affect the level of total employment but does affect its distribution among industries. For the New York Region, the most important changes in manufacturing are those which concern the food, chemical, rubber and plastics, electronics and metals-using industries. There is also some shift between manufacturing industries and wholesale trade. However, the change in classification has had little effect on the combined total for manufacturing and wholesale trade, shown in Table 7. The changes in classification seriously affect the data for subgroups within the transportation, communications and public utilities category but not the totals for the category as a whole.

Table 10. Zoning of Vacant Land by Use, 1960, by County (thousands of acres)

	Zoned Vacant Land		Single Family		Multi-Family		Commercial		Industrial and Research		Conservation	
	Area	% of all Vacant Land	Area	% of Zoned Vacant Land	Area	% of Zoned Vacant Land	Area	% of Zoned Vacant Land	Area	% of Zoned Vacant Land	Area	% of Zoned Vacant Land
Connecticut												
Fairfield	243.3	100.0	233.4	95.9	0.8	0.3	1.4	0.6	7.3	3.0	0.4	0.2
New Jersey	841.7	96.4	702.4	83.4	5.5	0.7	16.8	2.0	98.9	11.7	18.1	2.2
Bergen	64.7	100.0	51.6	79.8	1.5	2.3	0.8	1.3	9.1	14.1	1.6	2.5
Essex	22.3	100.0	19.2	86.2	0.2	1.0	0.5	2.0	2.4	10.8	—	—
Hudson	11.0	100.0	—	—	0.6	5.7	0.2	2.0	10.2	92.3	—	—
Middlesex	127.0	100.0	91.0	71.7	2.0	1.6	2.3	1.8	31.7	24.9	—	—
Monmouth	209.3	100.0	194.7	93.0	0.1	a	6.3	3.0	8.3	4.0	—	—
Morris	192.4	91.8	169.5	88.1	0.4	0.2	4.4	2.3	18.1	9.4	—	—
Passaic	57.5	80.5	34.8	60.5	0.3	0.5	1.5	2.6	4.4	7.6	16.5	28.8
Somerset	142.0	100.0	131.5	92.6	0.2	0.1	0.6	0.4	9.7	6.9	—	—
Union	15.4	100.0	10.1	65.3	0.1	0.6	0.2	1.3	5.1	32.8	—	—
New York	1,065.8	61.7	999.3	93.8	9.4	0.9	13.9	1.3	42.9	4.0	0.3	a
Dutchess	126.4	26.5	120.8	95.5	0.5	0.4	1.8	1.5	3.3	2.6	—	—
Nassau	48.0	100.0	44.9	93.6	0.1	0.1	0.7	1.4	2.3	4.9	—	—
Orange	135.8	30.5	126.0	92.8	—	—	2.3	1.7	7.6	5.5	—	—
Putnam	120.4	100.0	116.2	96.5	—	—	1.7	1.4	2.5	2.1	—	—
Rockland	56.7	99.1	52.7	93.1	—	—	0.3	0.6	3.6	6.3	—	—
Suffolk	410.7	100.0	389.2	94.8	0.1	a	3.8	0.9	17.6	4.3	—	—
Westchester	155.3	100.0	148.3	95.5	1.8	1.1	3.2	2.1	1.7	1.1	0.3	0.2
N. Y. excl. N. Y. C.	1,053.3	61.5	998.2	94.8	2.4	0.2	13.9	1.3	38.6	3.7	0.3	a
Bronx	n.c.											
Brooklyn	n.c.											
Manhattan	n.c.											
Queens	n.c.											
Richmond	12.5	100.0	1.1	8.9	7.0	56.4	0.1	0.2	4.3	34.5	—	—
New York City	n.c.											
Region excl. N. Y. C.	2,138.3	75.6	1,934.0	90.4	8.6	0.4	32.0	1.5	144.9	6.8	18.9	0.9
Core	n.c.											
Inner Ring	196.2	100.0	156.4	79.7	10.1	5.2	3.9	2.0	23.8	12.1	1.9	1.0
Intermediate Ring	1,489.8	97.9	1,353.5	90.9	4.3	0.3	21.2	1.4	93.8	6.3	17.0	1.1
Outer Ring	452.4	40.7	425.2	94.0	0.6	0.1	6.6	1.5	20.0	4.4	—	—
REGION TOTAL	2,150.8	75.7	1,935.1	90.0	15.7	0.7	32.0	1.5	149.1	6.9	18.9	0.9

a Less than one-tenth of one percent.
n.c. Not computed.
SOURCE: Regional Plan Association
NOTE:　Detail may not add to totals because of rounding.

Table 11. Minimum Lot Size of Vacant Land Zoned for Residence, 1960, by County (thousands of acres)

