

PHILADELPHIA CITY PLANNING COMMISSION—1960



COMPREHENSIVE PLAN FOR THE CITY OF
PHILADELPHIA

COMPREHENSIVE PLAN

THE PHYSICAL DEVELOPMENT PLAN

FOR THE CITY OF PHILADELPHIA

1960



CITY OF PHILADELPHIA
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May 4, 1960

TO HIS HONOR THE MAYOR OF THE
CITY OF PHILADELPHIA AND
TO THE PRESIDENT AND MEMBERS OF THE
COUNCIL OF THE CITY OF PHILADELPHIA

I have the honor to transmit herewith the comprehensive plan, the Physical Development Plan for the City of Philadelphia, prepared by the City Planning Commission in accordance with Section 4-600 of the Philadelphia Home Rule Charter.

The Plan represents the best thinking of the staff and the members of the Planning Commission, assisted by many agencies and groups, on what the City of the future ought to be. From time to time the Plan will be modified by the Commission. It is hoped that it will come to represent the best collective thinking of the City as to its goal for its fullest and finest development.

Work on the Plan was begun during the Chairmanship of Edward Hopkinson, Jr. It was intensified in 1956 under the leadership of Albert M. Greenfield, who was then Chairman. The development of the Plan has been possible only because of the continuing cooperation and support of the many City agencies and of the Council.

SINCERELY YOURS,



G. HOLMES PERKINS
CHAIRMAN

PREFACE

Because it is a community venture in the broadest possible sense of the term, the planning of a city's future is necessarily a collaboration. To be done well, it must involve all of the best that a city has to offer in talents. Such, the authors are convinced, has been the case in the Comprehensive Plan presented here.

This Preface is designed to demonstrate the extent of the collaboration, and to acknowledge with gratitude the assistance, cooperation and constructive criticism received from a large number of agencies and individuals.

The greatest over-all contribution in citizen time and effort was undoubtedly made by the Comprehensive Planning Committee of the Citizens' Council on City Planning. In 1954 a committee was established by Citizens' Council to meet periodically with the staff of the City Planning Commission. Its purpose was to exchange ideas, to review, and to criticize staff work in the comprehensive planning process.

These meetings have progressed through four phases: first, review and discussion of the general nature of a comprehensive plan; second, review and criticism of the Commission's proposed work program; third, review and criticism of the components of the Pilot Plan, and fourth, review and criticism of the components of the Comprehensive Plan.

In the last two stages, the Citizens' Council set up several sub-committees to provide detailed criticism of different elements of the Plan.

The time, effort and sound criticism of both its members and of the Citizens' Council staff is gratefully acknowledged.

The Commission also received indispensable help from the Department of Recreation and the Technical Advisory Committee on Recreation, which undertook the lengthy and complicated task of establishing a workable set of recreation standards and critically reviewed their application in the Comprehensive Plan.

Special advisory committees assisted in reviews of major consultant studies: *Industrial Land and Facilities*, prepared by the Institute of Urban Studies, University of Pennsylvania; *Future Distribution of Non-Manufacturing, Non-Residential Activity*, prepared by Marketers' Research, Inc.; *The Useful-*

ness of Philadelphia's Industrial Plant, prepared by Arthur D. Little, Inc.

The assistance, cooperation and criticism of the staffs of the Planning Commissions of the surrounding counties has been substantial and significant, and the City Planning Commission is happy to recognize their neighborly help.

Officials of the Pennsylvania Railroad, the Baltimore and Ohio Railroad, and of the Reading Company have been most cooperative and helpful in consultation on those aspects of the Plan which bore on their fields of activity.

The staffs of the Old Philadelphia Development Corporation and the Philadelphia Industrial Development Corporation put in many hours on difficult questions of mutual concern, the former in the Center City Plan, the latter in the Industrial Land Use Plan. Their assistance was considerable and deserving of a special word of thanks.

Among official groups the most important contribution was made by the Urban Traffic and Transportation Board. Its report, *Plan and Program 1955*, wrestled with the difficult job of setting up a balanced transportation program that would meet the complex needs of the City and Region.

The policy proposals of the agency have been accepted in the Comprehensive Plan. The Board's staff has worked continuously with the Commission's staff in weaving these policies into the Plan.

In addition to the Urban Traffic and Transportation Board, the Planning Commission's thanks are due in particular to the City's Department of Streets and Department of Public Property, because their staff members also participated in long and arduous work sessions to produce the major elements of the Transportation Plan. This is not to overlook the fact that at one time or another, assistance was required from practically every City department and commission. For this assistance the Commission is duly grateful.

Other experts to whom the Commission turned for professional consultation included Larry Smith and Company, who provided a study of shopping centers, and Ladislav Segoe, internationally known city planner, who provided a thorough and searching criticism of the plan as it stood at about the two-

thirds point in the work. Invaluable assistance was given by Frederic Hyde in the final writing of the plan.

Finally, the Commission acknowledges with gratitude the hard work of its own staff under the direction of Arthur T. Row, Assistant Executive Director, and Larry Reich, Chief of the Comprehensive Planning Division. The various sections of the work were under the charge of the following staff members:

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In spelling out these contributions of so many agencies, the Commission in no way intends to imply endorsement by them of the Plan's final form, except that of course the professionals named stand behind the statements made in their particular areas of competence and responsibility.

In most areas it is fair to state that there is general agreement, but the many individuals involved undoubtedly have points of view that are either not reflected in the Plan, or that diverge from some of its proposals. But that is in the nature of the comprehensive planning process and—fortunately—in the system of government within which we live.

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"The City Planning Commission shall prepare and adopt, from time to time modify, and have custody of a comprehensive plan of the City showing its present and planned physical development. The comprehensive plan shall be known as the Physical Development Plan of the City and shall show the general location, character and extent of streets, parks, recreation facilities, sites for public buildings and structures, pierhead and bulkhead lines, City and privately owned utility facilities, waterways, water conduits and such other features as will provide for the improvement of the City and its future growth and development and afford adequate facilities for the housing, transportation, distribution, health and welfare of its population. The Physical Development Plan may be prepared as a whole or in successive parts corresponding to major geographical sections of the City or to functional subdivisions of the subject matter of the plan, as the Commission shall determine. The Commission shall transmit the Physical Development Plan or any part and any modification thereof to the Mayor and to the Council."

—Section 4-600,
Philadelphia Home Rule Charter

INTRODUCTION

IN THE PAGES that follow is a blueprint for the Philadelphia of tomorrow.

It is a blueprint of a new kind of city, its beginnings already in evidence, which is within the financial and physical means of Philadelphia's people to bring to full realization in the remaining decades of this century.

It is a proposal based on two fundamental assumptions:

1. That a city's reason for being is to provide a satisfactory environment for those who live and work in it.
2. That Philadelphia as a city must provide this and much more to its people if it is to survive in the vigorously competitive conditions of the future, against other cities on the one hand and against its own suburban areas on the other.

The steps that must be taken to bring these things about constitute the core of this Comprehensive Plan. Its sponsors believe this Plan is best designed to meet major civic needs which are urgent for Philadelphia.

Without far-sighted and imaginative planning for the most effective future use of its land, its industrial and commercial facilities, and the skills of its people, it has become evident that Philadelphia cannot maintain for long its present enviable position among the great cities of the nation and the world.

While the ideal of this Plan is complete fulfillment, and while some of the improvements envisioned here are interdependent with others, any part of it which is carried out will represent an advance for the City. This is a working proposal, and in no sense an ivory-tower fantasy.

Although the Plan set forth here is concerned with the City of Philadelphia and its needs, the Commission is fully cognizant of the fact that the City is only one part of a great metropolitan complex whose future needs call for scientific planning at re-

gional and interstate levels. Such planning is now in progress, and Philadelphia, as the hub of this complex, is a party to that planning. The proposal presented here is a separate, independent unit but is so drawn that it can be integrated readily with planning at other levels.

Care also has been taken to maintain throughout this program the nicely adjusted set of balances without which a single unified plan of this sort could not function: as between residential and commercial development, between urgent and secondary need, between the time required for a long-range project and the capital funds available for its support. In fact, the unique contribution of the Plan to the City's development policy is that each component of the City's structure is analyzed, projected, and, finally, planned in the context of all the components.

Any plan such as this is prepared by fallible people in a fallible society. It is important to be explicit at the outset about the terms within which this Plan has been prepared.

Major parts of it are based upon careful statistical analyses and projections. Other parts, of necessity, are the product of judgments made in the field of human values—values which cannot be measured statistically, but which, as factors influencing final decisions, are just as important as the measurable ones. The value judgments employed here are set forth as explicitly as possible, but public officials and citizens who study this Plan should be aware that explicitness is not always possible.

Clear understanding of the Plan's objectives calls first for a careful analysis of the conditions under which it must operate. To make this possible through a presentation of matters in their logical order, the chapters that follow deal first with the historical developments which brought about present condi-

tions; the nature of the City's people, and estimates of the size and composition of the population of the City and Region in the future.

The strategy which this Plan proposes to carry out in meeting these problems, and an estimate of the costs involved, are then followed by a discussion of the technical concepts of planning which serve as a framework for the entire program. What occupies the balance of the report is a chapter-by-chapter demonstration of the way it will be applied to different segments of Philadelphia's community activity.

The costs of this proposal are big. But everything about it is big, and the figures themselves should not take on an exaggerated importance. What is important is the rate at which the City can absorb these costs. Needs will change, and this Plan will change. Just as the parts of the Plan are interdependent, so are the Plan and the future of the local economy. The potential ability of Philadelphia's people to pay the price tags on these proposals derives in part from the increased efficiency, prosperity, and higher community morale which the Plan eventually may bring about.

To infer from what has been said thus far that haste is urgent to the success of this Plan is incorrect. To infer that these improvements will take place without firm decision-making is also incorrect. As will be seen later, accurate projections for use in this Plan have proved possible only up to 1980, while for various reasons the program as a whole is expected to encompass a span of 40 years.

Time has not always been on Philadelphia's side, but in this instance it seems to be. For the "new Philadelphia" now emerging, here are the guide rails which, given proper pace and acceleration, can lead the City to a future far more brilliant than her past.

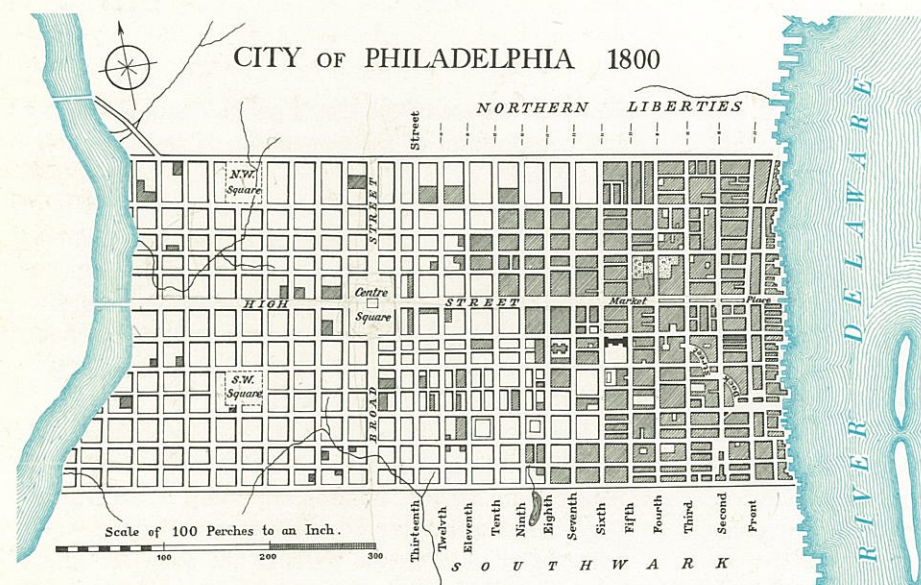


FIGURE 1—PHILADELPHIA IN 1800
URBANIZED AREA

From the beginning, the port has influenced Philadelphia's development pattern. Penn's plan included a strip running from river to river, but actual development clung close to the Delaware and spread westward very slowly.

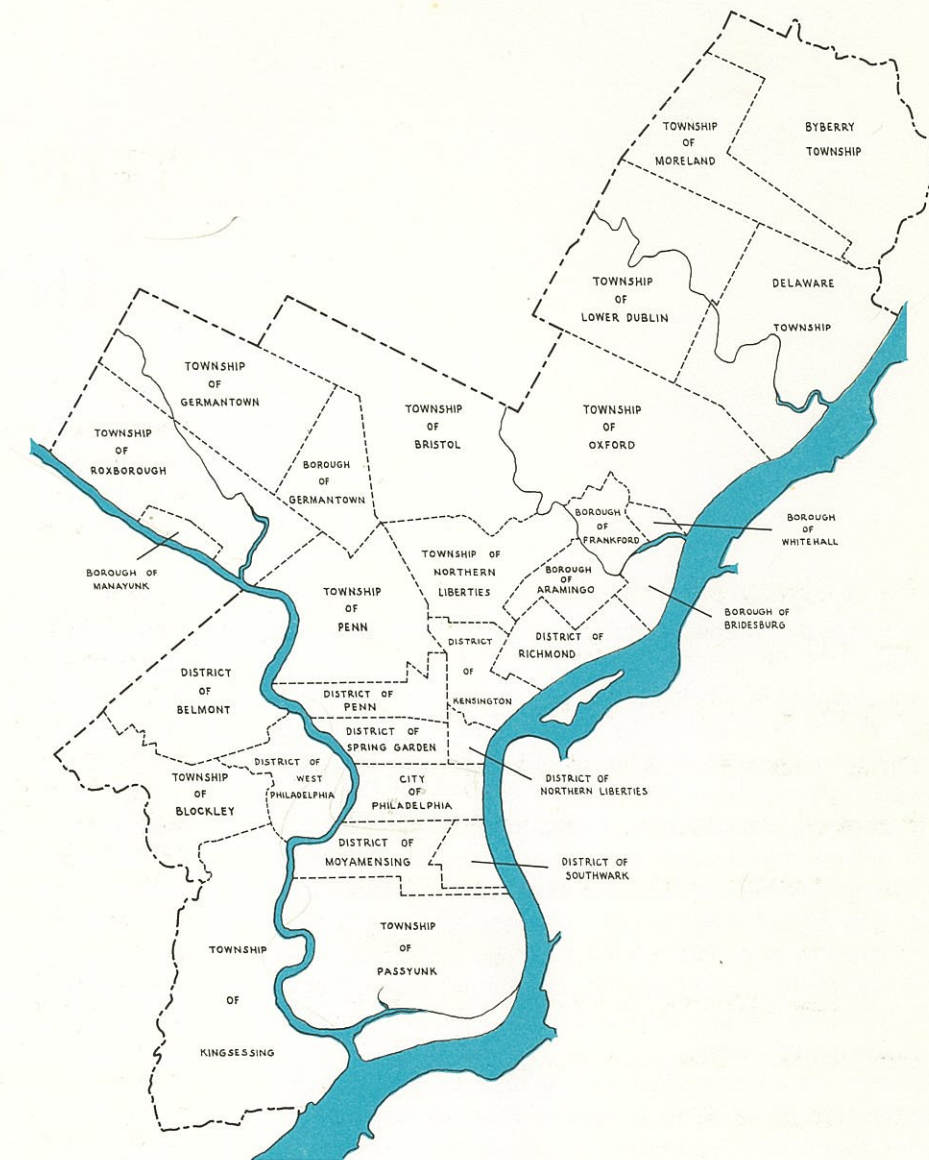


FIGURE 2—PHILADELPHIA IN 1854
POLITICAL BOUNDARIES

Local diversity for Philadelphia is not an idea invented by its planners. Until 1854 the present City was made up of many independent townships and districts. Together with the facts of geography they provide a basis for the community planning areas which are a major feature of the Plan.

Philadelphia the first planned city... A key site, carefully chosen... Its strategic location a basis for its prosperity over three centuries... Other advantages... Years of expansion... And years without planning... Penn's plan and what is left of it... The City's position today... It faces tremendous new competitive challenges... The need for careful planning to meet them.

THE CITY AND ITS HISTORY

FROM ITS VERY BEGINNINGS nearly three hundred years ago, the City of Philadelphia has enjoyed advantages bestowed upon it by the far-sighted and imaginative planning of its founder.

Its strategic location on the Atlantic Seaboard, first as the terminus of traffic with the mother country and later as the focus of natural transportation routes to other parts of America, was the result of the painstaking directions given by William Penn. Its growth and development over the centuries reflected not only the choice of a key site, but Penn's own skill in so laying out his city as to make most effective use of its immediate and nearby terrain.

The site was chosen for three principal advantages. First, the deep water of the Delaware River lay close to the shore, to make for ideal docking facilities. Second, the Schuylkill River provided a convenient back door to the interior. Third, the dry ground of the city site and the gently rolling character of the surrounding countryside made land development and transportation relatively easy.

Trade routes making use of the rivers and of a soon-developed radial system of highways to the north, west and south contributed to Philadelphia's rapid growth as a commercial center. The first major highway in the United States, the Lancaster Turnpike, was built in colonial times to the westward. Other turnpikes fanned out to Reading, Lebanon, Bethlehem and other inland towns before the Revolution. By 1700, the southern counties of Pennsylvania, as well as Maryland and western New Jersey, were under the City's commercial dominance. By 1720, its sphere of influence had extended about forty miles west of the Delaware. It was this continuing expansion of its commerce which enabled Philadelphia to surpass Boston in size and become the largest city in America in the 1760s.

This predominance endured until about a half-century after the Revolution ended. Then, the opening of the Erie Canal in 1825 soon enabled New York to overtake this city in commercial importance by connecting the Hudson with the rich Great Lakes area.

Pennsylvania embarked upon major canal development at about the same time, and its canals soon became important

factors in spurring the growth of Philadelphia and its nearby towns as industrial centers.

Canals such as the Schuylkill Navigation, opened to Pottsville in the anthracite fields in 1825, the Delaware River Canal and the Lehigh Canal assisted in the rapid growth of the coal mining, iron, brick and cement industries of eastern Pennsylvania. All carried heavy traffic until the 1860s, when they were outmoded by the railroad.

The railroad era began in 1830, when the Baltimore & Ohio opened its first section out of Baltimore. Philadelphia was quick to respond, thrusting a parallel road of steel across the mountains to Pittsburgh and beyond. This was the Pennsylvania, incorporated in 1846 and destined to become one of the giants in its field. It and other rail lines were of great importance, as the canals had been earlier, in Philadelphia's development. Industrial fuel and raw materials could be brought cheaply to the City; they enabled it to become the workshop and distributor, first for the immediate hinterland and later for the eastern half of the United States.

New York's advantage in water-borne commerce, given it first by the canals, was augmented in mid-century when ocean-going steam packets began to replace sailing vessels. The fact that New York was somewhat nearer to European ports had been no handicap to Philadelphia in the slower days of sail; it became important to the regularly scheduled steamers because terminating at New York represented a significant saving of time on each crossing.

While ocean-borne passenger traffic and commerce in finished goods gravitated to New York, the Delaware Port came to serve the import and export trade in raw or semi-raw materials: coal, sugar, cotton, grain, timber, coffee, cocoa and wool.

Philadelphia's position as the one great industrial complex located close to the battle lines during the Civil War gave it a tremendous further impetus, from which the City went on benefiting throughout the balance of the 19th Century, until at the turn of the century it could boast, with justification, of being "the workshop of the world."

In dealing historically with Philadelphia, several distinctions must be made. The commercial and cultural center which

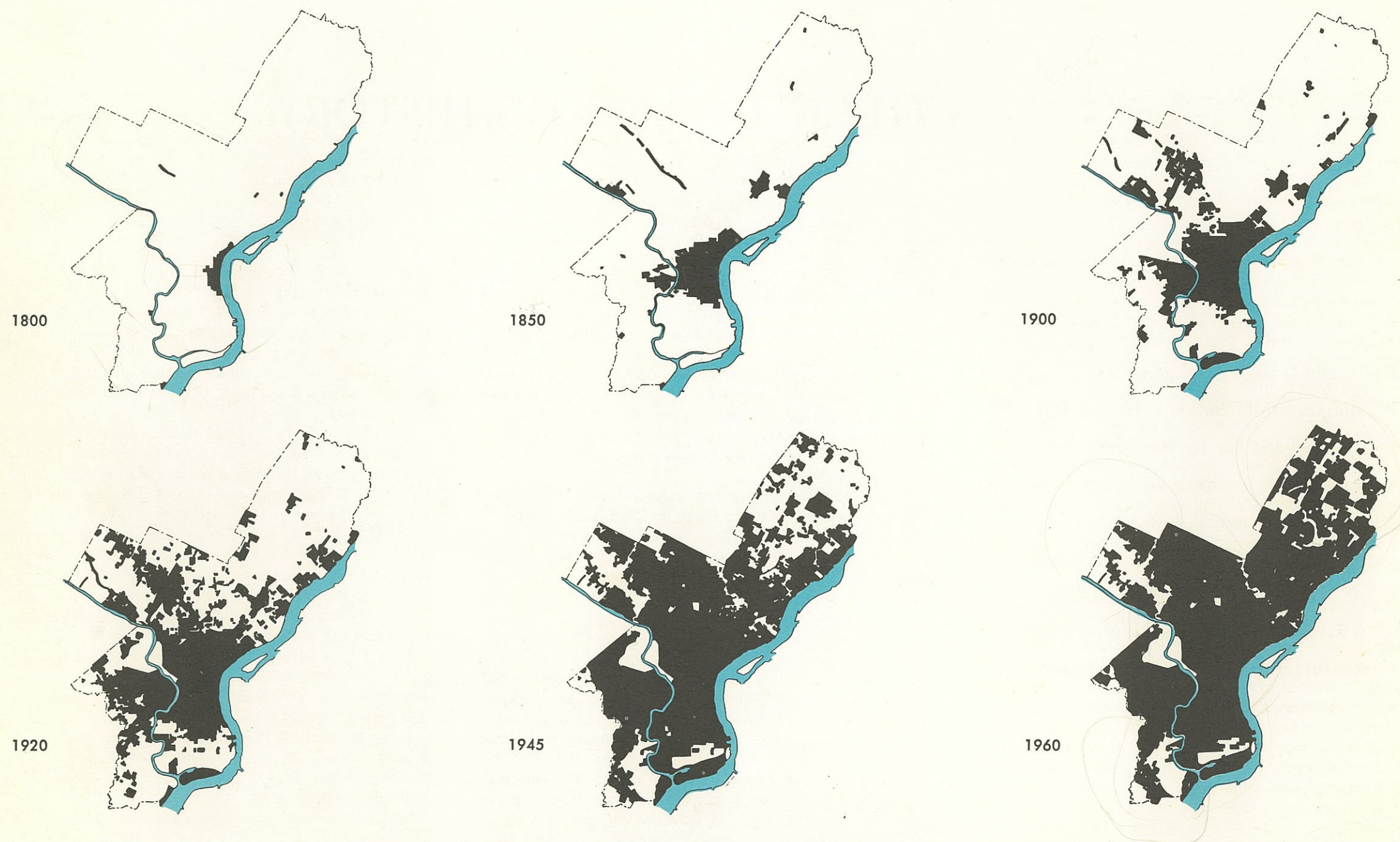


FIGURE 3—URBAN GROWTH IN PHILADELPHIA 1800-1860

Until quite recently, the City found growing space within its own boundaries. Now almost all its land is occupied. Major new growth can take place within the City only with the aid of redevelopment.

served as the rallying point of the colonies and the capital of the infant Republic was a relatively small city, whose citizens hardly dreamed it would some day be the central city in an urbanized area of well over 400 square miles. Even as the Civil War arsenal of the North, key city of the Keystone State, it was a metropolis separate and distinct from the rural counties which surrounded it.

It is only since the turn of the century, and particularly since the start of the First World War, that Philadelphia as a commercial and manufacturing center, and as one of the nation's major concentrations of population, has overflowed the sharply defined political boundaries within which the Comprehensive Plan necessarily operates. The term "Philadelphia," as customarily used today, refers to a complex reaching far beyond the City proper, to a megalopolis whose problems are shared in common with such formerly distant towns as Bristol and Chester. The history offered thus far has been chiefly of the city proper, although of a city steadily growing outward in the areas just beyond its boundaries. It now becomes necessary, for an understanding of the present situation, to go back for a few moments to Penn's original plan and his disposition of the lands surrounding central Philadelphia.

It was Penn's concept that Philadelphia would be an open, well-shaped town running east and west in a rectangle between the two rivers. It was to be the seat of a great rural region, farmed by large landholders, each living on his own farm. The relationship between the region and the City was close not only economically but politically. With the purchase of a large tract of farmland, a town lot, at first in the City and later in the Liberties, went to the purchaser. For example, a 500 acre tract in the country brought with it a 10 acre lot in the Liberties.

The large rural landowners looked to Philadelphia not only as a market for their goods and a source of supply, but also as the center of much of their social and cultural activity. Thus, in early colonial times, Philadelphia's dominance and close relationship with the surrounding region was assured.

Although Penn's original plan for Philadelphia was for a fairly narrow strip extending from the Delaware to the Schuylkill, the actual development that took place tended to stretch along the Delaware River banks. One hundred years after its founding, the City had spilled over the original boundaries to the north and south, but had progressed less than one-third of the way to the Schuylkill River to the west.

Where the founder had decreed that each dwelling would be centered on its individual plot of grass and trees, rapid population growth and the demands of commerce soon resulted in the substitution of the two or three story row house, which in its

thousands has become Philadelphia's trademark as the "City of Homes." The row house, popular in Baltimore and other Middle Atlantic cities, became so much a Philadelphia tradition that as much as 75 per cent of all new residential construction in the City was devoted to it until as recently as the 1930s. By the mid 50's, this percentage had dropped to 25.

One feature of Penn's planning which outlasted others long after the City had grown beyond its original boundaries was the gridiron pattern of streets and parks he had laid out for his initial development. It endures today throughout most of the City, with a system of diagonal arterial streets, tracing the routes of the original roads into the country, penetrating through it, Germantown and Ridge Avenues for example.

Various forces, often unrelated, have been at work in shaping Philadelphia's present face throughout the past half-century. Evidences of them are the City's transit system, of which the Broad Street and Market Street subways are a notable feature, the spectacular Benjamin Franklin Parkway between City Hall and the Art Museum, and Roosevelt Boulevard.

During this period the City extended rapidly outward, with very little planning to guide its growth, producing, along with most other large cities of the period, vast areas of "urban sprawl."

That this came about was the result, again, of the forces which turned the City in the direction of fabricating, finishing and heavy manufacture. The influx of substantial numbers of skilled weavers from the British Isles and Germany made the textile industry one of the City's most important, and before the widespread introduction of steam, its wool and cotton mills sought out water for power. Prior to 1775, there were 11 mills scattered along the banks of the Wissahickon Creek alone, and 16 of the area's main creeks were utilized for water power before Flat Rock Dam was built on the Schuylkill in 1829.

Around these sites developed a number of manufacturing centers, such as Manayunk, to the northwest of the City but within the county of Philadelphia, although separated from the metropolis by several miles of woods and farmland. With other communities of similar origin, such as Germantown and Wissinoming, they set a leapfrog pattern of industrial and residential development in the City's distant outskirts which, without benefit of planning, led inevitably to filling the spaces in between with a hodge-podge of factories, dwellings, warehouses and shops.

As noted earlier in this chapter, however, the principal direction of the City's growth for many years was northward and southward along the Delaware. Its expansion westward was

extremely slow. By 1854, when the first City Consolidation Act was adopted, the northward development had pushed beyond what is now Girard Avenue. The City took another 22 years, until the Centennial Year of 1876, to advance to the north another five blocks as far as Columbia Avenue. Thereafter, spurred by the activities of the Centennial Exposition and supported by new trolley lines, urban expansion in all directions became much more rapid.

If Penn's planning, the detailed outline of his dream, has been blurred and overlaid by the accretions of time, if some of the unplanned city is in evidence along with the planned, the fact of the founder's still powerful influence upon his city's destiny remains always. Aside from its site-location, which in relation to other markets and sources is unsurpassed, Philadelphia has enjoyed surroundings almost without drawback from the point of view of growth prospects.

Of the 134 square miles contained within the City's limits, an extremely small percentage of land has proved unusable. Marginal areas, such as the swampy sections of Eastwick, have been among the last to be utilized. Areas too sharply sloped for building, such as the ravines of the Wissahickon, were early turned to good account as park land.

The gently sloping Piedmont Plateau to the City's northwest, and the coastal plain to the southeast, both have served in very recent years to absorb the tremendous overflow of Philadelphia's population, thus relieving pressure at the center while at the same time helping to create the very megalopolis mentioned earlier. Thus served, the City has been put in a position to make more effective and even specialized use of the land still available within its borders.

Philadelphia is fortunate that this has been so. The dynamics of growth dictate that no organism, including a city, can stand still or mark time; that to do so is to invite regression and decay. This city is in constant competition with other cities subject to the same dynamics, for trade, markets, and sources of supply. The contest is just as keen for those intangibles which give pride to a city's people and create prestige for a community in the nation's eyes.

Philadelphia has the fresh energy, the foresight and the flexibility to meet the challenge of the day, through the only means certain to succeed: the creation of a step-by-step plan for its orderly physical development and growth.

The Comprehensive Plan presented here is an assurance that Philadelphia, by the time it celebrates its Bicentennial as the nation's birthplace in 1976, will be well on the way toward its rendezvous with a future even greater than the one Penn planned for it.

COSTS AND STRATEGY

Estimated total cost of Comprehensive Plan: \$3,483,000,000... Expected Federal and State share: \$1,717,000,000... City's: \$1,482,000,000... Board of Education's: \$284,000,000... One-third of City's investment to be self-sustaining. At present rate of capital investment by City, Plan to take 37 years to complete. If City's spending for capital projects increases proportionate to expected personal income rise, would take 28 years to complete... But all parts of Plan to be "paced" to assure maximum effectiveness in implementing other parts.

Total Costs: In order to carry out all the proposals outlined in this Plan, it will be necessary for government as a whole to make capital investments of some \$3,482,839,000 in Philadelphia (See Figure 4.). Of this amount, the Federal and State government will furnish an estimated \$1,717,329,000 or 49% of the total. The Philadelphia Board of Education will have to spend an estimated \$283,600,000. The City of Philadelphia, itself will have to invest \$1,481,910,000 or 43% of the total investment in capital facilities. However, it is estimated that some \$560,946,000 of the City's investment will be self-sustaining and that only \$920,964,000 will have to be provided from tax-supported funds.

These tax-supported costs to the City should receive the most intense scrutiny of all the cost categories of Figure 4. They are the "hard-cash" costs to the City and as a result are the expenditures which are confronted with a firm financial limitation in the capital programming process. In addition, unless certain of these tax-supported funds are invested, Federal matching funds will not be granted.

At the present rate of \$25,000,000 per year, it will take approximately 37 years to accomplish the tax-supported projects implied by the Comprehensive Plan.

However, if the rate increases as fast as Philadelphia's total personal income is expected to increase, then all tax-supported projects can be accomplished in 28 years. If a greater proportion of gross city income is used for city government, the capital improvement program can be speeded up even more.

These cost estimates are based on the assumption that the present formulas for determining Federal matching funds will not change. Of course, it is possible that Federal participation in local projects will change radically, as it did after the 1949 Housing Act and again after the 1956 Highway Act became law. The trend has been toward more and more Federal partici-

pation. Should it continue, the City's share will decrease and the time necessary to complete the Plan will shorten.

City Tax-Supported Costs for Each Functional Group

The costs of the projects which make up the \$920,964,000 of tax-supported funds are summarized by functional group in Figure 5. If the goals expressed in the Plan are to be achieved, the City government must invest the amounts shown in the various types of facilities.

The proportions shown in Figure 5 reflect not only the standards which went into the Comprehensive Plan and the relative magnitudes of the various completed systems, but also the existing facilities in each category. For example, the difference between the Fire and Police bar and the Other Motorways bar can be explained not only by the fact that the street system as a whole represents a far larger investment, but also because the Fire and Police facilities at present are nearly up to standard and require few improvements while the arterial street system is far below standard and requires a great number of improvements.

Thus, the proportion or profile shown in Figure 5 is unique: it describes the capital needs of the City of Philadelphia beginning in 1960. A profile describing Philadelphia's needs at some other date or a profile describing the needs of some other city of the same size as Philadelphia might show few similarities to Figure 5.

Over half (59%) of the capital requirements for City tax-supported funds are for transportation. Motorways account for 46% and transit for 13%. The second largest group is renewal. Residential renewal, including the provision of community facilities, accounts for 11% of the total when relevant outlays made by the Redevelopment Authority, the Department of Recreation, the Free Library, the Department of Public Health,

CAPITAL REQUIREMENTS TO COMPLETE THE COMPREHENSIVE PLAN

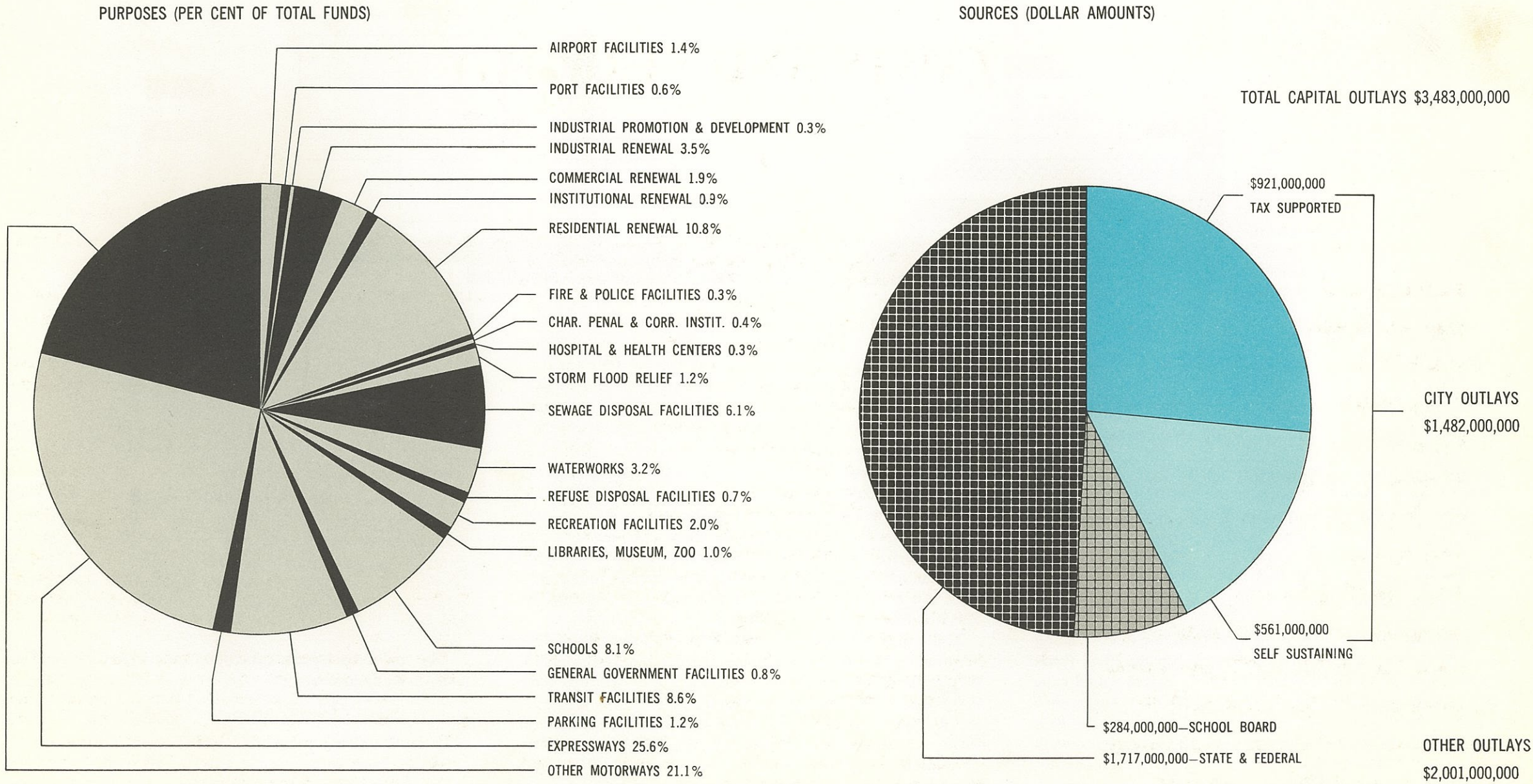
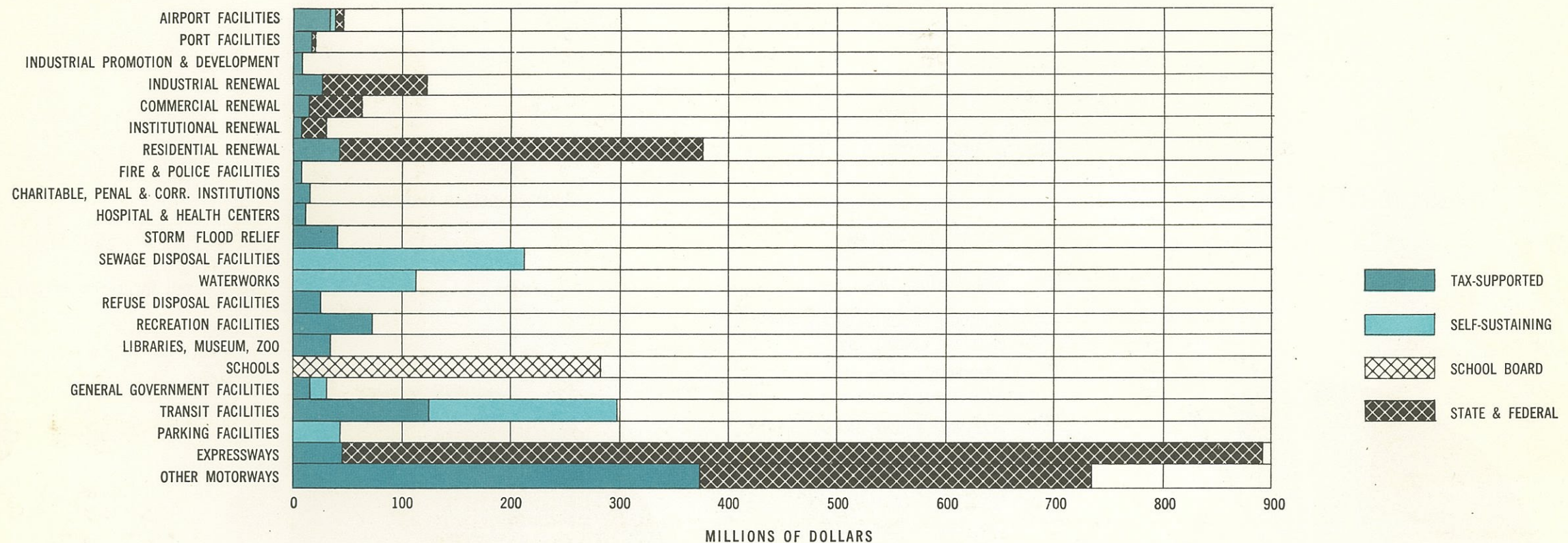


FIGURE 4—This diagram shows the costs of the public facilities called for by the Comprehensive Plan and where the money will come from. This public investment will stimulate private investment many times as great.

FIGURE 5—CAPITAL REQUIREMENTS TO COMPLETE THE COMPREHENSIVE PLAN



the Fire Department and the Police Department are counted. Outlays made solely for the clearance and redevelopment of land for residential re-use account for \$42,900,000 or 5% of total City tax-supported funds.

Profile for an Even Rate of Completion of All Functional Groups

If the City were to try to achieve an even rate of completion in each of the categories of the Comprehensive Plan, funds scheduled in every future 6-year Capital Program would have to follow the proportions of the profile of Figure 5. Under such a policy, the tax-supported portion of any 6-year Capital Program would be 46% for expressways and other motorways (combined), 13% for transit, 11% for general residential renewal and so forth. If every succeeding 6-year program followed these even rate proportions, then every category would be completed at the same date in the future. That date would be determined by the total amount of tax-supported funds expended in each 6-year period.

The present financial policy of the City is to spend \$150,000,000 of tax-supported funds on capital improvements

in each 6-year program. The dollar amounts which would result if the \$150,000,000 were to be allocated according to the Comprehensive Plan proportions can be read on the third column of Figure 6. By reading the three columns, one can see that the \$124,200,000 to be spent on transit to complete the Plan represents 13% of total tax-supported funds, and when this even rate proportion is followed would account for \$20,200,000 out of a 6-year budget of \$150,000,000.

There is, of course, no reason why all groups should be programmed to approach completion at the same rate. In fact, they should not, for in building anything it is evident that some things should be done before other things.

Although it is not to be followed directly, the profile of Figure 6 is a most valuable tool which, by presenting the proportions of an even rate, makes it possible to discern how much of a "speed-up" or a "slow-down" a given allocation actually represents. It also enables us to see how a "speed-up" in one category must be compensated by a "slow-down" in other categories if the budget is held constant. All projects, even those which appear to have little functional relationship with each other, are direct competitors for scarce capital investment funds.

The Strategy of Development

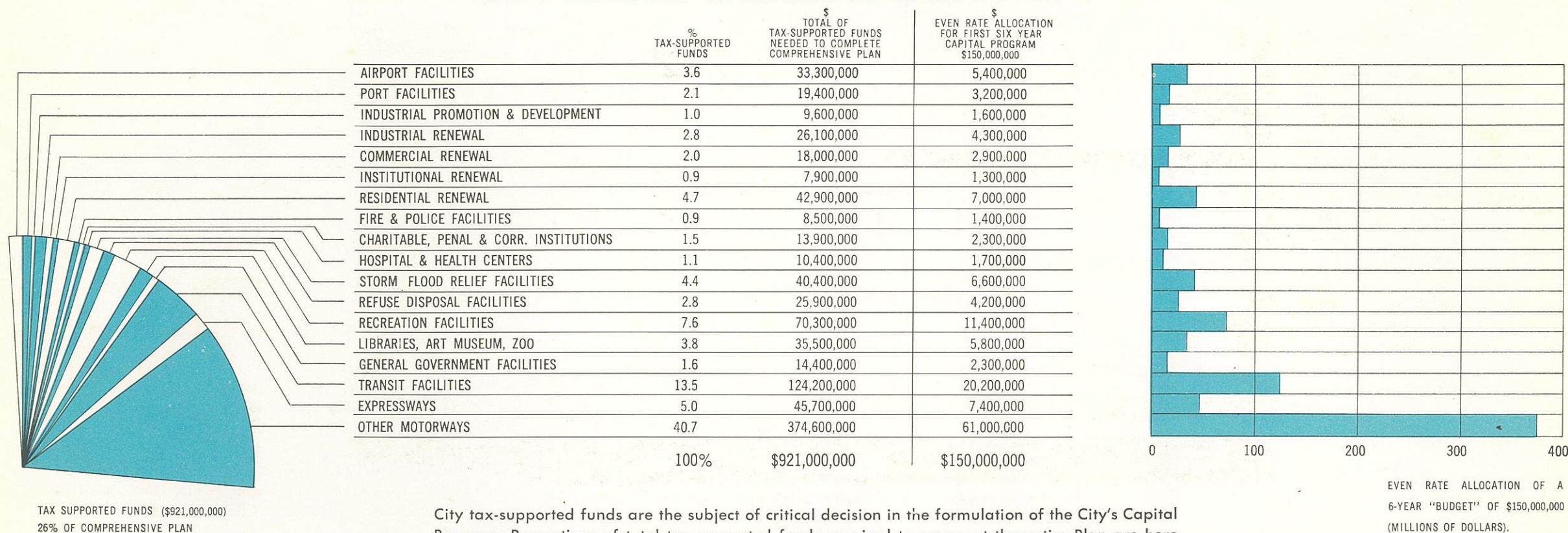
It makes a great difference which projects are done first. Unless the City undertakes the projects of the Comprehensive Plan in a proper sequence it may be impossible to achieve the goals of the Plan, which is based on a number of background condition assumptions. An unwise sequence of development might allow these conditions to change and make the Plan obsolete.

The major background condition assumptions of the Plan include the following:

1. Center City will remain the dominant regional center.
2. The City's economic growth will proceed rapidly enough to enable the City to invest in the facilities called for.
3. The City will maintain a balanced population, including middle and high, as well as low-income families.

The three background assumptions are closely related. They express a belief that the City, through public action, can halt the commonly observed weakening of the City's economic

FIGURE 6—COMPREHENSIVE PLAN PROPORTIONS AND THE EVEN RATE ALLOCATION



City tax-supported funds are the subject of critical decision in the formulation of the City's Capital Program. Proportions of total tax-supported funds required to carry out the entire Plan are here applied to a typical 6-year "budget" to determine how such a "budget" would be allocated in order for each set of facilities to approach completion at the same rate. The resulting even-rate allocation is not a recommended 6-year program but a reference point from which a recommended program can be formulated.

position due to competition from the suburbs. In the recent past, growth in sales, in production, and in medium and high income residential population has become typical of the suburbs. On the other hand, slowing down of economic growth and a replacement of higher income population by lower income population has become characteristic of the City.

In order to combat this trend and validate the background assumptions of the Plan, public improvement programming must concentrate on those investments which can be demonstrated to contribute to increasing the vitality of the City economy in general and to strengthen the City's tax base in particular. Examples of such investments are those which, by improving access, local circulation, parking, and amenity will foster economic activity in Center City and in the several subcenters. Improving radial rapid transit to Center City is one of the best ways of reinforcing its position. Development and redevelopment of land for industry and improvement of the City's port and airport facilities also serve this end directly.

Improvement of the transportation system, although no tax revenues result directly from it, may have the largest single effect on reducing the costs of doing business in Philadelphia, and thereby spur economic growth in the City and cause in-

crease in tax revenues. However, if an expressway is scheduled at such a time that new industrial and commercial sites benefiting from the improved access are available for development in the suburbs but not in the City, then such an expressway is likely to weaken the City economy. Therefore, expressways must be scheduled carefully and coordinated with the scheduling of redevelopment and industrial promotion projects.

Aside from timing considerations which derive from the availability of developable land within and outside the City, the inherent benefit of each expressway to the City is a basis for determining scheduling. Some expressways improve the accessibility of City sites much more than suburban sites and, therefore, from the City's point of view, should be scheduled as soon as possible. The Delaware Expressway, which lies within the City for some 15 miles, serves industrial areas along nearly all of that distance and acts as a radial expressway to Center City from both the north and the south, is a prime example. Its construction should be expedited.

Facilities—like the proposed Municipal Services Building—which will reduce the operating costs of government obviously deserve high priority since the savings they will bring will be realized directly by the City.

Vital as it is, improvement of the economic base proper cannot be pursued at the expense of deterioration of the residential environment. If the residential environment does not remain at least as good as it is now, those citizens who are able to do so will move away. These very citizens who have the ability to move are the same who are the most desirable for the City to have as residents, for they are the people who have achieved higher incomes and can provide higher tax revenues to the City. They are the people who have become "successful" in other spheres, too, and can provide the kinds of leadership the City needs if it is to continue to lead its region. Therefore, at a minimum, future capital programs must include improvements to the residential environment which will prevent the flight to the suburbs of such people.

Because it serves the end of improving the residential environment to obtain a favorable balance of people, and also because if not achieved now it will not be possible to achieve ever, the acquisition of open space for recreation deserves a high place in immediate programming. If it is to be acquired before it is built on, most open land called for in the Plan should be bought within the next 6-year program; virtually all of it should be obtained within the next ten years.

A projected City population of 2,250,000
...Metropolitan population 6,000,000 by
1980... More small households, more
large households in City... Resultant
prospective demands for housing,
schools... Increasing percentages of
older, younger people... A smaller work-
ing force supporting a larger non-work-
ing one... Achieving a balance between
in-migration and out-migration... The
new racial and economic proportions...
Stability ahead.

THE CITY'S PEOPLE

A city is primarily an aggregation of people, who are referred to collectively as its "population." It is also a very complex system of physical facilities and socio-economic activities which are both created by the population and required by it to maintain day-to-day community life.

The total size of the population determines the amount of its requirements as well as its potentialities; the people making up that population determine the kinds of facilities and services needed, and, often, the way such facilities are arranged. Regardless of the many other subjects which must be dealt with in the development of a Comprehensive Plan, its focal point of interest must always be the people and their needs. Its primary objective must be to provide the physical facilities and services required to meet those needs.

In reading the material which follows, it should be noted that the City and County of Philadelphia have identical boundaries, while the Philadelphia Standard Metropolitan Area includes the City plus the counties of Bucks, Chester, Delaware and Montgomery in Pennsylvania, and Burlington, Camden and Gloucester in New Jersey. The seven suburban counties are referred to collectively in this chapter as the "suburbs."

Preliminary 1960 Census figures¹ show the population of the Standard Metropolitan Area as 4,289,194, and the City of Philadelphia as 1,960,036. The final count is expected to be slightly higher.

PAST AND PRESENT CHARACTERISTICS AND TRENDS: As reported by the United States Bureau of the Census, the total population of the Philadelphia Standard Metropolitan Area in 1950 was 3,671,048, and that of the City of Philadelphia, 2,071,605. For both areas, these figures represented substantial increases, of 14.7% and 7.3% respectively, over the previous enumeration in 1940. They also indicate the resumption of previous long-term upward trends, which had prevailed during

most of the past century with the exception of the "depression decade" of 1930-40, when growth for the total area diminished to only 2.0% and the City experienced an actual decrease of about 1.0%.

The 1960 Census figures indicate that this upward trend is continuing for the total Standard Metropolitan Area, but that the City of Philadelphia has ceased to participate proportionately in that growth.

Figure 7 presents details of this past growth by individual counties from 1850 to 1960. It is significant to note that the City's share in the total population of the area increased steadily from 58.60% in 1850 to 68.37% in 1900, remained fairly constant to 1920, but declined to 56.43% by 1950 and to 45.70% by 1960. Growth in the other counties was steady but gradual up to 1920, but, since that date, has forged ahead of the rate for Philadelphia.

This change is attributed to a combination of two factors: the increasing prevalence of the automobile and the approaching exhaustion of space for further residential expansion within the City limits. Although growth within Philadelphia accounted for 29.8% of the increase for the entire area between 1940 and 1950, all of its increase from 1950 to 1960 took place in the suburbs while the City's population remained about stable.

Most of this past growth has resulted from "natural increase," or an excess of births over deaths in the resident population. What is referred to as "net migration," the difference between the numbers moving into and out of the area, played only a secondary role. During the past quarter-century, again with an interruption between 1930 and 1940, the number of births occurring in Philadelphia has greatly exceeded the number of deaths, the highest increment being attained in 1947, when births (52,932) outnumbered deaths (24,714) by more than two to one (See Figure 8).

Although precise data are not available, there is little doubt that there has always been an active flow of migrant popula-

¹ All population analyses and projections in this report were made prior to the release of the preliminary 1960 Census figures.

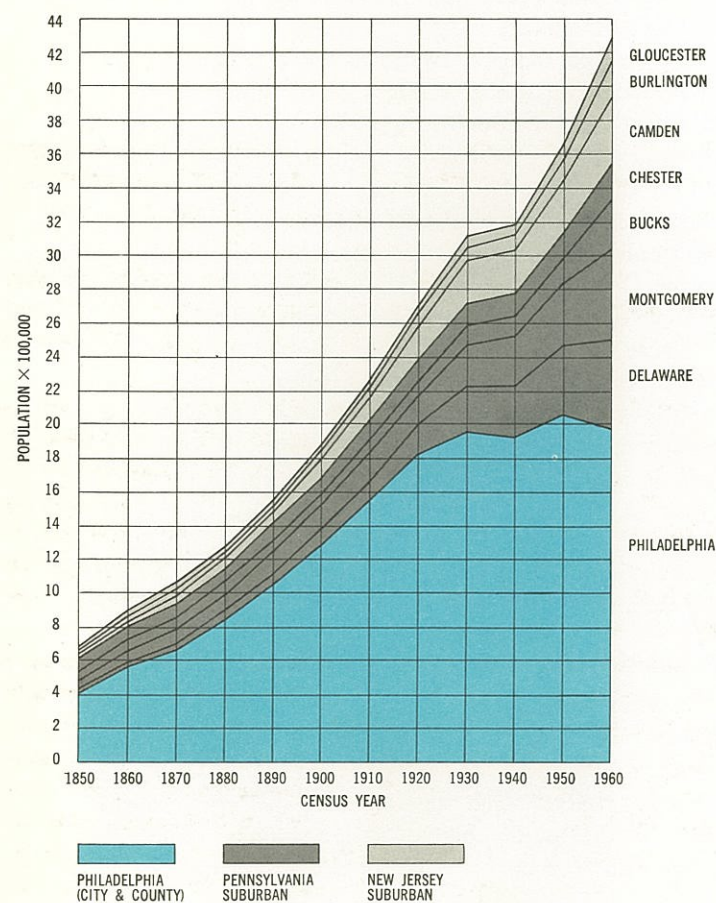


FIGURE 7—POPULATION OF THE PHILADELPHIA STANDARD METROPOLITAN AREA 1850 TO 1960 BY COUNTIES.

tion, both in and out, between the Philadelphia area and other communities, and also between the City and its metropolitan suburbs. Prior to 1920 there is evidence of a considerable excess of in-migrants (positive net-migration) which added significantly to the natural increase of population in both the City and the metropolitan area.

While this trend probably is continuing for the suburbs, the margin of positive net-migration for Philadelphia has gradually diminished to practically nil since World War II, with preliminary 1960 Census figures indicating that the City has lost more people to its suburbs than it has gained from people moving in. Much of the growth of population in the suburbs has been derived from Philadelphia.

Frequently the best evidence of this ebb and flow of migrant population, as well as clues to its significance, is found in the changes which appear in the composition of the population between successive decennial census enumerations. Figure 9 shows that, prior to 1920, a significant portion of the in-migrant population of Philadelphia came from foreign countries, as indicated by a steady increase in both the number and proportion of foreign-born white resident population.

A still more striking increase in non-white (mostly Negro) population has occurred in the last three decades with increments definitely higher than could have resulted from the excess of births over deaths in that group. The accompanying decrease in the number of foreign-born residents since 1930 has occurred as older members of this group have died off without replacement. The rapid leveling of the curve for native-born white could only indicate that a substantial number of this group have moved out of the City.

Further detailed analysis of the City's population by age-groups, sex and race shows that when it is broken down into five-year age-groups, such as those between ages 20 and 25, all except eight of the 28 age-groups of the white population, both male and female, suffered substantial losses through an

excess of out-migration between 1940 and 1950. The increases in the age-groups which proved exceptions were very small; they occurred only among males and females 65 years of age and over, and among females in the 10-to-14 and 20-to-24 year age-groups.

On the other hand, substantial increases in every age-group, both male and female, occurred in the City's non-white population.

Obviously, since the greatest changes occurred in the young and middle-aged adult groups (which constitute both the heart of the labor force and the parents of the coming generation) the impacts of migration are going to be much greater on the City's future economy and the make-up of its population than they appear to be at present.

Population of the City and Its Suburbs Compared

Although the differences in make-up between the populations of the City and its suburbs are not so great as they would be if the municipal boundary were a demarcation between the densely developed and sparsely developed portions of the metropolitan area, they are nevertheless of sufficient importance to command serious attention in the designing of the Comprehensive Plan.

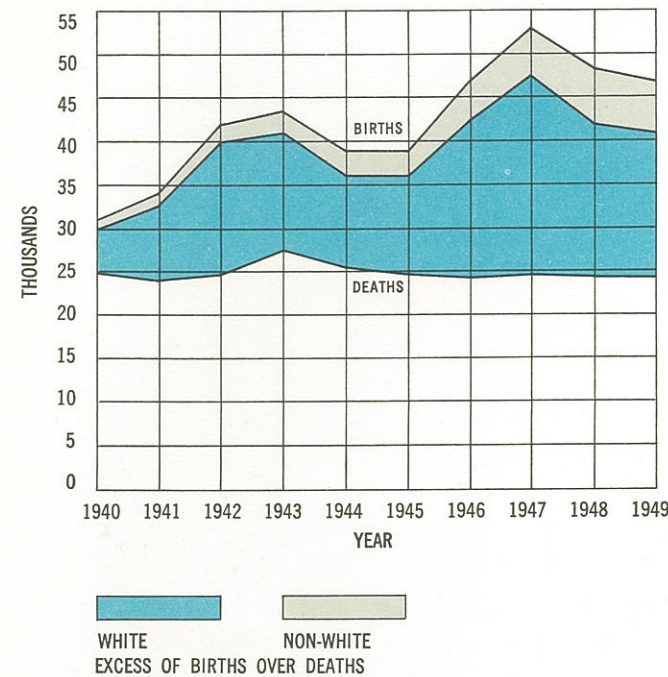
Actually, more than 10% of the suburbs' population lives in the cities of Camden and Chester, under conditions not unlike those in the central portions of Philadelphia, while sizable portions of northeast, northwest and southwest Philadelphia have residential densities lower than in many of the unincorporated suburban communities.

Philadelphia's population averages considerably older than that of the suburbs, with most of the difference resulting from lower percentages of children and higher percentages of elderly persons in the City than in the suburbs. This difference is somewhat greater for females than for males.

There is a lower percentage of males but a higher percentage

A—NATURAL INCREASE

TOTAL BIRTHS AND DEATHS; AND NATURAL INCREASE—WHITE AND NON-WHITE, 1940-1949

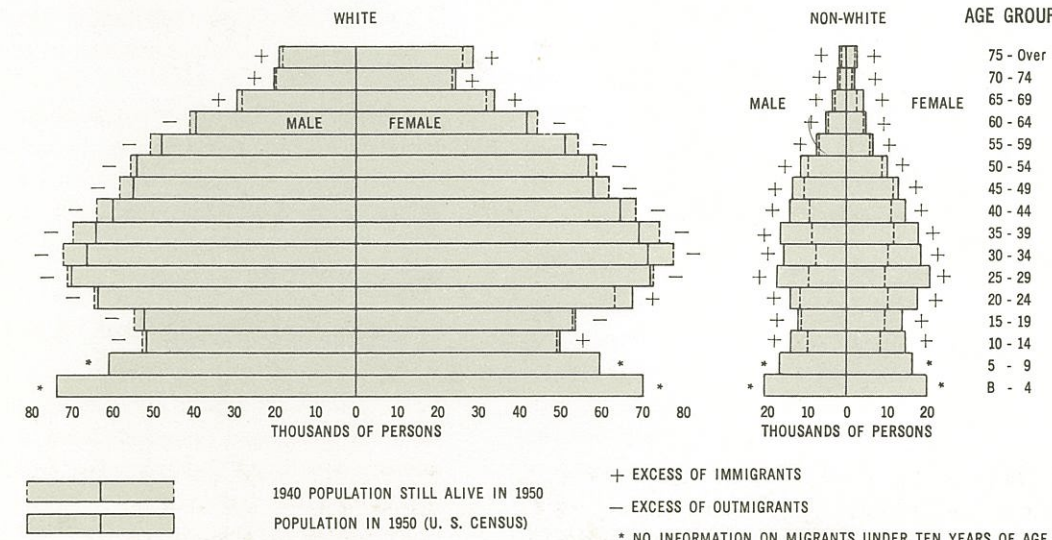


YEAR	BIRTHS	DEATHS	INCREASE
TOTAL POPULATION			
1940	31,227	24,884	6,343
1941	34,118	24,371	9,747
1942	41,978	25,070	16,908
1943	43,521	27,438	16,083
1944	38,825	25,355	13,470
1945	38,899	25,214	13,685
1946	46,907	24,512	22,395
1947	52,932	24,714	28,218
1948	48,123	24,664	23,459
1949	46,836	24,569	22,267
NONWHITE			
1940	5,190	3,776	1,414
1941	5,550	3,734	1,816
1942	6,188	3,816	2,372
1943	6,782	4,299	2,483
1944	7,018	4,062	2,956
1945	7,104	4,088	3,016
1946	8,002	4,069	3,933
1947	9,743	4,145	5,598
1948	10,142	4,181	5,961
1949	10,190	4,163	6,027
WHITE			
1940	26,037	21,108	4,929
1941	28,568	20,637	7,931
1942	35,790	21,254	14,536
1943	36,739	23,139	13,600
1944	31,807	21,293	10,514
1945	31,795	21,126	10,669
1946	38,905	20,443	18,462
1947	43,189	20,569	22,620
1948	37,981	20,483	17,498
1949	36,646	20,406	16,240
40-'49	423,366	250,791	172,575

CITY OF PHILADELPHIA, DEPT. OF PUBLIC HEALTH, DIV. OF VITAL STATISTICS, ANNUAL REPORT 1950

B—NET MIGRATION

POPULATION OF PHILADELPHIA: NET MIGRATION 1940 TO 1950, BY AGE, SEX AND RACE



Age Group	Population 1950	Survivors 1940-1950	Migration 1940-1950	Population 1950	Survivors 1940-1950	Migration 1940-1950	Population 1950	Survivors 1940-1950	Migration 1940-1950	Population 1950	Survivors 1940-1950	Migration 1940-1950			
WHITE MALE				WHITE FEMALE				NON-WHITE MALE				NON-WHITE FEMALE			
75-over	18,682	17,932	+ 750	28,570	25,800	+ 2,770	1,844	1,544	+ 300	2,494	2,000	+ 494			
70-74	19,128	19,065	+ 63	24,381	23,993	+ 388	2,129	1,737	+ 392	2,404	1,791	+ 613			
65-69	29,177	27,915	+ 1,262	34,549	32,126	+ 2,423	3,674	2,787	+ 887	4,210	2,793	+ 1,417			
60-64	39,142	40,607	- 1,465	41,859	44,254	- 2,395	5,058	4,390	+ 668	5,045	4,281	+ 764			
55-59	47,876	50,313	- 2,437	50,262	53,807	- 3,545	7,175	6,728	+ 447	7,040	6,559	+ 481			
50-54	53,852	55,124	- 1,272	56,995	58,861	- 1,866	10,888	9,082	+ 1,806	10,436	9,242	+ 1,194			
45-49	54,115	57,825	- 3,710	57,812	61,522	- 3,710	12,734	10,110	+ 2,624	13,225	11,853	+ 1,372			
40-44	60,073	63,600	- 3,527	64,092	67,903	- 3,811	13,608	8,856	+ 4,752	15,061	11,739	+ 3,322			
35-39	63,818	69,217	- 5,399	69,230	74,214	- 4,984	15,274	8,634	+ 6,640	18,373	12,243	+ 6,130			
30-34	65,441	71,808	- 6,367	70,769	77,387	- 6,618	15,174	7,760	+ 7,414	18,670	11,061	+ 7,609			
25-29	69,668	70,870	- 1,202	72,412	72,424	- 12	16,970	9,094	+ 7,876	20,593	10,227	+ 10,366			
20-24	63,412	64,493	- 1,081	67,226	63,070	+ 4,156	13,189	10,523	+ 2,666	17,684	11,016	+ 6,668			
15-19	51,919	54,677	- 2,758	52,902	53,089	- 187	11,612	10,327	+ 1,285	13,683	10,428	+ 3,255			
10-14	51,539	51,559	- 20	49,747	49,673	+ 74	13,659	9,531	+ 4,128	14,297	9,591	+ 4,706			
5-9	60,935	Not Computed		59,277	Not Computed		15,995	Not Computed		16,222	Not Computed				
Under 5	73,690	Not Computed		70,087	Not Computed		20,212	Not Computed		20,136	Not Computed				
Total	822,467	715,005	-27,163	870,170	758,123	-117,317	179,395	101,103	+42,085	199,573	114,824	+48,391			

Estimates of survivors 1940-1950 based on U. S. life tables 1939, northern cities of 100,000 or more by sex and race.

of females participating in the labor force in Philadelphia than in the suburbs, and a definitely higher percentage of unemployment among males in the City. There is also a significantly larger percentage of the suburbs' population in the higher-paid occupations, such as professional and technical people, managers, officials and proprietors, and craftsmen and foremen, while much higher percentages of City residents are engaged in the lower-paid occupations, such as clerical, sales, operatives, service and laborers.

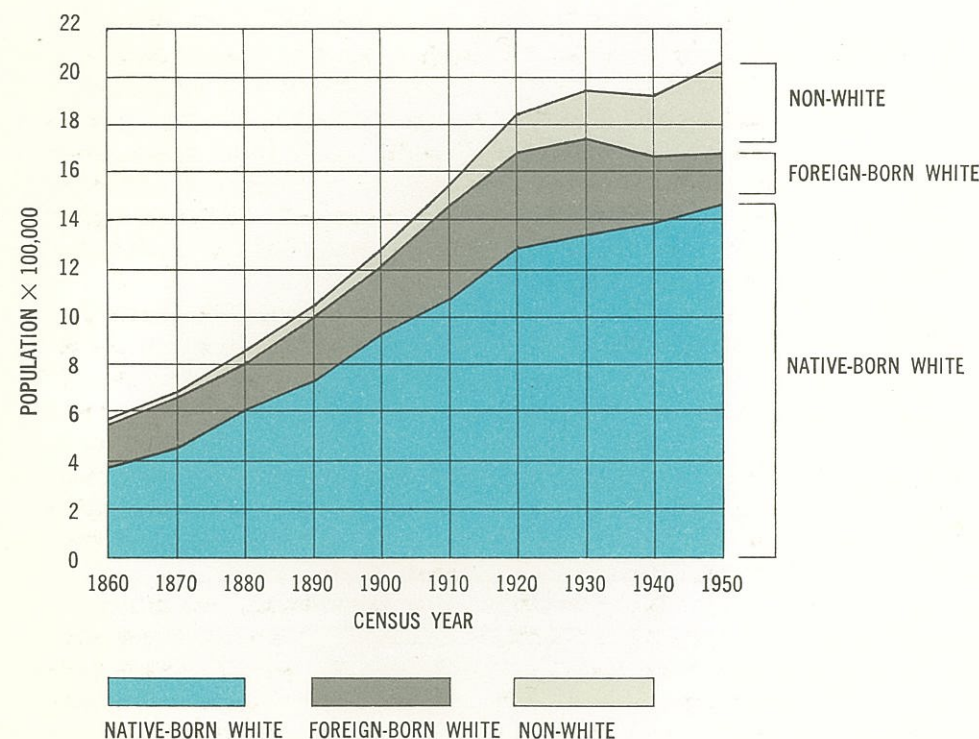
By far the sharpest contrasts are between the populations of Philadelphia and its suburbs on the basis of educational attainment and individual-worker incomes during 1949. Although percentages for graduates of grammar school and high school do not differ greatly, the percentage of college-trained persons is much higher in the suburbs while the percentages for persons with only one to six years of education are significantly higher in the City. The suburbs greatly outrank Philadelphia in percentage of persons in the higher income brackets.

There are considerably higher percentages of small (one and two person) households in Philadelphia, with highest ratios for middle-size households in the suburbs, and surprisingly little difference in the percentage of households of eight or more persons in both areas. Dwelling units also tend to run larger, in terms of number of rooms, in the suburbs than in the City. However, there is little or no conformity between the patterns of distribution of households by number of persons, and dwelling units by number of rooms, in either area.

Population Forecasts

A plan must wrestle not only with present needs but with future requirements, and therefore it is just as important to anticipate the future as to understand the forces at work in the present situation. The remainder of this chapter will discuss some of the major changes which may be expected to take place with respect to the size and composition of the popula-

FIGURE 8—SOURCE OF INCREASE IN THE POPULATION OF PHILADELPHIA 1940 TO 1950.



Census Year	POPULATION					INCREASE DURING DECADE — NUMBER				
	All Groups	All White	N. B. White	F. B. White	Non-White	All Groups	All White	N. B. White	F. B. White	Non-white
1950	2,071,605	1,692,637	1,460,050	232,587	378,968	+140,271	+14,060	+71,798	-57,738	+126,211
1940	1,931,334	1,678,577	1,388,252	290,325	252,757	-19,627	-49,880	+28,419	-78,299	+30,253
1930	1,950,961	1,728,457	1,359,833	368,624	222,504	+127,182	+40,277	+69,580	-29,303	+86,905
1920	1,823,779	1,688,180	1,290,253	397,927	135,599	+274,771	+224,809	+211,589	+13,220	+49,962
1910	1,549,008	1,463,371	1,078,664	384,707	85,637	+255,311	+233,698	+144,331	+89,367	+21,613
1900	1,293,697	1,229,673	934,333	295,340	64,024	+246,733	+223,083	+197,223	+25,860	+23,650
1890	1,046,964	1,006,590	737,110	269,480	40,374	+199,794	+191,228	+126,083	+65,145	+8,566
1880	847,170	815,362	611,027	204,335	31,808	+173,148	+163,508	+142,797	+20,711	+9,640
1870	674,022	651,854	468,230	183,624	22,168	+108,493	+108,510	+94,316	+14,194	-17
1860	565,529	543,344	373,914	169,430	22,185					

Census Year	PERCENT OF TOTAL POPULATION					INCREASE DURING DECADE — PERCENT				
	All Groups	All White	N. B. White	F. B. White	Non-White	All Groups	All White	N. B. White	F. B. White	Non-white
1950	100.0	81.7	70.5	11.2	18.3	+7.3	+0.8	+5.2	-19.9	+49.9
1940	100.0	86.9	71.9	15.0	13.1	-1.0	-2.9	+2.1	-21.2	+13.6
1930	100.0	88.6	69.7	18.9	11.4	+7.0	+2.4	+5.4	-7.4	+64.1
1920	100.0	92.6	70.8	21.8	7.4	+17.7	+13.4	+19.6	+3.4	+58.3
1910	100.0	94.5	69.7	24.8	5.5	+19.7	+15.4	+15.4	+30.3	+33.8
1900	100.0	95.1	72.2	22.8	4.9	+23.6	+22.2	+26.8	+9.6	+58.6
1890	100.0	96.1	70.4	25.7	3.9	+23.6	+23.5	+20.6	+31.9	+26.9
1880	100.0	96.2	72.1	24.1	3.8	+25.7	+25.1	+30.5	+11.3	+43.5
1870	100.0	96.7	69.5	27.2	3.3	+19.2	+20.0	+25.2	+8.4	-0.1
1860	100.0	96.1	66.1	30.0	3.9					

N. B. White = Native-born White, F. B. White = Foreign-born White. In 1950 99.23% of Non-White was Negro and 0.77% other Non-White races.

FIGURE 9—POPULATION IN THE CITY OF PHILADELPHIA 1860-1950 BY RACE AND NATIVITY.

tion of Philadelphia and the metropolitan area within the next few decades.

Forecasts of Trends in Total Population. Estimates of the future population of the Standard Metropolitan Area and of the City of Philadelphia are equally important. In fact, it is impossible to estimate the population of the City satisfactorily without estimating the population of the metropolitan area, of which the City is the central part.

Forecast for the Metropolitan Area. A number of agencies have undertaken estimates of the population of the metropolitan area to the year 1980. Although different methods have been used in making the estimate, these studies have all agreed that a population of approximately 6,000,000 may be anticipated for the area by 1980.

Population change in an area is, of course, the result of a number of both social and economic forces. In the method

which will be briefly described below, these forces are inherent, as will be clear. As a check, however, population estimates have been made based on the probable future employment potential of the area.

The future population with which we are concerned is that which can be considered a part of the Philadelphia metropolitan system, i.e. a population that is socially and economically dependent on and a part of the urban area of which Philadelphia is the center. Since there is little doubt that the Standard Metropolitan Area as defined includes the area of residence of that population, our first concern is predicting the future population of the metropolitan area. Because the area is so large, 3,550 square miles, there is also little doubt that, despite the dramatic increase in the amount of space being utilized in recent developments, practically all of the future population related to the metropolitan community can easily be absorbed within the

boundaries of the area as presently defined. Clearly, this circumstance is not true of the City. A critical factor in the probable future population of the City is the amount of space available to absorb the future population at the kinds of densities which they will seek. In the following calculations, the method carries the City's population alongside that of the area as a whole, and it will be noted in Table 1 that there has been a surprisingly consistent relationship in the past. For a variety of reasons, the most important of which is space, modification is made to the City projections later in this chapter.

In technical terms, the method of approach which was employed in this study is known to demographers as an "inter-group ratio method." In less technical terms, it involves the derivation of population estimates for a specific local area from corresponding forecasts for some larger area of which the former is an integral part, by statistical projections of past

The City's People continued

TABLE 1—POPULATION OF THE UNITED STATES, THE PHILADELPHIA STANDARD METROPOLITAN AREA AND CITY OF PHILADELPHIA
ACTUAL 1850 TO 1950—PROJECTED 1960, 1970 AND 1980

YEAR	SOURCE	U. S. TOTAL* POPULATION	PSMA POPULATION	PHILADELPHIA POPULATION	% PSMA OF U. S. ACTUAL TREND	% PHILADELPHIA OF PSMA ACTUAL TREND
1850	ACTUAL	23,191,876	697,541	408,762	3.008	—
1860	"	31,443,321	903,583	565,529	2.874	—
1870	"	38,558,371	1,056,343	674,022	2.740	—
1880	"	50,155,783	1,293,823	847,170	2.580	—
1890	"	62,947,714	1,577,720	1,046,964	2.506	—
1900	"	75,994,575	1,892,128	1,293,697	2.490	2.518
1910	"	91,972,266	2,268,209	1,549,008	2.466	2.507
1920	"	105,710,620	2,714,271	1,823,779	2.568	2.496
1930	"	122,775,046	3,137,040	1,950,961	2.555	2.485
1940	"	131,669,275	3,199,637	1,931,334	2.430	2.474
1950	"	150,697,361	3,671,048	2,071,605	2.436	2.463
1960	SERIES I	181,200,000	4,443,000	2,354,000	—	2.452
"	SERIES II	180,100,000	4,416,000	2,338,000	—	—
"	SERIES III	179,800,000	4,408,000	2,332,000	—	—
"	SERIES IV	179,400,000	4,398,000	2,328,000	—	—
1970	SERIES I	219,500,000	5,357,000	2,659,000	—	2.441
"	SERIES II	213,800,000	5,218,000	2,589,000	—	—
"	SERIES III	208,200,000	5,082,000	2,520,000	—	—
"	SERIES IV	202,500,000	4,943,000	2,451,000	—	—
1980	SERIES I	272,600,000	6,624,000	3,058,000	—	2.430
"	SERIES II	260,000,000	6,318,000	2,919,000	—	—
"	SERIES III	245,400,000	5,963,000	2,753,000	—	—
"	SERIES IV	230,800,000	5,608,000	2,587,000	—	—

* 1850-1950: U. S. Census of Population.

1960-1980: U. S. Bureau of the Census; Current Population Reports, Series P-25, No. 187, November 10, 1958, Table A.

trends of their relative growth ratios. The detailed procedures followed in this study are shown in Table 1. They may be further described in three distinct stages set forth below.

First, three historical series of Census data were compiled to show the actual populations of the total United States, the Philadelphia Standard Metropolitan Area and the City of Philadelphia by decennial intervals over the entire century from 1850 to 1950 (Cols. 3, 4, 5, 1850-1950) from which two series of actual inter-group percentage ratios were computed (Cols. 6, 8, 1850-1950). These ratio series represent, respectively, Philadelphia Standard Metropolitan Area population as per cent of total United States population, and Philadelphia popu-

lation as per cent of Standard Metropolitan Area population.

Second, these historical series of actual inter-group ratios were analyzed for secular trends and selected portions of them were then projected statistically to yield corresponding estimated inter-group ratios for 1960, 1970 and 1980 (Cols. 7, 9). As indicated by the characteristics of the historical data, the formula used for these projections was the "straight-line, least squares" method.

Finally, these projected inter-group ratios were applied to four alternative series of estimates of future population for the United States which had previously been compiled by the Bureau of the Census (Col. 3—1960-1980) to produce corre-

TABLE 2—POPULATION FORECAST SUMMARY

YEAR	SERIES	METROPOLITAN AREA	PHILADELPHIA
1960	II	4,416,000	—
1960	III	4,408,000	2,332,000
1970	II	5,218,000	—
1970	III	5,082,000	2,520,000
1980	II	6,318,000	—
1980	III	5,963,000	2,753,000

sponding numerical estimates of future population for the Standard Metropolitan Area and Philadelphia (Cols. 4, 5—1960, 1970, 1980).

The selection of this general method of approach is justified by the remarkably close conformity in both shape and direction of the past growth curves of all three population groups, as illustrated earlier. Obviously, a very strong long-term secular trend has prevailed in the relative rates of growth of these three population groups throughout all of the past century. Although the rates of growth for both of the local areas have steadily fallen slightly behind those for the United States, this divergence also has proceeded at a remarkably constant rate. For

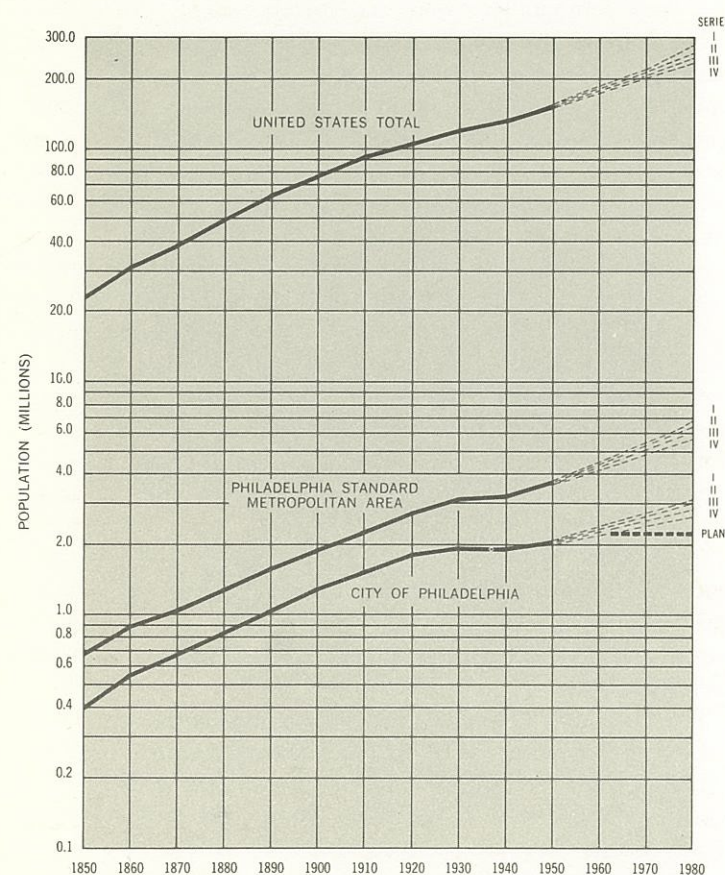


FIGURE 10—POPULATION GROWTH RATES IN THE UNITED STATES, THE PHILADELPHIA STANDARD METROPOLITAN AREA, AND THE CITY OF PHILADELPHIA PROJECTED TO 1980.

the metropolitan area this may be expected to continue into the future.

The decision to use only the latter portions of the total century trends for calculating projections (1900-1950 for the PSMA and 1920-1950 for Philadelphia) was based in part on the analysis of the data (slight but significant changes in the relative rates of growth) and in part upon knowledge of changes in specific factors which affected population growth for the local areas (for example, the effect of the automobile on the rate of suburbanization since 1920).

The explanation of the differences in rates of future growth described by the four alternative series of Census estimates of

U.S. population is that each is based upon a different assumption with respect to the levels of reproduction rates which may be anticipated in the future. If broken down by age groups, all four of these series would be identical for population twenty-five years of age and over in 1980, and all of the difference in total population would be accounted for in age groups under twenty-five in that year.

Because the Census provided four alternative series of estimates for the U.S. total population, a corresponding number of series are shown in Figure 10 for the City and for the metropolitan area.

Of the four Census birth rates assumed, the two extremes

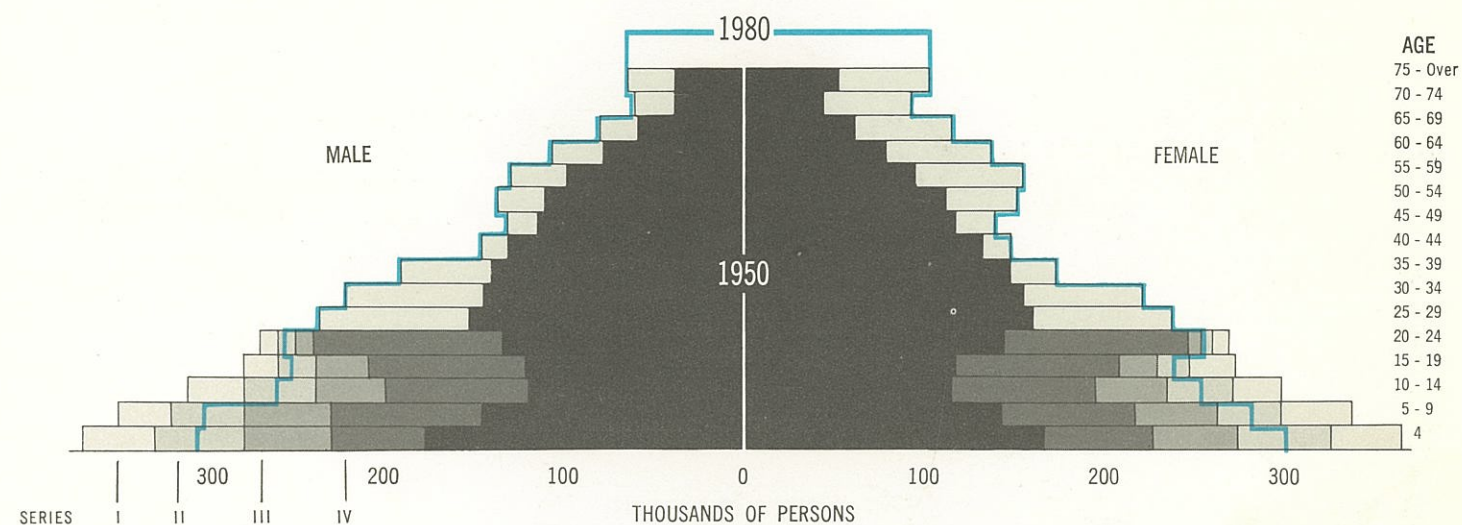
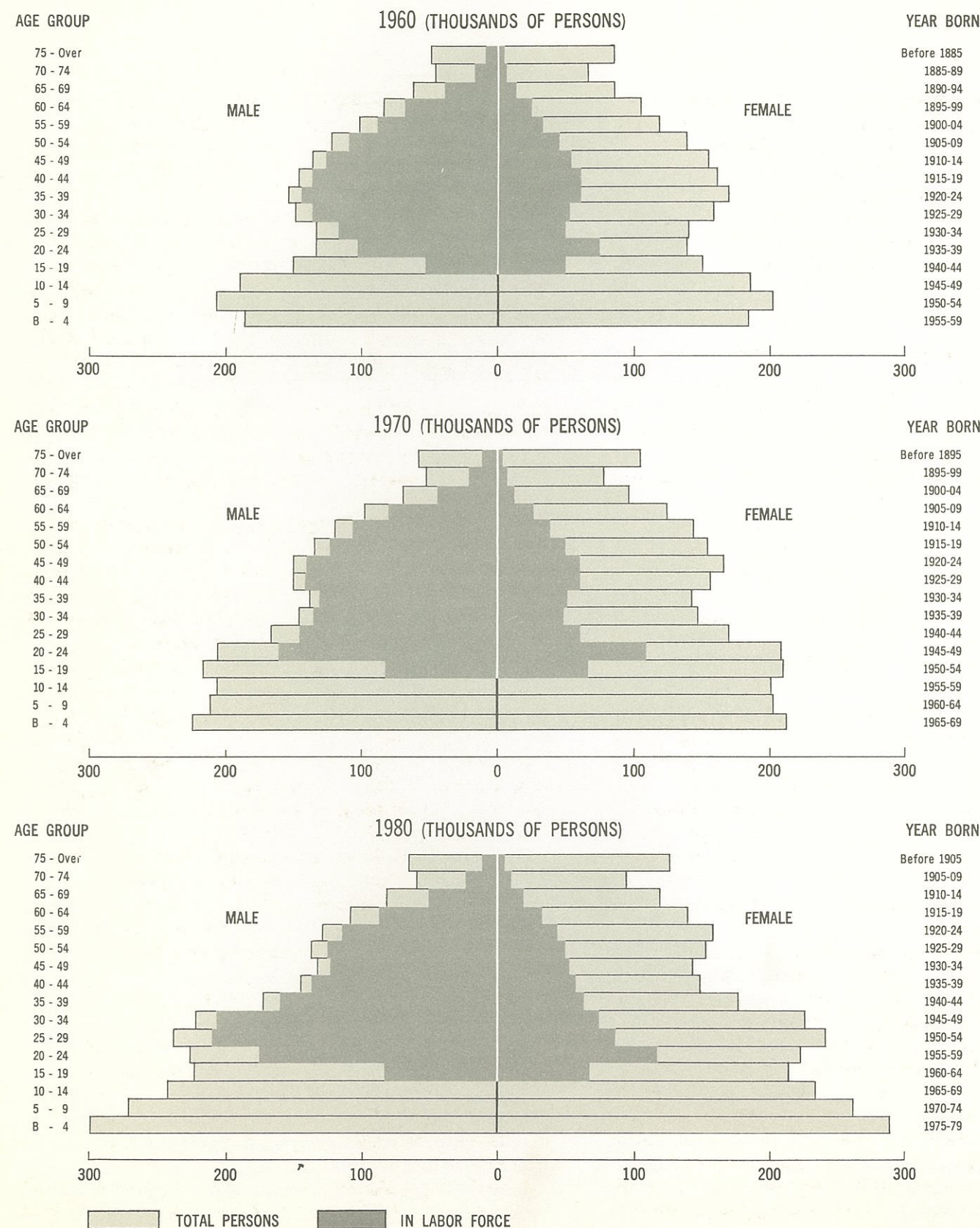


FIGURE 11—POPULATION IN THE PHILADELPHIA STANDARD METROPOLITAN AREA 1950 AND 1980 (EST.) BY AGE GROUPS AND SEX.

are rejected as unlikely. One extreme, Series I, assumes a higher level of reproduction than any attained in this century; the other extreme, Series IV, assumes a drop to the all-time low of the depression decade.

Properly, the population estimate should forecast a range. The most probable range is shown in the results between Series II and Series III of the Census assumptions. However, for a number of reasons it is necessary to quantify requirements in the Plan, and quantification requires numbers. Therefore, for purposes of internal consistency one set of figures is used, derived from the application of the Series III projections prepared by the Bureau of the Census in 1958. The basic assumption

The City's People continued



therein was that fertility would decline from the 1955-57 level to the 1949-51 level by 1965-70 and then remain at that level to 1975-80. This appeared to be a reasonable choice at the time these computations were undertaken.

The method just described contains the implicit assumption that the economic growth of the Philadelphia region will continue into the future in about the same relationship to national economic growth as it has in the past. The resultant figures are borne out by a separate population projection in which the forecast was derived from projections of future economic potential of the region in relation to the national economy.

Forecast for the City of Philadelphia. Estimating the future population of the City of Philadelphia is both an exercise in projection and a statement of objective derived from the application of objectives for the residential land use plan. This is a two way street in the sense that the City must be prepared to meet the needs of future population potential, and at the same time, in developing the Comprehensive Plan itself, the City establishes in effect a capacity for population absorption. A somewhat different aspect of this same view is to state the problem in terms of the probable distribution in space of the estimated 6,000,000 1980 metropolitan population regardless of municipal boundaries but given the existence of certain socio-economic forces and certain development programs affecting their distribution.

The City population figure of 2.75 million shown in Table 2 is a population potential based upon two critical assumptions: first, that there is adequate space at acceptable development densities within the finite municipal boundaries to absorb this figure; second, that the socio-economic forces at work in the past would continue to exert themselves in the same general way.

In the chapter on Residence the land proposed for residential development and the densities at which it is proposed to be developed yield a capacity figure. If the Plan is to be achieved by 1980, this represents a City population figure for 1980. The figure derived on this basis is 2.25 million.

The decision as to the land to be devoted to residential use,

FIGURE 12—POPULATION AND LABOR FORCE ESTIMATES FOR THE PHILADELPHIA STANDARD METROPOLITAN AREA BY AGE GROUP AND SEX.

and, more importantly, the decision as to the densities which will be permitted, are bound up in the planning policies underlying the substantive components of the Plan set forth in succeeding chapters. In determining proposed densities the Plan must take into account the requirements of a suitable living environment, the existing development pattern, and the transportation structure of the City and Region. The combination of these factors suggests development and redevelopment in the direction of lower densities than presently exist. This in turn suggests that the potential population figure of 2.75 million is too high because it would require an actual increase in density to be achieved.

A separate population estimate for the City, made by Marketers Research, Inc., is based upon the extension of trends in land development intensity as related to population rather than in trends of population numbers *per se*. This yields a City population estimate of 2.3 million for the year 1980. This checks well with the capacity figure of 2.25 million.

For the purposes of the Plan the working figure for the City population that is used is 2.25 million.

Implications of the Above Estimates. If the 1980 population of the City and the metropolitan area are 2.25 million and 6 million respectively, then the City will have increased by only 8% over 1950 and the suburban area will have increased by 75%. Depending upon the precise figure for the present City population, the net general effect is that the City has just about stabilized in total figures and almost all the expected increase must be absorbed in the suburbs.

Since rates of natural increase are presently about equal in both areas, it is clear that a significant portion of the population of the suburbs will represent out-migration from the City. The implications of this are serious. The composition of recent out-migration is largely a middle and upper income white group.

It is important to the City and to the metropolitan area as a whole that the population of the City represent some reasonable balance of income groups, family sizes, and races. It is not possible to determine mathematically what this composition should be, but out-migration of only one group is unhealthy. Obviously the solution to, or at least the amelioration of, this problem is the maintenance and establishment in the City of conditions for satisfactory urban living that will attract to the City both white and non-white, high income and low income, small household and large household. It must be recognized that population mobility and transition will continue, and that this is the sign of health in our society, but that the urban situation should be such that movement can take place in both directions.

To achieve this, the City has before it two divergent courses of action. One is to attempt to meet the forces of out-migration

by seeking to retain a larger proportion of its natural increase population through permitting higher density development. The other is deliberately to accept a greater volume of out-flow in order to establish residential living conditions that meet the demands of all the groups in our society.

This Plan is based upon the latter course. It is believed that the former course would prove illusory in terms of total numbers because it would require residential densities that would be rejected by many of the very households the City should properly retain or attract.

Anticipated Future Population Composition

Figure 11 shows the age-group composition of the metropolitan area's population through 1980. Of particular significance in these data is the continued persistence of irregularity in the size of the age-groups resulting from the successive very low and very high reproduction rates of the 1930-40 and 1940-50 decades.

Persons now entering the labor force and comprising the basic family-forming potential of the community are in the unusually small groups of persons born between 1930 and 1940. This suggests that there should be, in the near future, a decline in the potential demand for new housing, and, as either an alternative or a parallel, that this is a particularly good time for demolition of obsolete housing. This situation should persist generally through the 1960-70 decade.

Furthermore, the "depression baby" group now emerging as adults are not sufficiently numerous to replace the next older age-group in the labor force. A decline in crude birth rates (births per 1,000 total population) can also be anticipated, even though the refined birth rate (births per thousand women of childbearing age) remains at the present level, simply because there will be fewer women in the childbearing age group. The wartime (1940-50) and post-war (1950-60) baby-boom groups represent a serious current demand for school capacity and for family consumer goods.

In the latter 1960's the wartime-born age-groups will be entering the labor force and the family-forming group, but the total prime labor force, comprising persons under 50 years of age, will still be smaller than normal, relative to the population of younger and older age groups. This means that fewer workers will be supporting more non-workers. By 1970 the school-age groups will have leveled off or possibly declined slightly as a result of the declining crude birth rate of the preceding decade. By the middle of this 1970-1980 decade there should be a significant revival of the demand for additional housing.

By 1980 all of the large 1940-60 age groups will have entered the labor force and the family-forming groups, and it is likely that a second baby-boom will ensue. At this point the

demand for adequate facilities and services to meet the demands of the population will be at an all-time high, at least quantitatively. This suggests a point in time at which much, if not all, of the Comprehensive Plan should be completed in order to meet these needs.

The trend toward a somewhat smaller average size of household which has been in progress for several decades will probably be continued. Actually, two factors are involved, and reference to an over-all average is misleading. As indicated in the data presented thus far, most of the smaller households of one or two persons contain no children under eighteen years of age. This is the group which has been increasing most rapidly for two reasons: First, it has become the practice for young adults to leave their parents and set up separate households, thus creating two or more small households from what was formerly a single larger one; second, the increasing span of life means many years for older couples after their children have departed. This trend is likely to continue.

On the other hand, the size of families as measured by the total number of children ever born to married couples, a figure which also declined steadily between 1920 and 1940, has recently been rising, probably as the result of two decades of economic prosperity and hence a spirit of optimism on the part of persons still in the reproductive age bracket.

This segment of the population is "more married" than ever before, and while it is the custom for more young wives to work for a year or two after marriage, the higher incidence of home ownership has proved conducive to early reproduction and to the births of more second, third-and-more children than many parents dared to risk during the "depression 30's." In this respect the "size of families" has risen, and may well continue to do so throughout most of the forecast period.

The ultimate result may be a distinct bi-modal distribution, with households clustered in two groups; the childless, averaging somewhat less than two persons, and the parent-children households, averaging slightly more than four persons. This suggests two different types of housing, and careful planning as to its distribution.

The trend toward a population characterized by increases in the numbers of people in the older age brackets may also be expected to continue, both as the result of continued lengthening of the average span of life, and because the larger numbers of people born between 1910 and 1930 are now arriving at that age. By 1980, the smaller 1930-1940 groups will be entering the 50-60 year age bracket and probably will cause it to shrink somewhat.

Irregularities in the shape of the population pyramids caused by the radically different reproduction rates of the 1930-40 decade and the succeeding 1940-60 decades are certain to be

reflected at intervals of approximately thirty years for several generations, and may be either amplified or diminished, depending on the level of the economy prevailing at the time each group passes through the reproductive age period. These will continue to cause fluctuations in the size of school-age groups, the labor force, and the potential housing market.

Racial Composition. In the Philadelphia Metropolitan Area, the future proportion of the population that is non-white, as compared to today's proportion, does not represent a significant change. More significant is the way in which white and non-white populations will be distributed between the City and its suburbs, and the distribution of relative income.

The proportion of the non-white population is expected to increase, both for the City and the Metropolitan Area, through in-migration and through a somewhat higher rate of natural increase. However, it is expected that future in-migration will be significantly reduced from the rates of the recent past. Although statistical data are difficult to obtain, it is reasonably certain that rates of non-white in-migration in the 1950-60 decade have been lower than in the previous decade. Further, there are a number of factors in the present and future that would support a judgment for reduced migration in the future.

One is the reduction in the number of southern Negroes in the migratory age group. A second is that the market for unskilled labor in Philadelphia is saturated. A third is that the general direction of migration has shifted toward the cities of the West Coast.

Thus, although it is difficult to cite specific figures on the point, the proportion of non-whites in the Metropolitan Area in 1980 may be in the vicinity of 19%, as compared to a present estimate of 15% and a 1950 figure of 13%.

The situation in the City of Philadelphia is significantly different since that 78% of the non-white families in the metropolitan area live within the City. It is estimated that 24% of the City's population is Negro. Both because of discrimination in housing, and because Negro families are often among the lower-income groups who seek homes in the City because of greater job opportunities, the City's Negro population is bound to increase.

Further, not only are Negro birth rates higher, but even if the refined birth rate were the same, the crude birth rate for Negroes would be higher because a higher percentage of the Negro women are within the child-bearing age group. Both of these factors will probably change as social and economic con-

ditions for the non-white population change. Finally, although in-migration is expected to continue its decline, most of what migration there is will first seek a location in the City.