	Total Vacant Land Zoned for Residence	Single Family												Multi-Family	
		2 Acre Lots or Larger (80,000 to 435,000 sq. ft.)		1 Acre Lots (40,000 to 79,999 sq. ft.)		½ Acre Lots (20,000 to 39,999 sq. ft.)		¼ Acre Lots (10,000 to 19,999 sq. ft.)		⅛ Acre Lots (5,000 to 9,999 sq. ft.)		Less than 5,000 sq. ft. and Unrestricted			
	Area	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Connecticut															
Fairfield	234.2	113.8	48.6	94.7	40.4	17.5	7.5	4.6	2.0	2.8	1.2	0.1	a	0.8	0.3
New Jersey	707.9	83.1	11.7	300.9	42.5	211.6	29.9	64.0	9.0	39.5	5.6	3.4	0.5	5.5	0.8
Bergen	53.1	10.2	19.2	13.5	25.4	14.7	27.7	8.7	16.3	3.9	7.3	0.6	1.2	1.5	2.9
Essex	19.4	0.6	2.8	5.2	26.9	7.5	38.8	3.8	19.7	1.9	9.9	0.1	0.8	0.2	1.1
Hudson	0.6	—	—	—	—	—	—	—	—	—	—	—	—	0.6	100.0
Middlesex	93.1	0.2	0.2	21.1	22.7	40.2	43.2	9.5	10.2	19.7	21.2	0.3	0.3	2.0	2.2
Monmouth	194.8	—	—	91.1	46.8	83.4	42.8	14.2	7.3	5.9	3.0	0.1	a	0.1	a
Morris	169.9	39.6	23.3	74.6	43.9	35.0	20.6	15.6	9.2	4.3	2.6	0.4	0.2	0.4	0.2
Passaic	35.1	0.6	1.7	13.8	39.5	10.6	30.3	7.9	22.5	1.7	4.8	0.2	0.4	0.3	0.8
Somerset	131.7	31.9	24.2	79.7	60.5	18.5	14.1	1.1	0.9	0.3	0.2	—	—	0.2	0.1
Union	10.2	—	—	1.8	17.8	1.6	15.8	3.2	31.3	1.7	17.2	1.7	17.1	0.1	0.8
New York	1,008.7	137.4	13.6	196.8	19.5	155.2	15.4	354.7	35.2	153.1	15.2	2.2	0.2	9.4	0.9
Dutchess	121.3	9.2	7.6	18.9	15.6	49.9	41.1	35.9	29.6	7.0	5.7	—	—	0.5	0.4
Nassau	45.0	27.5	61.2	4.9	10.9	1.5	3.2	2.8	6.3	8.2	18.2	0.1	0.1	0.1	0.1
Orange	126.0	0.5	0.4	10.9	8.6	0.8	0.6	110.8	88.0	2.4	1.9	0.6	0.5	—	—
Putnam	116.2	—	—	43.8	37.7	33.9	29.2	38.3	33.0	0.2	0.1	—	—	—	—
Rockland	52.7	11.2	21.3	24.1	45.8	11.3	21.5	3.7	7.1	1.0	1.8	1.3	2.5	—	—
Suffolk	389.3	10.9	2.8	54.7	14.1	37.6	9.6	155.2	39.9	130.8	33.6	0.1	a	0.1	a
Westchester	150.1	78.0	52.0	39.4	26.2	20.3	13.5	7.9	5.3	2.5	1.7	0.2	0.1	1.8	1.2
N.Y. excl. N.Y.C.	1,005	137.4	13.7	196.8	19.7	155.2	15.5	354.7	35.4	152.0	15.2	2.2	0.2	2.4	0.2
Bronx	n.c.														
Brooklyn	n.c.														
Manhattan	n.c.														
Queens	n.c.														
Richmond	8.2	—	—	—	—	—	—	—	—	1.1	13.7	—	—	7.0	86.3
New York City	n.c.														
Region excl. N.Y.C.	1,942.6	334.3	17.2	592.4	30.5	384.3	19.8	423.3	21.8	194.2	10.0	5.6	0.3	8.6	0.4
Core	n.c.														
Inner Ring	166.5	42.3	25.4	30.9	18.5	34.3	20.6	27.3	16.4	18.8	11.3	2.8	1.7	10.1	6.1
Intermediate Ring	1,357.8	281.6	20.7	510.1	37.6	292.4	21.5	146.4	10.8	120.8	8.9	2.2	0.2	4.3	0.3
Outer Ring	425.7	10.3	2.4	51.3	12.1	57.5	13.5	249.6	58.6	55.8	13.1	0.6	0.2	0.6	0.1
REGION TOTAL	1,950.8	334.3	17.1	592.4	30.4	384.3	19.7	423.3	21.7	195.3	10.0	5.6	0.3	15.7	0.8

a Less than one-tenth of one percent.
n.c. Not computed.

SOURCE: Regional Plan Association, see p. 41.
NOTE:　Detail may not add to totals because of rounding.

Basis for land development projections

Vacant Land Measurement

The possible effect of local planning policies on future land development was determined by measuring the amount of vacant land, classified by zoning district, for each county except the Bronx, Brooklyn, Manhattan and Queens. The measurement was done at a scale of 1:24,000, using U. S. Geological Survey maps as a control; boundaries of zoning districts were taken from the Region's 509 municipal zoning ordinances.

First the Region's "committed" land was delineated; the remaining area was considered "vacant." Land in residential, commercial, industrial and institutional use, all publicly owned land, and land immediately surrounding buildings on farms and estates was considered committed. Cropland and open land in private estates, private golf courses and reservations were counted as vacant.

Aerial photography, a desirable source of land development information, was not available at the time of the study for the entire Region, hence the sources varied from county to county. Aerial photography of April, 1961 (scale 1:18,000) was used for Bergen, Essex, Hudson, Richmond, Union and parts of Middlesex and Passaic Counties; November, 1960 aerials (1:20,000) were used for Putnam and Westchester; summer, 1960 aerials (1:24,000) were used for Nassau and Suffolk west of Brookhaven. March, 1957 aerials (1:20,000) were used for the eastern part of Suffolk, and fall, 1958 aerials (1:24,000) for southern Middlesex.

Statistics on land development from county planning agencies were relied on in Monmouth and Orange; the County's delineation of vacant land was used in Morris, and local land use maps were used for Somerset, Rockland and Fairfield. These ranged from a generalized land use outline for Somerset County to land use maps of varying detail for individual municipalities in Fairfield County, dated from 1956 to 1961, and a large-scale 1961 land use map by the Greater Bridgeport Regional Planning Agency. For Dutchess, northern Passaic and three towns in Fairfield (New Fairfield, Shelton and Sherman) adequate information was not available and U. S. Geological Survey maps in conjunction with very small-scale aerial index sheets were used.

The accuracy of the vacant land measurement for individual counties varies somewhat because of differences in date and the amount of detail shown in the sources. More-

Table 12. Dwelling Unit Capacity of Vacant Land Zoned for Residence, 1960, by County (thousands of units)