Thus, the prospects are for a further increase in the City's Negro population, both in absolute numbers and in proportion of the total. Turning these generalizations into numerical forecasts without better statistical data is hazardous. But making the assumption that the proportion of Negroes in the suburbs will remain constant, then the Negro population of the City can be estimated in the order of 915,000, or 40% of the population, by 1980.

If we were to make the different assumption that the proportion of Negroes in the suburbs will decline because the growth in suburban Negro population will occur only through natural increase whereas the white increase in the suburbs will be buttressed by out-migration from the City, the Negro population in the City may approach 45%.

On the other hand, there is likely to be a looser and less restricted housing market in the suburbs. If so the City's Negro population may be less than 40%.

What are the implications of these figures for a physical development plan?

A majority of those in the lowest income quartile will continue to be Negro throughout the present forecast period, although to an increasing degree Negroes will be represented in the middle income quartiles. This income distribution has a bearing upon the kinds of housing, facilities and services planned for the immediate future in the areas where the non-white population is currently concentrated. The social and physical redevelopment of the inner city with its shopping districts, obsolescent housing and basically sound conservation areas will be conditioned by this legacy of non-white income distribution in the lower quartiles.

A further implication of the expected trends within the Negro population is that, despite the persistence of lower incomes for a large number of non-whites, there will be a corresponding and notable growth of the number of non-whites achieving middle or upper income status. This group, like the entire non-white population, will be relatively young. Middle income non-whites will be disposed toward change, advancement and the fulfillment of long delayed aspirations for improvement in housing, education, employment and civic life. The migration of this group to outlying areas will be selective, but their mobility will be very significant as a forecast and a demonstration of the large scale non-white trend

toward personal and family improvement that will stimulate the life of the City in future years.

The movement of non-whites beyond their present social and economic positions is beset with problems, but this movement can be predicted with confidence in view of the dynamic potential in coming decades. The pace of the change and certain variables related to it, such as the future strength of housing restrictions based on race, militate against clear predictions. The youth of the non-white population, the degree to which it represents a reservoir of economic and educational demand, and the general trend of urban society toward expanding opportunities, all point toward the necessity of considerable flexibility in the planning outlook.

A Summary Point. Analyses of the composition of the present population and forecasts of future population provide a basis for estimating the needs of people that the Plan must aim to satisfy. But land in the City is limited and migration patterns are selective. A basic objective of the Plan is a healthy balance of families resident in the City: non-white and white; high, low and middle income; professional, craftsman, and laborer. Therefore, the Plan must provide a range of kinds of residential land in sufficient volume to permit different kinds of households reasonable choice in their place of residence.

It follows closely the national pattern . . . One of the world's great industrial centers, with major emphasis on manufacturing, consumer servicing, trans-shipment . . . Highly diversified . . . Substantial increases forecast in almost all categories . . . Projected increase in proportion of non-manufacturing industries . . . Now the nation's fourth labor market . . . May decline proportionately a trifle . . . Personal income high, to go higher . . . Its implications for the City's growth.

THE ECONOMY

In any urban community, the over-all course of economic development greatly influences that community's scale and structure, its level of well-being, and its ability to provide public facilities and services.

The present chapter outlines the course of economic development that is anticipated during the next 20 years for the City of Philadelphia, and for the larger Metropolitan Region of which the City constitutes the center. The chapter will describe future trends in the size, composition and spatial pattern of the Philadelphia metropolitan economy. Economic prospects for the City, and for its central business district, also will be summarized.

The set of current estimates and future projections which form the basis of the present chapter were developed by Marketers Research Service, Inc., under contract to the Philadelphia City Planning Commission. The changes in composition and magnitude of the local economy set forth in this chapter constitute a reasonable basis on which to anticipate future potentials, needs, and ability to pay. Precise accuracy in the forecasts should not be inferred; they represent "best" estimates. The precision of the figures for the future derives from the computational methods used and they should be read with this qualification in mind.

THE NATIONAL SETTING: The course of economic growth in the United States as a whole has, in the past, set the over-all pace of economic growth in the Philadelphia Metropolitan Region.² Since the general relationship between national and metropolitan development is expected to continue in the future, any projection of the metropolitan economy must be based on an analysis of anticipated national economic trends. The projections summarized below have been accepted by the staff and consultants of the Commission as a realistic forecast of these trends.³

The expected 1960-80 increase in the U.S. population, from 180 million to 245 million, will lead to considerable economic expansion in the nation as a whole. Economic analysts have projected the pattern of this expansion on the premise that the following conditions will hold during the 1960-80 period:

² The Philadelphia Metropolitan Region is defined as the Philadelphia Standard Metropolitan Area (PSMA), which covers 3,550 square miles and eight counties: Philadelphia surrounded by a seven-county ring consisting of Bucks, Chester, Delaware and Montgomery in Pennsylvania, and Burlington, Camden and Gloucester in New Jersey.

³ All economic projections in the present chapter were developed on the basis of detailed analyses dealing with historical relationships and with the future changes that may be expected as a result of population growth and technological innovation. They will be spelled out in a separate report to be published later.

1. Virtual full employment of the labor force that will be created by the projected growth in population.
2. An annual rate of increase in worker productivity of 1.6%, generally conforming to the rate of growth which technological improvements have brought about in this country since 1900.
3. No drastic changes in economic, social or political conditions, and particularly no significant modification in the share of national income devoted to defense. A substantial relative reduction in defense expenditures could lead to major increases in the outlay for urban renewal, and for highways and other public facilities.

The magnitude of the anticipated national expansion is indicated by a comparison of several key 1980 forecast figures with corresponding figures for a recent base period, the spring of 1957. Between these two points, with the number of people in the country increasing 43%, the gross national product of goods and services is expected to rise 111%, and the number of jobs 42%. These figures imply productivity increases of 47% and 49% respectively in output per person and output per worker. During that same period, while the agricultural sector is expected to become relatively less significant in the national economy, both manufacturing and non-manufacturing (nonfarm) activity will slightly increase their respective shares.

Regional Prospects

Over-all Trends. The Philadelphia Metropolitan Region is one of the world's great industrial centers. Its economy performs four major functions:

1. Manufacturing for internal and for national consumption.
2. Internal business and consumer servicing.
3. Business and consumer servicing for those parts of the larger Philadelphia Market Area⁴ which lie outside the Metropolitan Region proper.
4. Inter-regional and international trans-shipment.

Philadelphia's metropolitan economy is exceptionally diversified, with 87% of all Census-defined industries found within

⁴ The Philadelphia Market Area is the 20-county territory for which the City serves as the principal administrative and distributive center. It consists of the Trenton, Atlantic City, Wilmington, Reading and Allentown Metropolitan Areas and the non-metropolitan counties of Warren, Hunterdon, Cumberland and Cape May in New Jersey.

its boundaries. Both durable and non-durable manufacturing are well represented, as are all types of non-manufacturing industry. Leading non-manufacturing categories are finance, insurance and real estate, retail trade, professional services, contract construction, and transportation services, the last-named focusing on the Port of Philadelphia. Among the different industries, there is considerable variation with respect to productivity and wage levels.

In 1957, the latest period for which complete metropolitan estimates are available, the 4,173,000 residents of the Philadelphia Metropolitan Region included 1,715,000, or 41.1%, in the labor force, and 1,617,000, or 38.7%, actually employed. The Region's 1,617,000 workers produced 12.053 billion dollars' worth of goods and services, of which 41.7% were in manufacturing and the remaining 58.3% in non-manufacturing. Total personal income amounted to 10.161 billion dollars, or about \$2,435 per capita.

Except for the relative insignificance of its farming and mining activities, the metropolitan economy is, in many ways, a miniature of the national one, and the over-all level of business activity in it has tended generally to reflect conditions in the nation as a whole. This correspondence between local and national business levels is expected to continue in the future. In contrast, however, significant divergences are anticipated between the future evolution of the local and national economic structures.

The over-all size of the metropolitan economy is projected to expand at a rate which will continue the pace that has marked economic growth in the Region since World War II, and reflect the pace of 1957-80 economic growth in the nation as a whole. Population gains in the Philadelphia Metropolitan Region itself, together with the expansion of the Region's national markets, will generate increases estimated at 125% in the output of goods and services, 41% in total employment, and 109% in total personal income. Continuing technological innovation, particularly in the Region's growth industries, will bring rises of 59% in metropolitan productivity and 46% in per capita income.

The composition of Philadelphia's metropolitan economy also is expected to evolve in a manner which will extend recent regional trends. With the exception of textiles, no major manufacturing groups are expected to suffer absolute decreases; in fact, substantial gains are anticipated for several of these groups, such as food, machinery and metals. Nevertheless, the relative share of manufacturing will continue to decline at the rate which has prevailed in the Region since World War II, as indicated by a projected drop in 1957-80 of 27% in the ratio of metropolitan manufacturing to total output. In this respect, the Region will move in a direction opposite to that taken by the nation as a whole.

The increasing proportion of non-manufacturing industries in the future regional economy will result from two major trends. First, regional manufacturing activity will grow comparatively slowly due to the economics of industrial location which have been making other sections of the country relatively more attractive to manufacturing enterprises. Second, the City's role as an administrative and distributive center will be greatly strengthened during the next 20 years—an expansion expressed most dramatically by the high gains foreseen for finance, insurance and real estate, and for public administration.

Some of this anticipated increase in the City's service function will be due to the transfer from New York to Philadelphia of office activities serving the entire nation. By far the largest share of the increase, however, will be due to population growth in the Philadelphia Market Area, and to improvements in that Area's access to the City's central business district. Thus, a Market Area population growth from 6 million in 1957 to 9 million in 1980 will be accompanied by the construction of new transportation facilities which will link the central business district more closely to outlying parts of its own Metropolitan Region, as well as to the other metropolitan regions making up the larger Market Area.

Output. The total output of 12.053 billion dollars in goods and services produced by the Philadelphia Metropolitan Region in 1957 constituted 2.69% of the gross national product. It indicated a metropolitan productivity of \$7,475 per worker, compared with the corresponding national productivity figure of \$6,617.

In value added per worker, a ratio which largely determines wage levels, the economic activities of the Philadelphia Metropolitan Region in 1957 varied greatly. Industries achieving high value-added ratios were metal and machinery production in the manufacturing category, and finance, construction and transportation in the non-manufacturing group. Industries in which these ratios were low included apparel manufacturing and consumer services.

Between 1957 and 1980, significant growth is anticipated in the Region's total output of goods and services, which will increase 125% to more than 27 billion dollars, and in output per worker, which will increase 59% to \$11,890. These increases represent metropolitan annual growth rates of 3.7% for output and 2.0% for productivity. Corresponding annual growth rates for the nation are 3.3% and 1.6% respectively. As a result, the Region's share of the gross national product will rise from 2.69% in 1957 to 2.88% in 1980.

The projected increase of 169% in metropolitan non-manufacturing output will be much greater than the 64% growth in manufacturing output. In this respect, the Region differs sharply from the nation as a whole, where output will grow somewhat less in non-manufacturing than in manufactur-

ing. Similarly, metropolitan non-manufacturing productivity will rise much more sharply than manufacturing productivity during 1957-80; here, however, the metropolitan trend conforms to the national one.

Table 3 presents the above data in greater detail.

Employment. The Philadelphia Metropolitan Region today ranks as the nation's fourth largest labor market. In 1957, manufacturing accounted for 34.4% of employment in it; the remaining 65.6% was in non-manufacturing. In the former category, jobs were distributed almost evenly between durables and non-durables, with major employers being machinery and apparel manufacturing. In the non-manufacturing category, major employers were retail trade, professional services, and transportation and communications. (See Table 4.)

Between 1957 and 1980, total employment in the Region is expected to grow 41.3% from 1,617,000 to 2,284,000. Since the Region's population is expected to increase from 4,173,000 to 5,963,000 during the same period, the projected 1980 job figure implies a slight drop in the metropolitan employment ratio, from 38.7% to 38.3%.

Between 1957 and 1980, manufacturing employment will rise by 28.2%, much more slowly than the expected 48.2% rise in non-manufacturing. In the former group, chemicals and machinery will register substantial gains, while textiles will suffer a slight absolute loss. In the latter group, professional services, public administration, and finance, insurance and real estate will all experience spectacular increases.

The rise in public administration will reflect the growing importance of urban areas in both the national and state economy. Urban renewal, transportation management, water resources management, "urban extension services", are examples of probable future expansion in the field of public administration.

Personal Income. With respect to personal income, the best available yardstick of regional living standards and consumer purchasing power, the Philadelphia Metropolitan Region measures up favorably. In 1957, its 4,173,000 residents received a total of 10.161 billion dollars of personal income. The resulting metropolitan per capita income figure of \$2,435 was significantly higher than the corresponding national figure of approximately \$2,070. The Region's relatively favorable per capita income level followed from the fact that several of its major employing industries, such as machinery production and finance, were characterized by high ratios of value added per worker.

Between 1957 and 1980, with population growing to 5,963,000, annual personal income in the Region is expected to rise 108.9% to 21.230 billion dollars, thereby raising per capita annual income to \$3,560. These figures represent a projected per capita income growth of 46.2% over the 23-year

TABLE 3—VALUE ADDED IN THE PHILADELPHIA STANDARD METROPOLITAN AREA: 1957 AND 1980 (1958 DOLLARS)

	1957	1980	PER CENT INCREASE 1957-80
Manufacturing			
Total: Amount (billions)	\$5.029	\$8.249	64.0
Per Cent of Metropolitan Economy	41.7	30.4	
Per Worker	\$9.031	\$11,584	28.0
Non Manufacturing			
Total: Amount (billions)	\$7.024	\$18.913	169.3
Per Cent of Metropolitan Economy	58.3	69.6	
Per Worker	\$6,629	\$12,035	87.1
Metropolitan Economy			
Total: Amount (billions)	\$12.053	\$27.161	125.3
Per Cent of Metropolitan Economy	100.0	100.0	
Per Worker	\$ 7,475	\$11,890	59.5
Per Person	\$ 2,761	\$ 4,589	57.7

TABLE 6—ESTIMATED PERSONAL EXPENDITURES IN THE PHILADELPHIA STANDARD METROPOLITAN AREA: 1980

	AMOUNT (MILLIONS OF 1958 DOLLARS)	PER CENT OF TOTAL
Food	\$ 4,820	25.6
Clothing	1,249	6.6
Housing	2,964	15.7
Household Operations and Furnishings	2,580	13.7
Transit	96	0.5
Private Auto Transportation	1,972	10.5
Recreation and Entertainment Services	617	3.3
Education, Religion and Welfare	739	3.9
Other	3,793	20.2
Total	\$18,830	100.0

TABLE 4—EMPLOYMENT IN THE PHILADELPHIA STANDARD METROPOLITAN AREA: 1957 AND 1980

	1957		1980		PER CENT CHANGE 1957-80
	PERSONS	% OF TOTAL	PERSONS	% OF TOTAL	
Manufacturing	557,000	34.4	714,000	31.3	28.2
Food and Kindred Products	45,100	2.8	61,000	2.7	35.3
Textiles	41,300	2.6	21,000	0.9	-49.2
Apparel	61,300	3.8	82,000	3.6	33.8
Printing and Publishing	36,000	2.2	42,000	1.8	16.7
Chemicals	35,700	2.2	60,000	2.6	68.1
Oil and Petroleum	23,200	1.4	28,000	1.2	20.7
Primary and Fabricated Metals	83,500	5.2	113,000	5.0	35.3
Machinery	102,400	6.3	150,000	6.6	46.5
Other Manufacturing	128,500	7.9	157,000	6.9	22.2
Non-Manufacturing	1,059,660	65.6	1,570,000	68.7	48.2
Contract Construction	103,200	6.4	117,000	5.1	13.4
Transport and Communications	129,230	8.0	175,000	7.7	35.4
Finance, Insurance, Real Estate	77,980	4.8	201,000	8.8	157.8
Wholesale Trade	61,530	3.8	105,000	4.6	70.6
Business and Repair Services	43,680	2.7	62,000	2.7	41.9
Retail Trade	268,900	16.6	312,000	13.7	16.0
Consumer Services	88,760	5.5	66,000	2.9	-25.6
Professional Services	146,600	9.1	286,000	12.5	95.1
Public Administration	83,600	5.2	197,000	8.6	135.6
Other Non-Manufacturing	56,180	3.5	49,000	2.1	-12.8
Total	1,616,660	100.0	2,284,000	100.0	41.3

TABLE 7—DISTRIBUTION OF ECONOMIC QUANTITIES IN THE PHILADELPHIA STANDARD METROPOLITAN AREA, CENTRAL CITY AND RING: 1955-56 AND 1980

	1955-56*		ESTIMATES 1980		PER CENT CHANGE
	AMOUNT	% OF PSMA	AMOUNT	% OF PSMA	
Total Value Added (millions of 1958 dollars)					
Philadelphia	\$ 7,062	64.1	\$14,640	53.9	107.3
Ring	3,954	35.9	12,521	46.1	216.7
Total (PSMA)	\$11,016	100.0	\$27,161	100.0	146.6
Employment (workers)					
Philadelphia	965,000	63.1	1,214,000	53.2	25.7
Ring	564,000	36.9	1,070,000	46.8	89.9
Total (PSMA)	1,529,000	100.0	2,284,000	100.0	49.4
Total Personal Income (millions of 1958 dollars)					
Philadelphia	\$ 5,165	51.7	\$ 7,789	36.7	50.8
Ring	4,827	48.3	13,441	63.3	178.5
Total (PSMA)	\$ 9,992	100.0	\$21,230	100.0	112.5
Per Capita Personal Income (1958 dollars)					
Philadelphia	\$ 2,351		\$ 3,462		47.3
Ring	\$ 2,531		\$ 3,620		43.0
PSMA	\$ 2,435		\$ 3,560		46.2

* Value added and employment data for 1956; personal income data for 1955.

TABLE 5—PERSONAL INCOME* IN THE PHILADELPHIA STANDARD METROPOLITAN AREA: 1957 AND 1980 (1958 DOLLARS)

	1957	1980	PER CENT CHANGE 1957-80	PER CENT ANNUAL GROWTH RATE
Total Income (billions)	\$10.161	\$21.230	108.9	3.3
Population	4,173,000	5,963,000	42.9	1.6
Per Capita Income	\$ 2,435	\$ 3,560	46.2	1.7

* Personal income is defined here to consist of wages and salaries, other labor income, proprietor's income, property income and transfer payments—minus personal contributions for social insurance—minus military income.

TABLE 8—ECONOMIC QUANTITIES IN PHILADELPHIA CENTER CITY: 1956 AND 1980

	1956			1980		
	AMOUNT	% OF CITY	% OF PSMA	AMOUNT	% OF CITY	% OF PSMA
Value Added (billions of 1958 dollars)	\$2.894	41.1	26.3	\$4.992	34.1	18.4
Employment (Workers)	375,000	38.9	24.6	416,000	35.3	18.2
Assessed Valuation (billions of 1956 dollars)	\$0.612	16.4	(not available)	\$1.606	21.1	(not available)

period, and imply an annual growth rate of 1.65%. The substantial rise in per capita income over the period may be attributed to the high productivity gains which are expected for the Region's major growth industries. Table 5 summarizes the foregoing.

Personal Expenditures. According to projections made by the Planning Commission staff and consultants, the residents of the Philadelphia Metropolitan Region will spend 18.830 billion dollars in 1980. This represents 88.7% of the total personal income forecast for the Region for that year. Distribution of personal expenditure by type of outlay is represented in Table 6. A significant change is expected to take place in the relative shares of three key items: the proportion spent on food and clothing is expected to decline while the proportion spent on housing is expected to grow.

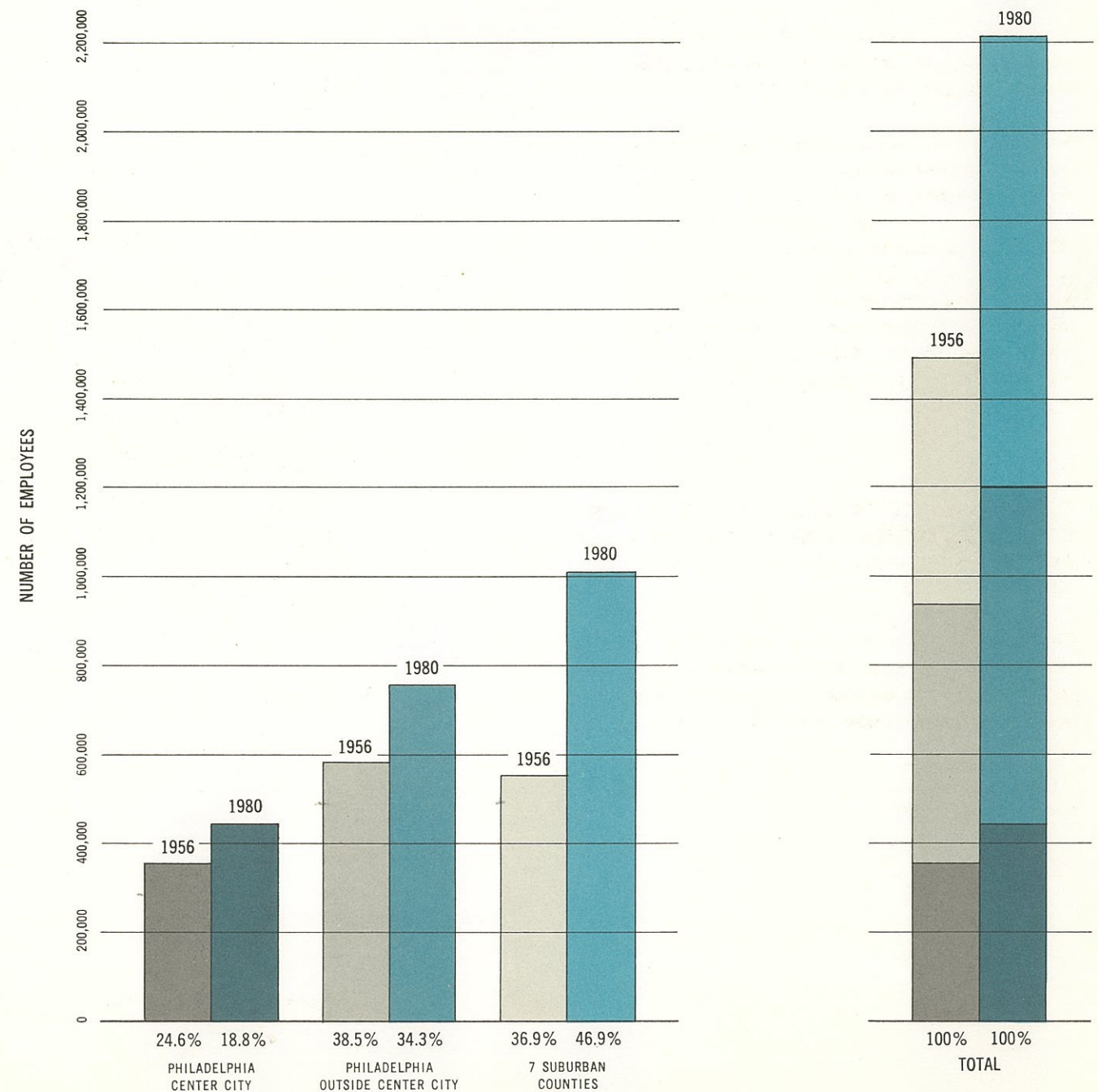
The Changing Spatial Pattern of the Metropolitan Economy

The way in which the three basic economic quantities of value-added, employment and personal income are distributed throughout the Philadelphia Metropolitan Region constitutes the spatial pattern of the economy. At present, these quantities are highly centralized in the City of Philadelphia. Nearly two-thirds of Regional production takes place within the City, and about one-half of the Region's total personal income goes to City residents.

The City of Philadelphia, which constitutes the core of the eight-county Metropolitan Area, takes up only 134 (3.8%) of the Region's 3,550 square miles. Yet in 1956, the most recent year for which complete economic data on the Region's sub-areas are available, Philadelphia accounted for 64.1% of value added, 63.1% of employment, and 51.7% of personal income.

The City's share of the Region's personal income in the same year, however, was much lower than its share of value-added and employment. This disparity followed largely from the fact that in 1956, Philadelphia had within its boundaries only 54% of the area's population. To a lesser extent, the disparity was also due to average per capita income being lower in the City in 1956 than in the seven-county Ring: \$2,351 and \$2,531 respectively.

The next 20 years will see considerable growth in the economy of the Philadelphia Metropolitan Region. The period is expected to bring substantial changes in the spatial pattern of the metropolitan economy. Although value-added, employment and personal income will still be concentrated in the City, by 1980 these three economic quantities are expected to have become much less centralized. This change will be a natural consequence of suburban population growth, and of the availability of large tracts of vacant land in the seven-county Ring.

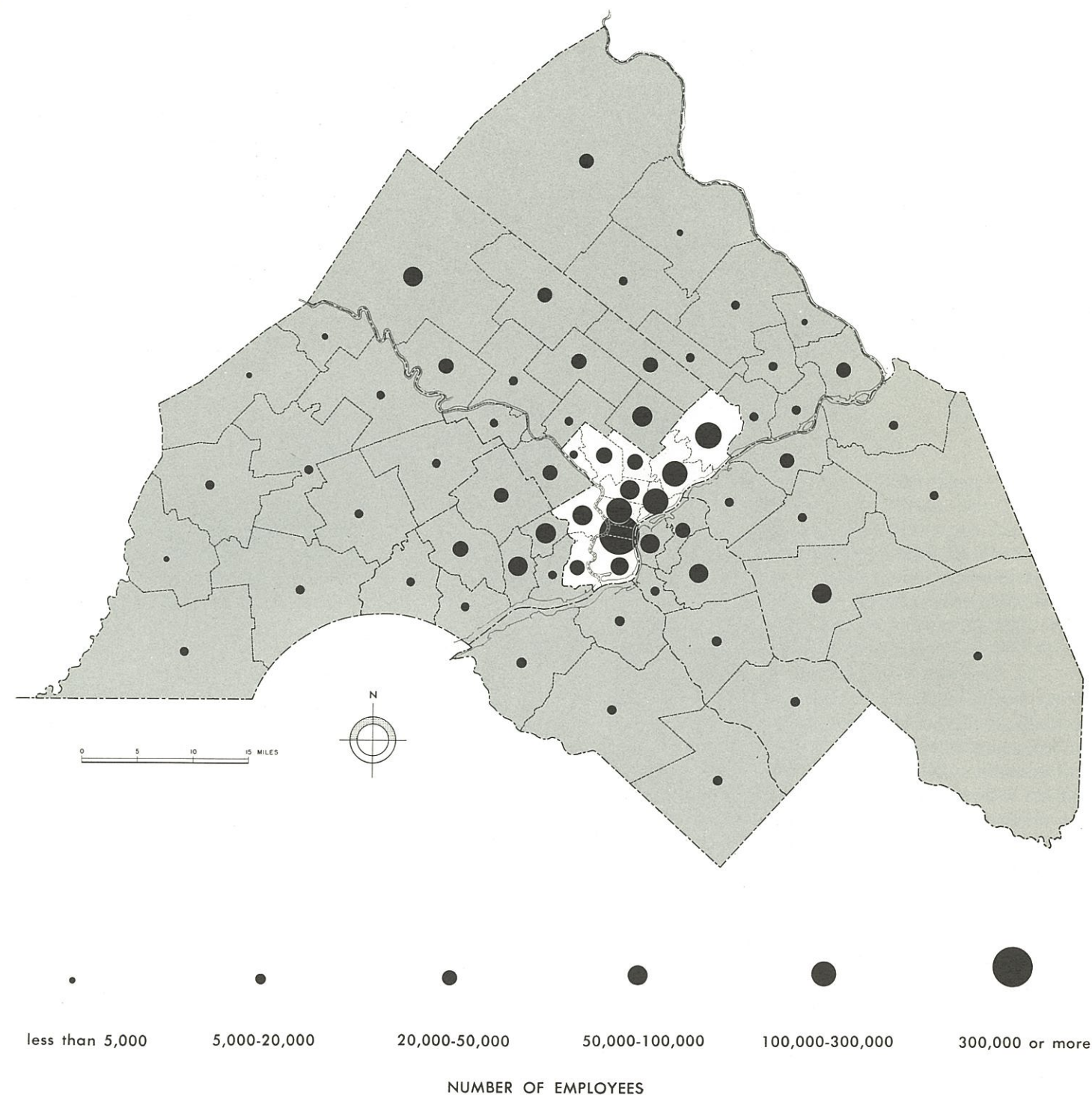


◆ FIGURE 13—EMPLOYMENT IN THE PHILADELPHIA STANDARD METROPOLITAN AREA 1956 AND 1980 (EST.) BY MAJOR AREAS.

In 1980, the distribution of employment within the Philadelphia Metropolitan Area is expected to remain highly centralized, with half of all jobs being in the City of Philadelphia itself. Although the number of jobs in Philadelphia will increase by 249,000, jobs in 1980 will be much less centralized than in 1956. While 37% of the Metropolitan Area's employment was located in the seven suburban counties in 1956, 47% is expected to be in these counties in 1980.

◆ FIGURE 14—EXPECTED EMPLOYMENT IN THE CITY OF PHILADELPHIA AND THE STANDARD METROPOLITAN AREA 1980 BY PLANNING ANALYSIS AREAS.

◆ The projected 2,284,000 jobs will be distributed widely throughout the Metropolitan Area in 1980 but the heavy job concentrations will continue to be in Philadelphia as they now are.



The Economy concluded

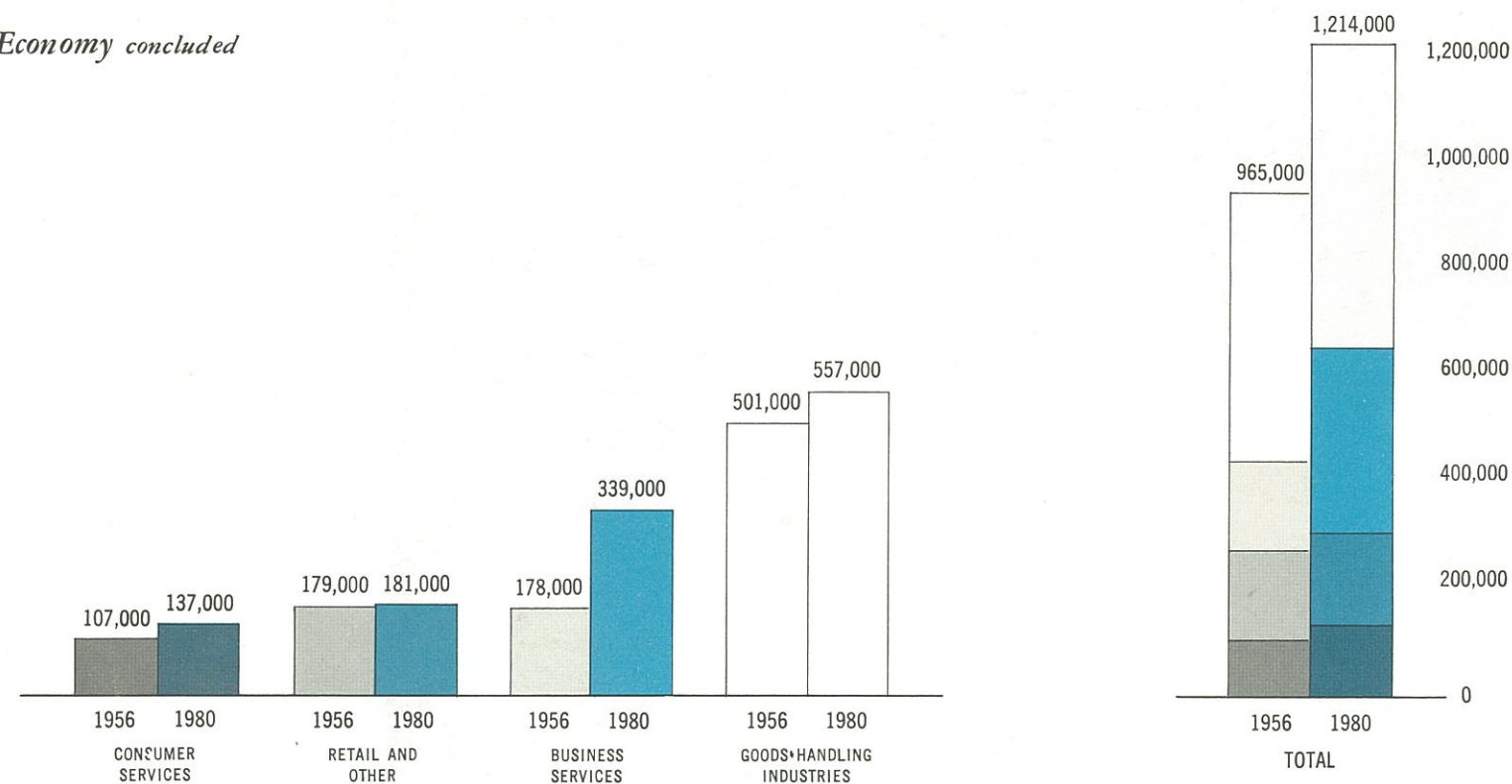


FIGURE 15—EMPLOYMENT IN THE CITY OF PHILADELPHIA, 1956 AND 1980 (EST.) BY MAJOR ACTIVITY.

During the 1956-80 period, both productive activity and population will grow much more slowly in the City than in the Ring, so that while value-added in Philadelphia will increase a substantial 107.3%, the City's share of Regional output will drop from 64.1% to 53.9%. Similarly, in the face of a 25.7% increase in jobs, the City's share of Regional employment will decline from 63.1% to 53.2%. Finally, with total personal income within the City limits rising 50.8%, Philadelphia's share of Regional income will fall from 51.7% to 36.7%. Table 7 presents this information in greater detail.

In contrast with the disparate growth rates summarized above, the City's 1956-80 percentage rise in per capita personal income, amounting to 47.3%, will be about the same as the rise expected for the seven-county Ring. Per capita income figures of \$3,462 and \$3,620 are anticipated for 1980 for City and Ring respectively (Table 7).

Economic Prospects for Philadelphia

In 1956, the assessed valuation of industrial and residential real estate in the City of Philadelphia totaled 3.732 billion dollars. In that year, approximately 965,000 persons were employed in the City, with jobs in goods-handling industries accounting for 51.9% of the total. Also during 1956, goods and services amounting to 7.062 billion dollars were produced within the City limits. In the previous year, the City's 2.2 million residents had received 5.165 billion dollars in personal income, an amount yielding a 1955 per capita income of \$2,351.

Between 1956 and 1980, the City's economy will grow considerably. Assessed valuation is expected to increase 104%, to 7.605 billion dollars (in terms of 1956 purchasing power). Output of goods and services will rise 107.3%, to 14.640 billion dollars, and per capita income will rise 47%, to \$3,462. Total employment, finally, will increase 26%, to 1,214,000 jobs. At the same time, the relative share of business service employment is expected to grow at the expense of the share held by employment in goods-handling and retail activities.

Economic Growth in Philadelphia's Center City

Although Philadelphia's Center City occupies only 2.2 square miles between Vine and South Streets and between the Delaware and Schuylkill Rivers, its importance to the municipal economy is indicated by the fact that in 1956 it accounted for 41.1% of the City's total output of goods and services, 38.9% of its jobs, and 16.4% of its assessed valuation.

Expressed in concrete terms, Center City's output totaled 2.894 billion dollars; it employed 375,000 persons, and contained real estate assessed at 611.7 million dollars. On the assumption that the Plan's transportation proposals, making Center City considerably more accessible to the metropolitan area, are carried out in the next 20 years, Center City's production of goods and services in 1980 is expected to increase 72.5% over 1956, to 4.992 billion dollars. Employment, on the same assumption, is expected to register a 10.9% gain, to 416,000 workers, and assessed valuation 162.5%, to 1,605.9 million dollars. (See Table 8.) These projections imply a con-

siderable future strengthening of business activity and tax values in Center City.

Implications

The preceding pages have outlined the course of economic development that is anticipated during the next 20 years for the City of Philadelphia, and for the Metropolitan Region of which the City constitutes the center.

The regional and intra-regional projections summarized above depend on implementation of many of the proposals in the Comprehensive Plan, but most particularly on the transportation proposals. In turn, these projections provide a basic framework for the Plan itself. They have been used:

1. To test the adequacy of the Regional demographic projections (summarized in the chapter on Population) by evaluating the ability of anticipated 1980 employment to support the population forecast for that year by means of the ratio method;
2. To estimate the future amount of land required by different types of economic activity within the City of Philadelphia;
3. To estimate the future size and purchasing power of the consumer market which will be served by Philadelphia's Center City and by the major regional shopping centers;
4. To estimate the future size of Philadelphia's municipal tax base.

GENERAL CONCEPTS



GENERAL CONCEPTS

The Plan's objective: giving all people good access to all types of facilities....Two methods: bring facilities to people, or people to facilities.... Each means radically different way of arranging transportation, residential, other facilities.... The concept of the Center as the dominant point of a radial and circumferential system of arteries.

- Formerly, cities were built for the protection and enjoyment of a fortunate few—others were left to find what advantages they could in city life and, doubtless, even for these the advantages were considerable. In the present democratic era, however, the only allowable objective is that **all** men be helped to avail themselves of **all** of the opportunities which the city offers and, if possible, to avoid the more harmful effects of city life. For City Planning, which must serve the instinct of the age, this means planning the city in such a way that all people have good access to facilities of all kinds. Here is one of the great technical objectives of contemporary planning and perhaps it will play the same role in giving cities form, which the requirements of military defense, trade and industry have each played at various times in the past.

From the point of view of the Comprehensive Plan, the city is the means for bringing together people and the facilities which serve them. In the pages which follow are set forth the concepts of the Plan, the broad principles which should be followed if the community is to accomplish this purpose most effectively.

THE ELEMENTS OF STRUCTURE

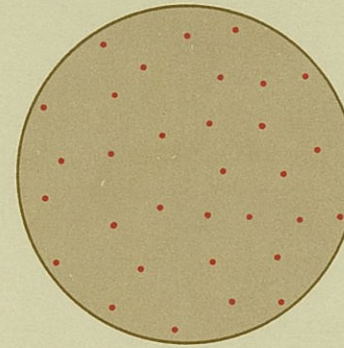


FIGURE A

Certain facilities are used so often, or are so important to the public welfare that, if possible, they must be distributed throughout the City so as to be within easy reach of all. Some of the more important facilities which fall into this category are small parks and playgrounds, schools, small shopping centers, fire and police stations.

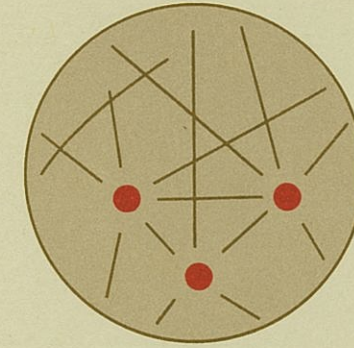


FIGURE B

Other facilities can be distributed only in the sense of being made accessible to people through the transportation system.

- The objective is to bring together people and the facilities to meet their human and cultural needs. In working toward this objective there are only two means at hand: people can be transported to facilities, or facilities can be distributed to people. Each method in the extreme produces a different kind of city.

In Figure B, the function of transportation is to overcome total distance between people and facilities. In Figure A, transportation has no function since total distance is overcome by means of distribution.

Actually, neither transportation nor distribution can do the whole job because, on the one hand, not all persons are mobile and, on the other hand, not all facilities can be distributed. Persons may be place-bound because of age (the young and the old) or because of social role (as women with young children). Some facilities cannot be distributed because they are underpinned by natural resources or be-

cause, to exist at all, they must be of a physical or economic size that prevents their being multiplied indefinitely.

These constraints mean the use of both methods for overcoming distance between people and facilities. Part of the distance must be overcome by means of distribution. The remaining distance must be overcome by means of the transportation system. Accordingly, we combine Figures A and B to give a truer picture of urban structure in Figure C.

From the point of view of bringing people and facilities together, urban structure has three major elements: the distributed facility, the undistributed facility, and the transportation system. In overcoming distance the first and third have complementary roles: more distributed facilities mean less distance for the resident to travel, and less need for transportation capacity. Fewer distributed facilities mean more distance and greater need for transportation

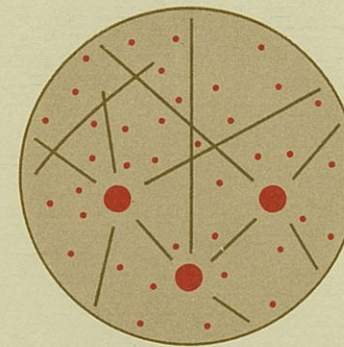


FIGURE C

City structure results from a combination of both methods of distributing facilities. Figure C is the anatomy of the Plan.

capacity. Place-bound people and place-bound facilities set practical limits to both the concentration and distribution of facilities. Figure C is the anatomy of the Plan.

Yet one other feature of urban structure affects the amount of distance which the resident must travel, namely, the way the structural components just described are arranged on the ground—the pattern they make.

The obvious effect of the arrangement in Figure C is much movement back and forth between place of residence and non-distributable facilities. Concentrate such facilities at one point and the total distance to be covered will decrease. It will decrease even further if the concentrated facilities are put at the center of population (Figure D). This fact gives functional meaning to the Central Business District of Philadelphia and to the radial form of the metropolis.

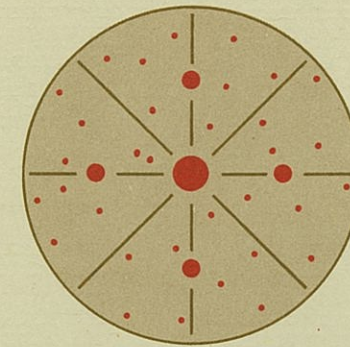


FIGURE D

The objective of reducing distance between all people in the City and all opportunities requires that one activity center in the urban field be privileged with respect to size and location. This fact gives functional meaning to the Central Business District of the City and to the radial form of the whole metropolis.

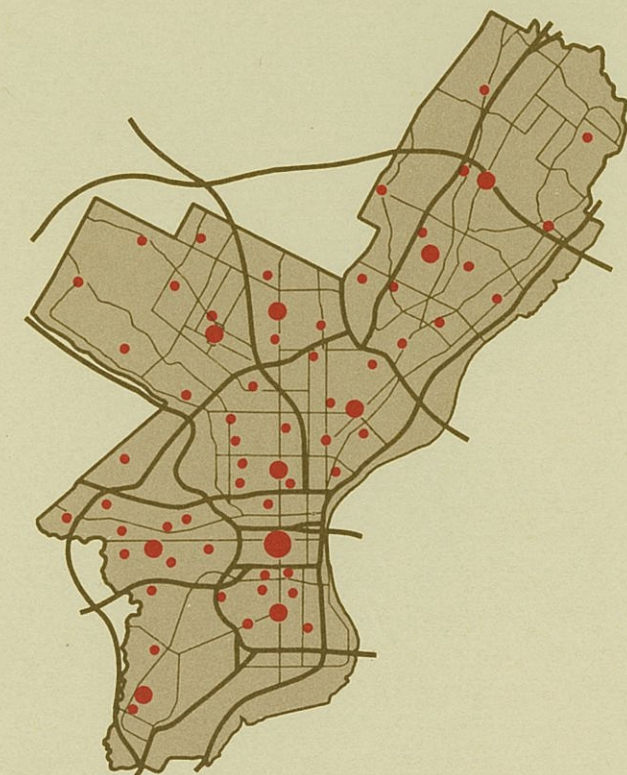


FIGURE E

The anatomy of Philadelphia.

URBAN FORM

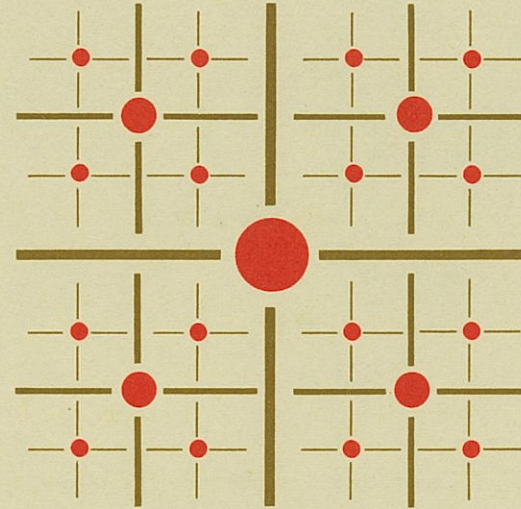


FIGURE F

• Limits to both concentration and distribution are set by immobile persons and by facilities which cannot be distributed. But people are not equally immobile, nor are facilities fixed or concentrated to the same extent. Mobility varies according to age, sex, and income, while the distribution of facilities is a matter of economic plant size or of accessibility requirements—hence, the hierarchical tendency of urban structure requiring people to travel different distances to different facilities and the facilities themselves to have different service ranges. Facilities which in order to exist at all must be accessible to the entire region tend to locate near the center of the metropolitan population. Facilities which need only be within walking distance of relatively few people distribute themselves throughout the entire urban area in close proximity to their clients, in neighborhood centers. Between these two extremes, there are facilities with service areas of various sizes located at centers of corresponding importance.

From this discussion it will be apparent that the

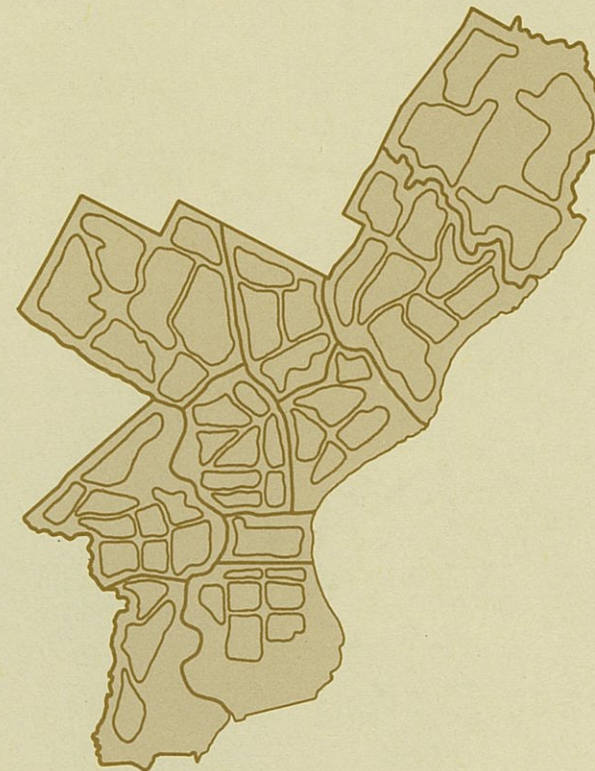


FIGURE G

For each set of facilities a service area.

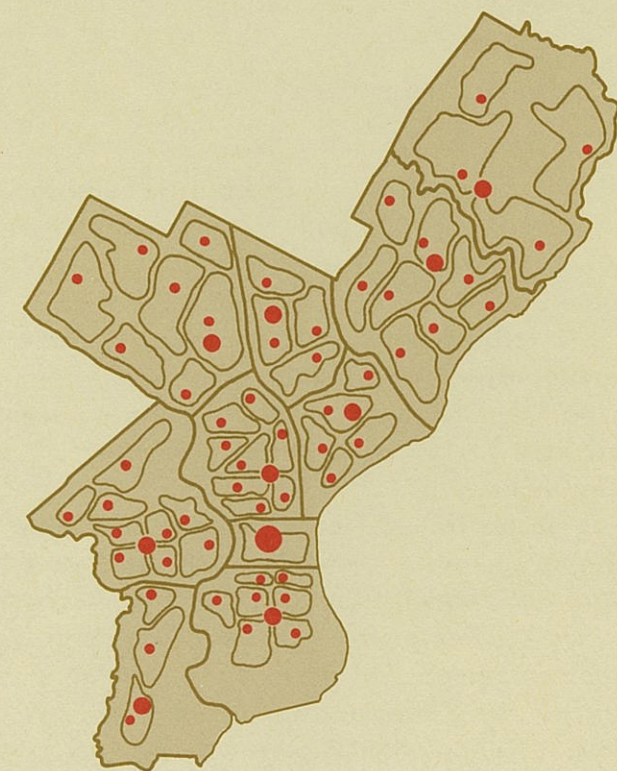


FIGURE H

For each service area a center.

form which the Plan advocates (Figure F) is based on a respect for certain underlying social and economic realities. The purpose of aiding this natural community design to function more effectively, and of facilitating its emergence in new areas can be pursued by means of five planning measures:

1. providing for each age group a set of appropriate facilities;
2. determining for each set of facilities a service area;
3. establishing for each service area a center;
4. differentiating highways by design and capacity according to the centers they serve;
5. facilitating the development of a hierarchy of communities based on successively wider interests and fostering a progressively wider sense of place.