| | Total Dwelling Units | Single Family | | | | | | | | | | | Multi-Family | |
| | | 2 Acre Lots or Larger (80,000 to 435,000 sq. ft.) | | 1 Acre Lots (40,000 to 79,999 sq. ft.) | | ½ Acre Lots (20,000 to 39,999 sq. ft.) | | ¼ Acre Lots (10,000 to 19,999 sq. ft.) | | ⅛ Acre Lots (5,000 to 9,999 sq. ft.) | | Less than 5,000 sq. ft. and Unrestricted | | | |
		D.U.'s	%	D.U.'s	%	D.U.'s	%	D.U.'s	%	D.U.'s	%	D.U.'s	%	D.U.'s	%
Connecticut															
Fairfield	167.8	41.7	24.9	69.9	41.6	23.9	14.3	10.1	6.0	8.0	4.8	0.2	0.1	14.0	8.3
New Jersey	**816.4**	**22.8**	**2.8**	**218.7**	**26.8**	**266.6**	**32.5**	**124.0**	**15.2**	**113.6**	**13.9**	**12.7**	**1.6**	**58.0**	**7.1**
Bergen	79.8	4.1	5.1	10.5	13.1	17.7	22.2	17.1	21.4	11.7	14.7	2.9	3.6	15.9	19.9
Essex	29.2	0.2	0.8	4.1	14.2	8.6	29.6	7.3	25.2	5.5	18.9	0.6	1.9	2.7	9.4
Hudson	4.7	—		—		—		—		—		—		4.7	100.0
Middlesex	158.1	0.1	a	15.9	10.1	43.7	27.7	19.8	12.5	55.2	34.9	1.0	0.6	22.5	14.2
Monmouth	230.1	—		68.7	29.9	116.5	50.7	26.0	11.3	17.4	7.6	0.3	0.1	1.0	0.4
Morris	160.1	11.9	7.4	57.7	36.0	44.5	27.8	28.8	18.0	12.2	7.6	1.1	0.7	3.9	2.5
Passaic	51.1	0.2	0.3	10.9	21.3	14.2	27.8	16.7	32.6	5.0	9.7	0.5	1.1	3.7	7.2
Somerset	80.3	6.4	8.0	49.5	61.6	19.1	23.8	2.1	2.6	0.9	1.2	—		2.2	2.8
Union	23.0	—		1.4	6.2	2.2	9.4	6.1	26.5	5.7	24.9	6.3	27.4	1.3	5.6
New York	**1,702.8**	**48.2**	**2.8**	**151.4**	**8.9**	**204.5**	**12.0**	**670.9**	**39.4**	**435.4**	**25.6**	**7.9**	**0.5**	**184.6**	**10.8**
Dutchess	181.8	2.5	1.4	14.7	8.1	61.6	33.9	70.8	38.9	24.7	13.6	—		7.5	4.1
Nassau	48.8	10.3	21.2	3.6	7.3	1.9	3.9	5.9	12.1	26.0	53.4	0.1	0.3	0.9	1.8
Orange	220.5	0.2	0.1	8.6	3.9	1.0	0.4	201.8	91.5	6.8	3.1	2.2	1.0	—	
Putnam	151.9	—		34.6	22.8	45.6	30.0	71.2	46.9	0.4	0.3	—		—	
Rockland	48.8	4.5	9.3	18.3	37.4	11.0	22.5	7.1	14.6	3.2	6.6	4.7	9.6	—	
Suffolk	762.2	4.4	0.6	41.3	5.4	56.0	7.3	297.0	39.0	363.1	47.6	0.1	a	0.3	a
Westchester	145.6	26.2	18.0	30.3	20.8	27.4	18.8	17.1	11.7	7.8	5.4	0.7	0.5	36.1	24.8
N. Y. excl. N. Y. C.	**1,559.6**	**48.2**	**3.1**	**151.4**	**9.7**	**204.5**	**13.1**	**670.9**	**43.0**	**432.1**	**27.7**	**7.9**	**0.5**	**44.8**	**2.9**
Bronx	n.c.														
Brooklyn	n.c.														
Manhattan	n.c.														
Queens	n.c.														
Richmond	143.1	—		—		—		—		3.4	2.3	—		139.8	97.7
New York City Region excl. N.Y.C.	**2,543.9**	**112.8**	**4.4**	**439.9**	**17.3**	**495.0**	**19.5**	**805.0**	**31.6**	**553.7**	**21.8**	**20.8**	**0.8**	**116.7**	**4.6**
Core	n.c.														
Inner Ring	387.6	16.0	4.1	23.7	6.1	41.6	10.7	54.2	14.0	58.5	15.1	10.7	2.8	182.9	47.2
Intermediate Ring	1,539.8	93.7	6.1	375.9	24.4	376.3	24.4	284.3	18.5	341.0	22.2	7.9	0.5	60.7	3.9
Outer Ring	754.3	3.0	0.4	40.3	5.3	77.1	10.2	466.5	61.9	157.6	20.9	2.2	0.3	7.7	1.0
REGION TOTAL	**2,687.0**	**112.8**	**4.2**	**439.9**	**16.4**	**495.0**	**18.4**	**805.0**	**30.0**	**557.1**	**20.7**	**20.8**	**0.8**	**256.5**	**9.5**

a Less than one-tenth of one percent.
n.c. Not computed.
SOURCE: Regional Plan Association, see p. 41.
NOTE: Detail may not add to totals because of rounding.

over, measurement at the relatively small scale of 1:24,000 resulted in some generalization, so that measurements for large areas, such as low density residential zones, are more reliable than those for use zones in small parcels, such as commercial and multi-family residential. Because of time limitations, an initial attempt to classify zoned vacant land by buildable, excessively sloped and swamps, was abandoned.

The final adjusted data, checked wherever possible against local sources and spot recounts of sample areas, are accurate within 3 to 10 percent. As an example, the area of vacant land calculated by Regional Plan for Suffolk County is 8 percent higher than that published by the County Planning Department in June, 1962. As elsewhere, a large part of this discrepancy can be explained by differences in time and in definition. Differences in definition, particularly the inclusion of farmsteads and low density uses in outlying counties, also prevent a comparison of vacant land data given here with those for 1954 in Regional Plan Bulletin No. 87, *People, Jobs and Land.*

Zoned Capacity of Vacant Land

The amount of vacant land and its zoning cannot, by itself, determine the capacity of land to absorb population. Lots tend to have some "oversize," (they exceed the legal minimum) and streets and community uses, such as schools and parks, preempt some residentially zoned land.

Streets and "oversize." To determine current practice in land allocation for streets and lot oversize, the records of 792 subdivisions with 17,340 lots approved between 1958 and 1961 in nine counties of the Region were analyzed. The composition of the sample is a fair representation of the different areas of the Region but was influenced more by the availability of data than by any rigorous statistical design. The results are shown in Tables 16 and 17.

Two major findings of the survey are the great extent to which actual lot size in current subdivisions exceeds the zoned minimum and the relatively small area devoted to streets.