However, it should be noted that there is a potential conflict to be avoided in a system such as the one we have been describing which is composed of communities within communities.

The land occupied by any particular community is viewed as its home territory to be used for a local purpose. For the next larger community, a group subjected to different pressures and with a viewpoint so large as to be impersonal, the same land may represent a resource: the potential right-of-way for a new expressway, the ideal site for a high school or shopping center.

Where these different viewpoints produce conflicting demands on the same land, a technical solution is required in the form of a set of defined land use relationships to permit a working out of both local and regional aims in the same area with as little friction as possible. Of course, possibilities are different in different parts of the City. Reconciling opposing local and regional interests is more difficult nearer the City center, where the great regional paths converge and where regional facilities come to predominate.

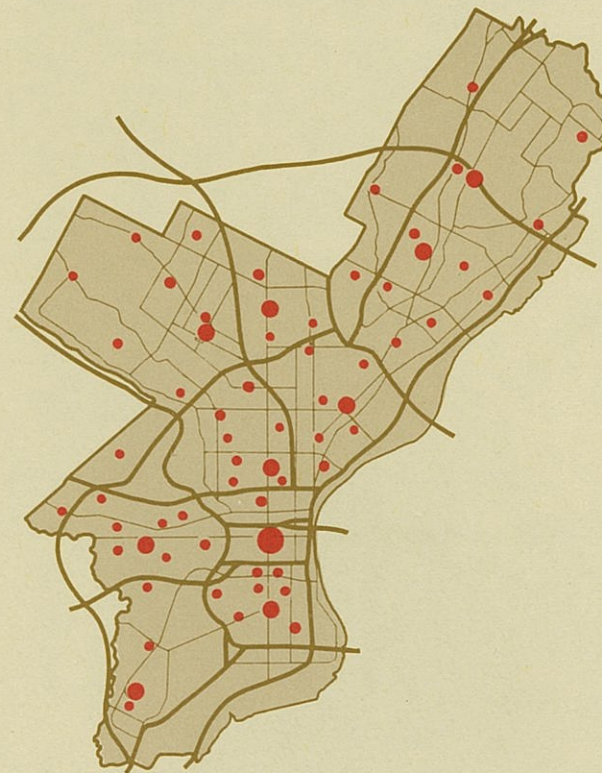


FIGURE I

Highways differentiated in design and capacity according to the centers they serve.

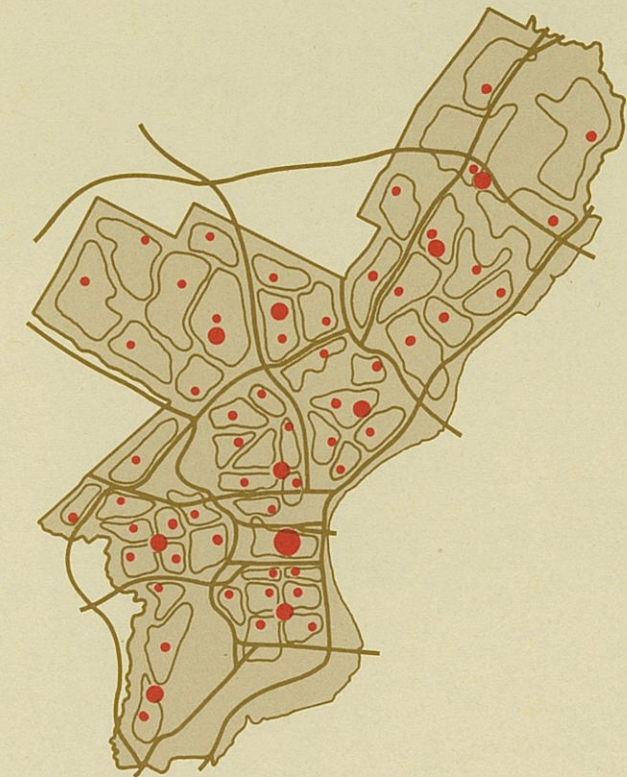


FIGURE J

A hierarchy of communities based upon successively wider interests and fostering a progressively wider sense of place.

DENSITY—ITS BASIS IN URBAN STRUCTURE

- Density is a key factor in the distribution of facilities and is itself influenced by the structure depicted in Figure F.

Density at any point is mainly a product of two interacting factors: 1. the accessibility which the place has to every other place, and 2. the number of people who need or want that degree of accessibility.

If all people in the City had the same access needs and preferences, then all would try to locate at one place. But all people do not have the same locational needs, so every habitable place in the City is occupied.

But the whole City is not evenly occupied. For although each place is valuable to some people, not all are valuable to the same number of people. The reason for this is that certain places because of their

locations offer better opportunity for over-all access than do others. For example, the Center City of Philadelphia and some of the major sub-centers, such as Germantown, offer superior access. Therefore, it is proposed that these places should continue to be more densely occupied than other places (Figure K). Thus the Plan makes the best use of certain features of the City structure in the interest of the residents.

Where, in terms of access, one place is supreme as in a metropolitan region, every other place acquires an access value which is some fraction of the value of the chief place: the amount depending on how well it is able to substitute for the chief place. The better it can substitute, the more desirable it becomes as a place of business or residence. Hence, there is greater demand for it.

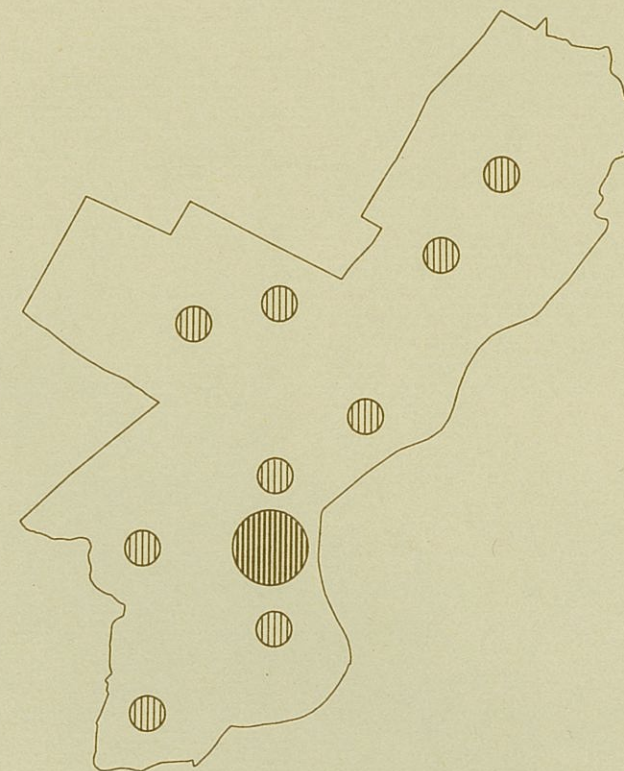


FIGURE K

The basis of density is accessibility—to all facilities in the region as a group as well as to particular facilities. Accessibility is greater at the regional center and sub-centers...

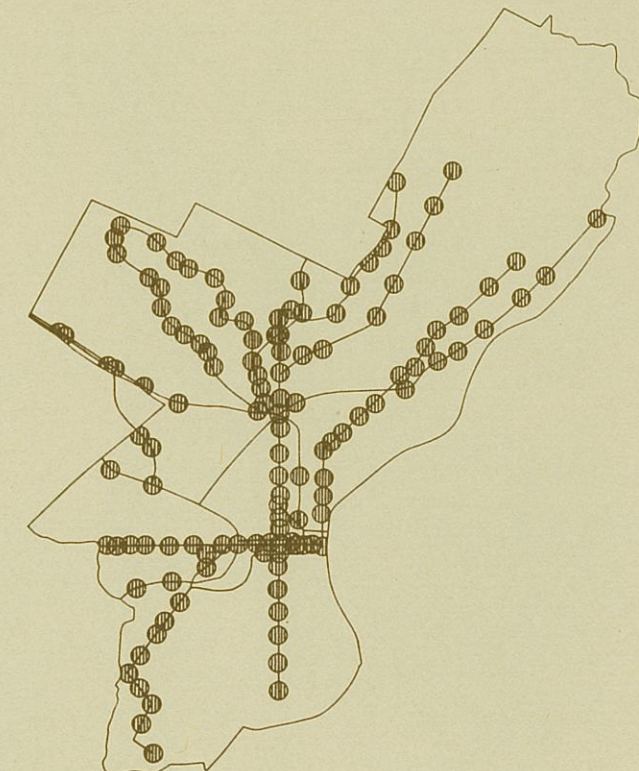


FIGURE L

... along major transportation routes and in the vicinity of expressway interchanges and mass transit stations...

As a rule, as one leaves the center of a region, ease of access declines and with access the ability of a place to substitute for the center. Therefore, a second feature of density policy is to provide for successively lower densities with distance from Center City and from the major sub-centers (Figure M).

However, where conditions are favorable, higher density is allowed, than is typical for points at that distance from the center. Conditions are favorable along major transportation routes, or in the vicinity of expressway interchanges, or mass transit stations (Figure L). Such places allow quicker access to the center than do immediately neighboring points. Therefore, they can sustain a higher volume of activity. Conversely, some places, due to bad site conditions or to poor transportation, are required to have

lower densities than do neighboring points.

The density policies which we have been explaining are summarized in Figure N: a pattern of different degrees of intensity dominated by a high density center progressing to a low density periphery with upward variations occurring in the vicinity of sub-centers and transportation interchange points, and downward variations where site conditions are unusual or where particular public or private objectives have repressed or inhibited development.

Thus density adds a third dimension to the pattern of distributed and non-distributed facilities, and to the hierarchy of centers and sub-centers. The Plan proposes a density pattern in which the distribution of population is logically related to the other development proposals of the Plan.

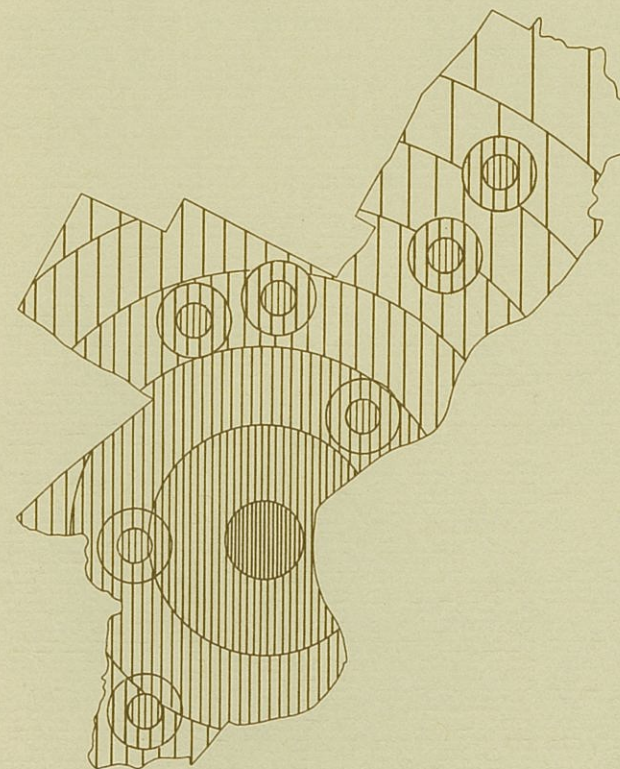


FIGURE M

... and declines with distance from all such access-privileged points.

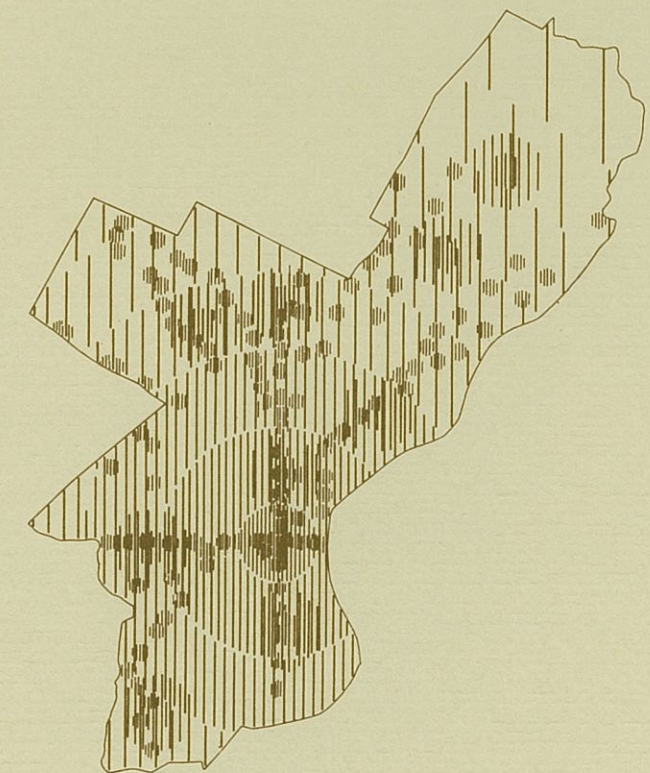


FIGURE N

The density policy proposals of the Plan are based on a recognition of the underlying realities of urban structure and form.

GROWTH AND ITS CONSEQUENCES

- Place-bound people and place-bound facilities cause the community to have a stable spatial structure. In turn, this structure affects the community's size.

Figures O and P are similar to Figures A and B except that patterns have been used to represent the loci of different major activities. A characteristic of Region 2 (Figure P) is the separation of place of play, work and residence at a metropolitan scale. In Region 1 (Figure O) separation of activities is local.

Corresponding to these structural differences, there are implied differences in the amount of traveling a resident has to do in the course of a day. In Region 1, composed of locally-organized units, he would hardly have to travel at all since he could meet all of his daily requirements within a relatively small area. No matter how large such a region might be, it would impose no strain on the time or energy of any of its inhabitants.

On the other hand, the size of the type of region pictured in Figure P is subject to a practical limit determined by the ability of people to reach unique

activity centers and represented in this figure by the circumference of the circle. Growth beyond this limit requires structural changes in the form of either faster or more far-reaching transportation facilities, or new regional centers.

These considerations permit us to give to the concept "urban growth" a definite meaning.

Growth involves an increase in size and an adjustment to size. In nature these two processes occur at the same time or so close together that they can hardly be distinguished. Cities, however, increase in size first and adjust to size only gradually. As a result transitional relationships often confuse the features of the old and the new equilibrium. But always emerging in the growth of a city is the perduring structure of the human community at a larger scale.

Urban growth involves the welfare of individuals as well as of whole communities.

The political community is affected when, as a result of adjustments to size, its boundaries cease to coincide with the boundaries of the functional community. Figure Q, illustrates the possibility: a vacuum

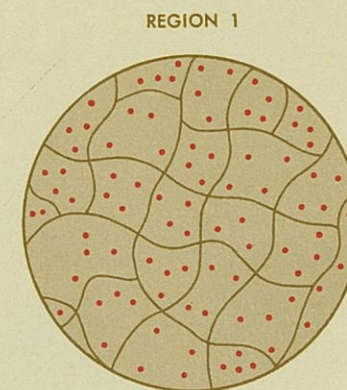


FIGURE O

No "adjustment" is required in the growth of the type of region pictured here. It grows simply by adding identical "cells." Each cell contains all the facilities which its residents need in order to live or to participate in their culture.

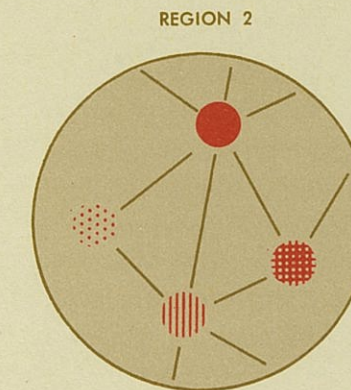


FIGURE P

In this type of region certain kinds of facilities are concentrated at one or a few points. Here growth involves adjustments in the form of new activity centers or new transportation facilities.

caused by excessive distance from the established urban centers comes to be served by centers outside the City. The influence of the new centers ranges deep into the service areas of the old, causing the reorientation of considerable numbers of people.

If the new centers arise within the bounds of the political community (Figure R), old established centers within it may lose their supremacy, but this loss may be offset by the advantage to the political community of retaining its custom and winning new custom beyond its boundaries.

Older centers may keep their importance by the device of improved transportation to the new growth areas, transportation being, as we have shown, the functional equivalent of distributed facilities.

When growth occurs, population movements ensue caused by many people seeking points in the new larger urban structure corresponding to the points they occupied in the old. As a result, some areas develop and others decay, giving rise to problems of economic and social succession which must be treated by means of development and redevelopment.

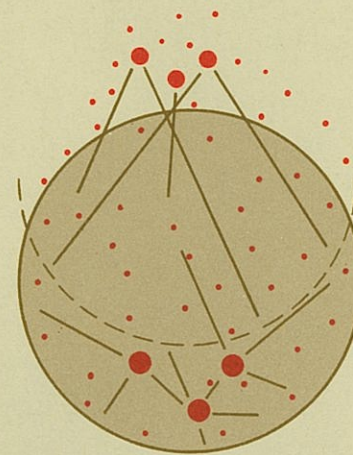


FIGURE Q

It makes a difference whether the activity centers which serve new growth develop inside or outside the City. In the situation pictured here, outside centers have cut deep into the service areas of the older City centers.

The basic development issues facing the City derive from these factors of growth and the consequences for Philadelphia, the central city of the region. The Plan presented here proposes to meet these issues by a series of major improvements in transportation; by significant readjustments in land use, particularly in the direction of industrial and commercial development and redevelopment; by the intensification of activity in Center City and a number of sub-centers; and by the improvement in quality of homes and their surroundings.

By definition growth occurs in time. But growth itself, and even more so its consequences, take place or appear unevenly along a time scale. Public efforts at directing readjustment must be sensitive to time. Thus timing of public development activity adds a fourth dimension to the Plan.

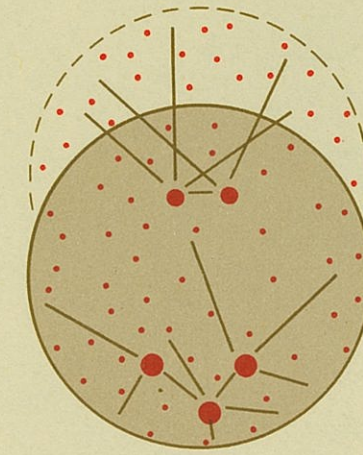


FIGURE R

The situation pictured here is more salutary from the City's point of view. The newer centers extend the City's commercial hegemony over suburban territory.



Industry's growing need for space...The tendency to seek it outside the City... How to overcome this tendency through redevelopment and relocation... Urban industrial parks... Separating out industrial and residential intermixtures... Giving industry new opportunities... The establishment of acceptable density patterns... Making factories accessible to workers... Industry's dependence on transportation.

THE PLAN FOR INDUSTRY

Changes in the technology of manufacturing have drastically altered the land requirements for industry over the past few years. These have accelerated the well known flight of city industries to the suburbs where they can find the large acreage they want for one-story assembly line production, and they have left within the city a large number of obsolete, vacant multi-story loft buildings. The development of an adequate plan to meet the situation is of the utmost importance to the City's well-being. The Industrial Land Use Plan is an important part of a total program.

To aid it in the development of the Plan, the Commission has had the assistance of a series of specialized consultants' studies, including one by The Institute for Urban Studies of the University of Pennsylvania in 1956 entitled Industrial Land and Facilities for Philadelphia; one by Marketers Research Inc. in 1959 entitled Present and Future Scale and Spatial Distribution of Non-Residential, Non-Manufacturing Activities in the Philadelphia Standard Metropolitan Area; and The Usefulness of Philadelphia's Industrial Plant: An Approach to Industrial Renewal compiled by Arthur D. Little, Inc., in 1959.

The basic scale of the problem is set by the chapter on Economy which projects 2,284,000 jobs by 1980 for the urban area. Of these, about one-half are in urban "industrial" or "goods-handling" jobs, i.e., manufacturing, construction, motor freight and warehousing, wholesale trade, and transportation and utilities.

This chapter of the Comprehensive Plan is devoted to providing an estimate of how many of these jobs can be expected to locate in the City of Philadelphia, what kinds of industry are most suited to location in the City, and the development of these estimates into an Industrial Land Use Plan.

The Plan is a guide for action showing:

- 1. areas that are to remain industrial;*
- 2. vacant areas suitable for future industrial use that should be reserved for this use;*
- 3. areas which are now in other uses that should be redeveloped for industry;*
- 4. industrial pockets that should be removed.*

The development of the Plan is based on a projection of employment by industry type. A review of the characteristics of specific industries and industrial districts permits an assignment of this employment to areas of the City. Space standards are then applied to these projections to estimate the quantities of land required. The

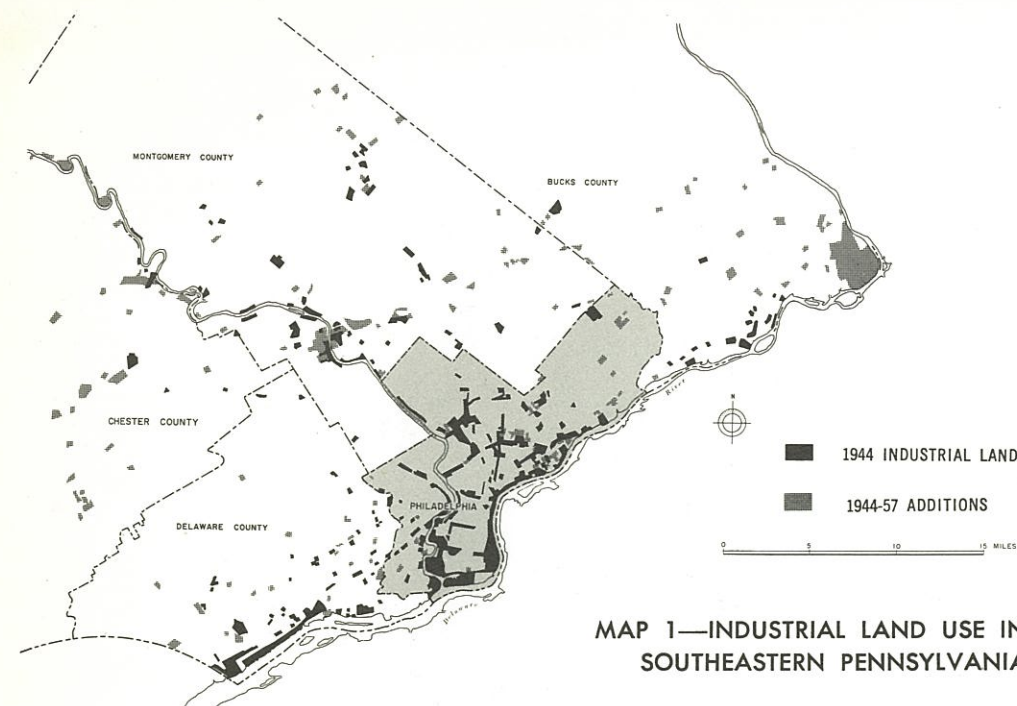
Plan provides a total of over 18,000 net acres for industrial use, an increase of 5,500 acres over that presently in use. Included are about 1,200 acres to be made available for industry through the process of redevelopment.

Trends in Industrial Locations: Compared to both the Metropolitan Region and the nation, the City of Philadelphia has suffered a relative decline the past two decades in manufacturing employment. Even in industries where employment has increased, it has generally done so at a slower rate than in neighboring counties. This relative contraction is caused by two factors: 1. the movement from the City of firms needing more space; 2. the location in the suburbs of firms new to the Region.

A study of the movement of manufacturing firms in the Region was made recently for the Planning Commission by the Institute for Urban Studies. This was designed to determine the scale and relative importance of the movement from the City, and to project the trends into the future. The consultants sought to survey all firms which had made locational decisions, including those which decided not to move and which therefore expanded on existing sites, as well as those which moved or built branches.

In general, they found that the majority of the decisions resulted in either expansions on the site, or new locations within the City. Nearly all relocations were within either the City or the Metropolitan Area; only a small portion went to outside areas. The results are given in Table 9. As can be seen, movement rates varied considerably among industries, with high and low rates such as could be expected from the nature of the industries.

The consultants arrived at the reassuring conclusion that the movement of firms out of the City was "not alarming"; but when they broke the period 1943-54 down into three sub-periods they found that the 17 per cent average for all manufacturing over the 11-year period represented an acceleration,



Most of the increase in industrial land use in Southeastern Pennsylvania in recent years has occurred outside Philadelphia. During the years 1943-1954, 77 firms employing 12,846 people moved from the City to its four adjacent Pennsylvania counties.

TABLE 9—LOCATIONAL DECISIONS, SOUTHEASTERN PENNSYLVANIA, 1943—1954

	1948 EMPLOYMENT	MOVED WITHIN CITY		MOVED TO SUBURBS*		MOVES TO SUBURBS AS % OF TOTAL MOVES†
		FIRMS	EMPLOYEES	FIRMS	EMPLOYEES	
Food	32,405	82	2,946	3	66	2
Tobacco	7,856	17	916	—	—	—
Textiles	45,800	98	5,799	13	1,588	21
Apparel	51,517	370	18,965	5	1,217	6
Lumber and Furniture	8,167	89	1,332	2	67	5
Paper	10,935	50	2,031	6	943	32
Printing	27,450	193	3,191	5	1,289	29
Chemicals	16,531	54	2,318	2	1,170	34
Petroleum	10,156	2	142	—	—	—
Rubber	2,385	7	318	2	282	47
Leather	9,157	46	2,319	2	158	6
Stone, Clay, Glass	3,782	22	617	3	92	13
Primary Metals	7,487	12	368	4	283	43
Fabricated Metals	35,324	133	5,219	7	555	10
Non-Electrical Machinery	33,312	96	6,455	13	3,207	33
Electrical Machinery	30,072	42	6,339	3	1,243	16
Transportation Equipment	6,664	5	206	—	—	—
Precision Instruments	7,887	31	1,249	2	240	16
Miscellaneous	9,874	103	3,867	5	446	10
Total	356,761	1,452	64,597	77	12,846	17

* Bucks, Chester, Delaware, and Montgomery Counties.

† Employment in firms moving to suburbs as per cent of employment in all firms of that type which moved.

TABLE 10—LOCATIONAL CHARACTERISTICS OF INDUSTRIAL ZONES IN PHILADELPHIA

	I CENTER CITY	II INNER ZONE	III OUTER ZONE	IV WATERFRONT	V FAR NORTHEAST
DESCRIPTION OF ZONE	Center City is small and goods-handling industries occupy only a small part of total area. But average floor area ratio and employee density are high. Hence a large part of goods-handling employment is concentrated here.	The Inner Zone is larger than Center City and mostly devoted to goods handling. Floor area ratio and employee density are lower, but the two inner areas provide for about one-half the City's goods-handling workers.	The Outer Zone is vast and comprises a number of distinct districts. Floor area ratio varies widely with industry and district, averaging much lower than inner areas. Most remaining goods-handling workers are employed here.	The waterfront area is also vast, but employment density is low. Much land is used for railroad yards, terminals and docks; airport, power, water supply and sewage disposal facilities.	Density is extremely low with much vacant land held in reserve. "Industrial Park" applies to places where effort is made to achieve prestige and amenity by careful control of activities within the industrial area.
FACTORS DRAWING INDUSTRIES INTO THIS ZONE	High accessibility to Center City markets for unstandardized time-sensitive products; linkage to business services offered only in Center City; availability of varied, flexible, work-force; use of central post office and railway express facilities, to reach New York markets (apparel and printing trades).	Access to Center City markets and business services, post office, express, and rail less-than-carload facilities; location at center of regional market; availability of large, low-wage work-force via public transit.	Inter-industry linkages in metal working industries; availability of large, skilled work-force, assembled by auto and public transit; access to rail network for heavy metal supplies and truck routes to regional and national markets.	Access to water transportation and the railroad net for heavy, bulky and/or imported materials; availability of abundant process and cooling water in the river and wells; other factors relating to adjoining belts (at points) close to I, II, III, V.	Very quick access to inter-regional highways, freeways, airports for fast delivery of high value-per-pound freight; good access by auto to large, high-quality, residential areas, providing a highly skilled but "thin" work force; inter-industry linkages in rapidly growing industry complex.
FACTORS MAKING IT POSSIBLE FOR THEM TO EXIST IN THIS ZONE	Firms are small and can use unspecialized space in multi-story buildings; can tolerate congestion (small physical volume, high-value goods), and do not generate nuisances.	Firms can use unspecialized space in multi-story buildings; can tolerate nuisance and congestion; are tolerated if they generate moderate nuisances.	Medium and large firms can provide many business services internally. High productivity industries can pay high wages which enable workers to drive to work over great distances. Slow growing industries and firms can get along with existing plant, or split activities to use several sites.	Firms with extensive land requirements, but low productivity per square foot can find adequate sites; noxious processes are tolerated.	Medium and large firms can provide many business services internally. Low cost of large sites permits large firms, and firms anticipating rapid growth to acquire adequate sites and land reserve. Processes creating nuisances (e.g. vibration) must be isolated from residential areas.
VACANT LAND AND SPACE IN ZONE	Large supply of vacant floor space in varied condition and price promotes formation of small firms, provides flexibility for firms able to move easily, and favors setting up branch operation. Lack of vacant land forces firms growing beyond certain size to move outward.		Vacant textile mills offer supply of space when modernized; results same as in Areas I and II. Small supply generally forces growing firms and growing industries to seek land elsewhere.	Vacant land is available in large plots, but poor foundation and drainage conditions limit development.	Usable vacant land is available in large plots.

from 11 per cent in the first sub-period to 30 per cent in the last.

This striking increase in decisions to relocate underscores the urgency of the City's need to redevelop potential industrial areas within its limits, so that its industries, old and new, will have the room they require for expansion, access, parking and loading. Redevelopment will provide sites close to modern transportation facilities.

As a first step in preparing the Industrial Land Use Plan, a detailed study was made of the location of existing industries, of existing industrial areas, and of the probable location of prospective industries. As a framework for this, the City was divided into five zones as shown on Map 2. The locational characteristics of these areas, relevant to industry and influencing locational decisions, were then studied: the results are summarized in Table 10.

In addition, for each important industry group a loca-

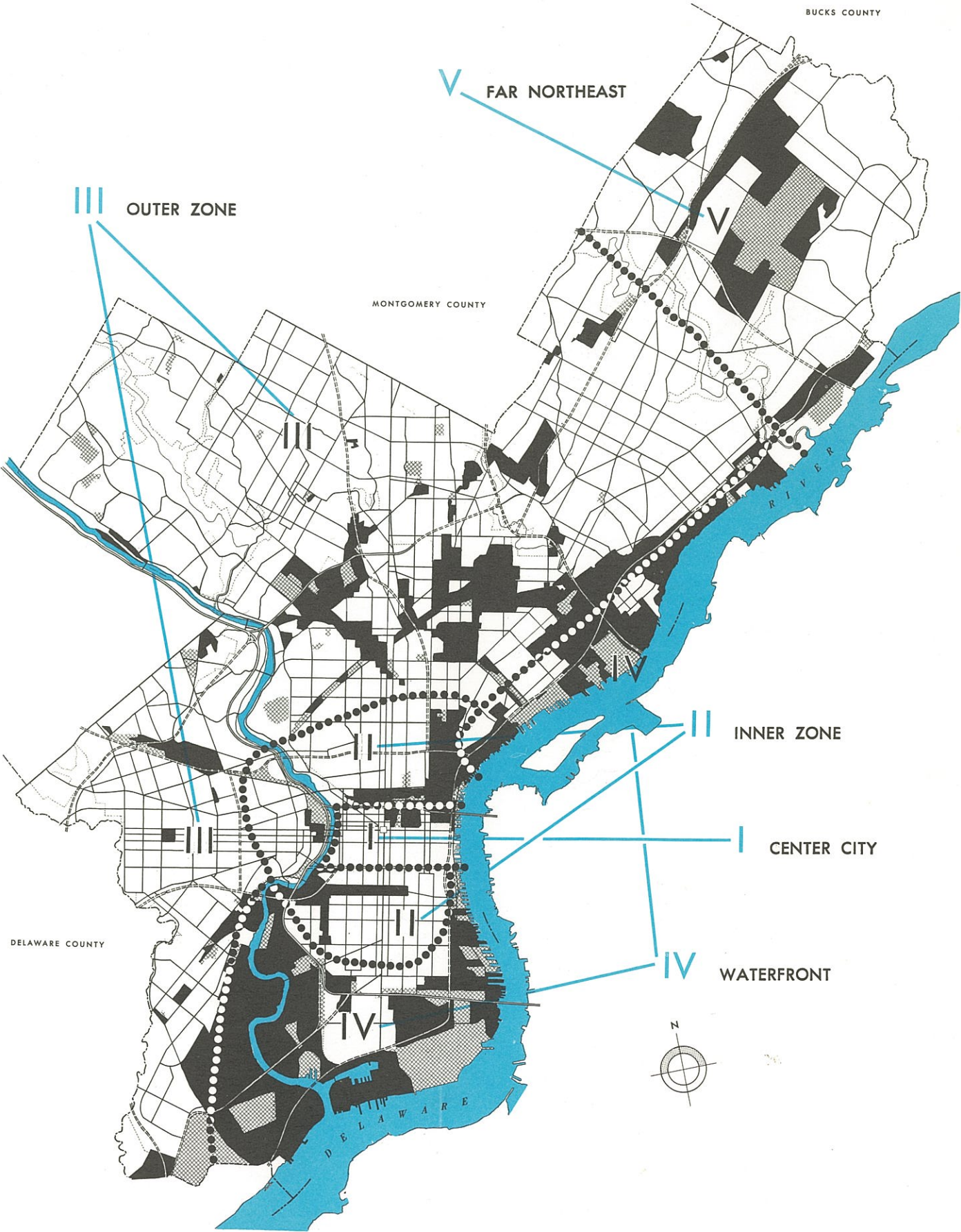
TABLE 11—FACTORS INFLUENCING INDUSTRIAL LOCATION

LOCATIONAL FACTORS	RELEVANT INFORMATION (ON EACH INDUSTRY)	SOURCE
Ability to pay for land.	Value added per worker. Value added per square foot of floor space. Floor area ratio of typical plant.	Marketers Research Service, Inc. Interviews*
Economic advantage of central locations (i.e., willingness to pay for central location).	Existing firm locations. Market linkages to Center City or other market (or supply) linkages. Labor force and transportation requirements.	Employment data.
Ability to do without business services.	Firm size distribution. Linkage to business services.	Employment data. Interviews.
Ability to utilize small plots of land.	Firm size and location. Plot size of typical plant. Employee parking requirements.	Employment data. Interviews.
Toleration of nuisances. Generation of nuisances and sensitivity to regulation of nuisances.	Zoning classifications (existing and proposed). Firm location within industrial district.	Industrial district studies. Zoning Advisory Commission reports. Employment data.
Special resource or facility requirements.	Rail siding, water transport, process and cooling water.	Railroad study. Interviews. Studies of waterfront land and port operations.
Desire to reserve land for future growth.	Growth rate. Speed of technical change.	Bureau of Census and employment data. Interviews.

* Interview materials were available from several studies: Industrial Land and Facilities, The Usefulness of Philadelphia's Industrial Plant Studies of Selected Industrial Groups for Factors Affecting Location Decisions with Reference to the Industrial Environments of Philadelphia.

MAP 2—INDUSTRIAL ZONES

For purposes of this analysis, the City has been divided into five industrial zones, each having the characteristics necessary to attract certain kinds of industries.



The Plan for Industry continued

TABLE 12—LOCATIONAL SUITABILITY OF INDUSTRY GROUPS

	I CENTER CITY	II INNER RING	III OUTER RING	IV WATERFRONT	V FAR NORTHEAST
MANUFACTURING INDUSTRIES					
Food	Confectionery; Small firms in several other groups (S)	Specialties in meat, dairy and canned foods; Bottling (S)	Baking; Brewing; Dairy; Prepared meats; Chewing gum; Bottling extracts and syrups (SML)	Sugar; Meat packing; Distilling; Chocolate processing; Coffee roasting; Grease and tallow; Grain mill products (ML)	Baking; Dairy products (L)
Tobacco	Cigars; Cigarettes (S)	Cigars (L)	—	—	—
Textiles	—	Knitted outerwear (S)	Broad woven fabrics; Ribbons; Knit goods; Yarn and thread; Lace goods; Finishing and dyeing; Carpets; Wool scouring (SM)	Jute and hemp products; Wool scouring; Textile waste products (M)	Carpets; Tire cord (L)
Apparel	Women's outerwear (SM)	Women's outerwear; Women's hats (SM)	Men's outerwear; Women's outerwear (ML)	—	—
Lumber and Furniture	—	Style and custom furniture for office, store and home (S)	Lumber; Metal furniture (M)	Lumber; Sash and door; Prefabricated houses (M)	Metal furniture (M)
Paper	—	Envelopes; Business forms; Bags; Paper maché; Die cut products (SM)	Boxes; Containers; Paper board; Paper coating and glazing (ML)	Paper board; Building paper (L)	Stationery; Corrugated boxes (M)
Printing	Commercial (job) printing; Plate making; Book binding; Printing services; Book publishing (SM)	Newspaper and magazine publishing; Labels; Blank books; Greeting cards (M)	Book publishing; Commercial (job) printing (L)	—	Greeting cards; Commercial printing (ML)
Chemicals	Fine "batch" chemicals; Cosmetics and perfumes (S)	Drugs (except biologicals) (ML)	Soap; Dyes; Plastic materials; Paints; Printing ink; Pesticides; Drugs (except biologicals) (SM)	Biologicals; Industrial organic and inorganic chemicals; Industrial gases; Paints; Fertilizers; Woodgum; Petrochemicals (SML)	Drugs (including biologicals) (SM)
Petroleum and Coal	—	—	Lubricating oils (S)	Oil refining; Coke; Asphalt products (ML)	—
Rubber	—	Plastics fabrication (S)	Rubber products (except tires); Plastics fabrication (SM)	Foam rubber (S)	—
Leather	Personal leather goods; Luggage (S)	Personal leather goods; Luggage; Footwear (SM)	Footwear; Industrial belting and packing; Luggage; Cut stock findings (SM)	Tanning and finishing (M)	—
Stone, Clay and Glass	Purchased glass products (S)	Purchased glass products (S)	Purchased glass products; Asbestos products; Packing (SM)	Concrete, gypsum and structural clay products; Abrasives; Refractories (SML)	Concrete products; Cut stone (S)
Primary Metals	—	—	Steel mill products; Cast, rolled, forged, drawn, and extruded iron and steel products; Aluminum and copper-alloy castings (SML)	Blast furnace and steel mill products; Non-ferrous metal smelting and scrap recovery (M)	—
Fabricated Metals	—	Metal stampings; Coating and plating; Architectural work; Sheet metal work; Wire products; Metal foil (SM)	Cutlery, hand tools and hardware; Metal cans; Structural steel products; Metal stampings; Screw machine products; Valves and pipe fittings (SML)	Hand tools and hardware; Heating apparatus and plumbing fixtures; Metal barrels (M)	Cutlery, hand tools and hardware; Metal barrels; Screw machine products; Metal stamping (SML)
Non-Electrical Machinery	Miscellaneous small parts components and finished products; Printing trades machinery and equipment; Job machine shops (S)	Metal working and printing trades machinery and equipment; Job machine shops (S)	Metal working, food industry, textile industry, paper industry, general industrial, computing and service industry machinery and equipment; Job machine shops (SML)	General industrial machinery and equipment; Job machine shops (ML)	Heating and ventilating equipment; Internal combustion engines; Machine tools, special dies, jigs and fixtures; General industrial machinery and equipment (SML)
Electrical Machinery	Small electrical and electronic components; Electrical measuring instruments; Lighting fixtures (S)	Lighting fixtures; Electronic components; Industrial controls (SL)	Transmission equipment (including electrical measuring and testing, switchgear); Electrical industrial apparatus; Lighting fixtures; Radio and TV receiving and broadcasting sets; Electronic components; Batteries (SML)	—	Carbon and graphite products; Transmission equipment; Household appliances; Electronic components; Data processing equipment (SML)
Transportation Equipment	—	—	Truck and bus bodies; Trailers; Motor vehicle parts; Aircraft engine parts; Aircraft parts (SML)	Shipbuilding and repair; Boat building (SM)	Railroad equipment; Auto assembly (L)
Precision Goods	Scientific instruments; Medical, dental, surgical, orthopedic and prosthetic instruments, apparatus and appliances, etc. (S)	Medical, dental, surgical, orthopedic and prosthetic instruments, apparatus and appliances, etc. (SM)	Scientific instruments; Mechanical measuring instruments (ML)	—	Mechanical measuring instruments (M)
Miscellaneous	Jewelry; Costume jewelry; Signs; Few firms in all other groups (S)	Firms in many groups (SM)	Few firms in many groups (SM)	—	—
NON-MANUFACTURING INDUSTRIES					
Wholesaling	Drugs and chemicals; Dry goods and apparel; Groceries; Confectionery; Electrical goods; Professional goods; Tobacco; Alcoholic beverages	Drugs and chemicals; Groceries; Electrical goods; Hardware, plumbing and heating equipment and supplies; Machinery (commercial, industrial, professional); Alcoholic beverages (including bottling); Paper	Motor vehicles and equipment; Groceries; Iron and steel; Lumber and construction materials; Scrap and waste recovery; Machinery (industrial)	Petroleum; Metals and minerals; Farm products; Scrap and waste; Lumber and construction materials	Electrical goods; Lumber and construction materials; Iron and steel; Motor vehicles; Low pressure gas
Public Warehousing	Special products warehousing	Household goods storage (general, special and bonded)	Household goods storage (general, special and bonded)	Farm products; Bonded foreign trade goods; General	Food lockers
Transportation (except railroad)	Local trucking	Freight forwarders; Packing and crating; Auto for hire; Truck transportation	Joint truck terminals; Freight forwarders; Packing and crating; Truck, Taxicab and bus transportation	Stock yards; Sea transportation; Lighterage and towing services; Truck transportation	Truck transportation; Airport terminal services; Air freight transportation
Construction	Miscellaneous small building construction; Contractors in specialized materials and equipment	General contractors; Trades contractors (plumbing, painting, electrical, roofing, masonry, carpentering, glass, sheet metal)	General contractors; Trades contractors (all types)	Heavy construction (including highways, bridges, utilities and marine terminals)	General contractors; Special trades contractors
Business and Consumer Services and Retail Trade Branches of an "Industrial" Character	Medical and dental laboratories; Research and testing laboratories; Blueprinting services; Warehouses and delivery services of retail stores, restaurant chains and vending machine operators; Package delivery services	Research and testing laboratories; Laundry and dry cleaning; Auto repair and parts overhaul; Warehouses and delivery services of retail stores, etc.; Film processing	Research and testing laboratories; Laundry and dry cleaning; Coal and oil dealers; Auto repair and parts overhaul; Auto parts salvage and junk yards	Auto parts salvage and junk yards; Tire recapping	Research and testing laboratories

S = Small (1-99 employees); M = Medium (100-499 employees); L = Large (500 or more employees)

TABLE 13—PROJECTED DISTRIBUTION OF MANUFACTURING FIRMS BY SIZE CLASSIFICATION AND RESULTING EMPLOYMENT DISTRIBUTED BY ZONE: 1980

ZONES	NUMBER OF FIRMS BY SIZE CLASS—1980			1954 EMPLOYMENT	1980 EMPLOYMENT
	1-99 EMPLOYEES	100-499 EMPLOYEES	OVER 500 EMPLOYEES		
Center City (I)	1,003	91	2	54,055	40,413
Inner Zone (II)	1,702	113	15	65,195	79,617
Outer Zone (III)	1,610	217	52	151,252	172,039
Waterfront (IV)	815	98	15	47,774	65,390
Far Northeast (V)	190	56	6	9,295	26,541
City Total	5,320	575	90	327,571	384,000

TABLE 14—PROJECTED EMPLOYMENT IN GOODS-HANDLING INDUSTRIES, BY INDUSTRY BY ZONE

INDUSTRIAL ZONE	I CENTER CITY	II INNER ZONE	III OUTER ZONE	IV WATER- FRONT	V FAR NORTHEAST	CITY TOTAL
Food	2,570	5,960	14,170	13,500	3,600	39,800
Tobacco	348	2,552	—	—	—	2,900
Textiles	—	3,012	8,908	3,468	412	15,800
Apparel	20,075	17,250	12,375	—	—	49,700
Lumber and Furniture	—	1,750	3,750	2,350	450	8,300
Paper	—	2,640	8,300	2,850	510	14,300
Printing	8,080	15,720	12,310	—	290	36,400
Chemicals	2,560	6,533	4,527	10,890	1,990	26,500
Petroleum and Coal	—	—	640	10,360	—	11,000
Rubber	—	170	920	2,120	290	3,500
Leather	220	1,790	1,690	2,300	—	6,000
Stone, Clay and Glass	720	800	1,880	1,400	1,200	6,000
Primary Metals	—	—	4,840	1,960	—	6,800
Fabricated Metals	—	5,150	28,386	7,922	4,342	45,800
Non-Electrical Machinery	1,000	2,500	26,023	4,570	7,507	41,600
Electrical Machinery	1,640	8,700	27,000	—	2,160	39,500
Transportation Equipment	—	—	2,870	1,700	3,230	7,800
Precision Instruments	400	1,440	8,400	—	560	10,800
Miscellaneous Manufactures	2,800	3,650	5,050	—	—	11,500
Total Manufacturing	40,413	79,617	172,039	65,390	26,541	384,000
Construction	13,775	4,671	18,576	3,454	9,872	50,348
Motor Freight and Warehousing	20,808	18,369	17,577	6,167	38	62,959
Wholesale Trade	16,680	6,835	14,042	3,865	3,489	44,911
All Other Goods-Handling	23,170	780	3,555	454	6,767	34,726
Total Non-Manufacturing	74,433	30,655	53,750	13,940	20,166	192,944
Total, All Goods-Handling	114,846	110,272	225,789	79,330	46,707	576,944

tional profile was developed; Table 11 describes the factors considered.

Finally, Table 12 gives the result of matching industries with the zones best suited to their requirements. Industry groups used were the 3 digit Standard Industrial Classification Code groups.

Location of Employment

In order to determine how much land will be needed by industry in the future, it is necessary to estimate the volume of future employment in the various types of industry, and to translate the results into demand for land. The procedure used is given in the following outline:

1. Metropolitan and City projections, summarized in the chapter on Economy, were provided for all manufacturing, construction, motor freight and warehousing, wholesale trade, and other goods-handling industries.
2. Projections for individual manufacturing industries in the City were prepared independently, and adjusted to total manufacturing employment figures.
3. Projected employees in each manufacturing industry were distributed to industrial areas by means of a study of firm size in the industry. The procedure employed was as follows:
 - a. Firm size distributions were obtained for several years dating back to 1940. From these, average employment in each class for each industry was computed. It was found that the number of firms in the smallest class (1-99 employees) was large enough to support useful statistical generalizations. In some industries, the number of firms in this class increased with total industry employment; in others, the number decreased as total employment increased.
 - b. Thus, the number of such firms in the future could be estimated from projected employment in the industry. Multiplied by average employment per firm, this figure gave an employment which was assigned to zones according to the profile above. An additional model for all manufacturing industries by industrial district developed a control total for the number of small firms in each such area.
 - c. Estimates of the future distribution of medium and large firms were reviewed individually. Some changes in the location of firms with 100 to 499 employees are anticipated. Firms with over 500 employees are expected mainly to remain in existing locations; a few new establishments are expected to develop in the Far Northeast and Waterfront areas.

Final distribution of firms by size class and by zones is given in Table 13.

4. Employment in the non-manufacturing goods-handling industries was distributed by a procedure which related the competition for space between the goods-handling and non-goods-handling groups, and the degree to which they complemented each other economically. This model was developed for the Planning Commission by Marketers Research Service, Inc., and is described in a separate report.
5. The assignments developed in Paragraphs 1 to 4 above were checked against another model of the total goods-handling economy which related employment density (workers per acre) to per cent of land in residence, distance from the metropolitan center, and income of both residents and workers, in an area-by-area analysis. This approach emphasizes the competition of various users for land: in effect, the supply side of the land-use picture, as contrasted to the previous approach, which gives great weight to the demand side. The results of each approach were closely parallel. The final employment projections by industry and by Industrial Zones are given in Table 14.

Space Standards

The problem of finding suitable locations for goods-handling industries is complicated by the fact that they vary widely in the way they use space. There are several means of expressing this use of space. For the purpose of this analysis the two used were floor space per worker and the ratio of the total floor area of a building to its site area (hereafter referred to as "floor area ratio"). There is a strong tendency for firms with similar floor area ratios to group together in the City.

Calculation of land requirements, therefore, requires an assumption of floor area ratio for each industrial zone, and of the floor space per worker in each industry. If the latter varies by industrial area, this also must be accounted for. The values used in the Plan appear in Table 15. In summary, their justification follows:

1. Floor area ratio tends to be nearly uniform for industrial buildings within zones. Average figures given in the table for present ratios are derived from *The Usefulness of Philadelphia's Industrial Plant: An Approach to Industrial Renewal*. Variation is largest in Center City and in the Far Northeast. In the former, variation is due to different heights in loft buildings covering nearly 100 per cent of their sites. This makes no difference to the industrial tenant who pays for floor

TABLE 15—SPACE STANDARDS USED TO DETERMINE ACREAGE REQUIREMENTS, BY INDUSTRY BY ZONE

	I CENTER CITY		II INNER ZONE		III OUTER ZONE		IV WATERFRONT		V FAR NORTHEAST	
	FLOOR AREA RATIO									
Present (1959)	4.50		2.50		1.00		0.85		0.30	
Future (1980)	3.00		1.50		0.60		0.50		0.30	
	SPACE STANDARDS									
	FLOOR SPACE PER WORKER (SQ. FEET)	WORKERS PER ACRE	FLOOR SPACE PER WORKER (SQ. FEET)	WORKERS PER ACRE	FLOOR SPACE PER WORKER (SQ. FEET)	WORKERS PER ACRE	FLOOR SPACE PER WORKER (SQ. FEET)	WORKERS PER ACRE	FLOOR SPACE PER WORKER (SQ. FEET)	WORKERS PER ACRE
MANUFACTURING										
Food	600	218	600	109	700	37	1000	22	1200	11
Tobacco	250	523	250	261	250	105	—	—	—	—
Textiles	—	—	500	131	500	52	500	44	500	26
Apparel	125	1045	175	373	225	116	—	—	—	—
Lumber and Furniture	—	—	700	93	700	37	700	31	700	19
Paper	—	—	500	131	500	52	500	44	500	26
Printing	350	373	400	163	400	65	—	—	400	33
Chemicals	600	218	600	109	600	44	600	36	600	22
Petroleum and Coal	—	—	—	—	—	10	—	5	—	5
Rubber	—	—	350	187	350	75	350	62	350	37
Leather	375	348	375	174	375	70	375	58	—	—
Stone, Clay, and Glass	600	218	600	109	600	44	600	36	600	22
Primary Metals	—	—	—	—	1200	22	1200	18	1200	11
Fabricated Metals	—	—	400	163	600	44	600	36	650	20
Non-Electrical Machinery	450	290	450	145	450	58	450	48	450	29
Electrical Machinery	220	594	220	297	300	87	—	—	350	37
Transportation Equipment	—	—	—	—	400	65	400	54	400	33
Precision Instruments	250	523	350	187	500	52	—	—	600	22
Miscellaneous	400	327	400	163	400	65	—	—	400	33
NON-MANUFACTURING										
Construction	—	209	—	72	—	82	—	86	—	90
Motor Freight and Warehousing	—	70	—	46	—	48	—	50	—	19
Wholesale Trade	—	61	—	51	—	48	—	52	—	41

space with certain facilities. The future ratio assigned, which represents the same building type on a larger plot of ground allowing for adequate truck access and parking spaces, similarly is of little interest to the tenant who is still concerned with the rent per square foot of space. Computation on an average, therefore, sacrifices nothing useful even though buildings of differing floor area ratios are lumped together.

In the Far Northeast, the floor area ratios of individual plants are complicated by the presence of large areas of reserve land, listed as part of the plant site in land-use surveys, but actually not used by industry at all. The present floor area ratio was estimated from a study of a number of plant sites on aerial photographs in which active-use areas on the property were separated from idle land. The future floor area ratio assigned is the same, as these plants represent the most recent development trends.

2. Floor space per worker tends to be uniform for an industry group (3 digit classification) in a generally similar location. But different industry groups have different floor space per worker norms. This is in contrast to the similar floor area ratio norms by industry zone, regardless of industry type, set forth in (1) above.

Under these assumptions, the second column under each Industrial Zone heading (Table 15) was calculated.

These figures for workers per acre were then applied to the employment estimates in Table 14 to yield the land requirements in Table 16.

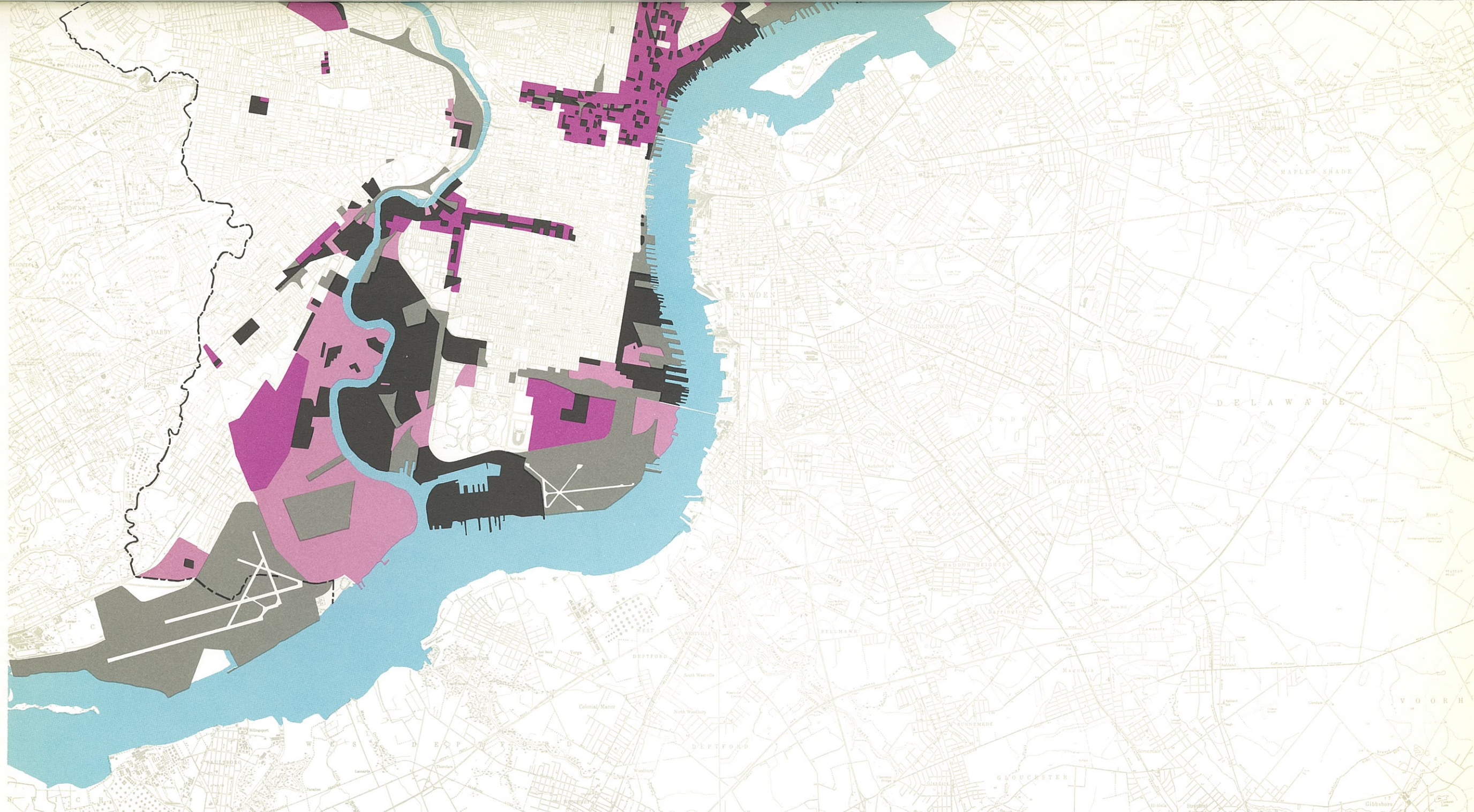
"Floor area ratio" and "floor space per worker" mean little in industries operating in the open, such as oil refineries, shipyards or junk yards, or in those where the building is simply a shell around enormous pieces of machinery, as in steel mills, breweries and power-generating stations. For such industries, the number of workers per acre is quite low, and was estimated directly; again, variations by industrial area were accounted for.

Land required for transportation and utilities, and for Federal establishments of an industrial nature, is with certain specific exceptions (such as the planned expansion of the North Philadelphia Airport) assumed to be the same as land presently in these uses. Land requirements for these facilities have been included in Table 16, but are not related to specific employment projections.

Land Supply and Demand

Table 16 summarizes the land required to provide work-space in each of the goods-handling industry groups, Table 17





PHILADELPHIA CITY PLANNING COMMISSION—MARCH 1960

THE PLAN FOR INDUSTRY

0 5,000 10,000 15,000 20,000 FEET

- INDUSTRY
- EXISTING
- RENEWAL
- VACANT
- TRANSPORTATION & UTILITIES

gives the sources of land supply for industrial purposes in the Plan. All areas are expressed in net acres: that is, usable land after providing for streets and rail lines. Gross areas can be calculated from these.

Comparison of the land supply and demand figures, zone by zone, will reveal that they do not match. In Center City (I), there is an indicated shortage of 620 acres. In the next zone outward (II), a shortage of 407 acres appears, and in the Outer Zone (III) there is a shortage of 807 acres. The Waterfront (IV) has an excess of 1,540 acres and The Far Northeast (V), an excess of 949 acres.

It is evident that if land demands in the central areas are to be satisfied, their location must be shifted outward or their degree of development made more efficient. Both things are likely to take place, but the Plan proposes that Inner Zone and Outer Zone industries expand into the Waterfront areas. (It should be noted that the waterfront includes the lower Schuylkill as well as the Delaware.) The future freeway system will make this area more centrally located in relation to the entire metropolis. Thus it becomes a good substitute for the land sought, but not available, in the innermost sections of the City.

Land unused in 1980, after these adjustments, will be about 650 acres. This will not be an excessive reserve for possible requirements after 1980.

The Plan for Industry

The Industrial Land Use Plan indicates the quantity of land required to provide space for goods-handling functions in the City's 1980 economy and locates this land on the map. (See Map 3.)

About one-quarter of the land area of the City is designated for industrial use, in comparison to the present 18 per cent—a growth of 46 per cent. This substantial growth is due, in part, to the expected increase in the industrial work force, but most of it is used to make up for the continuing reduction in the density (or intensity) of land use.

To provide this large area, great tracts of presently vacant land in the Far Northeast and Eastwick have been allotted to the future use of industry. The Plan locates these new industrial areas in large blocks placed so that access from arterials and expressways does not pass through adjoining residential areas. The size of each district offers a large variety of jobs, but none of the districts will overload the traffic system sustaining them. The largest district proposed, that around the North Philadelphia Airport, which will provide for 10,000 workers, has 11 arterial streets and two expressways offering entrance to motor traffic.

The Plan proposes to clear 1,234 acres of land now used for residential and commercial purposes within industrial areas and to make them available for industrial development. Obso-

TABLE 16—DEMAND FOR INDUSTRIAL LAND—1980 (NET ACRES)

	I CENTER CITY	II INNER ZONE	III OUTER ZONE	IV WATERFRONT	V FAR NORTHEAST	CITY TOTAL
Manufacturing	86	455	3,265	3,777	1,206	8,789
Construction	66	65	227	39	110	507
Motor Freight and Warehousing	297	402	363	123	2	1,187
Wholesale Trade	272	135	293	75	85	860
Transportation and Utilities*	7	465	1,266	2,383	1,161	5,282
Federal Establishments†	—	—	252	609	—	861
All Other Goods-Handling‡	16	1	9	16	10	52
Total	744	1,523	5,675	7,022	2,574	17,538

* Includes railroad yards and stations, and railroad-owned piers; airports; P.T.C. facilities; reservoirs; water and sewage treatment plants; electric and gas stations, plants, etc.

† The Navy Yard (not including Mustin Airfield), Frankford Arsenal, and the Naval Aviation Supply Depot.

‡ Includes miscellaneous transportation and repair services; other government establishments; agriculture and mining.

TABLE 17—STATISTICAL SUMMARY: INDUSTRIAL LAND USE PLAN (NET ACRES)

	I CENTER CITY	II INNER ZONE	III OUTER ZONE	IV WATERFRONT	V FAR NORTHEAST	CITY TOTAL
Existing Land Use, 1959	170	995	4,448	5,693	1,302	12,608
Manufacturing, Construction, Motor Freight and Warehousing, Wholesale Trade, Federal Establishments and All Other Goods-Handling	99	530	3,101	3,482	447	7,659
Transportation and Utilities	71	465	1,347	2,211	855	4,949
Removals from Existing Use	-127	-177	-951	-37	-115	-1,407
Additions to Existing Use						
Development of Vacant Land	—	+49	+813	+2,560	+2,336	+5,758
Redevelopment from Other Uses	+81	+749	+558	+346	—	+1,234
Net Change 1959-1980	-46	+121	+420	+2,869	+2,221	+5,585
Future Land Use, 1980	124	1,116	4,868	8,562	3,525	18,193
Manufacturing, Construction, Motor Freight and Warehousing, Wholesale Trade, Federal Establishments and All Other Goods-Handling	117	651	3,602	6,179	2,362	12,911
Transportation and Utilities	7	465	1,266	2,383	1,163	5,282

The Plan for Industry continued

lete or deteriorated industrial structures would be rehabilitated or cleared as necessary. Most of this is in locations close to the Center where a substantial imbalance between the demand and supply of land is projected. The first land offered industry will be in highly strategic locations close to the Midtown Loop of the expressway system. The American Street Redevelopment Area is typical. It has the service of rapid transit as well as a network of surface lines to sustain its relatively high density of use. Since the land will be available in large plots on an improved street system in a generally modernized neighborhood, the density costs now prevalent in these areas will be reduced.

In addition to the large scale clearance to create new or

expanded industrial districts in central areas, the Plan proposes the application of urban renewal on a spot basis to provide improved access, room for parking, or for expansion of existing industries that are being strangled by their surroundings. Industrial districts have been rounded out in areas of recent development and healthy older areas. The new land provided here is obtained partly from vacant acreage and partly through shifts from other uses. Of the latter, certain parcels can be obtained without public intervention, but most of them must go through the redevelopment process if the benefits of clear separation and adequate buffers between industry and other uses are to be obtained. In the Outer Zone, additional industrial land is concentrated around Aramingo and Erie Avenues, at the railroad

yards and on City Line Avenue in West Philadelphia. Aramingo contains the junction of two expressways while the two districts in West Philadelphia similarly are located close to proposed expressway junctions. Only the important Erie Avenue district is subject to some doubt as to the adequacy of its traffic service, an indication that careful study should be given this problem in order to conserve and improve the area.

Table 18 indicates the variety of conditions and treatments possible in the urban renewal program. Treatment areas are shown on Map 4. Each is an essential part of a total plan to keep Philadelphia's Industrial Base vigorous.

TABLE 18—URBAN RENEWAL IN INDUSTRIAL AREAS

	EXISTING CONDITIONS	DEGREE OF CLEARANCE	DISPOSAL OF CLEARED LAND	OTHER IMPROVEMENTS
Limited Reconstruction	Defective street, block and lot layout; mixture of residential or commercial uses with industry; many structures obsolete or deteriorated.	Partial to nearly complete clearance; useful industrial structures to remain.	Addition of land for parking, loading, and expansion for existing industries; sale of cleared land for new industrial development.	New or widened streets and alleys; abandoned excess streets and alleys; elimination of grade crossings and rail lines in streets; rehabilitation of obsolete industrial structures.
Rehabilitation	Congestion of streets, and shortage of parking within industrial area otherwise sound.	Clearance to eliminate pockets of blighted residence and deteriorated industrial structures.	Parking or other uses not adding to congestion.	Widened streets and alleys.
Reconstruction	Deteriorated residential area, small blocks and narrow streets.	Complete clearance.	Sale of new large lots for industrial development.	New streets, utilities and subdivision plat.
Site Improvement	"Dead" subdivision, marsh or tidal land, land affected by obnoxious industries.	Clearance of few residential or commercial uses, or obnoxious industries.	Sale or lease of new large sites for industrial development.	Clear titles, filling of low-lying ground, new streets and utilities.

MAP 4—INDUSTRIAL RENEWAL AREAS

A wide variety of actions, ranging from the modernization of industrial structures to complete clearance and subsequent reconstruction of blighted areas, will be necessary to provide the industrial sites called for by the Plan—and to provide sites of such quality that they will attract industry in competition with sites in other metropolitan regions and with sites in Philadelphia's suburbs.

- LIMITED RECONSTRUCTION
- ▨ REHABILITATION
- RECONSTRUCTION
- SITE IMPROVEMENT
- EXISTING INDUSTRY
- ▨ TRANSPORTATION AND UTILITIES

0 5,000 10,000 15,000 20,000 FEET



THE PLAN FOR COMMERCE

The need for maintaining a strongly dominant commercial center...The Plan for strategically grouped subordinate centers...A basic hierarchy of structure, depending on frequency of use and size of economic units...Besides a dominant Center, Plan calls for 5 regional shopping centers, 21 intermediate centers, 169 local centers, 91 free-standing commercial areas.

Technological changes in the methods of goods and food processing, distribution and merchandising, have revolutionized retail business. This requires basic changes in the distribution of retail activities throughout the City.

To aid it in developing a plan which reflects these changes, the Planning Commission enlisted the advice of Larry Smith and Company, widely known consultant to private commercial enterprises. This Company suggested a definite hierarchy of five levels of commercial centers which became a basic element in the Plan.

In order to determine the size and distribution of the centers necessary to serve the 1980 population, the Planning Commission made a study of the probable personal income in the City in 1980, based on the projections by Marketers Research Service of the Gross National Product for that year, applied to the projected City population. From this the probable distribution of the retail dollar among the five groups of commercial centers was calculated, providing the basic information needed for the Plan. The Plan as developed may be summarized as follows:

Central to the Plan is the proposal for an expanded and partially redesigned Center City with emphasis on new office, institutional, and residential development.

Five regional shopping centers are proposed. Their central components are department stores.

The Plan proposes 21 intermediate shopping centers. Their central components are junior department stores.

The Plan proposes 169 local shopping centers whose central components are supermarkets but which also include other retail and consumer activities of a local nature.

The Plan proposes a number of very small convenience centers located in the higher density sections of the City.

For those activities that are not properly located in commercial centers, 91 free-standing commercial areas are proposed.

A radical reduction of the amount of existing string commercial development and scattered shops is proposed.

The Plan provides a basis for private investment, for zoning, and for the redevelopment of the older parts of the City. It helps to indicate where public money can most effectively be used to aid and bolster existing centers through the provision of better access, parking, and other improvements. This is important in combatting suburban competition, in maintaining the City's economy, and in assuring adequate service for every Philadelphia citizen.

CENTER CITY: Because Center City is the subject of a complete and separate report, it will be treated here only in terms of the major effects to be considered in the plan for the rest of the City.

A major premise of the Comprehensive Plan and of the Center City Development Plan is that a vital center will continue to exist. Its major function as the decision making center of the metropolis will continue to develop. The recent trend toward the greater importance of office activities will continue. The transportation system plan provides for the improvement of access to Center City. Thus, the deflection of new office activity outside Center City is expected to be limited in volume.

The retail function will continue to be strong. Although only a very modest increase is proposed in retail space downtown, it is expected that the recent trend towards decline in sales will reverse itself in the near future. Center City retailing will be built around three main types: department stores; specialty stores, convenience stores and services for Center City workers.

Cultural and institutional activities are expected to increase in importance in Center City. Space for public administration activities will increase.

The business areas of Center City, as distinguished from the residential areas, will utilize more land. Residential areas on the other hand will continue to be improved and will displace some business activities.

Center City is now, and will continue to be, the most important section of the City economically, in every sense of that term. It is against this background that the planning for commercial areas elsewhere in the City is conceived and proposed.

Statistics and Methodology

The analysis for the Commercial Land Use Plan is divided into three parts: the projection of 1980 retail sales for the Philadelphia Standard Metropolitan Area, estimates of the 1980 distribution of sales by kind of shopping area, and the 1980 estimates of the commercial land use requirements and distribution.

In Part I, the relationship of the per capita Gross National Product to the per capita retail sales in Philadelphia from 1929

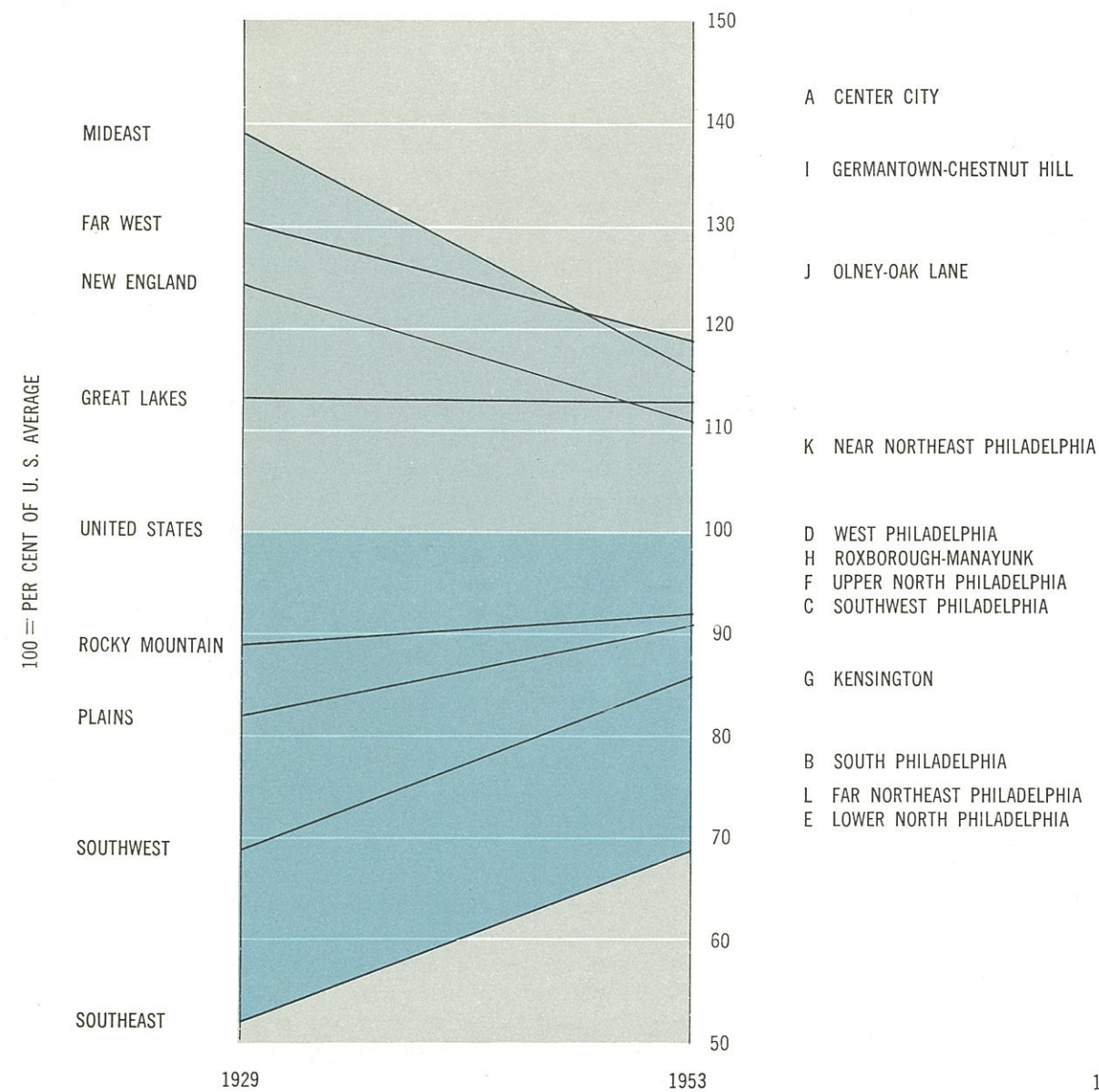


FIGURE 16—PER CAPITA PERSONAL INCOME AS PERCENT OF NATIONAL AVERAGE BY REGIONS.

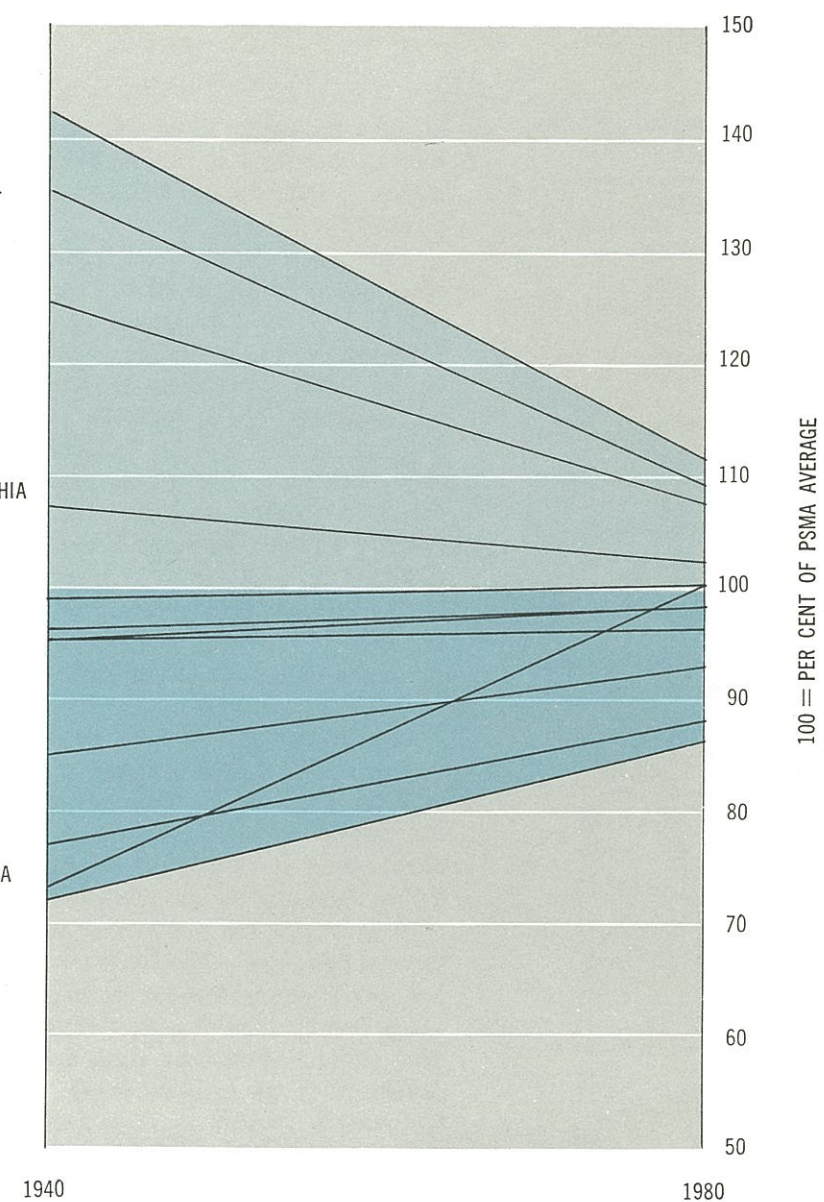
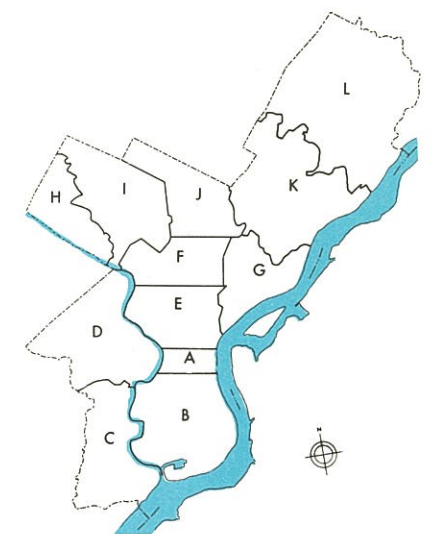


FIGURE 17—1980 ESTIMATE OF PER CAPITA INCOME AS A PERCENT OF PHILADELPHIA STANDARD METROPOLITAN AREA FOR (12) AREAS.



THE TWELVE PLANNING ANALYSIS SECTIONS OF PHILADELPHIA.

The Plan for Commerce continued

TABLE 19—RELATION OF 1948 INCOME BEFORE TAXES TO RETAIL CONSUMER EXPENDITURES FOR FAMILIES AND UNRELATED INDIVIDUALS

EXAMPLE FOR ONE OF 14 INCOME CLASSES (\$5,000—\$5,999)	
Estimated Gross Income	\$5,500
Federal Tax	—420
Estimated Net Income	\$5,080
Estimated Retail Consumer Expenditures	\$3,486
Other Estimated Consumer Expenditures	1,446
Total Estimated Consumer Expenditures	\$4,932

TABLE 20—PER CAPITA RETAIL CONSUMER EXPENDITURES: TOTAL, CENTRAL BUSINESS DISTRICT AND REGIONAL SHOPPING CENTERS BY PLANNING ANALYSIS SECTION: 1948 AND 1980

RESIDENCE OF SHOPPER BY SECTION	1948 PER CAPITA EXPENDITURES			1980 PER CAPITA EXPENDITURES		
	TOTAL	IN CBD AND REGIONAL CENTERS	% OF TOTAL	TOTAL	IN CBD AND REGIONAL CENTERS	% OF TOTAL
A	\$1,515	\$736	48	\$2,224	\$751	34
B	877	72	8	1,763	264	15
C	1,000	280	28	1,921	442	23
D	1,088	275	25	2,000	520	26
E	870	114	13	1,724	224	13
F	1,065	124	13	1,961	490	25
G	955	92	10	1,868	374	20
H	1,000	234	23	1,961	490	25
I	1,320	620	47	2,184	721	33
J	1,280	473	37	2,145	665	31
K	1,140	344	30	2,054	554	27
L	780	353	45	2,000	520	26

to 1954 was established and projected to 1980. Total retail sales were established from this and the projected population. In Part II, the per capita retail sales established in Part I were divided into the five kinds of shopping areas proposed by Larry Smith and Company (local, intermediate, regional, central business district, and free-standing commercial areas). Services were also added. In Part III, the sales projected in Part II were translated into floor space and land area requirements and located on particular blocks according to several guiding principles.

Part I. Projection of 1980 Retail Sales for Philadelphia. The trend of the ratio of per capita retail sales of the Philadelphia Standard Metropolitan Area to per capita Gross National Product between 1929 and 1954 was 52 per cent plus or minus 2 per cent. The ratio of 52 per cent was projected to 1980. The 1980 per capita Gross National Product of \$3,847 projected by Marketers Research Service, Inc. was then translated

into the per capita retail sales for the Philadelphia Standard Metropolitan Area of \$2,000. The total retail sales for the 1980 regional population of 6,000,000 are estimated to be 12 billion dollars.

The second phase of Part I was to distribute the per capita retail sales established above. To determine what the income of a section would be, trends were established. From 1929 to 1954 the per capita income levels of the eight regions of the United States have tended to converge. This same tendency is evident from 1940 to 1950 for the 12 planning analysis sections of the City and the 7 suburban counties. The 1980 per capita income for the 12 sections and 7 counties was established by extrapolating the trend toward convergence. Per capita retail sales are expected to increase from \$1,180 in 1954 to \$2,000 in 1980. In 1939 they were \$756 in 1958 dollars. Figure 17 indicates the estimated tendencies toward equalization in the 12 sections between 1949 and 1980. Figure 16 also shows the national trend toward equalization in the 8 regions in the United States 1929-1954.

Part II. Estimates of 1980 Distribution of Sales by Kind of Center. Part II is divided into four phases. The first is to determine the 1948 distribution of retail sales in the central business district and in regional shopping centers in the City's 12 sections and the surrounding 7 counties. The second is to develop the standards for the proposed 1980 shopping areas. The third is to determine the relationship of retail sales floor space to services floor space. The last is to make an estimate of the sales and services by type and location of shopping area.

Various kinds of statistical analysis were used to determine what sections spent how much money in the central business district. First, the 1948 retail sales were aggregated by 12 sections and 7 counties and adjusted for minor corrections such as the inclusion of mail order sales and the uneven geographic distribution of auto sales. Secondly, the 1948 retail consumption for 12 sections and 7 counties was constructed to match with the retail sales determined above. The first step in this process was to determine the retail consumer expenditures from the total 1949 income given by 14 income classes in the 1950 Census of Population. (See Table 19.)

Average per capita retail consumer expenditure by section was expanded to total retail consumer expenditures by multiplying it by the population in each of the 12 sections and 7 counties. By subtracting the retail sales from the retail consumer expenditures in each of the 12 sections and 7 counties, the expenditures going to the central business district were determined. Lastly, the pattern between income and expenditures downtown was determined for 1948 and estimated for 1980. (See Table 20.)

The second phase of Part II was to develop standards for the proposed 1980 shopping centers. These were derived from the report of Larry Smith and Company to the Philadelphia

City Planning Commission,⁶ and are summarized in Figure 18.

The relationship between retail floor space and service floor space was determined from several studies. A survey of forty different enumeration districts in the City showed average services floor space to be 20 per cent of retail floor space. Study of the various sizes and ages of shopping areas across the country demonstrated that usually the older the center the larger the amount of service floor space. Service floor space varied from 5 to 40 per cent of the retail floor space. The present experience of Philadelphia was applied to 1980.

The distribution of sales and services by type and location of centers was the fourth phase of Part II. Sales were divided into central business district, regional, intermediate, local and free standing commercial areas. Sales for the first three were determined by drawing trade areas around the proposed centers and combining the estimated future population with the per capita sales for the level of center. Local sales and sales for free standing commercial areas were estimated on a section basis.

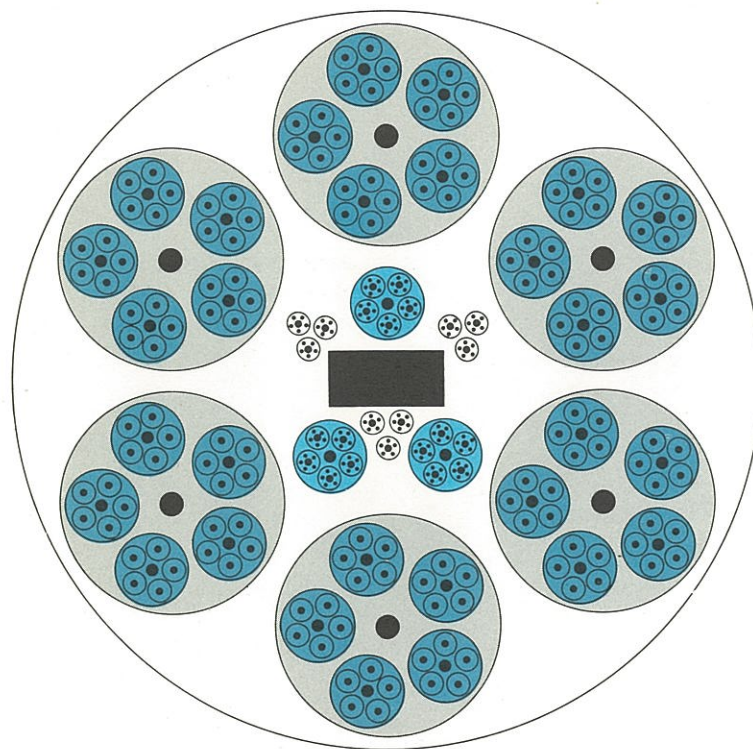
The share of the total per capita retail consumption estimates taken by the central business district and regional shopping centers as a whole was estimated from the analysis of Part II-1. The remaining per capita retail consumption estimate was divided between intermediate, local and free standing commercial areas on the basis of the Larry Smith report.

Within the regional trade area of Center City, roughly the five mile ring, all of the central business district and regional retail consumption expenditures were assigned to Center City (except for a small area around the Oregon Avenue Shopping Center). At the five to ten mile ring, where the regional centers in the city area are located, approximately two-thirds of the expenditures were assigned to the regional center and one-third to Center City. In the suburbs the amount assigned to Center City gradually dropped to fifteen per cent and the amount of expenditures assigned to the regional centers increased to 85 per cent.

The regional per capita retail expenditures from above were then multiplied by the population within each center's trade area to determine the total sales for that center. Trade area boundaries were drawn within the framework of the standards suggested by the Larry Smith firm and the existing regional centers in the metropolitan region. Table 21 is an example of a regional shopping center showing how the various per capita retail expenditures were combined with the trade area population to determine the total retail sales and services estimate.

On the basis of the Larry Smith report, 30% of the total retail sales were allocated to sales in free standing commercial areas. The sales were grouped by sections since trade areas are very flexible for this kind of center. They were adjusted in the

⁶ *Commercial Land Use Distribution*, September 10, 1957.



SCHEMATIC FORM OF CITY

	CONVENIENCE	LOCAL	INTERMEDIATE	REGIONAL	CENTRAL BUSINESS DISTRICT
FLOOR SPACE	3,000-5,000 SQ. FT.	20,000-80,000 SQ. FT.	100,000-300,000 SQ. FT.	375,000-1,500,000 SQ. FT.	OVER 7,000,000 SQ. FT.
MAJOR TENANT	SMALL FOOD STORE	SUPER MARKET	JR. DEPT. STORE	DEPT. STORE	SEVERAL DEPT. STORES
TRADE AREA POPULATION	1,500-2,500 PERSONS	5,000-40,000 PERSONS	40,000-150,000 PERSONS	OVER 125,000 PERSONS	OVER 2,000,000 PERSONS
TRADE AREA RADIUS	UNDER 5 MINUTES	5-6 MINUTES	5-15 MINUTES	UP TO 25 MINUTES	UP TO 1 HOUR

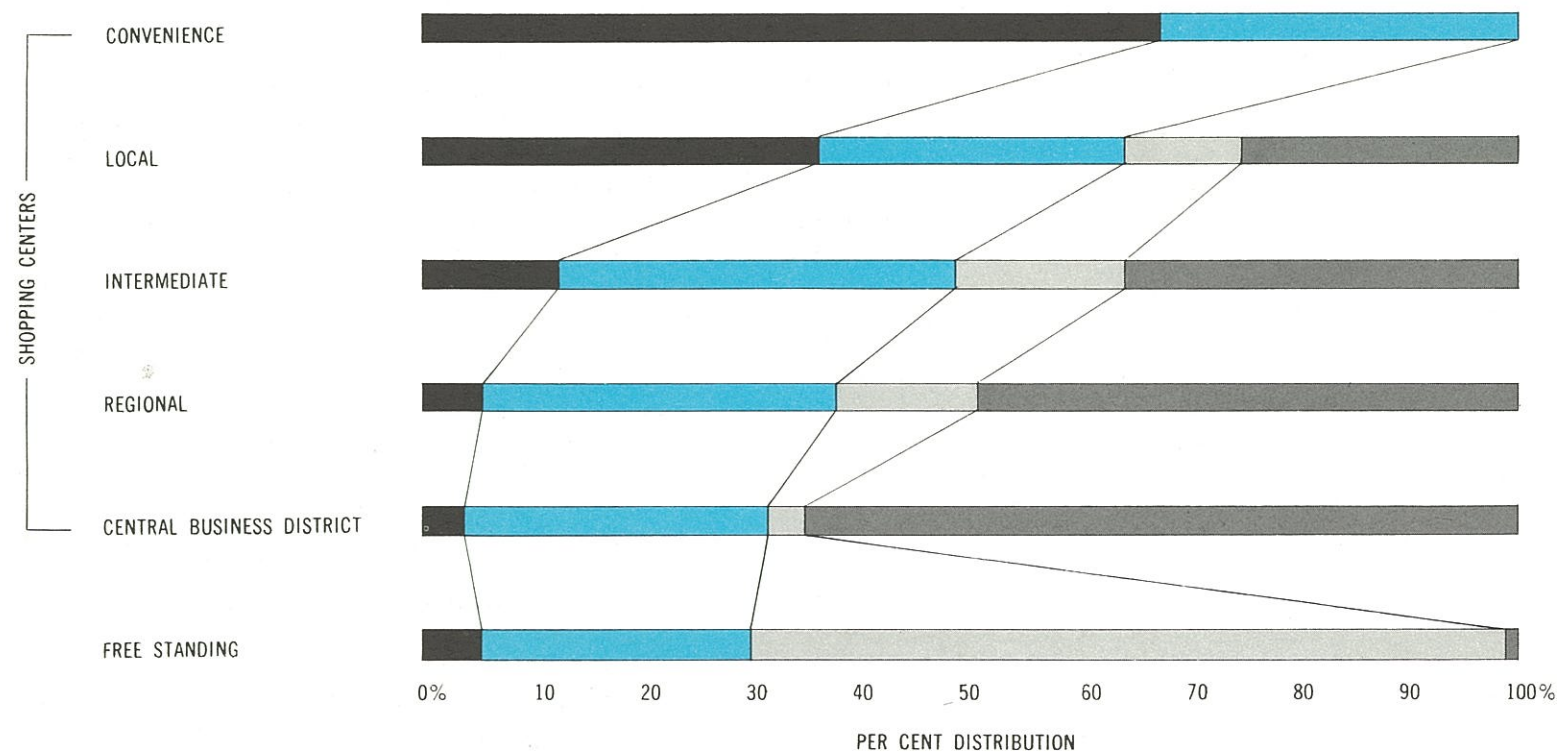
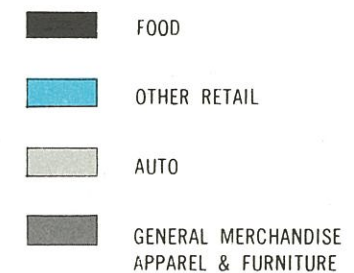


FIGURE 18—CHARACTERISTICS OF PROPOSED BUSINESS CENTERS BY TYPE.

The general standards are based upon consultants' analyses of economically viable centers of the different levels shown. Floor space devoted to food sales dominates the convenience center, where it accounts for 67% of all space. It decreases in importance in the successively larger centers: local, intermediate, regional, and central business district. Conversely, floor space devoted to general merchandise, apparel, and furniture is not usually found in convenience centers, while it makes up 25% of local centers, 36% of intermediate centers, 49% of regional centers, and 64% of the central business district. Free-standing centers find their market in the passing stream of traffic and are characterized by automobile sales.



The Plan for Commerce continued

plan where the land area was distributed along major streets.

Sales in the central business district, and the regional and free standing commercial areas were assigned as shown previously. The next step was to estimate the distribution of intermediate and local center retail sales. The Larry Smith report data were used to divide the remaining retail consumption expenditures between intermediate and local sales after central business district, regional and free standing were allocated. Thirty per cent of these remaining sales was assigned to intermediate centers and 70 per cent to local centers.

Intermediate shopping centers were treated in the same fashion as regional centers. Trade area boundaries were drawn around each proposed center and the population, sales, floor space and land area requirements were made accordingly. Adjustments were made to achieve desirable spacing between centers while keeping within the limits of the standards, and meeting planning objectives, such as emphasizing the subway lines.

Local shopping areas were distributed by section within the standards set up by the Larry Smith report. Trade areas were not developed.

The resulting distribution of sales for the region in Table 22 is in approximately the same proportion as the Larry Smith report.

Part III. 1980 Estimates of Commercial Land Use Requirements and Location. The existing commercial land use distribution in the City was determined from analyzing approximately half of the commercial areas of the City on large scale maps. Commercial uses were divided into 10 different groups of businesses. This was done, for example, for old strip commercial and convenience areas in South Philadelphia and for shopping centers like the Boulevard Center.

The estimate of future sales per square foot is an important factor in this whole analysis. This is the key in translating sales into floor space and land requirements. Forty different census enumeration districts in the City were surveyed. From this the 1948 sales per square foot were established. Trends were developed for department stores and supermarkets. These two kinds of businesses are not typical in retail business because both have more fully developed managerial policies. The estimate of sales per square foot suggested to the Planning Commission by Larry Smith was used in this analysis.

Regional Shopping Centers

A regional shopping center, as proposed in the Plan and as now to be found in a few areas of Philadelphia, includes one or more department stores and virtually complete comparison shopping. It has at least 375,000 square feet of floor space and serves a population of at least 125,000 within an area of up to 25 minutes' travel time. The regional centers proposed in the Plan have ground areas of 45 to 120 acres. Only shopping centers of this extent can compete directly with the central

TABLE 21—MARKET ANALYSIS OF THE GERMANTOWN SHOPPING CENTER: 1980 (1958 DOLLARS)

	POPULATION	PER CAPITA SALES	RETAIL SALES†
Regional Trade Area	173,000	\$292	\$51,400,000
Upper North(F)*	21,000	123	2,600,000
Roxborough-Manayunk(H)	22,000	275	6,050,000
Germantown-Chestnut Hill(I)	130,000	328	42,700,000
Intermediate Trade Area	109,000	198	21,700,000
Local Trade Area	62,000	600	3,700,000
Total Retail Sales			\$76,800,000

* Germantown's regional trade area extends into the three planning analysis sections, F, H, and I. Its intermediate and local trade areas lie entirely within section I.

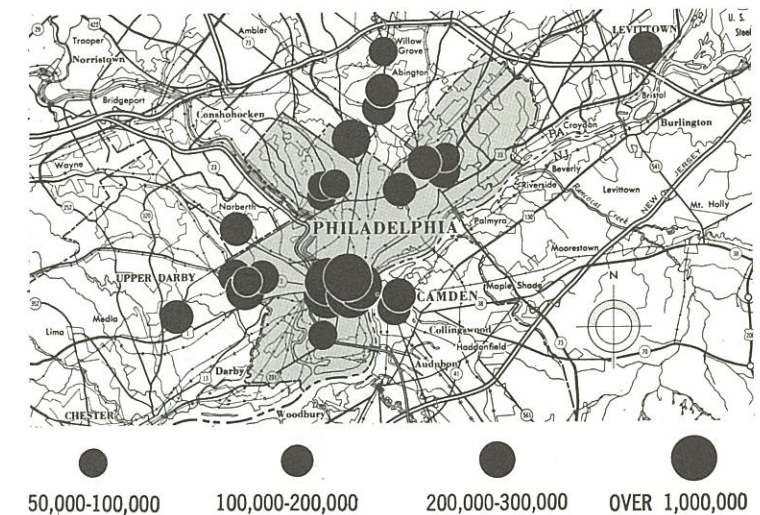
† Retail sales refers to portion of sales attributed to regional, intermediate and local shopping facilities respectively.