The average lot oversize varies from 8 percent of the

Table 13. Extent of Land Development and Zoned Average Lot Size on Vacant Land, 1960, by County

	Gross Population Density[1]	Land Area	Committed Land[2]		Vacant Land[3]	Density of Committed Land[4]	Zoned Density of Vacant Land[5]	Average Zoned Lot Size[6]		Mean Actual Lot Size[6]	Mean Gross Area per Residential Lot[6]
	Persons per Sq. Mi.	Sq. Miles	Sq. Mi.	Percent	Sq. Miles	Persons per Sq. Mi.	Persons per Sq. Mi.	(Mean) Sq. Ft.	(Median) Sq. Ft.	Sq. Ft.	Sq. Ft.
Connecticut											
Fairfield	1,033	632.9	252.8	39.9	380.1	2,585	1,634	49,800	43,560	58,761	66,085
New Jersey	**1,940**	**2,267.1**	**903.2**	**39.8**	**1,363.9**	**4,871**	**2,309**	**28,500**	**20,000**	**34,436**	**40,642**
Bergen	3,343	233.4	132.4	56.7	101.0	5,893	2,922	25,000	21,780	30,427	36,360
Essex	7,221	127.9	93.1	72.8	34.8	9,920	3,103	21,800	17,500	26,655	31,864
Hudson	13,512	45.2	28.0	61.9	17.2	21,812	1,012	—	—	—	—
Middlesex	1,387	312.8	114.1	36.5	198.7	3,802	2,947	19,300	12,000	23,641	29,247
Monmouth	702	476.1	149.0	31.3	327.1	2,244	2,602	25,500	20,000	30,866	37,065
Morris	559	467.7	140.2	30.0	327.5	1,866	1,987	34,000	27,000	40,948	47,512
Passaic	2,099	193.7	82.1	42.4	111.6	4,953	2,320	21,000	20,000	26,359	32,163
Somerset	468	307.3	85.4	27.8	221.9	1,685	1,339	55,600	43,560	65,713	73,357
Union	4,896	103.0	78.9	76.6	24.1	6,391	3,534	12,000	10,000	16,320	21,303
New York	**2,767**	**4,007.2**	**1,290.4**	**32.2**	**2,716.8**	**8,591**	**3,947**	**19,000**	**15,000**	**23,340**	**28,746**
Dutchess	216	815.8	71.1	8.7	744.7	2,475	3,415	20,000	15,000	24,594	30,179
Nassau	4,437	293.0	218.0	74.4	75.0	5,964	2,406	29,000	7,000	35,140	40,860
Orange	222	829.3	133.3	16.1	696.0	1,378	4,839	15,900	15,000	19,551	25,014
Putnam	135	234.7	46.6	19.9	188.1	681	2,988	22,500	20,000	27,350	33,318
Rockland	766	178.5	89.2	50.0	89.3	1,534	2,040	36,700	40,000	43,974	50,697
Suffolk	724	921.4	279.6	30.3	641.8	2,385	4,394	14,000	10,000	17,310	22,253
Westchester	1,861	434.6	191.9	44.2	242.7	4,215	2,219	44,000	40,000	52,219	59,038
N.Y. excl. N.Y.C.	**891**	**3,707.3**	**1,029.7**	**27.8**	**2,677.6**	**3,209**	**3,807**	**19,000**	**15,000**	**23,369**	**28,778**
Bronx	33,684	42.3	37.7	89.1	4.6	37,794	n.c.	n.c.	n.c.	n.c.	n.c.
Brooklyn	37,912	69.3	64.0	92.4	5.3	41,052	n.c.	n.c.	n.c.	n.c.	n.c.
Manhattan	77,195	22.0	21.3	96.8	0.7	79,732	n.c.	n.c.	n.c.	n.c.	n.c.
Queens	16,663	108.6	99.5	91.6	9.1	18,187	n.c.	n.c.	n.c.	n.c.	n.c.
Richmond	3,847	57.7	38.2	66.2	19.5	5,811	27,159	10,250	5,700	10,343	14,464
New York City	**25,949**	**299.9**	**260.7**	**86.9**	**39.2**	**29,850**	**n.c.**	**n.c.**	**n.c.**	**n.c.**	**n.c.**
Region excl. N.Y.C.	**1,265**	**6,607.3**	**2,185.7**	**33.1**	**4,421.6**	**3,823**	**3,158**	**24,000**	**15,000**	**29,070**	**34,849**
Core	27,531	311.5	272.5	87.5	39.0	31,471	n.c.	n.c.	n.c.	n.c.	n.c.
Inner Ring	4,395	985.9	679.4	68.9	306.5	6,378	4,679	23,500	15,000	28,394	33,987
Intermediate Ring	779	3,598.6	1,221.2	33.9	2,377.4	2,297	2,451	28,000	20,000	33,849	39,976
Outer Ring	211	2,011.2	273.3	13.6	1,737.9	1,554	4,151	16,000	12,500	19,709	24,843
REGION TOTAL	**2,337**	**6,907.2**	**2,446.4**	**35.4**	**4,460.8**	**6,597**	**3,264**[7]	**24,000**	**15,000**	**29,044**	**34,820**

1. 1960 population/land area.
2. Land in residential, industrial, commercial, institutional and transportation uses, and publicly owned open space.
3. Unused land, land in agriculture and forestry and private open uses such as golf courses and large estates.
4. 1960 population/area of committed land; includes regional parks and institutional land and is not comparable with next column which excludes these.
5. Zoned population capacity of vacant land/area of vacant land.
6. The difference among these three measures of lot size is that the first represents the legal zoned minimum; the second, the actual subdivided lot size, which is generally larger than the zoned minimum; and the third, the lot itself plus such appurtenant uses as streets and community facilities. Each of three measures applies to single family lots only.
7. Does not include Bronx, Brooklyn, Manhattan or Queens.
n.c. Not computed.

SOURCE: Regional Plan Association, see p. 41.