TABLE 22—TOTAL RETAIL SALES IN THE PHILADELPHIA STANDARD METROPOLITAN AREA: 1980

LEVEL OF SHOPPING CENTER	RETAIL SALES	
	AMOUNT (IN MILLIONS OF 1958 DOLLARS)	PER CENT
Local	\$ 3,730	31
Intermediate	1,150	9
Regional	2,110	18
Free Standing	3,600	30
Central Business District	1,410	12
Total	\$12,000	100

TABLE 23—TRENDS IN PRODUCTIVITY FOR FOUR SHOPPING LEVELS: 1960-1980

COMMERCIAL AREA	(ANNUAL DOLLAR SALES PER SQUARE FOOT OF GROSS FLOOR AREA)		
	1960 PRODUCTIVITY	20 YEAR INCREASE @ \$1 ANNUALLY	1980 PRODUCTIVITY
Local	90	20	110
Intermediate	65	20	85
Regional	50	20	70
Free Standing	35	20	55



MAP 5—EXISTING DEPARTMENT STORES IN THE REGION

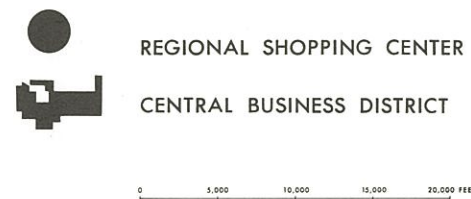
The dominance of the central business district as the region's unique shopping center is demonstrated by the fact that the five downtown department stores provide 75 per cent of the department store floor space in the region. At 5 to 7 miles from City Hall, there is a definite ring of smaller department stores.

TABLE 24—PROPOSED REGIONAL SHOPPING CENTERS: 1980

LOCATION	FLOOR SPACE (SQ. FT.)	PARKING (ACRES)	ESTIMATED TRADE AREA POPULATION	ESTIMATED SALES (1958 DOLLARS)
Oregon Avenue and 22nd Street	667,000	31	175,000	46,700,000
Germantown and Cheltenham Avenues	1,317,000	91	176,000	92,200,000
Roosevelt Boulevard and Adams Avenue	660,000	46	150,000	46,200,000
Castor and Cottman Avenues	1,740,000	80	280,000	121,800,000
Roosevelt Boulevard and Welsh Road	944,000	87	170,000	66,100,000
Totals	5,328,000	335	951,000	373,000,000

MAP 6—REGIONAL SHOPPING CENTER
PLAN

All 5 regional shopping centers proposed in the City exist today. These centers have at least one large department store and a trade area of 150,000 to 280,000 persons. Every resident in the City will be within 20 minutes of a regional center.





MAP 9—EXISTING SUPERMARKETS

The greatest concentrations of supermarkets are in outlying, recently developed areas. Most of the rest are scattered in the established older, middle-income areas. There are only a few supermarkets in the old, dense areas in North and South Philadelphia, where vacant land is scarce and expensive.

for expansion to an intermediate level. Their development will add a new dimension to the City's urban renewal program.

Local Shopping Centers

Local shopping centers, characterized by a supermarket, are primarily for daily convenience and weekly food shopping. They have 20,000 to 80,000 square feet of floor space and serve a population of 5,000 to 40,000 within a trade area of about five minutes' travel time. The shopping area at 48th and Spruce Streets is an example of a local shopping center with minimum parking space. City Line Center, at City Line and Haverford Avenue, is an example of an outlying local shopping center with more than three square feet of parking space per square foot of floor space.

Most of the local shopping today in the older areas of the City is done in small, unplanned shopping areas dominated by a grocery store or small self-service supermarket. Most of these are small chain or independent stores of less than 10,000 square feet with little or no off-street parking and little loading space.

There are nearly 4,000 of these small grocery stores in the City today. They are usually accompanied by a drug store, a dry cleaning shop, delicatessen, other small stores and perhaps a gas station. They are strung out along arterial streets causing traffic congestion and considerable inconvenience to both customers and businessmen. Many of these small stores are inefficient and unattractive, and do only a marginal business.

In the newer areas of the City, the local shopping center is characterized by a large supermarket of 10,000 square feet or more with its own parking lot. At present, there are 75 supermarkets, distributed mainly in West Philadelphia and the northwestern and northeastern parts of the City. Although supermarkets constitute only 1 per cent of the total food stores in the City, they account for nearly 50 per cent of the food business. Present distribution is shown on Map 9.

There are few existing supermarkets in the older sections of the City near the Center. Because they require an acre or more of land, the tendency has been to locate supermarkets where vacant land is available, usually along arterials in outlying areas.

The establishment of the supermarket as the prime food merchandiser means that the size, location, and distribution of local shopping centers must satisfy supermarket conditions: ease of accessibility by automobile, a trade area large enough for the supermarket to maintain a healthy business, and adequate parking space.

Thus far, the supermarket chains have not penetrated the older, densely built-up sections of the City except for some experimental units of smaller size and with little or no parking space. Although large supermarkets may be built in the older areas, a significant volume of food business will be handled by intermediate-sized stores of 4,000 to 8,000 square feet. Thus, the local centers in the densely populated areas will be smaller

and more intense with less parking than in the outlying areas.

The tendency for local retail stores to cluster near a food store is continuing with new supermarket developments and is a premise of the plan for local centers.

Plan for Local Centers. The Plan proposes 169 local shopping centers, whose trade areas will vary in size according to population density. In the older areas of the City, where population density is high, the trade-area radius is $\frac{1}{4}$ mile. At net dwelling unit densities of 40 to 50 per acre, the population could support one 16,000-square-foot supermarket, or two smaller ones. In the newer outlying areas, where population is more thinly settled, the trade area ranges up to $\frac{1}{2}$ mile in radius.

The proposed parking ratio ranges from 1:1 in the inner areas (one square foot of parking space for each square foot of total floor area) to 4:1 in the outlying areas where a much larger proportion of customers come by automobile.

As in the plan for intermediate centers, these proposals for local centers are tied in closely with a major redevelopment program. In the older areas of the City, there is an excess of retail store units. Through redevelopment, the number of these can be reduced, thus providing space in the proposed centers for off-street parking and loading, and opportunity for a visually attractive layout.

The Local Shopping Center Plan is shown on Map 10.

Convenience Centers

In dense urban areas, including approximately the 5-mile area surrounding City Hall, there is need for a fourth level of shopping and services. The convenience center which will meet this need is a small cluster of stores with a small food market of approximately 2,000 square feet as the major store, and perhaps 1,000 to 2,000 square feet of other stores. Off-street parking is not required because customers are expected to walk to shop, usually less than 500 feet or one block.

The inner area is saturated with this convenience level of shopping facility. This saturation is indicated by the rapid decline in the number of stores. Food stores have declined by almost 50 per cent, from 13,623 in the City in 1929 to 7,350 in 1954. Yet this was at a time when population increased slightly and new areas were developed. The number of other stores also has declined, but not so drastically as food stores.

Plan for Convenience Centers. This proposal is more a statement of policy than a physical plan. The Comprehensive Plan is tailored to a city, not a suburb; those things that are characteristic of a city should be enhanced. One of these characteristics, historically, is the proximity of homes to shops. The problem is to retain this relationship in the automobile age.

It is proposed that in those sections of the City where net dwelling unit density after redevelopment is expected to exceed 50 per acre, convenience centers of 4,000 square feet floor

MAP 10—LOCAL SHOPPING CENTER
PLAN

Every City resident will be within 5 minutes of one of the 169 local shopping centers proposed by the Plan. Each center will be characterized by one or more supermarkets and will have a trade area population of from 5,000 to 40,000 persons. Parking needs vary from a ratio of 1 square foot of parking to 1 square foot of floor space in the densely built up areas of the City, where local centers are close, to 4:1 in the low density areas of the Far Northeast, where they are much further apart.

- EXISTING LOCAL CENTER
- PROPOSED LOCAL CENTER

0 5,000 10,000 15,000 20,000 FEET



area, including a small 2,000-square-foot food store, be encouraged for each eight-block residential area.

Units of this size would be impractical for areas of substantially lower density for lack of adequate customer support.

Free-Standing Commercial Areas

Free-standing commercial areas are those designed for businesses that are self-sufficient and not dependent on customers of other stores. Thus, the stores in them are not grouped necessarily with others; they cater largely to customers who arrive by automobile and draw single-purpose trips. Examples range from auto sales and service to large commercial amusement centers, to office buildings. They have one or more of the following characteristics:

1. Their customer is the motorist himself.
2. They are large space-users and have low rent-paying ability per square foot.
3. Their customers do not make frequent purchases.
4. They combine retail, wholesale, service and repair in various ways.
5. Their market is other businesses, not households.
6. Their market area is large and thin.

As they exist today, free-standing businesses are a major cause of two of the problems listed at the start of this chapter; the unsightliness and the traffic congestion of many of the City's major streets.

Plan for Free-Standing Areas. The objective of this part of the Plan is to reduce the conflict between the requirements of free-standing business establishments and those of others which tend to group.

This can best be accomplished by locating free-standing businesses:

1. On the periphery of regional shopping centers and of some intermediate shopping centers.
2. On the periphery of the central business district.
3. In clusters on the arterial streets.
4. On the periphery of industrial areas.

Not all free-standing businesses require such locations, nor is shifting them to new locations a simple task. Some can function as well in shopping centers as in independent areas.

Areas set aside for free-standing businesses should be compactly designed and include the most efficient possible traffic-control devices, including service roads where necessary, so as to minimize the basic conflict in locating commercial areas on major streets.

In preparing the Plan, existing areas of free-standing busi-

ness were examined as to size and suitability of location. Those adjacent to shopping centers and industrial areas were kept but shortened and widened for compact design.

Form Components of the Plan

Figure 19 shows in summary form the two basic components of the Commercial Land Use Plan. The diagram on the left shows the proposed free standing areas just discussed, while the other diagram shows the central business district and the pattern of regional, intermediate and local centers. The regional centers are spaced in a ring about five miles from City Hall; the intermediate centers are of course more closely spaced; and the local centers are distributed very closely throughout the City, dense in the inner areas and more widely scattered in the outlying areas. The large sections of the map where no centers appear are non-residential, e.g., industrial districts and large park areas.

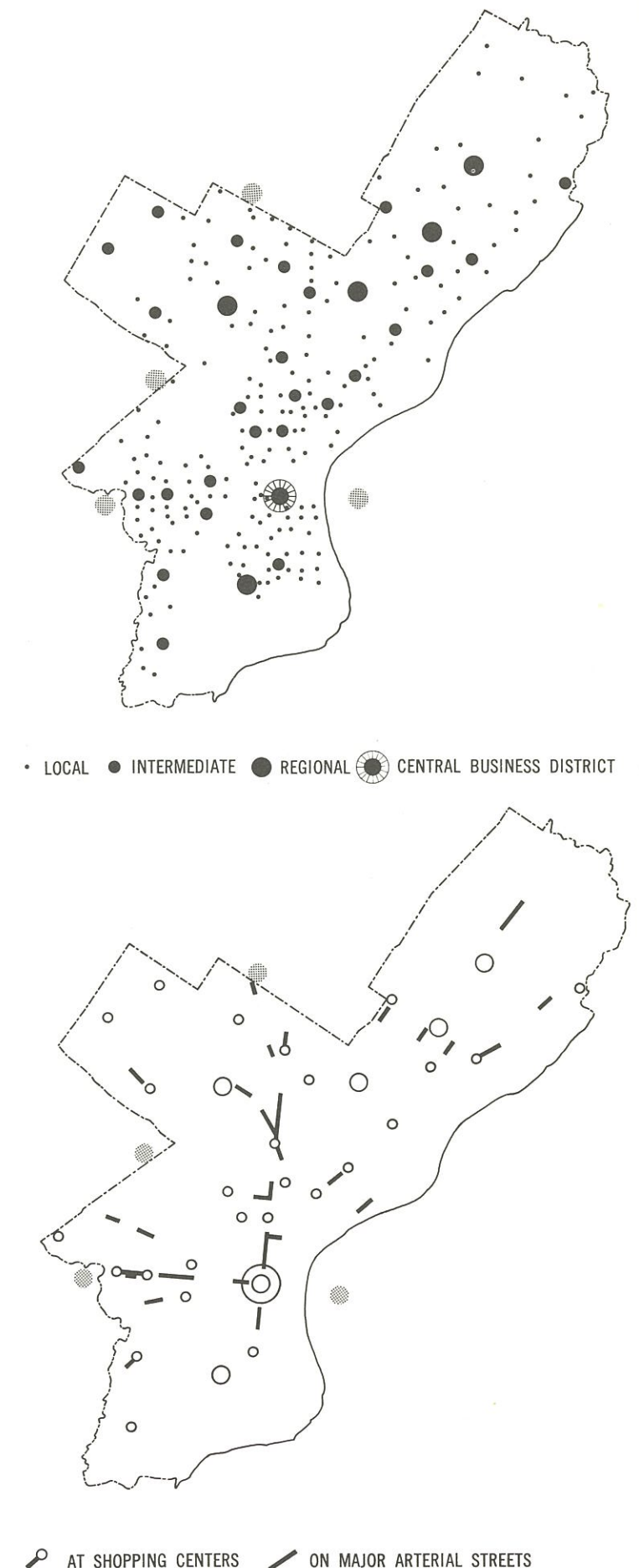
Map 11 sets forth the entire Commercial Land Use Plan in relation to the arterial street system.

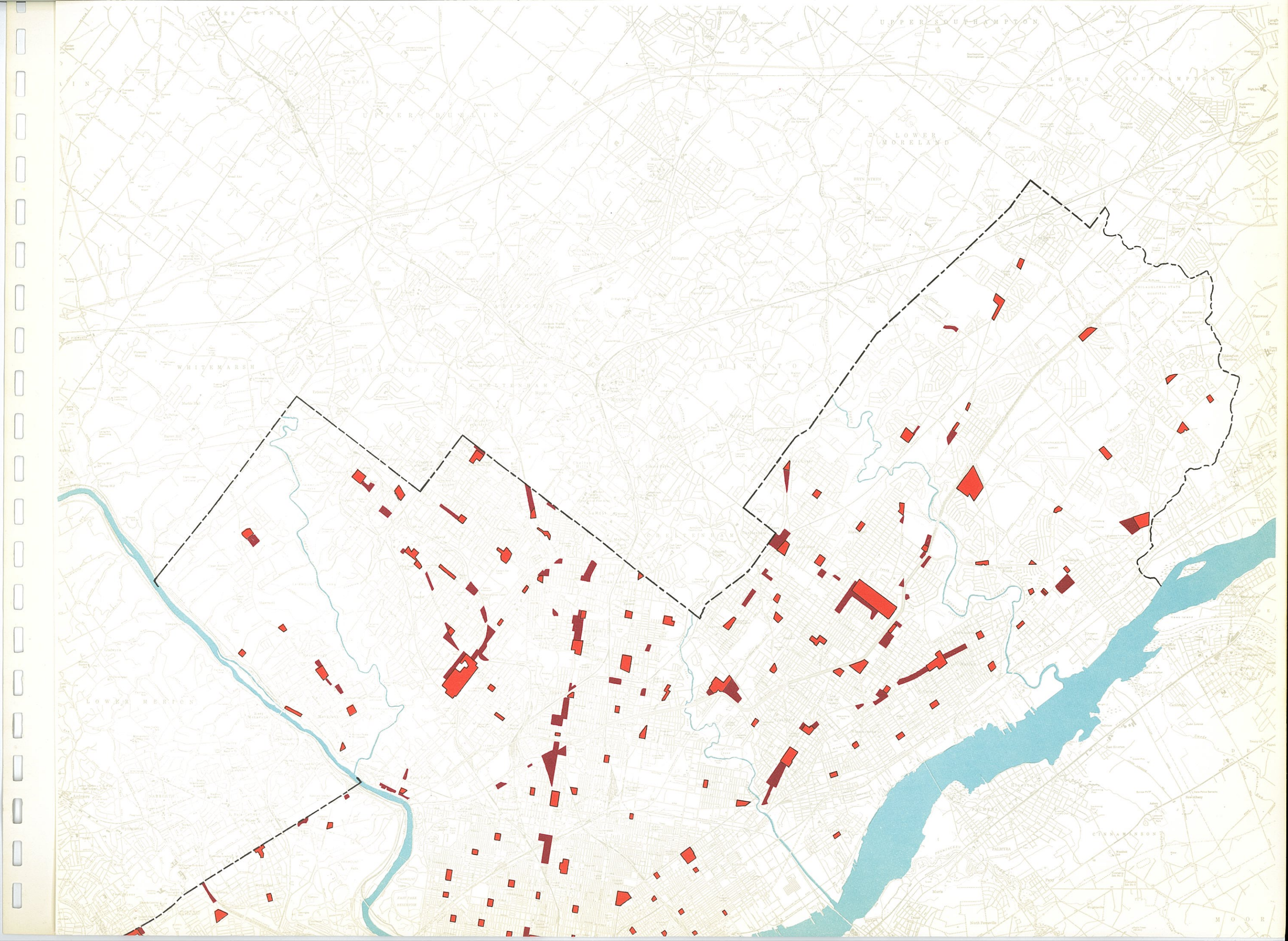
FIGURE 19—THE TWO FORM COMPONENTS OF THE COMMERCIAL LAND USE PLAN

Shopping Centers: A hierarchy of shopping centers is the direct result of the minimum sizes necessary for each of the store types—supermarket, the junior department store, and the department store—which characterizes each successively larger type of center. Other stores cluster around the dominant store in each center.

Shopping facilities, community facilities, and government facilities are grouped together in the Plan where possible. The shopping centers—local, intermediate, and regional—each with a successively larger area of service, correspond with the residential groupings of neighborhood, community, and district.

Free standing Commercial Areas: The stores of free standing areas do not need a supporting cluster of other stores for commercial success. Each establishment stands by itself and does not depend on the pedestrian shopping from store to store. Free standing areas exhibit no hierarchy of size and bear little relationship to the City's residential areas.







PHILADELPHIA CITY PLANNING COMMISSION—MARCH 1960

THE PLAN FOR COMMERCE

0 5,000 10,000 15,000 20,000 FEET

■ FREE STANDING
■ CENTERS

THE PLAN FOR RECREATION AND COMMUNITY FACILITIES

The key to the structural portion of the Plan: a proposal for regrouping of the City's communities around focal centers offering educational, cultural, and recreational facilities...It proposes creation of 10 major district centers throughout the City, and 56 subordinate centers...Plan proposes 207 playgrounds, 40 playfields, 20 district parks, 2 new large parks in City.

The quality and location of Philadelphia's recreation areas, schools, libraries, health facilities and governmental services are as important to the City's vitality as its industries, houses, and transportation system. They contribute to the health and well-being of its citizens and have a great influence on the quality of living in the City.

For these reasons, the City's need to expand its recreation and community facilities is an urgent one. This chapter of the Comprehensive Plan sets forth the ways in which this expansion should be carried out.

This part of the Comprehensive Plan deals with three closely related aims:

- 1. To meet human needs for mental and physical refreshment and for outdoor exercise.*
- 2. To break up the monotony of the urban scene with vistas of greenery, growing things, and open spaces.*
- 3. To give a recognizable shape to the arrangement of the residential community through the creation of local centers, so that urban conveniences and opportunities will no longer be haphazard, come-by-chance things.*

Two of the proposals made here are central to the Comprehensive Plan. One is the creation of many more areas of open space than now exist in the City. The other is the regrouping of community facilities within the City, around local centers. The proposals for open space are dealt with first in this chapter, followed by those for the local centers.

THE SUMMARY PLAN: As a step toward achieving these aims, the Plan proposes a major increase in the number of existing playgrounds and playfields and a doubling of district parks. It provides one playground for every 11,000 to 12,000 residents, and one playfield for every 5 or 6 playgrounds. Playgrounds range from 3 to 8 acres each in size, according to type; playfields are from 8 to 20 acres in size.

It proposes that local parks be provided in new neighborhoods, and in old neighborhoods that are undergoing renewal. Local parks will range in size from one to 5 acres.

The existing large parks are proposed to be extended, and two new ones created, one along the valley of Poquessing

Creek and the other along the Schuylkill River in Roxborough. At present, there are only 5 acres of regional parks per 1,000 persons in the Metropolitan Region; it is proposed that Philadelphia work with the surrounding counties and the State toward a goal of 21 acres of regional park per 1,000 persons, which, it is hoped, will ultimately be reached through the development of 26 new state and county parks.

New marinas are proposed along the Delaware River, providing access to a major resource that is relatively unused at present. More golf courses are required. It is proposed to acquire the sites of existing private golf clubs if and when they decide to relocate, and to construct new courses in the large city parks.

The Plan for District, Community, and Neighborhood Centers. The Plan proposes to create 10 district centers throughout the City to serve as focal points, where public facilities such as district libraries, health centers and branch offices of City departments will be grouped near a major shopping center for easy access.

It proposes to create 56 community centers at focal points for smaller areas of the City. These will bring together the community library, the satellite health clinic, the smaller shopping center, and voluntary community-service agencies. The secondary school and playfield will be located nearby.

The Plan for Recreation

Objectives:

1. To put recreation space and facilities in places where they will be most convenient to the people who are going to use them, and as near to the centers of the proposed communities-within-the-City as possible.
2. To distribute these spaces and facilities throughout the City in accordance with the distribution of the population, so that the greatest number of people can take advantage of each one.
3. To locate facilities so that they will be available to

the people of newly developed neighborhoods as well as of older ones.

4. To make the most efficient use of both school and recreation facilities. Although a plan for elementary and secondary schools is not included in this Comprehensive Plan, playgrounds and playfields have been located whenever possible next to schools to allow for joint planning and use.

Standards. The standards which underlie the Comprehensive Plan were developed by the Planning Commission's Technical Advisory Committee on Recreation, in close cooperation with the Commissioner of Recreation.

While these standards provide less gross acreage in the more dense sections of the City than would be provided by standards published by some cities, in many cases these other standards have not been carefully checked against the dislocation of population that would be required to carry them out, nor the operating funds necessary for their maintenance or use.

The plan presented here has been carefully adjusted to the different requirements of the areas of varying densities. It is an economical plan that will satisfy the needs of the various neighborhoods, and, unlike many other plans based on standards less carefully considered, is capable of being completed within a reasonable time, and can serve as a firm basis for the planning of urban renewal areas and the subdivision of open land, with the full knowledge that the final result will be a fair and equitable distribution of recreation facilities in all parts of the City.

Playgrounds. Since it is designed primarily for children, each playground includes as a minimum a tot-lot, a junior play area, a softball field, and a recreation building. Playgrounds are particularly related to the elementary school.

The Plan calls for 207 playgrounds, all located in areas planned to remain residential in character. This includes 95 existing Department of Recreation playgrounds. The acquisition of 82 completely new playground sites is proposed. It will also be necessary to acquire adjacent land for the enlargement of 20 existing sites to meet minimum standards of size.

The Department of Recreation now operates 113 playgrounds. Of these, 18 are not included in the Plan, because it is expected they will be discontinued due to expressway construction, poor location and size, or changes in the use of the land around them. Those to be discontinued will have to be kept in operation until new ones are ready to take their place to avoid leaving any residential area without recreation facilities.

The playground proposals are based on the standards set forth below and are shown on Map 12.

To serve their purposes adequately, playgrounds in residen-

tial areas with a high population density must be placed closer together than in low-density areas.

The radius to be served by each playground, according to the density of its area, is set forth below:

Density more than 175 persons per net residential acre	¼ mile radius
Density 75-174 persons per net residential acre	⅜ mile radius
Density less than 75 persons per net residential acre	½ mile radius

The population density in the area served by each playground affects not only its spacing, but its size, its development, and the kind of program it offers. In keeping with the spacing standards above, the Plan provides one playground for every 11,000 to 12,000 persons consistently throughout the City.

Just as there is a direct relationship between the population density of an area and the spacing of playgrounds, so there is a relationship between its size and the kinds of program it offers.

A playground of less than 3 acres does not permit the physical development necessary for a balanced program, regardless of how thoroughly the recreation program is supervised.

The proposed standards provide for three sizes of playgrounds, ranging in minimum size from 3 to 6 acres, and listed here as Types A, B and C.

The Type A and B playgrounds are intended for the high and middle density areas where it is difficult to acquire larger plots because of the existing street pattern, high land costs, and the displacement of families.

Type A playgrounds, of 3 to 8 acres, will be used in areas with a density of more than 175 persons per net residential acre; Type B, of 4 to 8 acres, in areas with a density of 75 to 174; and Type C, of 6 to 8 acres, in areas with a density of less than 75.

On Type A and B playgrounds, emphasis must be placed on a variety of sports which many can play on small spaces. Also, a high degree of supervision is necessary. The turf area on Type A playgrounds accommodates softball rather than football or baseball. On Type B playgrounds baseball can be provided.

On Type C playgrounds, special-purpose equipment can be added, the areas for adults can be enlarged, and a generally more generous layout achieved, primarily reflected in more baseball and football space.

In effect, the combination of standards for spacing and for

size, together with the necessity for serving large numbers of people, means more playgrounds of smaller size in high-density areas, and fewer playgrounds of larger size in lower-density areas. Applying the minimum standards theoretically, in a square mile of high-density residential area there would be four three-acre playgrounds; in a square mile of medium density area, two four-acre playgrounds; and in a square mile of low density area, one six-acre playground.

Playfields. The playfield is a facility designed to meet the larger space and program needs of youth and adults, and is particularly related to the secondary school. Primary requisites are large outdoor playing fields for organized sports, indoor meeting space for various groups, a swimming pool, skating rink and adequate offstreet parking. The playfield may also include a playground as a component, a recreation area for adults, and specialized adult sports facilities.

The Comprehensive Plan proposes 40 playfields. They are shown on Map 13. At present, there are 26, although many of these require additional development. Included in the present inventory are 6 athletic fields of the Board of Education, 11 of the Department of Recreation, and 9 of the Fairmount Park Commission.

Location of playfields within walking distance of all potential users is not essential, because the primary users are youths and adults, but most of the proposed playfields are located within ½ mile to 1 mile of homes in most residential areas.

One playfield is proposed for every 5 or 6 playgrounds. It will serve 60,000 to 75,000 people.

Playfields require 8 to 20 acres. If a playfield includes a playground as a component, its size must at least combine the minimum for each i.e., 8 acres plus 3 acres. As with playgrounds, several variables affect size, and a higher degree of programming and supervision is necessary on the smaller sites.

Parks. Philadelphia's parks range from small ornamental open spaces to extremely large regional parks. For convenience of reference, they are divided here into three general classes: local parks of 1 to 5 acres in size; district parks of 20 to 100 acres, and regional parks more than 300 acres in extent.

Local parks are properly a part of the residential environs in a community and should be designed integrally with neighborhoods. They provide public open spaces devoted primarily to individual recreation and esthetic satisfaction. The local park is one of the most important elements in restoring to residential neighborhoods the amenities of good City living.

The Comprehensive Plan proposes that local parks be provided in new neighborhoods and as a part of the renewal of old neighborhoods.

The Plan also proposes 20 district parks, of which 9 will

TABLE 26—RECREATION AREA STANDARDS: PLAYGROUNDS AND PLAYFIELDS

TYPE OF RECREATION AREA	SIZE	SERVICE AREA	DEVELOPMENT
1. Playground—Type A	3-8 Acres	$\frac{1}{4}$ mile radius. Serves 11,000 to 12,000 people.	Intensively Developed to Accommodate Maximum Users on Limited Space <ul style="list-style-type: none"> ■ Apparatus areas for pre-school and elementary school children. ■ Spray pool. ■ Hard-surfaced area for informal games: dodgeball, kickball. ■ Building for year-round activities with game and club rooms, meeting rooms, rest rooms, office and storage space. ■ Quiet recreation area, landscaped with benches. ■ Hard-surfaced area for a number of organized court games: basketball, volleyball, handball. ■ Turf area for softball.
2. Playground—Type B	4-8 Acres	$\frac{3}{8}$ mile radius. Serves 11,000 to 12,000 people.	Less Intensively Developed <ul style="list-style-type: none"> ■ Same elements as in Type A playground, but in different proportions. Fewer hard-surfaced areas for court games might be provided, but larger turf area.
3. Playground—Type C	6-8 Acres	$\frac{1}{2}$ mile radius. Serves 11,000 to 12,000 people.	Extensively Developed <ul style="list-style-type: none"> ■ Same elements as in Type B playground, with larger turf areas for baseball or football. Other facilities might be added according to space available and community interest.
4. Playfield	8-20 Acres	Serves 5 or 6 playground service areas.	Extensively Developed <ul style="list-style-type: none"> ■ Turf areas for softball, baseball, football ■ Hard-surfaced areas for court games. ■ Park area for quiet recreation, with picnic area where feasible. ■ Recreation building containing auditorium, gym, swimming pool, kitchen, plus features of playground recreation building ■ Ice and/or roller skating rink. ■ Automobile parking area. ■ Lighting for evening use. ■ May include playground.

TABLE 27—RECREATION AREA STANDARDS: PARKS

TYPE OF PARK	SIZE	SERVICE AREA	DEVELOPMENT
Local Park	1-5 Acres	$\frac{1}{4}$ to $\frac{1}{2}$ mile radius.	Landscaped With Ornamental Pool or Fountain and/or Other Facilities as Space Allows.
District Park	20-100 Acres	Serves a major portion of the City.	Developed according to the characteristics of the site. <ul style="list-style-type: none"> ■ Provisions should be included for outdoor sports and enjoyment of natural beauty. ■ Automobile parking. ■ May include playfield.
Regional Park	300-2,500 Acres	At least one regional park within 40 minutes travel time of majority of homes in metropolitan region.	<ul style="list-style-type: none"> ■ Facilities for swimming, boating, ball playing, golf, tennis, day camping, bicycling, hiking, picnicking, outdoor concerts. ■ Automobile parking areas. ■ Cabin or tent camping area.

be new. Three of the latter are in the Far Northeast, one in the Near Northeast, two on the rivers in Center City, one in Eastwick and two on the Delaware River near International Airport, one of which is Fort Mifflin.

The primary objective of a district park is to preserve or create a generous portion of open landscape in the urban environment. The chief criterion in selecting a site is some feature or combination of natural features on the basis of which the park can be designed and developed. Thus, the district park pattern does not lend itself to a simple geometric distribution in space. Accessibility by automobile and public transit is of prime importance.

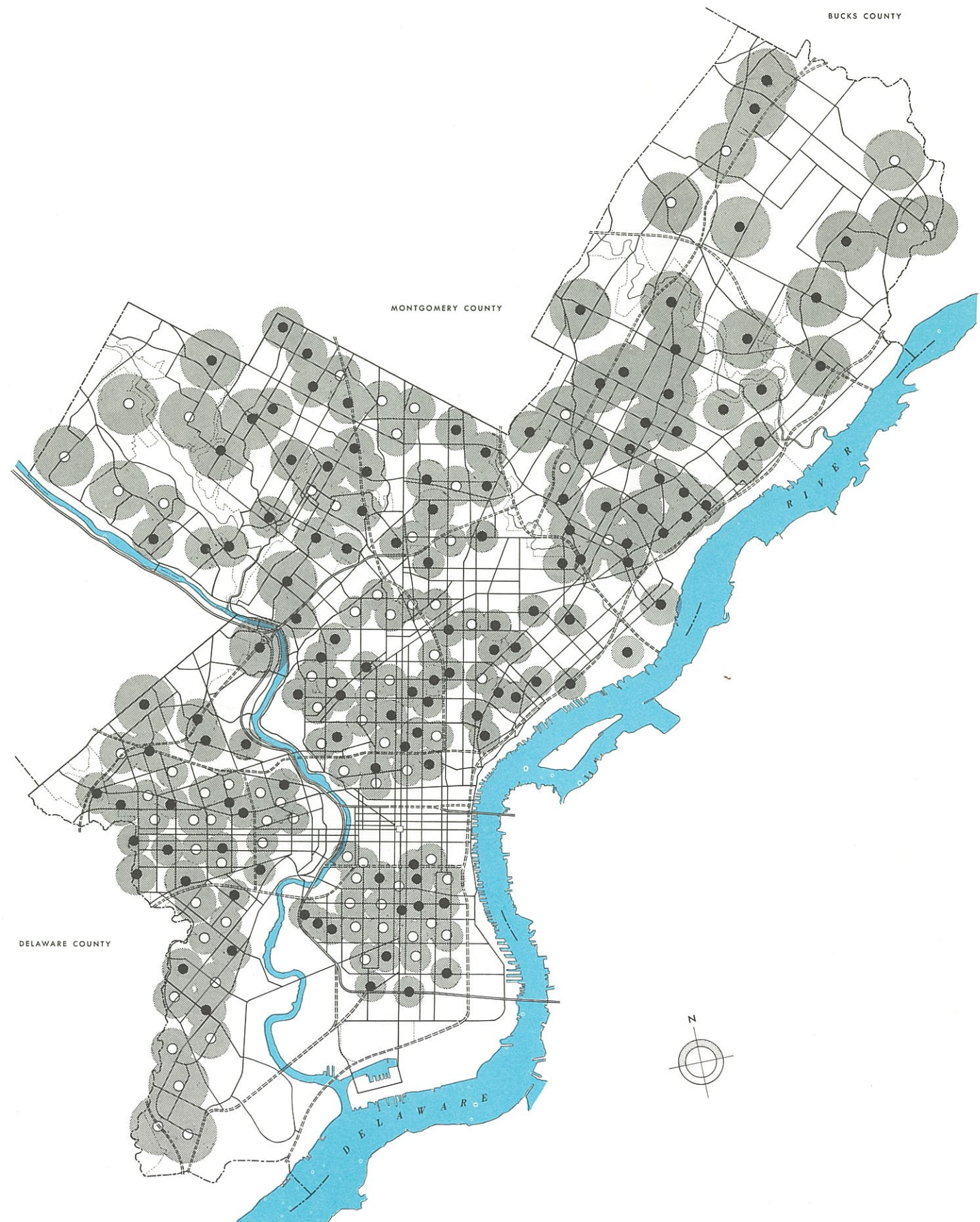
District park facilities depend on the characteristics and location of the site. A site with natural landscape features can provide for a children's day camp, for picnicking, hiking, boating, sledding, and other activities suitable to the setting. Most, but not all, of the district parks proposed are of this type. The proposed district parks on the rivers in Center City will be developed quite differently. The waterfront park on the Delaware at Market Street, for example, will contain a highly stylized grouping of waterfront facilities.

The Plan proposes two new regional parks for Philadelphia in addition to the six already in existence. One will be in the valley of Poquessing Creek and extending south from its mouth along the bank of the Delaware River to Pennypack Park. This is planned as a joint project with Bucks County, since the creek is the boundary between that county and the City. The second is in Upper Roxborough along the Schuylkill River. It is further proposed that Cobbs Creek and Pennypack Parks be expanded along the entire lengths of the streams. A large tract of land at the mouth of the Pennypack has been earmarked for park and recreation purposes.

The proposed district and regional parks are shown on Map 14.

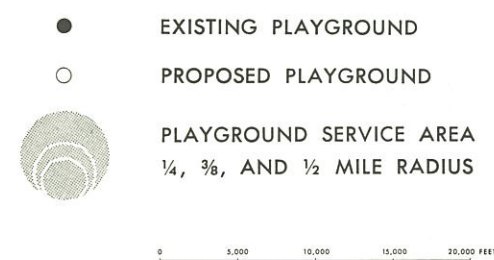
Specialized Facilities. District and regional parks are the logical setting for the development of specialized facilities such as marinas, golf courses, museums, zoos and aquariums. The existing museums, zoo and aquarium need expansion and rehabilitation, but, with the exception of the aquarium, no new facilities of this nature are proposed.

Marinas—New marinas are planned on the Delaware River at the mouth of Pennypack Creek, in Center City south of



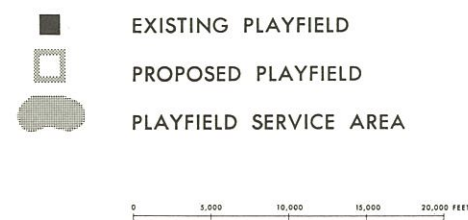
MAP 12—PLAYGROUND PLAN

The Plan adds 82 proposed playgrounds to 125 existing ones: a total of 207. Playgrounds range in size from 3 to 8 acres and in service radius from $\frac{1}{4}$ to $\frac{1}{2}$ mile. They are small and close together in dense areas, larger and further apart in lightly settled areas.





MAP 13—PLAYFIELD PLAN

The Plan proposes 14 new playfields in addition to the 26 existing ones: a future total of 40. Playfields range in size from 8 to 20 acres. Their service areas include 5 or 6 playground service areas.



MAP 14—PARK PLAN

Large parks include district parks (20-100 acres) and regional parks (300-2,500 acres). The Plan proposes 9 new district parks in addition to the 11 existing ones: a future total of 20. It proposes 2 new regional parks in addition to 6 existing ones: a future total of 8.

 EXISTING LARGE PARK
 PROPOSED LARGE PARK

0 5,000 10,000 15,000 20,000 FEET



Market Street, and in Southwest Philadelphia adjacent to International Airport.

Golf Courses—The five existing public courses in Wissahickon Park, Franklin Roosevelt Park, Cobbs Creek Park and Juniata Park are not adequate to meet present and future demand. The Plan proposes that both Bala and Holmesburg Country Clubs become public golf courses if and when they decide to relocate, and that new public courses be developed in Pennypack Park, West Fairmount Park, and Wissahickon Park.

Regional Parks in Southeastern Pennsylvania. Philadelphia's large parks, while separately administered, may be considered a part of a five-county regional system covering Southeastern Pennsylvania. Joint planning by the City and surrounding counties for this larger system proposes 83,000 acres of new state and county parks, which added to an existing 17,000 acres of parks, would give the Region a total of 100,000 acres of Regional parks by 1980. Most of this development would take place in the adjacent counties.

Plan for District, Community and Neighborhood Centers

The Comprehensive Plan proposes three types of activity centers, in descending order of size, for the City: the district, community, and neighborhood center. At each level, the center will serve as a focal point for residential areas designed to foster a sense of community identity.

District Centers. Each of the districts in the City will be made up of a number of communities and will contain from 150,000 to 300,000 persons. The district center contains district library, health center, shopping center, and City offices serving the public directly.

The Plan for district centers proposes eight new centers in addition to the main administrative center at City Hall and an existing district center in Germantown. They are designed primarily to serve adult needs. The term district center, as used in the Plan, does not refer to a building but to a cluster of facilities located near existing or proposed major shopping areas, highly accessible by public transit and by automobile.

Of the eight district centers proposed, four are at locations that are recognized and well established as major transportation crossroads and shopping centers: Broad Street and Snyder

TABLE 28—COMPONENTS OF RECREATION PLAN: ACREAGE AND NUMBER OF EXISTING AND PROPOSED FACILITIES BY OWNERSHIP

OWNERSHIP	PLAYGROUNDS		PLAYFIELDS		DISTRICT PARKS		REGIONAL PARKS		TOTAL ACRES
	ACRES	NUMBER	ACRES	NUMBER	ACRES	NUMBER	ACRES	NUMBER	
Department of Recreation	425	96*	98	11	79	2	145†	—	747
Fairmount Park Commission	54	11	76	9	329	8	6,535●	6	6,994
Board of Public Education	101	17	73	6	—	—	—	—	174
Other	8‡	1	—	—	32‡	1	—	—	40
Total Existing	588	125	247	26	440	11	6,680	6	7,955
Proposed Additional	362	82	115	14	526	9§	2,178▲	2	3,181
Total	950	207	362	40	966	20	8,858	8	11,136

* The Department of Recreation now operates 113 playgrounds. 18 of these will be discontinued because of expressway construction, poor location, or changes in land use. In addition, one playground site is being used for a temporary school by the Board of Public Education.

† Department of Commerce.

‡ 32 acres in Independence Mall—Independence National Historical Park.

§ Four of these, totaling 397 acres, are on land owned by Department of Commerce, adjacent to Northeast Airport and International Airport.

¶ Tinicum Wildlife Preserve. This is maintained by Department of Recreation but is counted as part of Cobbs Creek Park rather than as a separate regional park.

● Excluding 130 acres counted as playgrounds and playfields.

▲ 200 acres are now City-owned. Total figure includes Holmesburg and Bala Golf Courses, which are now privately owned.

Avenue in South Philadelphia; 52nd and Market Streets in West Philadelphia; Broad Street and Olney Avenue in Olney; and Cottman and Castor Avenues in the Near Northeast.

Two others, less well known, are also old centers: Broad Street and Columbia Avenue, adjacent to Temple University, and Kensington Avenue and Clearfield Street, the major shopping area for Kensington.

The remaining two are in newly developed areas: Island and Eastwick Avenues in Eastwick, and Roosevelt Boulevard and Welsh Road in the Far Northeast. A large shopping center is planned for the first location, and one exists at the second.

Because cultural and health facilities are quite as important as recreation and shopping facilities to the success of every fully developed center, libraries and health centers will be integral parts of most district centers projected in this Plan.

Health centers exist or are proposed at five of the district centers and satellite health clinics at two additional centers. A library exists or is proposed at eight of the district centers.

Community Centers. The Plan proposes 56 community centers, each to be the focal point of a grouping of 25,000 to 50,000 people. The term community center, as used here, does not refer to a building but to a cluster of facilities located near a major shopping center and accessible to most of the community's residents. The Community center contains a community library, satellite health clinic, shopping center, and voluntary agencies whenever possible. The secondary school and playfield are located nearby. The community center is oriented to the needs of youth as well as adults.

A good example is found in Roxborough, where Gorgas Park links the teenage facilities at Roxborough High School with the adult facilities in the shopping area at Ridge Avenue and Leverington Street. A new community library is proposed at this location.

Of the 56 community centers shown on the plan, 24 are at locations where both shopping and teenage recreation facilities are found within a few blocks of each other. Twenty-seven are at the location of a secondary school and/or playfield. Satellite health clinics are found at 15 community centers. All community centers are well served by public transit.

In three of the four community centers of the Far Northeast and Eastwick there will be a full range of facilities: secondary school, playfield, library and shopping center. In designating community centers, a guide is provided for the future location

of facilities such as libraries, voluntary agencies and secondary schools.

Neighborhood Centers. In the neighborhood center, the primary needs for school, playground, and shopping center, to provide for families residing within a radius of three to four blocks from the center. Where possible, school and playground should adjoin. The shopping center should be located separately.

The expressways and arterials will largely determine the boundaries of neighborhood groupings. The location of their centers will be determined largely by the location of playgrounds and elementary schools.

A total of 207 playgrounds is proposed in the Plan, or one for every 10,800 people of the estimated 1980 population. At present, there are 197 elementary schools, one for every 10,600 people. If this ratio is continued in the future, approximately 212 schools will be needed in 1980.

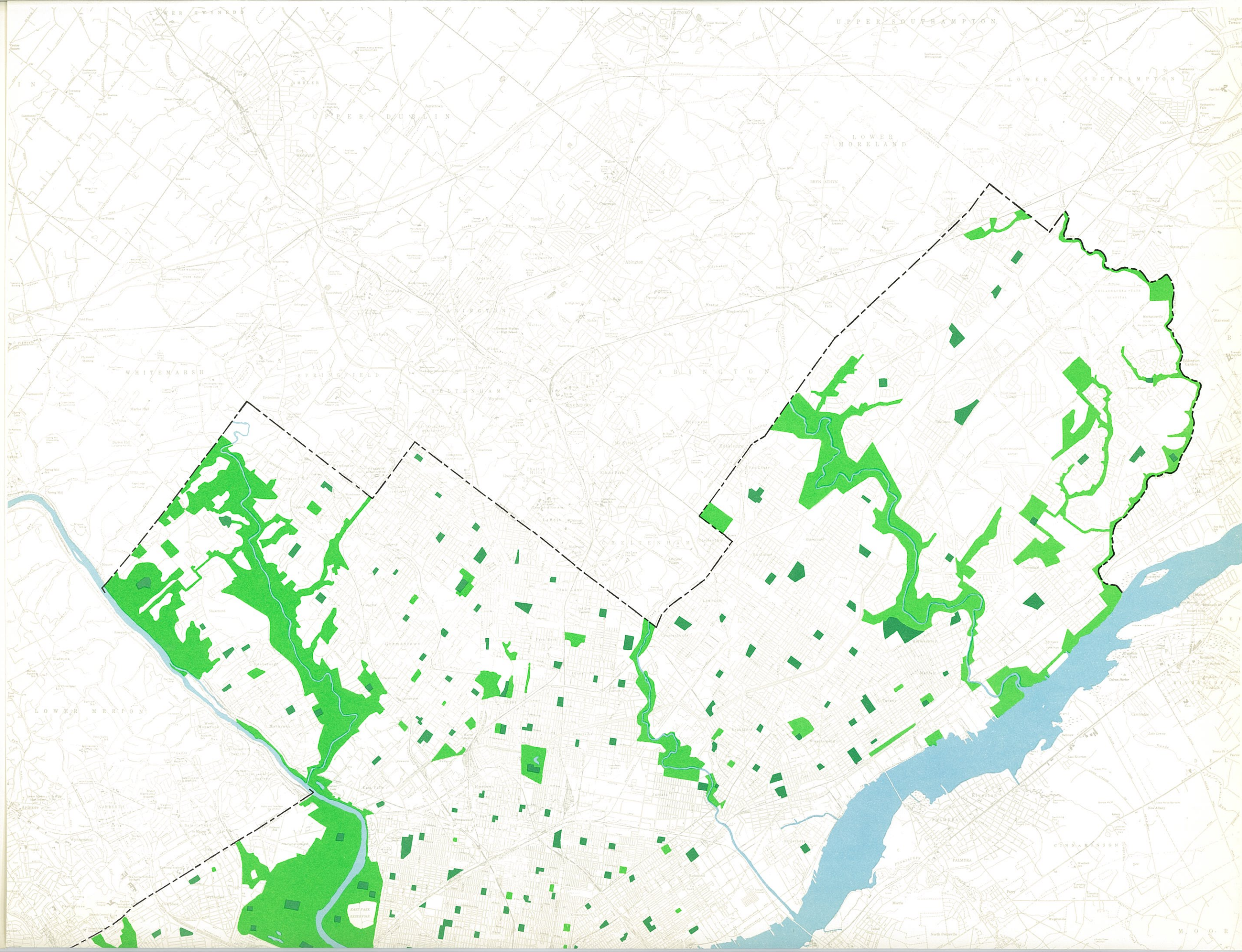
Thus, in the future building programs of both the Department of Recreation and the Board of Public Education, there will be opportunity for joint planning and development of playgrounds and schools to meet the needs of the neighborhoods they will serve. This has already taken place in such neighborhoods as Bridesburg in the Northeast, and East Poplar in North Central Philadelphia. It is also under way in the newly developing neighborhoods of the Far Northeast and in older ones such as Powelton in West Philadelphia.

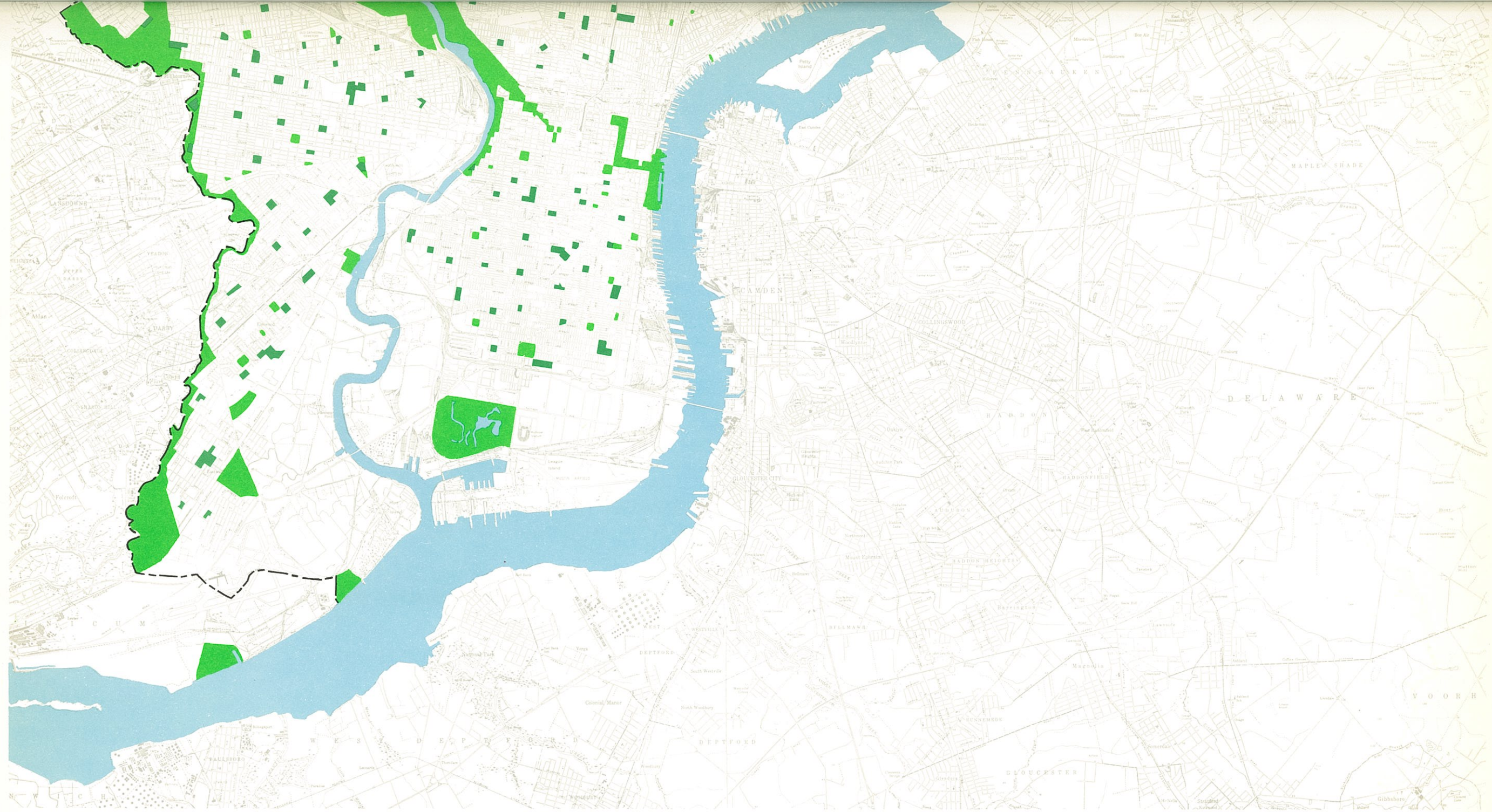
Plan for Libraries. As this chapter has already emphasized, libraries are essential elements of both community and district centers. The "branch library" is related to the community, and the "regional library" to the district. For clarity they are referred to here as community and district libraries.

The plan for libraries was developed by the Free Library of Philadelphia and the City Planning Commission, using as a basis the standards of the American Library Association and a general plan prepared earlier by the Free Library.

The Plan proposes 41 community libraries, 6 district libraries, and 3 special libraries, including the Central Library on the Parkway. Twenty-one libraries are located in or within 2 blocks of community centers, and 8 are located in or near district centers.

It is not always possible to achieve a combined location for the library and community center. Most of the libraries now in existence were planned and built years ago. Many are well located and still in good condition. For new and rebuilt libraries,





PHILADELPHIA CITY PLANNING COMMISSION—MARCH 1960

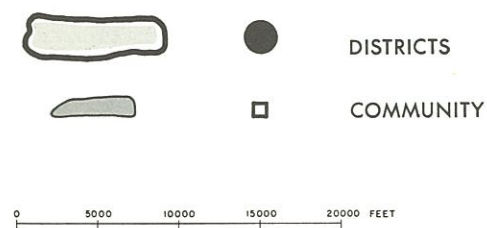
THE PLAN FOR RECREATION

0 5,000 10,000 15,000 20,000 FEET

 PARKS
 PLAYGROUNDS AND PLAYFIELDS

MAP 16—PROPOSED DISTRICTS AND COMMUNITIES

A total of 10 districts and 56 communities is proposed, each with its own center to provide a focal point for residential areas. Districts contain 150,000 to 300,000 people. Communities contain 25,000 to 50,000 people. District centers contain district library, health center, shopping center, and City offices serving the public directly. Community centers contain a community library, health clinic, shopping center, and voluntary social agencies whenever possible—with secondary school and playfield located nearby.



The Plan for Recreation and Community Facilities continued

the Plan has chosen locations for their proximity to proposed district and community centers. (See Map 17)

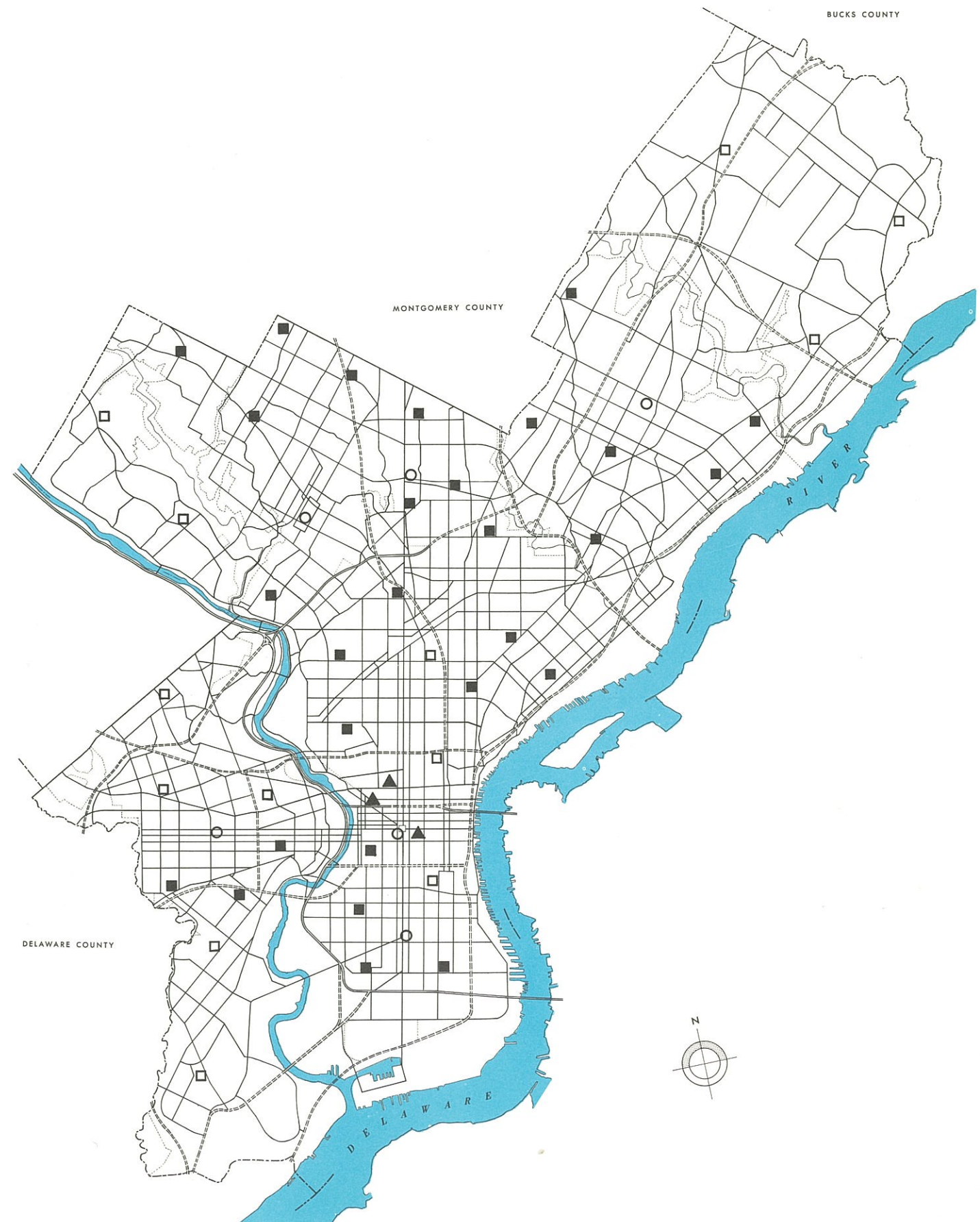
Plan for Health Centers. Each health center is designed to provide complete preventive public health services to a community of 200,000 to 250,000 people. Each center in turn may be supplemented by "satellite" clinics distributed throughout the community, to provide examination and/or treatment services. Community health clinics are subordinate in size and extent of service to district health centers.

The health center plan is based upon the earlier plan prepared by the Health Department with the aid of consultants. The Plan in this report proposes some modifications to the earlier plan and has been worked out by the City Planning Commission in consultation with the Health Department. It proposes 10 health centers, of which 5 are located at district centers. (See Map 18)

Satellite clinics are located in schools, housing projects, or social agencies as needed. Fifteen are now in or near the community centers proposed in the Comprehensive Plan. It is proposed that the community center plan be used as a guide for their location in the future.

Other Community Facilities

Plans have been developed for police and fire stations and for public welfare institutions by their respective departments. It is not proposed that these facilities be integrated into the district or community centers.



◆ MAP 17—LIBRARY PLAN

The Plan proposes 13 new community libraries in addition to 28 existing ones: a future total of 41. Each will be at or near a community center. Six district libraries are proposed at district centers. Three special libraries already exist.

- EXISTING COMMUNITY LIBRARY
- PROPOSED COMMUNITY LIBRARY
- PROPOSED DISTRICT LIBRARY
- ▲ EXISTING SPECIALIZED LIBRARY

0 5,000 10,000 15,000 20,000 FEET

MAP 18—HEALTH CENTER PLAN ◆

The Plan proposes 3 new health centers at district centers to complete a city-wide system of 10 health centers. Already 7 health centers exist, 2 of them at district centers.

- EXISTING HEALTH CENTER
- PROPOSED HEALTH CENTER

0 5,000 10,000 15,000 20,000 FEET



THE PLAN FOR RESIDENCE

City's total residential space to be increased to 26,470 acres by 1980... Use of density standards to result in 660,000 dwelling units, sufficient to house an estimated 1980 population of 2,250,000... Clearance proposed for 158,000 dwelling units, 116,000 of them to meet other development needs of City, 42,000 because they are substandard... Five and one-half square miles to be substantially rebuilt, 15 square miles to undergo limited rebuilding, and 11 square miles, intensive conservation... 180,000 new units to be built, 38,000 gained through conversion.

Just as each of the other parts of the Plan has a particular objective, differing from but related to the objectives of the chapters next to it, this proposal for residential areas has aims distinctly its own but contributing to the over-all scheme. Its purpose is to promote and maintain a good living environment for all residents of the City.

The fundamental objective of a Residential Plan is the establishment and maintenance of a good environment for all residential areas of the City to the end that the demands of a healthy variety of income and social groups are met within the City.

This Residence proposal may be broken down into three subdivisions:

- 1. A Plan for Population Distribution. The purpose here is to set up an explicit city-wide policy that marks certain areas for residential use and determines through density standards how many people are going to live in them when they have been developed or redeveloped.*
- 2. The Encouragement of Community Groupings. This section of the Residence Plan establishes standards for the distribution of community facilities which will strengthen and reinvigorate community life within the City and make the neighborhoods more nearly self-sustaining units.*
- 3. A Policy for Housing Quality. The purpose here is to achieve standards of quality in the construction and maintenance of housing that exceed the minimum for health, safety, and livability. This section proposes a significant percentage of present housing for removal or rehabilitation.*

These three sections of the proposal are interdependent. A policy for housing quality outside any rational framework for population density would be meaningless. A residential density policy without reference to communities would fall short of meeting the Plan's objectives. Each part of this proposal takes on meaning in relation to the other parts.

HOUSING CONDITIONS IN PHILADELPHIA: Philadelphia is an old city, and this fact is reflected in the condition of its housing. Nearly one-third of its dwellings are more than 60 years old. Decay associated with age has become a major problem.

Of the nearly 600,000 dwelling units in Philadelphia in 1950,

over 25,000 were dilapidated. Among the non-dilapidated units over 46,000 lacked a private toilet or bath.

According to the National Housing Inventory, a sample census taken in 1956, the number of dilapidated dwelling units in the City had decreased to 21,000 by December, 1956, while non-dilapidated units with no private toilet or bath declined to 29,600.

Special tabulations of the 1950 Census prepared by the Bureau of the Census reveal that one-third of the dilapidated units were of one to three rooms in size and that 85 per cent of the dilapidated units were renter occupied.

The standards used by the Bureau of the Census to determine "dilapidation" consider weather tightness, the extent of disrepair, hazards to safety, and inadequate or makeshift construction. They do not consider such sub-standard conditions as inadequate light or ventilation, inadequate heating or electrical system, rooms of less than minimum legal size, or inadequate lot area.

Age of Housing in City and Suburbs. City boundaries have not changed since 1854, but development has moved outward from the original area of Philadelphia. Since 1930, the suburban counties have exceeded the City in volume of new construction, largely because of their supply of buildable vacant land. Over 80 per cent of all dwelling units in the City were built before 1930; some 200,000 of these date from the 19th Century. By contrast, more than half of all the dwellings in the suburbs were built after 1930.

In each decade since 1930, more dwellings have been put up in the counties immediately adjoining Philadelphia than in the City itself. As a result, housing in the City is becoming increasingly aged compared to suburban housing.

Housing Types in Philadelphia. Fifty-seven per cent of Philadelphia's housing supply in 1950 was composed of row houses, reflecting the concentration by builders of many generations on this dwelling type. Twin houses and duplex units accounted for 17 per cent of the housing supply; 22 per cent were apartment units and only four per cent detached houses. The extreme concentration on row and twin houses is unusual; even

Baltimore, Washington and Boston have greater proportions of detached houses.

The 600,000 dwelling units in 1950 occupied about 440,000 residential structures.

Recently a change has occurred in the dwelling types built in the City. Between 1954 and 1956, some 18 per cent of the privately built dwellings in the City were single-family detached houses; 41 per cent were twin houses, and only 25 per cent

were row houses. Apartment buildings, other than in public housing, comprised only 7 per cent of new construction.

Changes in the Housing Supply. The Philadelphia Metropolitan Area had a net increase of 225,000 dwelling units between April, 1950, and December, 1956, according to the National Housing Inventory, with 82 per cent of the increase located in the seven suburban counties. The average annual increase was 27,600 dwellings in the suburbs, but only 6,100 in

the City. By the end of 1960 it can be predicted that the suburbs will contain more dwellings than the City.

New construction in the Metropolitan Area added 234,000 units, of which 45,000, or 19 per cent, were in the City. Conversions added another 30,000 units, two-thirds of which were in the City. New construction thus provided 95 per cent of the suburban increase, but only 70 per cent of the City's increase.

Removals from the housing supply totaled 24,000 units in

TABLE 29—HOUSING QUALITY IN PHILADELPHIA: 1950 AND 1956

CONDITION	NUMBER OF UNITS	
	1950	1956
NON-DILAPIDATED:		
Private Toilet and Bath and Hot Running Water	501,311	572,409
Private Toilet and Bath and Cold Water Only	6,143	5,211
Running Water; Lacking Private Toilet or Bath	46,231	29,619
No Running Water	620	0
DILAPIDATED:		
Private Toilet and Bath and Hot Running Water	9,922	10,733
Lacking Hot Water, Private Toilet or Bath	15,340	10,029
Not Reported	19,928	12,680
Total Dwelling Units	599,495	640,681

TABLE 30—AGE OF HOUSING: 1956

YEAR BUILT	PHILADELPHIA		SEVEN SUBURBAN COUNTIES	
	NUMBER OF UNITS	PER CENT OF REPORTED UNITS	NUMBER OF UNITS	PER CENT OF REPORTED UNITS
1950-56	45,000	7	190,000	30
1940-49	45,000	7	88,000	14
1930-39	25,000	4	41,000	7
Pre-1930	506,000	82	302,000	49
Sub-Total	621,000	100	621,000	100
Not Reported	20,000	—	16,000	—
Total Existing Units	641,000	—	637,000	—

TABLE 31—DWELLING TYPES IN PHILADELPHIA: 1950

DWELLING TYPE	NUMBER OF UNITS	PER CENT OF TOTAL
Single-family detached houses	22,657	4
Row houses	340,303	57
Single-family and duplex twin houses	50,115	8
Detached and row duplex units	54,396	9
3 and 4 family multiple dwellings	58,725	10
5 or more family multiple dwellings	73,299	12
Total	599,495	100

the City and 15,000 in the suburbs; in both areas the number of dwelling units removed by all causes was greater than the number added through conversions. Mergers of two or more units into a smaller number of units are responsible for 11,000 removals from the City's housing supply. These mergers rarely show up in building permit statistics, because they usually do not involve structural changes, but only removal of cooking facilities from a rented room or floor in a house. During the post-war housing shortage, many such temporary rental units were created. It can be seen from this that the City's housing supply has some flexibility in quantity, even without new construction.

Rising Vacancy Rate. The City's vacancy rate rose from 14,800 dwelling units, or 2½ per cent of the supply, in 1950, to 41,000 units, or 6 per cent, in December, 1956. A notable finding of the 1956 National Housing Inventory was that 20 per cent of the dilapidated units in the City were vacant, indicating that many lower income families have managed to move out of the poorest-quality housing.

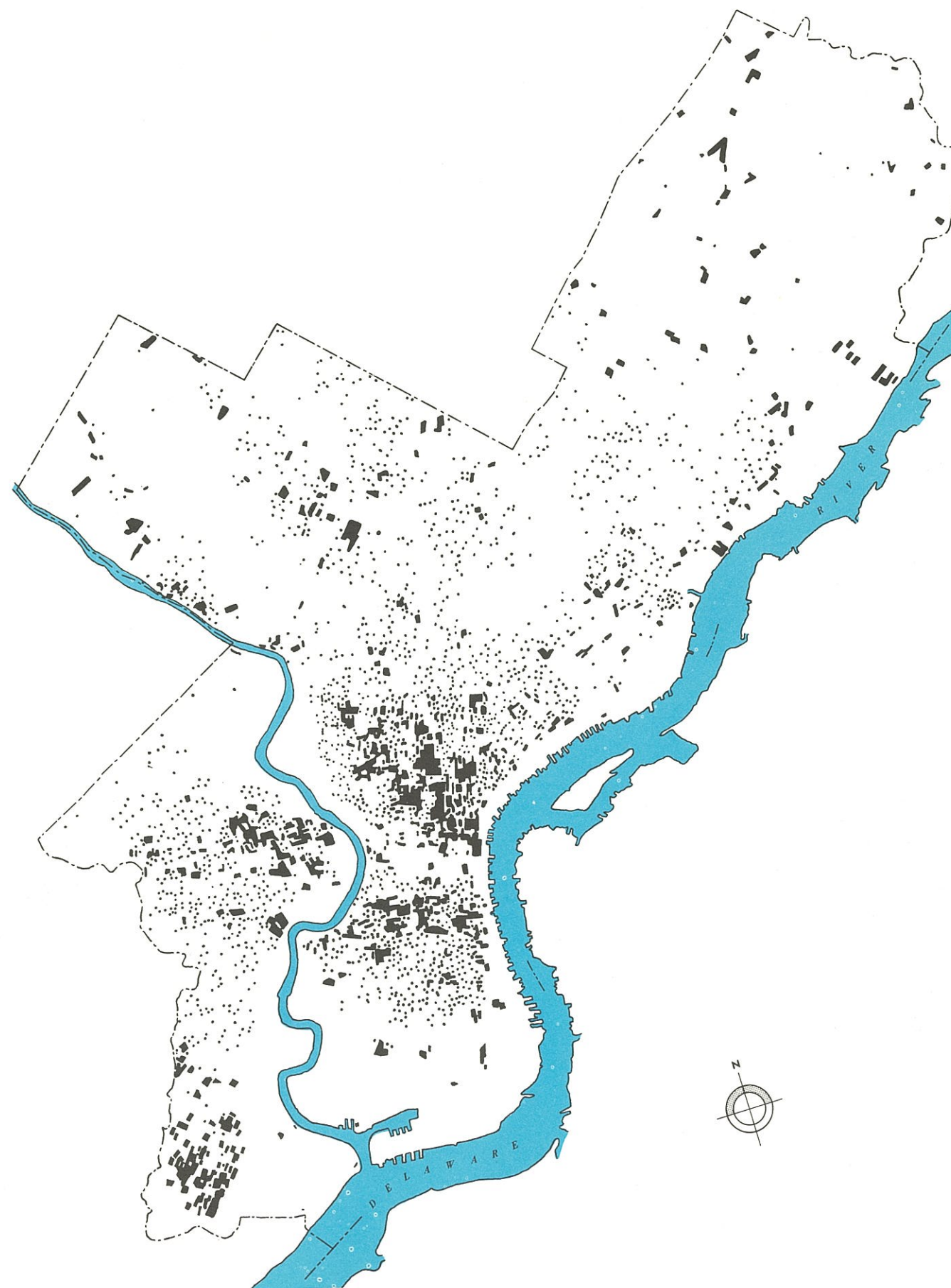
The present high vacancy rate represents a waste of public and private investment. Some percentage of vacancies is normal and desirable in order to provide reasonable choice of housing accommodations, but a rate of 4 per cent is considered adequate. On the other hand the present high rate presents an opportunity because it eases the problem of relocation of families displaced by clearance and redevelopment.

Home Ownership Increasing. City families who owned their homes in 1950 number 328,000 or 56 per cent of the total. Sixty-two per cent of the white families and 29 per cent of the Negro families were home-owners. By 1956, there were 367,000 home-owning households, or 61 per cent. Home ownership by white families had increased to 66 per cent, and by Negro families, to 43 per cent.

For most families, the home is their largest single investment. Thus, improvement of the residential areas of the City has economic importance as well as a gain in the quality of City living.

Value of Housing. In 1950 the Metropolitan Area contained 514,000 owner-occupied one-family dwelling units and 372,000 renter-occupied units, the remaining units being either vacant or other types of owner-occupied dwellings. The City contained 53 per cent of the owner-occupied dwellings and 68 per cent of the rental units. Significant differences exist between the City and its suburbs with respect to value and rent-level of the housing supply.

Of the owner-occupied dwellings, the City contained 62 per



MAP 19—HOUSING DILAPIDATION
1950 BY BLOCK

Of 600,000 dwelling units in 1950, over 25,000 were dilapidated; 46,000 lacked a private toilet or bath. One-third of the dilapidated units were of one to three rooms in size; 85 per cent were renter occupied.

PER CENT OF UNITS DILAPIDATED

- 10% OR MORE OF DWELLING UNITS
- 0.1-9.9% OF DWELLING UNITS

0 5,000 10,000 15,000 20,000 FEET

MAP 20—BUILT UP AREAS BY AGE
OF DEVELOPMENT

Eighty per cent of the dwelling units in the City were built before 1930; one-third were built before 1900. Since 1930 suburban counties have exceeded the City in volume of new construction; as a result, housing in the City is becoming increasingly aged compared to suburban housing.

- before 1800
- 1800-1849
- 1850-1899
- 1900-1919
- 1920-1944
- 1945-1960

0 5,000 10,000 15,000 20,000 FEET

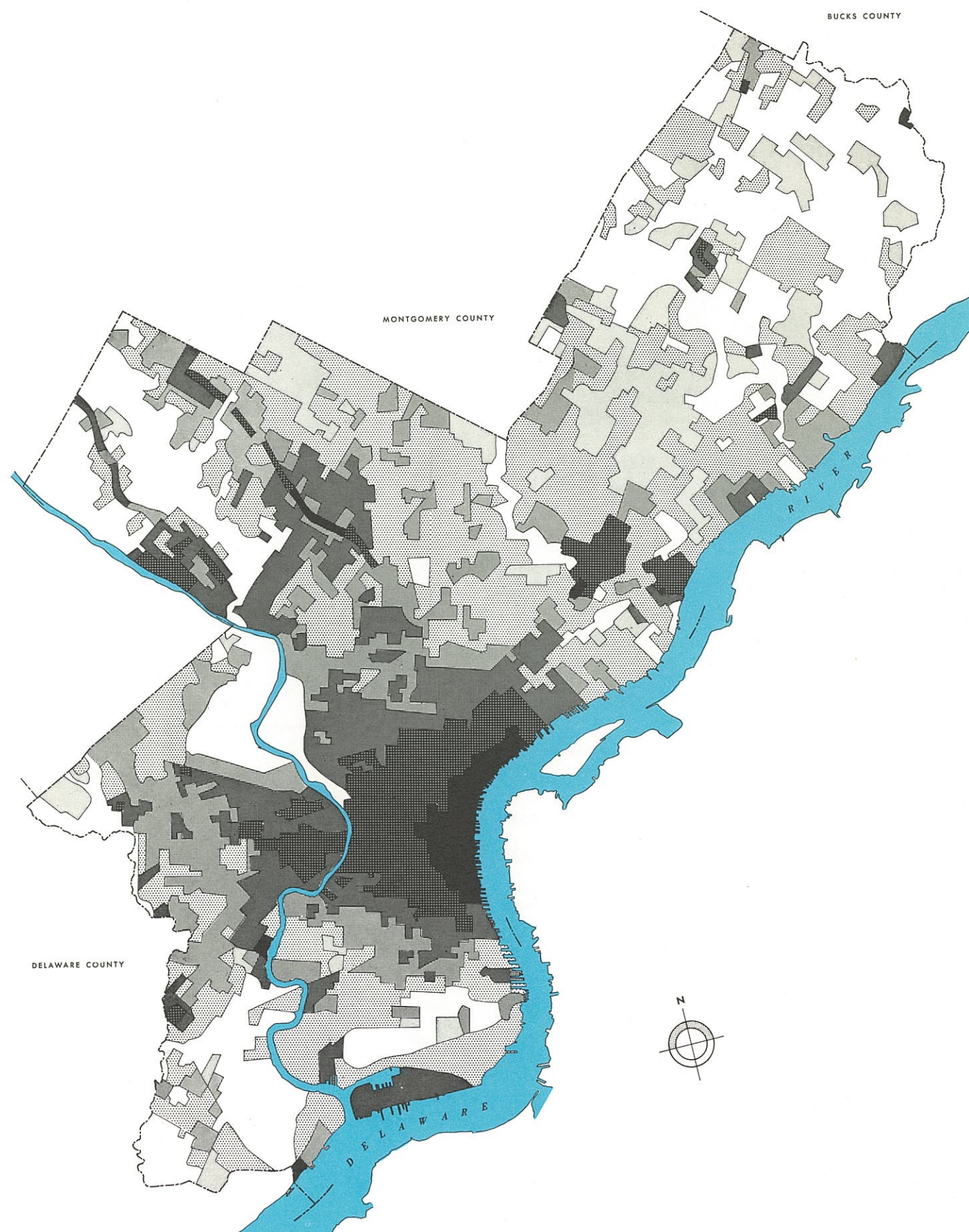


TABLE 32—CHANGES IN HOUSING SUPPLY: 1950 TO 1956

	NUMBER OF DWELLING UNITS		
	STANDARD METROPOLITAN AREA	PHILADELPHIA	SEVEN SUBURBAN COUNTIES
Total Dwelling Units 1950	1,053,000	600,000	453,000
New Construction	234,000	45,000	189,000
Conversions of Residential Units	23,000	15,000	8,000
Conversions from Non-Residential Units	7,000	5,000	2,000
Total Additions	264,000	65,000	199,000
Mergers	16,000	11,000	5,000
Conversions to Non-Residential Use	13,000	8,000	5,000
Demolitions and Abandonment	10,000	5,000	5,000
Total Removals	39,000	24,000	15,000
Net Increase 1950-1956	225,000	41,000	184,000
Total Dwelling Units 1956	1,278,000	641,000	637,000

TABLE 33—OWNER-OCCUPIED DWELLING UNITS BY VALUE: 1950

VALUE	NUMBER OF ONE FAMILY DWELLING UNITS	
	PHILADELPHIA	SEVEN SUBURBAN COUNTIES
\$20,000 and over	4,500	17,600
15,000—19,999	5,800	20,700
10,000—14,999	35,000	61,200
5,000—9,999	173,200	109,600
Under \$5,000	54,200	31,600
Total	273,600	240,700

TABLE 34—RENTER-OCCUPIED DWELLING UNITS BY GROSS MONTHLY RENT: 1950

MONTHLY RENT (INCLUDING UTILITIES)	NUMBER OF DWELLING UNITS	
	PHILADELPHIA	SEVEN SUBURBAN COUNTIES
Over \$100	7,000	4,500
\$75—99	12,900	12,400
50—74	61,000	41,100
25—49	152,800	55,300
Under \$25	18,700	7,200
Total	251,400	120,500

TABLE 35—FAMILY INCOME: 1949 AND 1956 (1956 DOLLARS)

INCOME RANGE	YEAR	PHILADELPHIA		SEVEN SUBURBAN COUNTIES		STANDARD METROPOLITAN AREA	
		FAMILIES NUMBER	%	FAMILIES NUMBER	%	FAMILIES NUMBER	%
\$10,000 and Over	1956	42,000	7	75,000	13	117,000	10
	1949	30,000	5	34,000	9	64,000	7
\$7,000—9,999	1956	70,000	12	119,000	20	189,000	16
	1949	41,000	7	36,000	9	77,000	8
\$4,000—6,999	1956	241,000	40	256,000	44	497,000	42
	1949	188,000	33	148,000	38	336,000	35
Under \$4,000	1956	247,000	41	133,000	23	380,000	32
	1949	314,000	55	175,000	44	489,000	50
All Ranges	1956	600,000	100	583,000	100	1,183,000	100
	1949	573,000	100	393,000	100	966,000	100

cent of those valued at less than \$10,000, 37 per cent of those valued at \$10,000 to \$15,000, and only 21 per cent of those valued at \$15,000 or more. These higher-cost houses constituted 4 per cent of the City's owner-occupied dwellings, but were 16 per cent of the suburbs' supply. Dwellings valued at less than \$5,000 were greater in number and proportion in the City, but the contrast between City and suburbs was not so great in this lowest value group as in the \$15,000 and over category.

The City contained more than twice as many rental units as did the suburbs, but although the City's rental supply included three-quarters of all units renting for less than \$50, the City also contained half the units renting for \$75 to \$100 and 60 per cent of the units renting for \$100 or more. These figures suggest that the City has an advantage over the suburbs in attracting apartment renters because many of these people are seeking locations convenient to urban activities. A notable feature of construction in the City since 1950 has been the addition of several large apartment houses in the Center City and in outlying areas of the City.

Recent Trends in Housing Value. The value of all one-family dwelling units purchased in 1955 and 1956 in the Metropolitan Area including both new and old houses shows great differences between City and suburbs. Among dwellings costing \$20,000 or more, only 4 per cent were in the City; of dwellings costing \$10,000 to \$20,000, 25 per cent were in the City; of dwellings costing less than \$10,000, 60 per cent were in the City.

Considering only the newly-built dwellings purchased in 1955 and 1956, 99 per cent of those valued at \$20,000 or more were in the suburbs, as were 81 per cent of those costing from \$10,000 to \$20,000. All of those valued at less than \$10,000 were in the suburbs, suggesting that City building standards are preventing the construction of new but low-quality housing which will deteriorate quickly.

Recent Income Trends in Philadelphia. Using 1956 dollar value, half the families in the Metropolitan Area had incomes of less than \$4,000 in 1949; by 1956 only a third of them were in this income group. More significant than percentage changes was the change in the number of families in each income group; the number of below \$4,000 families dropped by 135,000. Middle-income families making \$4,000 to \$10,000, increased by 200,000, and families earning \$10,000 or more increased by 40,000.

The income shifts experienced in the Metropolitan Area were not proportionately distributed between the City and the suburbs. Suburban high-income families increased in number by 100 per cent, while in the City they increased by only 25 per cent. In 1956 almost twice as many low-income families, making less than \$4,000, lived in the City as in the suburbs, and

almost twice as many high-income families, making \$10,000 and over, lived in the suburbs as in the City.

These figures indicate that although the suburban families have done well economically, City families have also enjoyed increasing incomes; consequently, a higher proportion of City families can afford good quality housing than could in 1949. Superficially, it might appear that the City's long-range position is improved by the rise in family income. Such a conclusion overlooks the greater age and obsolescent qualities of City housing compared to housing in the suburbs. As more families move into middle and upper income brackets, they may move outside the City if they find its residential areas unattractive.

The implicit question is whether the City can make its residential areas sufficiently attractive to retain the greater part of its middle and upper-income families and attract suburban families of this group back into the City. An answer is undertaken in the sections that follow.

The Residential Area Plan

Philadelphia must meet the demands for transportation, and for industrial, commercial and institutional development thrust upon it in its role as the central city in a large and growing metropolitan area. Meeting these demands is essential both for the health and efficiency of the Region and for the economic well being of the City itself. The requirements for industrial, commercial, and institutional development have been set forth in earlier chapters. Transportation requirements are spelled out in the succeeding chapter.

Since residence is presently the largest user of land in the City, residential areas bear the brunt of the readjustments in land use proposed. (See Table 36.)

Yet, in contradistinction to these regional demands, there remains the important requirement of meeting the needs of the City's present and future population in residential areas of adequate size and quality.

The plan for residential areas aims at a balance between these conflicting objectives. It seeks to meet the regional and local needs for non-residential activities within a framework that will promote at the same time an improved residential environment. It aims to effect the necessary readjustments at a pace that can be sustained without violent dislocations to either the population or the economy.

Present and Future Residential Land. In 1950, 20,515 acres of land were devoted to housing. Including streets and uses associated with the residential environment (e.g. churches), 34,000 acres or 52% of the developed area of the City was used residentially.

By 1980 it is proposed that 41,000 acres be used residentially or 48% of the developed area, a significant proportionate

reduction despite the absolute increase in residential acreage. Of this 41,000 acres, an estimated 26,470 net acres will be devoted to housing *per se*.

Of most significance in this readjustment is the actual removal of residential uses totalling 3,185 acres and the transfer of this land to other uses.

This estimate derives from a careful use by use study in the 12 planning analysis sections (See Map 21) of the effects of the other requirements of the Comprehensive Plan.

The largest proposed re-user of present residential land is industry: 1,085 acres. As described in the chapter on Industry, this is necessary to meet the needs for industrial expansion, for new sites in areas of demonstrable demand, and for parking, loading, and access to existing industry. These readjustments are essential to the City's (and therefore its population's) economic future. Most of this land is in areas of presently mixed use and low quality residential environment. Hence the twin ends of improving the City's economy and eliminating poor residential areas are met by this proposal.

The second largest re-user is commerce: 805 acres. All of this is proposed to meet the requirements for commercial areas set forth in the chapter on Commerce. A substantial part of this land would be used to meet the needs for parking at the proposed shopping centers, a necessity if the City is to retain its customers in competition with the new intermediate and regional shopping centers in the suburbs, and is to provide its citizens with a reasonable level of amenity for this important activity.

Transportation improvements will require 420 acres, mostly for expressway construction. In the chapter on Concepts the importance of the transportation system in the structure of the Region was made clear. Achieving the potential for economic growth set forth in the chapters on Economy, Industry, and Commerce depend in large measure upon development of the expressway system. Finally, the livability of the City's residential areas depends upon the diversion of traffic from local streets to arterials and expressways.

Execution of the Recreation Plan will require removal of 435 acres from residential use. This is the most important single step in raising the quality of the residential environment.

Closely related to recreation space is the need for additional land for public schools and for institutions such as the universities. These will require 155 and 285 acres of residential land respectively.

In sum then, 3,185 net acres presently in residential use would be cleared and converted to a series of other uses. This land presently supports 116,000 dwelling units, housing an estimated 350,000 persons. Of this total 1,890 acres are for the purpose of meeting the demands of the local and regional

The Plan for Residence continued

TABLE 36—RESIDENTIAL ACREAGE, DWELLING UNITS, AND POPULATION REMOVED BY CHANGES IN LAND USE: 1950—1980

PLANNING ANALYSIS SECTION	ITEM	INDUSTRY	COMMERCE	REMOVALS BY FUTURE RE-USE				TOTAL REMOVALS
				TRANSPORTATION	RECREATION	INSTITUTIONS	PUBLIC SCHOOLS	
A Central Philadelphia	Acres	20	35	5	5	15	5	85
	Dwelling Units	600	1,600	100	250	750	200	3,500
	Population	1,500	4,100	300	750	1,900	450	9,000
B South Philadelphia	Acres	100	70	55	75	15	25	340
	Dwelling Units	5,000	3,400	2,750	3,100	750	1,250	16,250
	Population	16,200	11,200	9,300	10,500	2,500	4,300	54,000
C Southwest Philadelphia	Acres	70	30	25	30	5	10	170
	Dwelling Units	1,500	900	750	450	50	350	4,000
	Population	4,900	3,200	2,800	1,500	200	1,150	13,750
D West Philadelphia	Acres	60	210	60	90	100	25	545
	Dwelling Units	2,150	7,350	2,000	3,100	3,400	1,000	19,000
	Population	7,100	2,400	6,600	10,500	11,000	3,400	41,000
E Lower North Philadelphia	Acres	305	110	95	75	100	40	725
	Dwelling Units	10,000	5,500	4,800	4,500	6,150	2,300	33,250
	Population	30,000	16,500	14,000	14,000	18,500	7,000	100,000
F Upper North Philadelphia	Acres	160	50	80	35	5	10	340
	Dwelling Units	6,500	2,100	3,300	1,300	300	500	14,000
	Population	21,450	6,900	10,900	4,300	850	1,600	46,000
G Kensington	Acres	100	60	20	30	5	10	225
	Dwelling Units	4,000	2,500	900	1,500	100	500	9,500
	Population	13,200	8,250	2,800	5,000	350	1,650	31,250
H Roxborough-Manayunk	Acres	5	15	5	5	5	10	45
	Dwelling Units	150	350	150	50	50	250	1,000
	Population	500	1,500	500	150	150	950	3,750
I Germantown Chestnut Hill	Acres	10	55	5	20	25	9	120
	Dwelling Units	350	1,600	100	700	600	150	3,500
	Population	1,100	5,200	300	2,300	1,850	500	11,250
J Olney-Oak Lane	Acres	25	65	30	30	5	10	165
	Dwelling Units	850	1,850	900	600	200	350	4,750
	Population	2,750	6,250	3,000	1,800	700	1,000	15,500
K Near Northeast	Acres	80	95	25	10	5	5	220
	Dwelling Units	2,000	2,300	600	300	150	150	5,500
	Population	6,500	7,800	2,000	1,200	500	500	18,500
L Far Northeast	Acres	150	10	15	30	—	—	205
	Dwelling Units	1,400	50	150	150	—	—	1,750
	Population	4,800	200	500	500	—	—	6,000
CITY	Acres	1,085	805	420	435	285	155	3,185
	Dwelling Units	34,500	29,500	16,500	16,000	12,500	7,000	116,000
	Population	110,000	73,500	53,000	52,500	38,500	22,500	350,000

TABLE 37—RESIDENTIAL ACREAGE: PHILADELPHIA, 1950 AND 1980

PLANNING ANALYSIS SECTION	NET ACRES 1950	REMOVALS	1950 ACRES REMAINING	ADDITIONS	NET ACRES 1980
A	305	85	220	110	330
B	1,640	340	1,300	175	1,475
C	1,000	170	830	675	1,505
D	2,830	545	2,285	405	2,690
E	1,780	725	1,055	485	1,540
F	1,250	340	910	150	1,060
G	1,080	225	855	235	1,090
H	890	45	845	645	1,490
I	3,210	120	3,090	155	3,245
J	2,140	165	1,975	600	2,575
K	3,170	220	2,950	1,650	4,600
L	1,220	205	1,015	3,855	4,870
City	20,515	3,185	17,330	9,140	26,470

economy, 420 acres are for meeting the City's transportation needs both from the point of view of the economy and of improving the residential environment, 590 acres are to improve the residential environment directly, and 285 acres achieve the twin ends of improving residential areas and meeting the health and educational requirements of the community.

Future Residential Land. New land for the construction of housing can come either from development of vacant land or from the redevelopment of land in other uses. In 1950 there were 20,000 acres of vacant land in the City, 23 per cent of the entire City area. Much of this vacant land is required for non-residential uses. Large tracts in the Northeast and Eastwick adjacent to rail lines and the airports are designated for industrial use. A regional park in Roxborough is planned. After removing the vacant land designated for major non-residential uses, 11,500 acres of vacant land remain for residential development; this yields 8,000 acres of net residential land after streets and community facilities are developed.

A secondary source of new residential land is redevelopment of existing non-residential uses. These uses are of three types: institutional or semi-public land of low intensity development, e.g., the former Philadelphia Country Club site; clusters of obsolescent industrial or commercial activity which are blighting adjacent neighborhoods (such as the Dock Street market); and scattered small industrial or commercial uses found in residential areas throughout the City. Redevelopment of these uses will provide an additional 1,140 acres of residential land.

Table 37 shows comparative residential acreage in 1950 and

MAP 21—PLANNING ANALYSIS
SECTIONS

0 5000 10000 15000 20000 FEET



1980 by major sections of the City.

Map 22 shows the proposed residential areas and those to be removed from residential use.

The Residential Density Plan

In 1950 the average net residential density in the City was 29 dwelling units per acre. In individual Census Tracts density varied from less than one dwelling unit per acre to over 100 per acre. Population density (as distinct from dwelling unit density) averaged 101 persons per acre in 1950, ranging from one to over 250 per acre by Census Tract.

Map 23 shows residential densities in 1950. The dense development of the inner areas of the City stems from the pre-automobile era when most people either walked to work or travelled by public transit. Since 1920 mass automobile ownership, aided by rising family incomes, has made longer distances between home and work possible; cheap land at the edges of urban development has become available for subdivision, making low density housing economically feasible.

Density and Dwelling Type. There are limits to the density

at which particular dwelling types may be built. Detached houses are being built at densities of about 6 per acre, twin houses in the City at about 12 per acre. Row houses in the Near Northeast average 25 to the acre, while the "C-1" rows in the Far Northeast are developed at 15 to the acre.

Two-story "garden apartments" are usually built at 25 per acre: whereas, three-story "walk-up" apartments may reach 55 per acre. Elevator apartment buildings can be built at densities as low as that of single houses or as high as 500 dwelling units per acre.

Row houses were built in the past at densities of 35 to 55 per acre. Apartments created through the conversion of such row houses may have densities as high as 150 per acre.

Density Trends. Population in the old, inner areas of the City has tended to decrease since 1930, as Table 38 shows. In spite of new construction on vacant land at the edges of this inner area and the creation of new dwelling units through the conversion of large houses to apartments, the central area as a whole contains fewer people than in 1930. Some sections have a lower population than in 1910.

A number of factors has contributed to the decline in numbers of people and in residential density in the older areas of the City. Among them are the rise in family incomes, the decrease in average household size, the increasing decay of the older housing stock, the displacement of residence by industry and commerce. The demolition of some structures, the boarding up of others, the partial vacancy of still others has taken place in a haphazard manner that has accelerated the blight and the outflow of population.

The trend is clear. But a reduction in density occurring in the manner just described is quite a different thing than a planned and systematic reduction aimed at improving the residential environment. The "natural" reduction is as much a result of urban readjustment and reaction to blight as it is a conscious seeking out of lower density.

It is an objective of the Plan to reduce densities in a large part of the inner areas of the City, although in a few instances an increase in density is proposed. These density proposals, aimed at improving the residential environment within a ra-

tional pattern of varying densities, are distinct from the effects of change that have produced density decreases in a wasteful and blight-generating way.

Ways to Reduce Densities. There are ways to reduce densities which can bring positive improvements to the City's residential neighborhoods. They are

1. *net density reduction:* the existing dwellings are cleared, and a smaller number of new units are built on the cleared site;
2. *neighborhood density reduction:* by selective clearance of housing in a neighborhood, adequate space can be provided for parks, playgrounds, schools, and parking, thereby reducing gross density in the neighborhood even though the remaining net density is unchanged.

Density Policy. Philadelphia's approach to density planning is a combination of these methods, but major emphasis is given to neighborhood density reduction. Achieving the Recreation Plan throughout the City will introduce needed open space into older parts of the City where housing is basically sound and not deteriorated enough to warrant large-scale clearance. In badly deteriorated areas both rebuilding at lower densities and expansion of community facilities will occur.

Not every neighborhood requires reduction of residential densities. In some areas densities higher than those existing would be desirable; these are generally areas of convenient access to public transportation lines or major employment centers.

Proposed Density Pattern. The major factors influencing the density of development in an urban area are accessibility to employment and the other urban opportunities and the transportation system. The choice of a residential location for an individual or family is a compromise between the dwelling type and open space required and the time required to travel to places of employment, shopping, school and other community activities. Other factors, of which family income is the most important, but including for example the amenities of a particular location, also influence the place of residence, but these operate to modify the theoretical choice of locations available. The location of major employment centers and the mode of

TABLE 38—POPULATION IN CENTRAL AREAS OF PHILADELPHIA: 1910, 1930, 1950

PLANNING ANALYSIS SECTION	POPULATION		
	1910	1930	1950
A	89,267	55,859	51,792
B	336,134	357,755	310,144
C	41,820	108,490	109,857
D	206,108	303,146	330,286
E, F, G	688,161	692,729	681,420
Total	1,361,490	1,517,979	1,483,499
Remainder of City	187,518	432,984	588,106
Total City	1,549,008	1,950,961	2,071,605

MAP 22—RESIDENTIAL LAND USE PLAN

The Plan proposes a net addition of 5,955 acres to the 20,515 net acres which were used for residence in 1950. This net change is a result of building residences on 8,000 acres which are now vacant and on 1,140 acres which are now in non-residential use, and of clearing 3,185 acres of presently residential land in areas which the Plan identifies for future expansion of industry, commerce, recreation, institutions or expressways. Land for future residential use totals 26,470 acres.

- REMOVED FROM RESIDENTIAL USE
- FUTURE RESIDENTIAL LAND
- RESIDENTIAL TO REMAIN

0 5,000 10,000 15,000 20,000 FEET



TABLE 39—RESIDENTIAL ACREAGE AND DWELLING UNITS BY DENSITY RANGE: 1980

PLANNING ANALYSIS SECTION	DWELLING UNITS PER NET ACRE* RANGE	AVERAGE	NET ACRES	TOTAL DWELLING UNITS
A	40—59	50	70	3,500
	60 and over	65	210	13,500
	60 and over	200	50	10,000
			330	27,000
B	20—39	25	380	9,500
	40—59	50	1,030	51,500
	60 and over	75	65	5,000
		45	1,475	66,000
C	20—39	30	1,445	43,250
	40—59	45	60	2,750
		31	1,505	46,000
D	Under 20	10	365	3,750
	20—39	35	1,345	47,250
	40—59	45	855	38,500
	60 and over	75	125	9,500
		37	2,690	99,000
E	20—39	35	240	8,500
	40—59	50	1,220	61,500
	60 and over	75	80	6,000
		49	1,540	76,000
F	Under 20	10	120	1,250
	20—39	35	65	2,250
	40—59	45	810	36,000
	60 and over	70	65	4,500
		42	1,060	44,000
G	20—39	25	275	6,500
	40—59	45	740	33,250
	60 and over	70	75	5,250
		42	1,090	45,000
H	Under 20	10	1,230	12,500
	20—39	25	260	6,500
		13	1,490	19,000
I	Under 20	5	1,945	9,750
	20—39	30	1,065	32,000
	40—59	45	215	9,750
	60 and over	70	20	1,500
		17	3,245	53,000
J	Under 20	10	470	4,750
	20—39	25	1,985	49,750
	40—59	45	80	3,750
	60 and over	70	40	2,750
		24	2,575	61,000
K	Under 20	10	2,480	24,750
	20—39	25	2,060	51,500
	40—59	45	20	1,000
	60 and over	70	40	2,750
		17	4,600	80,000
L	Under 20	9	4,855	43,500
	20—39	30	15	500
		9	4,870	44,000
CITY	Under 20	9	11,465	100,250
	20—39	28	9,135	257,500
	40—59	47	5,100	241,500
	60 and over	78	770	60,750
		25	26,470	660,000

* Average net density (dwelling units per net acre) is based on the density of existing housing, where major changes are not proposed, and on proposed development in other areas.

transportation are, therefore, critical factors in determining density distribution.