Table 14. Single Family Residential Zoning of Vacant Land in the Region, by Lot Size, 1960

Zoned Lot Size (Square feet)		Acres Zoned	Potential Lots[1]
435,600	(10 acre)	2,500	210
217,800	(5 acre)	29,550	5,080
174,240	(4 acre)	34,520	7,280
130,680	(3 acre)	56,110	15,490
120,000		2,370	700
108,900	(2½ acre)	3,570	1,190
87,120	(2 acre)	168,960	67,080
81,000		3,660	1,550
80,000		33,030	14,170
103,843	**(average)**	**334,250**	**112,750**
65,340	(1½ acre)	37,120	19,080
60,000		500	280
50,000		23,780	15,500
45,000		4,000	2,860
44,000		850	610
43,560	(1 acre)	241,510	177,030
43,000		180	140
42,000		1,340	1,000
40,500		2,510	1,930
40,250		20,030	15,620
40,000		260,530	205,820
42,882	**(average)**	**592,350**	**439,880**
38,332		3,270	2,690
37,500		3,440	2,890
35,000		10,180	9,080
34,000		710	640
32,670	(¾ acre)	1,610	2,410
32,500		180	170
32,250		10	10
32,000		630	600
30,000		64,400	65,110
29,055		100	110
29,040		90	90
27,000		3,140	3,480
26,000		130	150
25,000		57,810	68,450
22,500		6,160	7,940
22,000		1,520	2,010
21,875		6,060	8,040
21,780	(½ acre)	44,990	59,750
21,000		2,010	2,740
20,000		177,850	258,660
22,833	**(average)**	**384,270**	**495,000**
18,750		1,860	2,770
18,500		2,510	3,820
18,000		2,550	3,940
17,500		240	370
17,424		30	50
16,500		800	1,330
16,000		2,500	4,260
15,000		271,640	485,970
14,520	(⅓ acre)	9,020	16,680
14,000		22,230	42,060
13,500		1,550	2,930
13,000		90	170
12,500		36,810	75,730
12,000		17,140	36,350
11,250		7,600	16,960
11,200		140	320
11,000		140	320
10,890	(¼ acre)	4,210	9,600
10,800		160	360
10,625		10,440	24,370
10,500		70	170
10,000		31,580	76,430
13,817	**(average)**	**423,310**	**804,960**
9,500		380	960
9,375		2,730	6,880
9,300		60	160
9,000		7,580	19,550
8,750		60	170
8,712		630	1,640
8,400		34,150	91,120
8,000		18,350	50,290
7,700		1,750	4,850
7,500		101,090	285,480
7,200		40	110
7,000		1,960	5,690
6,600		50	160
6,500		370	1,120
6,250		1,090	3,370
6,000		7,930	25,220
5,700		730	2,400
5,500		200	660
5,000		16,180	57,290
7,351	**(average)**	**195,340**	**557,110**
4,800		30	120
4,500		1,170	4,330
4,000		420	1,690
4,364	**(average)**	**1,620**	**6,140**
Unrestricted S.F.		3,980	14,630

1. Includes allowance for lot oversize, streets and community uses (see Table 18).
NOTE: Detail may not add to totals because of rounding.

zoned minimum for very large lots (five-acre) to 82 percent for 5,000-square-foot lots. Lot oversize results for many reasons, including the impossibility of accommodating the legally permissible number of lots on a given tract because of its shape and topography; health regulations which may require larger lots where there are no sewers; and subdividers' decisions to market a larger lot. Lot oversize varies erratically from county to county, and from subdivision to subdivision, as evidenced by the large standard deviations from the means given in Table 17.

The area in streets varies with much greater consistency, from 2.7 percent of the total area of the subdivision at the five-acre zoned density to 17.8 percent at the 5,000-square-foot density. These are low figures compared with past experience and are characteristic of large lot development with fairly efficient street layouts. They also reflect the fact that small subdivisions often avail themselves of existing rights-of-way and therefore record no area in dedicated streets.

Since only 49 out of the 792 subdivisions in the sample (mostly those in Westchester and Nassau Counties) had land dedicated for park use, this category was omitted from Tables 16 and 17. Sumps, another public use in subdivisions, prevalent on Long Island, were likewise omitted.

On the basis of data summarized in Table 16, a scatter diagram was plotted on log-log paper relating zoned lot size to percent of area in streets and lot oversize, and a line of averages was fitted to the dot distribution. The conversion factors in Table 18 were derived from this curve; they represent points on the line of averages and are not identical with the observed values in Table 16.

Community uses. To the varying amounts of land in streets and oversize there was added, for each lot, a constant 2,300 square feet, representing land requirements for community activities, including the following:

schools, elementary through high	1,000 square feet
churches	220
cemeteries	130
local government facilities	50
local recreational use	800
local retail use	100

The land requirement for schools is based on an additional 1,828,000 students to be accommodated in 2,080 new elementary schools and 480 new high schools, somewhat exceeding existing State Department of Education site standards. However, the resulting 6.5 acres in schools per 1,000 population is comparable with the land in this use as shown in available local studies in the Region. The land requirement for churches and religious uses (other than schools) was assumed to be 1.4 acres per 1,000 additional population or 2.8 acres per estimated additional church, assuming church membership in the Region at its current 65 percent of the population. The land requirement for cemeteries is based on 3,896,000 deaths in the Region between 1960 and 1985 and an interment density of 800 burials per acre. Existing cemeteries in the Region have a substantial reserve capacity and the extension of cemeteries is often discouraged, but for the

Table 15. Average Lot Size in Subdivisions, 1950 to 1960, in Selected Counties (square feet)

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1958-1960 Average
Fairfield[1]	17,206	23,975	25,084	28,370	29,024	34,965	35,658	30,611	28,985	30,287	26,815	28,551
Bergen	7,674	13,432	18,200	14,885	14,078	17,000	18,400	20,986	21,078	17,968	23,026	20,614
Middlesex	7,300	8,100	7,800	7,400	7,600	8,100	9,600	8,300	10,600	10,200	10,000	10,240
Passaic	11,196	11,831	11,456	12,415	17,816	15,681	13,237	18,533	16,988	18,653	18,060
Westchester	13,068	14,810	14,810	16,552	20,037	20,473	28,314	31,798	26,136	26,572	22,559	24,955
5—County Average	9,176	12,748	13,958	13,753	15,130	16,255	17,923	19,465	18,652	17,032	19,334	18,241
Monmouth								20,430	21,056	23,973	26,963	24,068
Morris								24,500	25,300	38,418	29,252	31,836
Somerset								33,540	43,995	44,866	39,204	42,561
Nassau								8,399	9,373	9,643	15,327	11,518
Rockland								n.d.	24,136	22,931	25,708	24,561
Suffolk[2]								n.d.	11,096	12,936	12,914	11,927
11—County Average								21,300	21,395	22,261	23,700	22,554

1. Towns of Fairfield, Greenwich, Stamford; New Canaan added 1959 and 1960.
2. Towns of Babylon, Islip and Smithtown.
n.d. No data.

SOURCE: County reports and records.

Table 16. Area in Streets and Lot "Oversize"[1] in Current Subdivisions in the Region, by Lot Size

Minimum Zoned Lot Size (sq. ft.)		Average Actual Lot Size (sq. ft.)	Additional Land per Lot as a Percent of Minimum Zoned Lot Size			Number of Lots in Sample	Number of Counties in Sample
			"Oversize"	Streets	Total		
217,800	(5 acres)	235,442	8.1	4.0	12.1	46	1
174,240	(4 acres)	202,292	16.1	3.3	19.4	75	1
130,680	(3 acres)	165,310	26.5	8.5	35.0	100	2
87,120	(2 acres)	102,627	17.8	8.7	26.5	414	2
65,340		73,638	12.7	7.8	20.5	306	1
43,560	(1 acre)	54,624	25.4	11.8	37.2	1,128	6
40,000		47,360	18.4	12.4	30.8	324	4
35,000		38,255	9.3	13.1	22.4	568	2
30,000		38,400	28.0	15.7	43.7	412	1
25,000		26,825	7.3	13.2	20.5	406	2
22,000		28,248	28.4	19.7	48.1	1,229	2
20,000		24,760	23.8	17.7	41.5	1,176	7
15,000		18,420	22.8	22.1	44.9	3,220	5
12,500		17,350	38.8	23.6	62.4	422	2
10,000		14,210	42.1	27.8	69.9	2,855	7
7,500		11,288	50.5	29.1	79.6	2,442	7
6,000		8,832	47.2	39.8	87.0	1,219	3
5,000		9,125	82.5	39.5	122.0	499	4

1. Difference between zoned minimum and average actual lot size.
SOURCE: RPA survey, see p. 42.

Table 17. Variation of Area in Streets and Lot "Oversize,"[1] by County, 1958 to 1961

	7,500 Sq. Ft. Zone		10,000 Sq. Ft. Zone		15,000 Sq. Ft. Zone		20,000 Sq. Ft. Zone		1 Acre Zone		All Zones	
	% in Streets	% in Oversize	% in Streets	% in Oversize	% in Streets	% in Oversize	% in Streets	% in Oversize	% in Streets	% in Oversize	% in Streets	% in Oversize
Fairfield	22.5	43.6	—	115.2	—	—	11.9	16.6	8.5	24.1	6.6	19.4
Middlesex	31.5	40.5	29.6	58.7	19.6	25.0	16.0	10.8	—	—	29.9	45.4
Monmouth	13.2	103.8	20.5	70.5	17.1	25.8	14.2	46.2	40.1	43.1
Morris	38.8	55.4	—	—	23.5	23.0	19.8	14.7	11.6	31.6	17.7	19.0
Passaic	—	—	27.2	28.0	22.0	20.3	19.7	23.9	—	—	25.2	28.6
Somerset	35.3	24.5	31.8	17.8	20.3	15.3	19.8	29.7	10.8	12.5	15.3	31.3
Nassau	—	—	26.0	19.2	—	—	14.6	25.8	11.9	10.8	27.9	24.7
Rockland	38.4	74.1	—	—	22.3	25.0	—	—	11.7	11.6	17.6	17.8
Westchester	26.8	23.0	29.5	31.5	—	—	—	—	14.8	9.0	21.5	16.7
9-County Mean	29.1	49.8	27.8	42.1	22.1	22.7	17.7	23.8	11.8	25.4	17.4	27.6
Standard deviation	16.5	41.9	9.7	33.4	6.5	10.5	7.3	17.7	3.5	27.4	—	—

1. Difference between zoned minimum and average actual lot size.
SOURCE: RPA survey, see p. 42.

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Table 18. Factors for Converting Zoned Lot Size into Dwelling Unit Capacity

Minimum Zoned Lot Size		Average Actual Lot Size[1]	Gross Area Per Lot[2]	Street Area as % of Gross Area	Lots per Acre
		Sq. Ft.	Sq. Ft.		
435,600	(10 acres)	479,160	498,884	3	0.087
217,800	(5 acres)	241,760	252,770	3	0.172
174,240	(4 acres)	195,150	206,161	4	0.211
130,680	(3 acres)	148,980	157,809	4	0.276
120,000		136,800	146,300	5	0.298
109,000		125,350	134,190	5	0.325
87,120	(2 acres)	101,060	109,458	6	0.398
80,000		92,800	101,500	6	0.429
65,340		76,450	84,628	7	0.515
50,000		59,000	66,800	8	0.652
45,000		53,550	60,800	8	0.716
43,560	(1 acre)	51,840	59,364	9	0.734
40,000		48,000	55,100	9	0.791
37,500		45,000	51,800	9	0.841
35,000		42,000	48,850	9	0.892
32,000		38,720	45,500	10	0.957
30,000		36,600	43,100	10	1.011
27,000		32,940	39,290	10	1.109
25,000		30,500	36,800	11	1.184
22,500		27,680	33,800	11	1.289
21,780	(½ acre)	26,790	32,792	11	1.328
20,000		24,800	30,700	12	1.419
18,000		22,500	28,220	12	1.544
16,000		20,160	25,660	12	1.698
15,000		18,900	24,350	13	1.789
14,000		17,640	23,020	13	1.892
12,500		16,000	21,175	14	2.057
12,000		15,360	20,540	14	2.121
11,250		14,400	19,513	14	2.232
10,890	(¼ acre)	14,050	19,180	15	2.271
10,000		13,000	18,000	15	2.420
9,000		12,060	16,880	15	2.581
8,400		11,590	16,328	15	2.668
8,000		11,200	15,900	15	2.740
7,500		10,800	15,425	15	2.824
7,000		10,430	14,970	15	2.910
6,000		9,240	13,700	16	3.180
5,000		8,500	12,800	16	3.403

1. Minimum plus "oversize".
2. Actual area plus streets and 2,300 sq. ft. for community uses.
SOURCE: Regional Plan Association,

purposes of this study it was assumed that the reserve capacity would be carried forward to 1985. The allowance of 50 square feet per household in local government facilities includes land for police and fire protection, libraries, street maintenance and similar uses. The 800 square feet per household for neighborhood parks falls between the 5 to 7.5 acres per 1,000 population recommended for low density development by Regional Plan's Park, Recreation and Open Space Project and the 3.4 to 4.6 acres actually found in areas of low density today. Local retail use includes supermarkets, neighborhood stores and gasoline stations. It was assumed that other commercial uses would be accommodated on commercially zoned land and would not infringe upon the residential land supplies.

Zoned capacity. The residential capacity of vacant land zoned for single-family use was determined by applying the "lots per acre" factor in Table 18 to the vacant land acreage in each zoned district. Each lot was assumed to contain a household of 3.7 persons. For multi-family districts, a conservative density of 20 households per net acre was used, except in Richmond, where the density in rooms per acre, given in the New York City zoning ordinance was used and an occupancy of .75 persons per room was assumed. No allowance for streets was made in Richmond, where mapped streets were not counted as vacant land, but an allowance of 10 percent of the area was made for community facilities in all multi-family districts.

Population capacity of unzoned vacant land (mostly in Orange and Dutchess Counties) was based on the average zoned density of the county's zoned vacant land.

The foregoing results in a theoretical maximum capacity. Actual capacity is somewhat lower, since some land will remain vacant for topographic or other reasons and no allowance is made for each county's share of regional parks, institutions and other facilities (discussed below).

Total Land Consumption Projections

The requirement of 2,800 square miles of additional land in urban use by 1985 (Chart 14) was arrived at by projecting land requirements for each separate use category.

The requirement for residential use is based on accommodating 90 percent of the population increase on 25,000-square-foot average lots, and 10 percent in multi-family units at 20 households per net acre. The 25,000-square-foot average lot in future development is smaller than the actual average lot size of zoned vacant land (29,000 square feet) but greater than the average lot size in current subdivisions (22,000 square feet). In calculating future land requirements, it was assumed that the smaller lot zones will be developed first and that vacant land left over in 1985 will be predominantly in larger lots; moreover, in allocating population among counties, the zoned capacity was exceeded in certain Inner Ring areas, which also contributed to a smaller land requirement per household. If all new development were to take place at the 29,000-square-foot average lot size of present zoning with no multi-family building, the land requirements for residential use would be increased by 500 square miles.

For manufacturing and wholesaling use, densities of 15 employees per acre in the Inner Ring and 10 employees per acre in the Intermediate and Outer Rings, used in deriving the employment capacity of land zoned for industry (Table 1), were assumed. This reflects an expected continuing decline in industrial employment density, compared with the following current patterns: Rockland County, 12.3 employees per acre; Nassau County, about 17 employees per acre; county averages in Connecticut, 14 to 37 employees per acre (including old plants); new plants in the Naugatuck Valley in Connecticut, 2.5 to 30 employees per acre; and Westchester County, plants built since 1955, 19 employees per acre. For local community facilities, land needs were based on the figure given previously (2,300 square feet per household). The figure for regional parks is the 680 square miles for the Region as a whole recommended by Regional Plan's Park, Recreation and Open Space Project. The requirements for non-retail, non-local commercial and miscellaneous industrial and utility uses as well as regional institutional uses were estimated from existing per capita figures derived from land use reports in low density areas of the Region. For some 900 miles of expected new parkways and expressways, a land requirement of 60 square miles was assumed, using an average right-of-way width of 350 feet.

Basis for capital requirements projections

The projections of the requirements for investment in public and quasi-public supporting facilities between 1960 and 1985 were developed separately for each type of facility — schools, roads, water supply, parks, etc. — on the basis of distinct methods for each type, for there is no valid method for developing such projections applicable to all kinds of community facilities. The data shown in this Bulletin are estimates of the magnitudes of the capital requirements *likely* to accompany the Region's growth to 1985, *providing* existing trends and policies continue. Thus, these projections refer to what is likely, given present policies, not to what is desirable.

We arrived at projected capital requirements by totalling costs of all projects announced, under way or recommended by major studies of public and quasi-public agencies. To the extent that these did not provide for anticipated growth to 1985, additional capital requirements were estimated on the basis of objective standards developed by responsible authorities or standards now being followed. Needed replacement, rehabilitation or modernization of existing facilities not covered by current plans or projects were based on estimates of the useful lives of the various types of facilities and an analysis, in very rough terms, of the age and condition of existing facilities. In these projections, the cost of remedying glaring existing deficiencies, correction of which is clearly imperative, is included with replacement/modernization costs. This last category includes, for example, elimination of water pollution pursuant to orders having the force of law and replacement of non-fireproof hospital buildings.

The announced plans and programs relied upon include those already under way or approved and those which seem highly likely to be approved in the near future. Also considered here were programs which no doubt will be continued beyond their nominal terminal dates, such as the Interstate Highway program, scheduled for completion by 1972. Among the major plans considered were these: arterial highway plans for the Region; New York City's six-year capital budget program and other long-range New York City plans; the water supply proposals which led to the establishment of the Delaware Basin Interstate Commission; the Port Authority's airport and marine terminal studies and plans; and county and state water supply and sewage disposal studies and programs.

In general, reliance on announced plans and programs under way gives a pronounced conservative bias to the projections, especially those for regional, as distinct from local, facilities. This is because official planning horizons do not extend all the way to 1985 for some of the most expensive regional facilities. They aim to satisfy 1970 or 1975 needs. Thus, if taken at face value, some of the

projections would imply rising levels of capital outlays from now to 1970 or 1975 with sharp declines thereafter. This is highly unlikely; therefore, a substantially higher level of capital investment than projected here for the entire period 1960-1985 is more probable for such facilities as marine terminals and airports, but there is no basis for quantifying these investments.

For two types of facilities, however, this downward bias does not apply — (1) parks and open space and (2) suburban railroads. In both these cases the basis of the projections is essentially the costs of the programs recommended in two earlier Regional Plan studies:

The Race for Open Space (1960), Final Report of the Park, Recreation and Open Space Project, sponsored jointly by the Regional Plan Association and the Metropolitan Regional Council, and *Commuter Transportation* (1961), a study done for the U. S. Senate Committee on Interstate and Foreign Commerce.

Major studies and announced plans and programs do not cover all types of community facilities or all parts of the Region. To project requirements associated with growth (beyond those covered in major plans and programs), standards indicating facilities needed for each additional person, family, school-age child, and the like, were used. The changing age distribution of the Region's population had an important effect on the results. In some cases, the standards relied upon were cast in dollar terms and were adjusted to reflect current price levels. In other cases, the standards were in physical terms, and current unit-cost estimates were applied to these physical standards.

For some types of facilities, the density at which the added population settles has a major bearing on the costs of the facilities. In these cases, three different sets of unit costs (costs per additional household) were applied. One set referred to high density development, that is, row houses and multi-family structures. Another referred to low density development — single-family houses set on lots large enough to avoid the need for sewers. Other single-family house development was classed as medium density — characteristically, quarter- and third-acre lots. The extent to which each county is projected to develop at each of the three densities was decided on the basis of current trends and existing zoning.

Here are examples of a few of the standards and sources relied upon:

(a) local roads and streets; sewers and sewage disposal — the standards used were an adaptation of those developed in the 1957 study of *Municipal Costs and Revenue Resulting from Community Growth,* by Walter Isard and Robert E. Coughlin, for the three different densities of development. For sewerage, for example, costs were set

at $350 per added household for high densities, $720 for medium densities, and nominal for low densities.

(b) elementary and high schools — costs were set at amounts ranging upwards from $2 million per 1,000 additional pupils, based on variations in distribution between high school and elementary school enrollment increases, size of class and costs per classroom in the two levels, using current experience as a guide.

(c) local hospitals — the standards developed by the Hospital Council of Greater New York for beds of various types needed per 1,000 persons were used, with costs, for example, of $25,000 per bed in New York City.

(d) miscellaneous public buildings and equipment — for these projections, a hypothetical package of land and other physical needs per 1,000 additional persons was derived and priced, essentially for an "average" suburb, according to recent experience in various types of communities.

As indicated earlier, needs for replacement, modernization and rehabilitation in most cases were projected by using the physical or cost standards developed in connection with growth needs together with analysis of the useful lives, age and condition of existing facilities.

There are a few further considerations:

1. Table 19 shows the distinction between needs supplied by governments and those supplied by private organizations — voluntary hospitals, religious groups, private water companies, etc. This distinction was based on an analysis of the existing situation and probable trends in the various parts of the Region. In most cases, the governmental-nongovernmental ratios have been relatively stable for many years and are not expected to change greatly.

2. Chart 19 compares current and projected annual rates of capital outlays by government for supporting facilities for the 1960-1985 period. The basic source of the data on current rates is the 1957 Census of Governments, which provides the most recent comprehensive and comparable data on local government finances. But a few other sources have been used, partly to update the figures and partly to identify state government capital expenditures applicable to the Region. One such source, for example, is the U. S. Bureau of Public Roads annual compendium, *Highway Statistics*. These data are therefore not strictly comparable to those in any other report. New York City's figures differ most significantly from those in other sources. Some of the City's capital expenditures, for example, are classed with regional facilities, which are mostly provided by state and federal government agencies and the Port Authority.

3. The projections of capital requirements and the data on governmental capital outlays exclude the costs of urban renewal *per se*, public housing, and loans and subsidies for middle-income housing. These are considered to be analogous to the costs of private building, although paid for by government, and should not be included in a tally of the costs of underlying, supporting facilities. However, water supply, sewer, school, park, etc., costs associated with urban renewal efforts *are* included in the projections.

4. Chart 20, showing projections of local government expenditures from 1957 to 1985, includes that portion of projected capital requirements to be supplied by *local* governments (as distinguished from state and federal governments and private organizations), converted to annual rates which rise gradually to 1985. The projections of current operating costs are rough over-all estimates, heavily influenced by the anticipated rise in current costs of the public schools due to both rising enrollments and rising salaries and standards of education.

Table 19. Projected Infrastructure Costs of the Region, 1960 to 1985, by Type of Facility (millions of dollars)

Type of Facility	Total	Needed to Accommodate Growth	Needed for Replacement and Modernization	Supplied by Governments	Supplied by Private Organizations
Transportation	**$18,850**	**$13,460**	**$ 5,390**	**$18,660**	**$ 190**
Limited Access Highways and Major Bridges and Tunnels	8,700	8,700	—	8,700	—
Local Roads and Streets	6,000	3,690	2,310	6,000	—
Commuter Railroads and Transit	3,030	250	2,780	2,930	100
Airports and Port Facilities	1,120	820	300	1,030	90
Education	**13,090**	**7,790**	**5,300**	**10,030**	**3,060**
Elementary and High Schools	10,040	4,990	5,050	7,750	2,290
Higher Education	3,050	2,800	250	2,280	770
Water Supply and Sewerage	**4,210**	**2,230**	**1,980**	**3,570**	**640**
Water Supply Systems	2,210	1,290	920	1,570	640
Sewers and Treatment Plants	2,000	940	1,060	2,000	—
Health and Welfare Facilities	**3,560**	**1,670**	**1,890**	**1,720**	**1,840**
State Hospitals and Institutions	950	550	400	950	—
Local Hospitals and Institutions	2,610	1,120	1,490	770	1,840
Parks and Recreation	**2,750**	**640**	**2,110**	**2,750**	**—**
Other[1]	**4,180**	**2,630**	**1,550**	**2,570**	**1,610**
REGION TOTAL	46,640	28,420	18,220	39,300	7,340

1. Includes miscellaneous types of public buildings and equipment, and churches and miscellaneous non-public community facilities.
SOURCE: Regional Plan Association

Tables

Charts

Maps

REGIONAL PLAN ASSOCIATION

REGIONAL PLAN ASSOCIATION works for the satisfactory development of the Metropolitan Region surrounding the Port of New York. Through research and information programs, the Association provides governments and private organizations in the Region with data to make decisions on the way land is to be used and on the transportation system to serve it.

A pioneering development Plan of New York and Environs, fostered by the Association since 1929, has now been achieved in most of its fundamentals — in the network of radial and circumferential expressways of the Region, in regional parks, metropolitan airport and port development, and in the substantial growth of effective municipal and county planning.

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This bulletin was prepared by the research staff of the Regional Plan Association, listed at the right, with part-time assistance by the following: Judith Burke, Stephen Estrin, Harold Kassoff, H. Thomas Laughlin, Francine Rabinovitz and Jayn Rosenfeld. Valuable information and advice was contributed by individuals and by many local, county, state and regional agencies.