In the four diagrams shown in Figure 20 these several factors are mapped to show how the basic density pattern underlying the plan was constructed. Figure a shows a series of rings of decreasing density from center out, the dominant pattern of density. Figure b shows the major sub-centers, each of which represents a node of higher density in the general field and each also having small rings of decreasing density. Figure c shows the rail transit stops, each of which represents an area of transportation advantage and is therefore a location of potentially higher density than its surrounding field.

In Figure d, all of these factors are superimposed in one diagram. This diagram represents a basic abstract pattern of relative density against which the Plan was prepared.

Density Standards. Preparation of the Plan itself required the establishment of a set of density ranges taking into account proposed new development as well as existing sound development.

Because density is closely related to housing type, the standards must be expressed in terms of housing types. These are set forth in Table 40.

The Density Plan. Map 24 shows the plan for residential densities in Philadelphia. This plan will allow 660,000 dwelling

TABLE 40—DENSITY RANGES AND DWELLING TYPES

DWELLING UNITS PER NET ACRE	TYPICAL DWELLING TYPES
Under 20	Single family detached house Single family twin house "C-1" single family row house Multi-family very low density, e.g. garden apartments
20-39	Duplex twin house Single family row house Multi-family low density, e.g. high rise apartment with low land coverage
40-59	Duplex row house Pre-1920 single family row house Multi-family medium density
60 and over	High rise apartments Multi-family row house

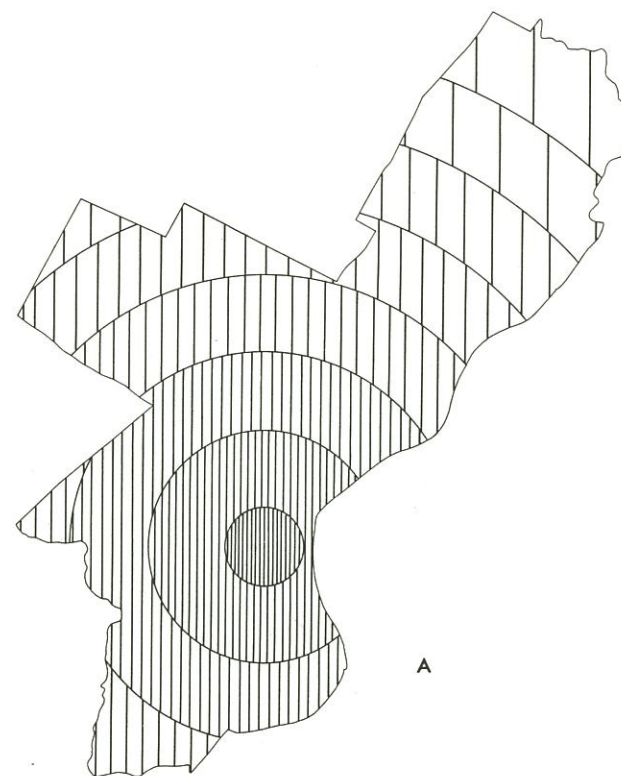
FIGURE 20—DENSITY—ITS BASIS IN
URBAN STRUCTURE

A. Density is highest at the dominant employment and transportation center and decreases with distance from the center.

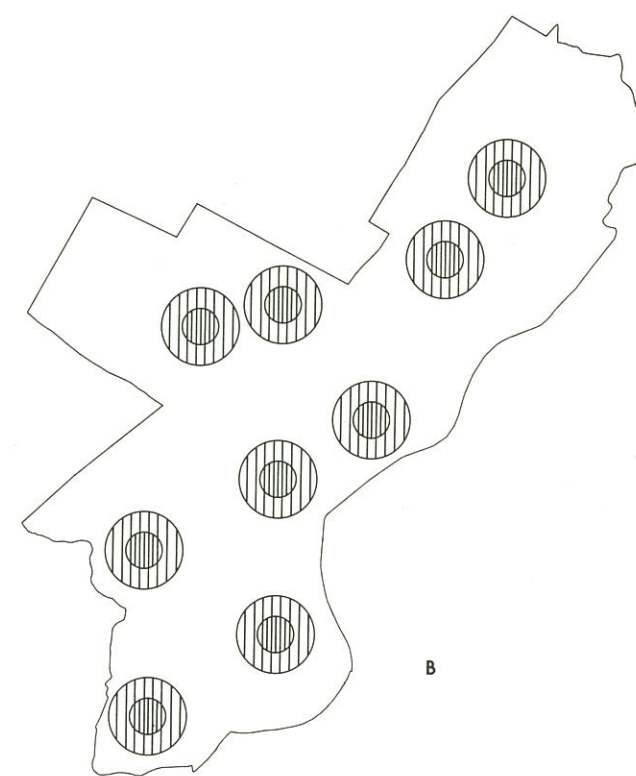
B. Sub-centers induce nodes of high density.

C. Rail transit stops create areas of transportation advantage which induce dense development.

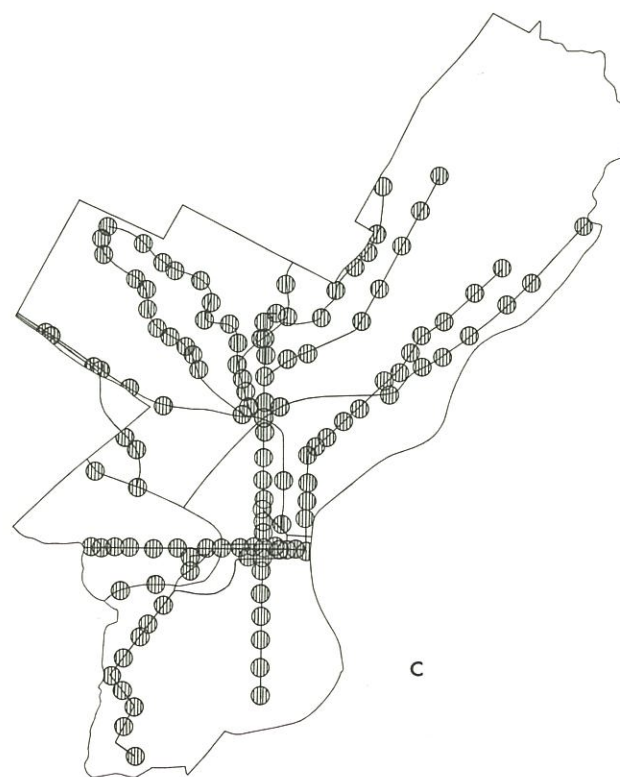
D. The combination of these factors produces a pattern of relative density.



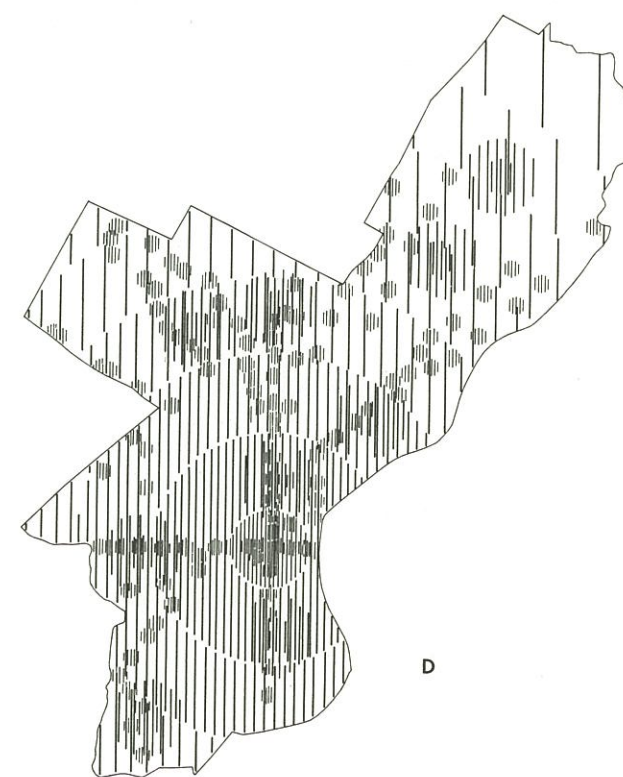
A



B



C

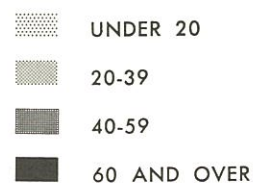


D

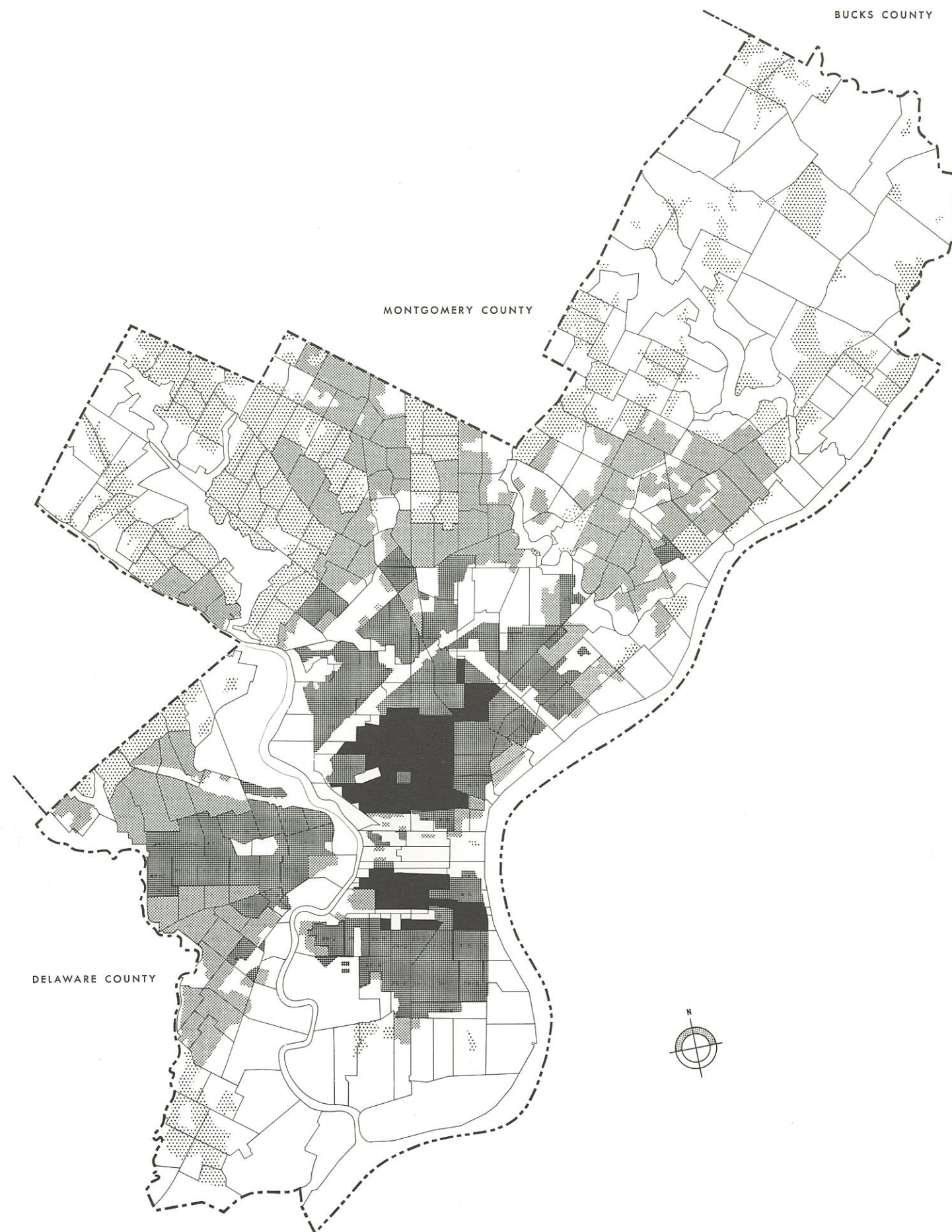
MAP 23—RESIDENTIAL DENSITY 1950
(BY CENSUS TRACT)

In 1950, dwelling unit density by Census Tract varied from less than one to over 100 units per net acre. Average density in the City was 29 units per acre. The dense development of inner areas dates from the pre-automobile era. Today, detached houses are built at 6 to the acre, twin houses at 12. Row houses and two-story "garden apartments" average 25 per acre, while "C-1" rows are developed at 15 to the acre. Three-story "walk-up apartments" may reach 55 per acre. Elevator apartments can be built at densities as low as those of single houses or as high as 500 units per acre. Row houses were built in the past at densities of 35 to 55 per acre; when converted to apartments, these structures may have densities as high as 150 dwelling units per acre.

DWELLING UNITS PER NET ACRE



0 5,000 10,000 15,000 20,000 FEET



MAP 24—RESIDENTIAL DENSITY PLAN

The Plan allows for a total of 660,000 dwelling units at an average density of 25 per acre. High density (60 and over) is planned for most of Center City, along subway lines, and other areas of special transportation advantage; high-medium density (40-59) within an area three miles from Center City and adjacent to commuter rail lines farther out; low-medium density (20-39) in an area three to six miles from Center City and adjacent to rail transit stops farther out; low density (under 20) in other areas of the City. Exceptions occur where existing development is good although at higher or lower density than optimum, where an institutional facility creates a special demand for housing, or where transportation facilities are not equivalent to those of comparable locations.

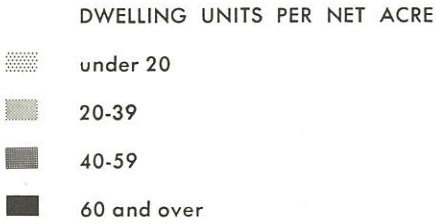


TABLE 41—RESIDENTIAL LAND, DWELLING UNITS, AND DENSITY:
PHILADELPHIA, 1950—1980

PLANNING ANALYSIS SECTION	1950			1980		
	NET ACRES	DWELLING UNITS	DWELLING UNITS PER NET ACRE	NET ACRES	DWELLING UNITS	DWELLING UNITS PER NET ACRE
A	305	17,250	57	330	27,000	82
B	1,640	82,500	50	1,475	66,000	45
C	1,000	29,250	29	1,505	46,000	31
D	2,830	96,250	34	2,690	99,000	37
E	1,780	111,250	62	1,540	76,000	49
F	1,250	49,000	39	1,060	44,000	42
G	1,080	42,000	39	1,090	45,000	42
H	890	10,500	12	1,490	19,000	13
I	3,210	36,000	11	3,245	53,000	16
J	2,140	53,500	25	2,575	61,000	24
K	3,170	67,250	21	4,600	80,000	17
L	1,220	5,250	4	4,870	44,000	9
CITY	20,515	600,000	29	26,470	660,000	25

TABLE 42—ESTIMATED POPULATION OF PHILADELPHIA: 1980

PLANNING ANALYSIS SECTIONS	DENSITY RANGE DWELLING UNITS PER NET ACRE	TOTAL DWELLING UNITS	PERSONS PER OCCUPIED UNIT*	HOUSEHOLD POPULATION	NON-HOUSEHOLD POPULATION†	TOTAL POPULATION
A Central Philadelphia	40—59	3,500	3.5	11,750		
	60 and over	13,500	2.7	35,000		
	60 and over	10,000	2.0	19,250		
		27,000	2.6	66,000	9,000	75,000
B South Philadelphia	20—39	9,500	3.7	33,750		
	40—59	51,500	3.5	173,000		
	60 and over	5,000	2.0	9,750		
		66,000	3.4	216,500	8,500	225,000
C Southwest Philadelphia	20—39	43,250	3.8	157,750		
	40—59	2,750	3.5	9,250		
		46,000	3.8	167,000	3,000	170,000
D West Philadelphia	Under 20	3,750	3.7	13,250		
	20—39	47,250	3.7	167,750		
	40—59	38,500	3.5	129,250		
	60 and over	9,500	2.0	18,250		
		99,000	3.5	328,500	19,500	348,000
E Lower North Philadelphia	20—39	8,500	3.8	31,000		
	40—59	61,500	3.5	206,500		
	60 and over	6,000	2.0	11,500		
		76,000	3.4	249,000	14,000	263,000
F Upper North Philadelphia	Under 20	1,250	3.7	4,500		
	20—39	2,250	3.6	7,750		
	40—59	36,000	3.5	121,000		
	60 and over	4,500	2.0	8,750		
		44,000	3.3	142,000	3,000	145,000
G Kensington	20—39	6,500	3.6	22,500		
	40—59	33,250	3.5	112,000		
	60 and over	5,250	2.0	10,000		
		45,000	3.3	144,500	1,500	146,000
H Roxborough- Manayunk	Under 20	12,500	3.8	45,500		
	20—39	6,500	3.5	21,500		
		19,000	3.7	67,000	1,000	68,000
I Germantown- Chestnut Hill	Under 20	9,750	3.8	35,500		
	20—39	32,000	3.6	110,500		
	40—59	9,750	3.3	30,750		
	60 and over	1,500	2.0	2,750		
		53,000	3.5	179,000	5,500	185,000
J Olney- Oak Lane	Under 20	4,750	3.8	17,250		
	20—39	49,750	3.6	172,000		
	40—59	3,750	3.3	11,500		
	60 and over	2,750	2.0	5,250		
		61,000	3.5	206,000	2,000	208,000
K Near Northeast	Under 20	24,750	3.7	88,000		
	20—39	51,500	3.5	173,000		
	40—59	1,000	3.5	3,250		
	60 and over	2,750	2.0	5,250		
		80,000	3.5	269,500	6,500	276,000
L Far Northeast	Under 20	43,500	3.8	158,500		
	20—39	500	3.3	1,500		
		44,000	3.8	160,000	8,000	168,000
CITY	Under 20	100,250	3.8	362,500		
	20—39	257,500	3.6	899,000		
	40—59	241,500	3.5	808,250		
	60 and over	60,750	2.2	125,750		
		660,000	3.5	2,195,500	81,500	2,277,000

* Vacancy rate is estimated at four per cent.

Persons per occupied dwelling unit is estimated on the basis of composition of dwelling supply, age of dwellings, and known population characteristics in sections of the City.

† Non-household population distribution in sections is estimated on the basis of known distribution in 1950 and expansion plans of institutions.

units, a ten per cent increase over the 1950 figure. Average density in the City will be 25 dwelling units per acre, a reduction from 29 per acre in 1950. A lower density is achieved through the reduction of density in the overcrowded areas which will be rebuilt and by development of vacant land at the edges of the City primarily for low density housing.

Not shown on Map 24 is the reduction of neighborhood density achieved through the provision of 700 acres of new recreation and community facilities in residential areas.

Briefly, the Plan proposes the following distribution of residential densities. *High density* (60 and over) in most of Center City, along the subway lines, and areas of special transportation advantage in Germantown and West Philadelphia; *high medium density* (40-59) in an area within roughly three miles of Center City and also adjacent to commuter rail facilities farther out; *low medium density* (20-39) in an area three to six miles from Center City and adjacent to rail rapid transit facilities farther out; and *low density* (under 20) in other areas of the City. Exceptions to this general statement occur where (1) the existing development is of good quality although at a higher or lower density than optimum for its location, (2) an institutional facility creates a special demand for housing in an area, or (3) transportation facilities are not equivalent to that of comparable location.

Table 41 presents the change in residential acreage, dwelling units, and density resulting from the residential land use and density plan.

Estimated City Population in 1980. The population within a city depends not only upon the supply of dwelling units to house people but also upon the vacancy rate, average family size, and the non-household population. These factors are only indirectly influenced by City actions. Changes in economic conditions or public preference can increase or decrease the population of the City. Stated below are the major assumptions and trends used to develop the 1980 population capacity estimate shown in Table 42.

Vacancy Rate. The past decade has seen a sharp rise in the vacancy rate of City housing, particularly in the dilapidated dwelling units. Because the Plan proposes the removal of substandard dwelling units and the rehabilitation of others it is assumed that the vacancy rate will drop to four per cent. This will allow a reasonable choice to those persons seeking housing without burdening landlords or sellers with a substantial proportion of unmarketable housing.

Average Family Size. Major factors influencing the average number of people per dwelling unit are (1) the increasing number and proportion of adult individuals and couples living in their own home, (2) the high birthrate of the past twenty years which has increased the average number of children per family,

(3) the level of economic prosperity, which affects the doubling-up of families within a dwelling, (4) the proportion of dwellings occupied by non-whites, who have a higher population per household, and (5) the cycle of occupancy within a dwelling as children grow up and then form their own families, leaving only the parents in the family home.

Because real incomes are expected to continue to rise over the next twenty years and because the City has special attractions for the adult person or couple without children it is estimated that the proportion of one and two person households in the City will increase slightly from 36 percent in 1950 to 42 percent of all households in the City. Among households of three or more persons the distribution will be more even than in recent decades, i.e., the percentage of large families will be higher. Households of 3 or more persons will be composed increasingly of families with children, rather than groups of adults sharing a home.

Single-family dwellings built during the next two decades are estimated to have a higher population per unit than today's average because the majority of these families will be those with children at home.

Non-Household Population. The "non-household" population is composed of people living in large rooming houses and hotels, college dormitories, homes for the aged, and similar accommodations. It is expected that the population in rooming houses will decline due to greater economic prosperity but that the population in college dormitories and homes for the aged will offset this decline.

Future Population. Using the assumptions set forth above, the population of the City can be estimated at 2,277,000 people upon execution of this Plan. This checks closely with the estimate of 2,250,000 persons stated in the chapter on the City and Its People, the working figure on which the requirements of the Plan are based.

The residential area and density plan will result in a decrease of population density per net residential acre from 101 in 1950 to 85 in 1980.

The Organization of Residential Areas

It has long been recognized that big cities do not provide their residents with the same degree of civic identity found in small communities. It is believed that one reason underlying the rapid growth of suburban communities is the opportunity they provide for citizens to play a direct role in community life.

In Philadelphia many residential areas do provide some sense of community. Such names as Germantown, Oak Lane, or Oxford Circle are recognized as describing particular areas within the City. There are, in fact, more than 50 such local areas. Starting with this well-established natural pattern, it

should be possible to enhance the feeling of community within Philadelphia, preserving at the same time the advantages of living in a metropolitan center.

Physical elements which can be used to promote a feeling of community are arterial streets (which provide boundaries), shopping areas and community facilities (which provide places where residents of an area come in contact with one another).

Proposed Residential Organization. Three functional levels of residential units are proposed for the City. They are the neighborhood, the community, and the district, each level serving a larger area within the City and each designed to foster a progressively wider sense of "community".

The Neighborhood—Its Size and Facilities. Properly understood, the neighborhood is a small territorial unit of known size and population which can be used as a framework for rational and effective planning in residential areas. Its principal elements are the nucleus, i.e. the focus of community life, and the boundary.

The internal character of the neighborhood is determined by its social purpose, which is to provide a healthful environment for family and personal life. The ideal neighborhood will be that area protected from the hazards of traffic and other disturbing influences, within which are located the facilities necessary for primary group living such as the elementary school, indoor and outdoor recreation, a community building for youth and adult assembly. Insofar as possible, these facilities will be located in such a way as to complement each other, comprise a community center, ensure convenient access, and stimulate participation in group life by all residents.

Institutions belonging to the focus should, of course, be located as close to the geographical center as possible. On the other hand, facilities belonging to higher levels of community, for example district parks, swimming pools, branch libraries, and the like, are better located off center or in centers at the next higher level in the hierarchy to make them more accessible.

Because the neighborhood must be free of traffic, it will find its most frequent boundary in the arterial street. From this it follows that the size of the neighborhood depends on arterial spacing. As spacing varies in different parts of the City, the size of the neighborhood must also vary.

The question arises as to how close arterials can be without impairing the function of residence which is to take place between them. In other words, how small can a neighborhood be? The answer requires consideration of both the penetration of noise, dirt, and fumes, and the danger to children of injury by automobiles. For typical medium density residential areas, a distance of 3 city blocks between major arterials (about 0.19 or $\frac{3}{16}$ miles) is considered minimum to ensure health. A distance of half a mile is desirable to protect children from the

hazards of arterial traffic. With such spacing in the denser areas of the City, at least, no children should have to cross arterials to reach an elementary school or playground.

The opposite question is how large can neighborhoods be without discouraging motorists from using arterials rather than local streets for long trips. In this regard, spacing at 0.7 miles would appear to be the maximum tolerable distance; while 0.5 miles is necessary for convenient transit access.

The conclusion of these investigations is that in order to fulfill its purpose adequately the neighborhood should not be smaller than 0.2 miles, nor larger than 0.7 miles in either of its two dimensions. Areas smaller than 0.2 miles in one dimension should be assigned to non-residential use, or non-family residential use. Areas larger in one dimension than 0.7 miles should be reduced through their bounding arterials, or by some other means.

The Community. The community is comprised of several neighborhood units and contains a wider range of facilities. Population may range from 25,000 to 50,000. Facilities for the community include indoor recreational facilities either in a secondary school or recreation center, and outdoor facilities, at a playfield. A branch library will be located at the shopping center, which may be of either the local or intermediate level, depending on the population served. Semi-public and private community service agencies should also be encouraged to locate at the center.

The District. The district would be made up of several communities and would provide for the decentralization of certain city-wide facilities, making them more accessible. The center of the district would be in a major shopping area at a hub of transportation. Public facilities would include a district health center, a regional library, and a branch administrative center. Branch centers would include district offices of such City departments as Streets, Surveys, Licenses and Inspections, and Health. These departments now operate district offices which are for the most part scattered in each district. Branch centers could provide services more conveniently than is possible with

the present dispersal and would create an identifiable focus of activity. Population of the district would range from 150,000 to 300,000 people.

The Plan proposes the creation of ten districts, within which are 56 communities. (See Map 25.) The facilities located at the centers of these districts and communities are discussed more fully in the chapter on Community Facilities.

Below the Neighborhood Level. In terms of the individual family, residential organization does not start at the neighborhood level but at the block. Public recreation areas, such as playgrounds or small parks, are generally considered to serve the neighborhood as a whole, but the greenway concept distributes open spaces to sub-areas of a neighborhood while organizing the facilities of the neighborhood.

The greenway is a strip of open space, usually containing a pedestrian walkway, connecting residential areas with local community facilities, such as a church or school. At some points along its length the greenway may consist of a paved walkway shaded by trees; at other points it may be much wider, planted in grass and shrubs, with a narrow walkway running through it.

Greenways are needed where private yards are small, and residents have no relief from the monotony of brick and concrete. The development of greenways will be an important part of residential renewal.

A Plan for Housing Quality

Attacking substandard residential conditions requires treatment of the decayed housing itself and treatment of conditions in the residential environment which lead to decay. The figures on housing clearance for non-residential activities, have been presented earlier, but treatment of the housing areas which are to remain residential has not yet been discussed.

Magnitude of Reconstruction and Rehabilitation. It was previously noted that the Census definition of "dilapidation" does not include all the factors for which a dwelling might be considered seriously substandard. A study of experience in actual

redevelopment areas of the City during the past decade indicates that 65,000 units of the 1950 housing supply will have to be cleared either because they are "dilapidated", seriously substandard in other ways, or because their clearance is necessary for neighborhood redevelopment. An estimated 130,000 units of the 1950 supply need rehabilitation. Removals for land use changes will take about 23,000 of the substandard units which should be cleared and an estimated 60,000 of the units otherwise needing rehabilitation. This leaves 42,000 substandard units to be cleared and 70,000 to be rehabilitated. Table 43 shows dwelling unit removals for all purposes.

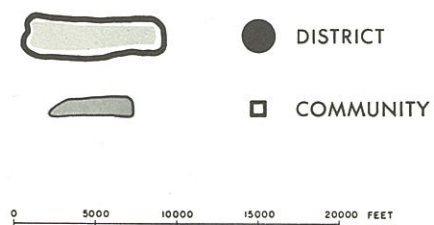
The residential treatment plan for Philadelphia showing conditions as of 1960, is shown on Map 26. Major reconstruction (for residential use) is proposed for 5½ square miles of

TABLE 43—ESTIMATED NUMBERS OF DWELLING UNITS TO BE REMOVED, BY CAUSE, PHILADELPHIA: 1950—1980

PLANNING ANALYSIS SECTION	DWELLING UNITS 1950	REMOVED FOR CHANGE IN LAND USE	REMOVED FOR SUBSTANDARD CONDITION	TOTAL REMOVALS	REMAINING UNITS 1980
A	17,250	3,500	1,750	5,250	12,000
B	82,500	16,250	9,250	25,500	57,000
C	29,250	4,000	3,250	7,250	22,000
D	96,250	19,000	4,750	23,750	72,500
E	111,250	33,250	19,750	53,000	58,250
F	49,000	14,000	500	14,500	34,500
G	42,000	9,500	500	10,000	32,000
H	10,500	1,000	500	1,500	9,000
I	36,000	3,500	500	4,000	32,000
J	53,500	4,750	250	5,000	48,500
K	67,250	5,500	750	6,250	61,000
L	5,250	1,750	250	2,000	3,250
City	600,000	116,000	42,000	158,000	442,000







MAP 25—PROPOSED DISTRICTS AND COMMUNITIES

The Plan proposes the organization of residential areas into a system of neighborhoods, communities, and districts in order to enhance the local civic identity which now exists in many parts of the City. Physical elements which can be used to promote a feeling of local identity are arterial streets, expressways, and large parks, all of which provide boundaries, and clusters of shopping and community facilities, which provide places where residents of an area come in contact with one another. Fifty-six communities are proposed, having a population range of 25,000 to 50,000 people. These communities form ten districts, in which population ranges from 150,000 to 300,000 people.



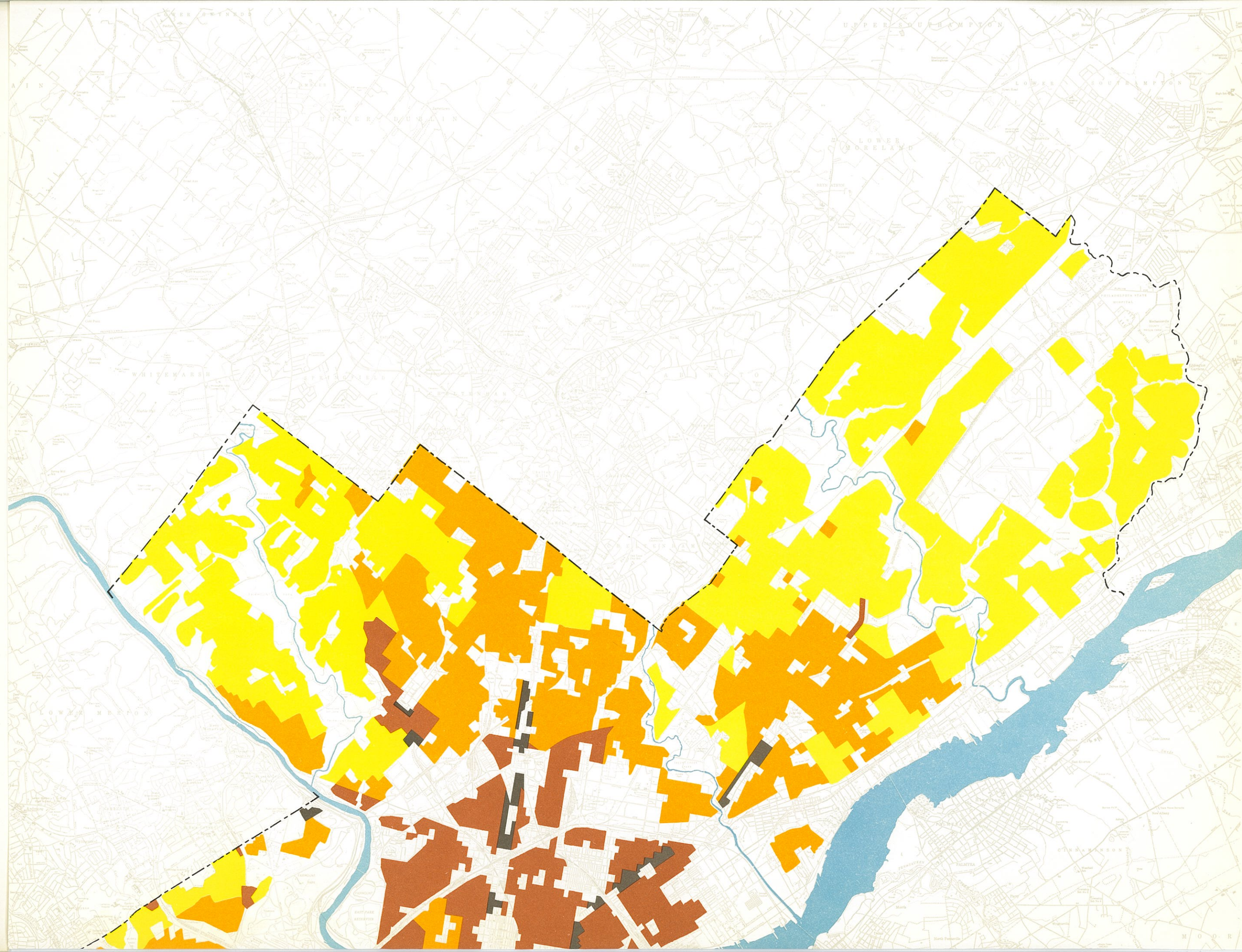
MAP 26—RESIDENTIAL TREATMENT
PLAN

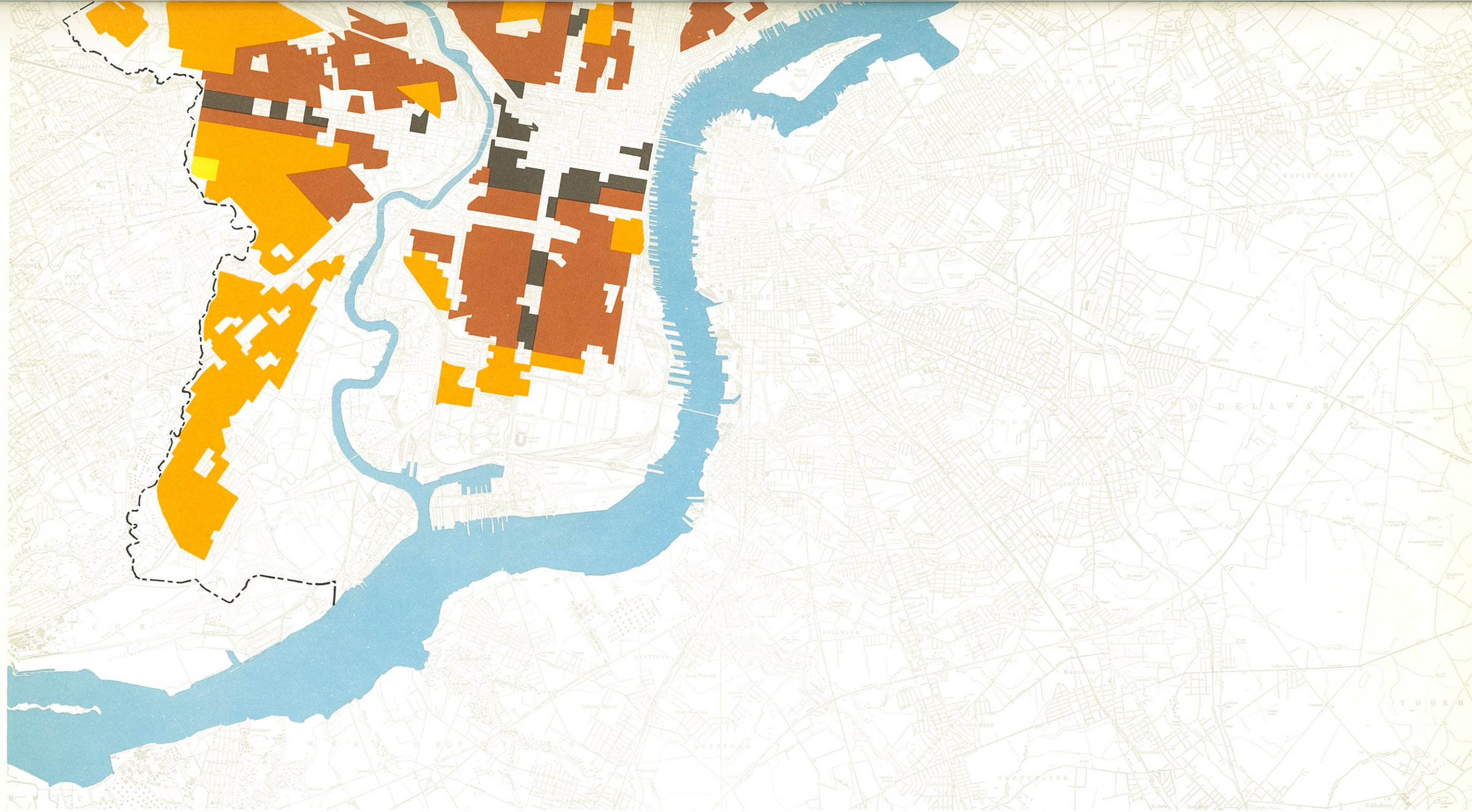
About 65,000 units of the 1950 housing stock must be cleared and 130,000 units rehabilitated to eliminate substandard housing conditions. Changes in land use will take 23,000 of the units to be cleared and 60,000 of the units needing rehabilitation, leaving 42,000 substandard units to be cleared and 70,000 to be rehabilitated. Major reconstruction (clearance of one-third or more of the dwelling units) is proposed for 5½ square miles; limited reconstruction (clearance of one-tenth to one-third of the units) for 15 square miles; and conservation for 11 square miles.

-  FUTURE DEVELOPMENT
-  STABLE
-  CONSERVATION
-  LIMITED RECONSTRUCTION
-  MAJOR RECONSTRUCTION
-  NON-RESIDENTIAL RECONSTRUCTION

0 5,000 10,000 15,000 20,000 FEET

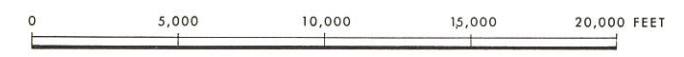






PHILADELPHIA CITY PLANNING COMMISSION—MARCH 1960

THE RESIDENTIAL DENSITY PLAN



- DWELLING UNITS PER NET ACRE
- UNDER 20
 - 20 TO 39
 - 40 TO 59
 - 60 AND OVER

TABLE 44—SUMMARY OF CHANGES IN NUMBER OF DWELLING UNITS, PHILADELPHIA: 1950—1980

PLANNING ANALYSIS SECTION	TOTAL 1950	REMOVALS	1950 STOCK REMAINING	CONVERSIONS	NEW CONSTRUCTION	TOTAL 1980
A	17,250	5,250	12,000	2,250	12,750	27,000
B	82,500	25,500	57,000	2,250	6,750	66,000
C	29,250	7,250	22,000	1,750	22,250	46,000
D	96,250	23,750	72,500	9,500	17,000	99,000
E	111,250	53,000	58,250	3,000	14,750	76,000
F	49,000	14,500	34,500	3,000	6,500	44,000
G	42,000	10,000	32,000	2,250	10,750	45,000
H	10,500	1,500	9,000	1,250	8,750	19,000
I	36,000	4,000	32,000	5,500	15,500	53,000
J	53,500	5,000	48,500	3,500	9,000	61,000
K	67,250	6,250	61,000	3,500	15,500	80,000
L	5,250	2,000	3,250	250	40,500	44,000
City	600,000	158,000	442,000	38,000	180,000	660,000

TABLE 45—ESTIMATED DWELLING UNIT REMOVALS AND ADDITIONS BY DWELLING TYPE, PHILADELPHIA: 1950—1980

DWELLING TYPE	NO. UNITS 1950	ADDITIONS 1950—1980			NO. UNITS 1980
		REMOVALS	CONVERSIONS	NEW CONSTRUCTION	
One Family Detached	22,500	3,000	—	12,500	32,000
One Family Attached	340,000	70,000	—	45,000	315,000
Twin and Duplex Twin	50,000	10,000	3,000	32,500	75,500
Other Duplex	54,500	20,000	13,000	5,000	52,500
Three or More Family	133,000	55,000	22,000	85,000	185,000
Total	600,000	158,000	38,000	180,000	660,000

the City. Limited reconstruction is proposed for 15 square miles and conservation actions for 11 square miles.

In the major reconstruction areas, clearance to eliminate substandard housing and provide community facilities will remove one-third or more of the dwelling units. In some sections of the major reconstruction area all of the existing dwellings will be cleared. There are about 100,000 dwelling units in the major reconstruction areas on 2,300 acres of land.

The limited reconstruction areas are those in which one-tenth to one-third of the dwelling units are to be removed to eliminate decayed housing and to provide community facilities. Net residential acreage within the limited reconstruction area totals 6,200, and there are approximately 200,000 dwelling units.

In the conservation areas the quality of the housing is generally good although spots of substandard housing occur. The primary treatment emphasis in these areas is on improvement of the residential environment through provision of public open space and community facilities. Within the conservation areas are 150,000 dwelling units on 4,900 acres of net residential land.

The areas designated as stable are primarily the newer residential areas of the City. Major emphasis in these areas is on protection of an already good quality. The stable areas contain 150,000 dwelling units and 9,000 net acres of residential land.

Composition of the Future Housing Supply. The total of all residential removals called for by the Plan is 158,000 dwelling units. The dwelling types included in the unit total are not typical of the distribution of dwelling types in the City. The bulk of the sub-standard housing units removed are in multi-family structures and in old row houses. The effect of the land use change removals, furthermore, is greatest on the central areas of the City where the predominant dwelling types are row houses, duplex row units, and multi-family row structures.

Table 45 shows the estimated removal and addition of dwelling units by dwelling type. The estimate of removals is based

upon the known composition of dwelling types in sections of the City. The estimates of new construction are derived from the density plan and from proposed development in the Far Northeast and Eastwick.

The estimated future housing composition represents a marked change from the housing supply of 1950, not only in volume of dwelling units but also in relative proportion. Multi-family units rise from 22 per cent to 28 per cent of the housing stock; single-family detached dwellings increase in number by more than 50 per cent, while all other types of single-family units—detached, twin, and row—decline in proportion of the total.

These shifts in dwelling type reflect the changes in family size and household type discussed in the chapter The City and Its People. It was pointed out that the distribution of households by size is becoming bi-modal. One large group is made up of couples and single persons, while another group is made up of families with growing children. The effect of this bi-modal demand for housing is that the demand for apartments is increasing at the same time that families with children are seeking suitable accommodations for child-rearing. As Table 45 shows, the greatest number of removals are of row houses, primarily the older ones with inadequate yard space. The greatest increase is in multi-family dwellings designed primarily for households composed of adults. The composition of single-family houses shifts to a higher proportion of detached and twin houses as well as newer row houses. All of these dwelling types have higher standards of yard space than were common in the City in the past.

THE PLAN FOR TRANSPORTATION

Plan calls for 100 mile system of expressways in City composed of radials and circumferentials...Major improvements to a 500 mile arterial street system... Extension of subway system and replacement of elevated by subway... Elimination of downtown rail terminals and replacement by through connection in new subway...Improvements to airports and port.

The central objective of this part of the Comprehensive Plan is the development of a system that will move people and goods quickly, cheaply and conveniently between any and all points of the City, and do it so as to give passengers and shippers a reasonable choice of facilities and routes.

This chapter, in order to accomplish an objective so broad, makes proposals for major improvements in public transit, streets, highways and expressways, and deals briefly with improvements in the City's publicly-supported facilities for air and water travel.

Care has been taken in drawing these proposals that they support the City's land-use and development objectives, and that the cost be reasonable in comparison with other required public objectives and investments.

The basic transportation policy of the City was developed by the Urban Traffic and Transportation Board and set forth in its "Plan and Program 1955." This chapter fits the Board's plan into the larger framework of the Comprehensive Plan, restates some of its arguments, and makes more explicit some major features of the general system proposed.

Major Proposals of the Transportation Plan

- An expressway system of 100 miles within the City to meet the free movement needs of long trips and to relieve arterial and local streets of long-distance traffic impact.
- An arterial street system of about 500 miles to meet the needs of middle-distance trips, serve the expressway system, and reduce the traffic on local streets.
- A rail rapid-transit system in subway or open-cut to meet peak-hour demands for commuter traffic to the Center City and to certain other points of high concentration. This includes 10 miles of new line and 8 reconstructed miles.
- A completely connected commuter rail rapid transit system to deliver peak loads to Center City from outlying suburban areas. A downtown commuter loop is proposed to connect the present Pennsylvania and Reading tracks and to replace Reading Terminal by a new underground station.
- A system of automobile parking facilities that will meet the downtown parking demand consistent with a reasonable

level of street capacity, the demand for parking at commercial sub-centers, and other high concentration points.

- A system of railroad and port facilities to meet requirements, for long-distance heavy-goods movement.
- Airport improvements to meet the demands of air travel, including helicopters.

Elements of the System and Their Characteristics

Mass Rapid Transit. Fast, low-cost, and occupying little space in crowded downtown Philadelphia, the rapid transit system is the one on which the City depends for moving the bulk of its office, store and shop workers daily between their homes and places of work. It is an irreplaceable element in the City's life—yet today it is in serious financial straits, caught between rising costs on the one side and declining revenues on the other.

These things have happened as much because of, as despite, an increase in the number of passengers the system carries daily, for the reason that more and more of the load is carried at peak hours and equipment is used by small numbers of passengers in the periods between. In this sense it has tended to become a single-purpose system, and hence inherently more expensive for the same service than it once was.

Because the rapid transit system is the only transportation element which can sustain a high concentration of activity in the Central City, its continued functioning and improvement is absolutely necessary to the City's future. Further, its capability for moving people regardless of weather makes it an important supplementary service in periods of emergency. Thus it becomes a central element of the Comprehensive Plan.

Expressways. By contrast with mass transit, the expressways are high-cost and require large amounts of space. They are also fast. In fact, they offer a unique combination of speed with the flexibility of individually operated vehicles.

A complete network of expressways connecting all parts of the Metropolitan Area is proposed in this Plan, although new studies now in process will be needed to justify fully every part

of the system and settle the details of its design.

The system proposed will be unable to carry the rush-hour loads in and out of Center City without creating excessive congestion by which the advantages of an expressway are nullified. Therefore, a control system to limit traffic flows to the capacity of each segment is recommended as an integral part of the system. Such a control system should give preference to busses in peak hour flows.

Arterial Streets. The all-purpose street network of the past has slowly evolved into a differentiated system of major and minor arterials, and local commercial and residential streets. The Comprehensive Plan proposes to carry this evolution to a logical conclusion for two major purposes: to move medium-distance traffic, and to improve living conditions by removing heavy traffic from local residential streets. To relieve the heavy overload of traffic on local streets, a system of arterials is proposed. Further, the expressway system requires a supporting arterial street system in order to function.

The Arterial Streets Plan implies a significant program of street improvements including widenings, grade separations, and improved traffic engineering.

Economics of Urban Transportation

The major economic factors underlying the transportation plans are set forth below.

Load Factor. This is probably the most fundamental idea in transportation economics. A facility exists 1,440 minutes of the day. If it is used only one minute of the day, the entire cost of its use must be loaded onto the user of that one minute. Finding a user for another minute halves the fixed cost by doubling the load factor, which may be defined simply as:

$$\frac{\text{Service actually used}}{\text{Potential service available}}$$

A high load factor spreading the costs over many units of use is a basic advantage that streets and expressway systems now have over rail transit systems. If almost every family has an

automobile and makes most trips, other than trips to work, by auto (and most deliveries of goods and materials in the City are made by truck) the rail transit system's load factor goes down and the street system's load factor goes up.

However, if the rail transit system were abandoned and the peak loads of work trips were carried by the rubber-tired system, its favorable load factor would be dragged down, forcing up the average cost of a ride. Home-to-work commuting by auto, because it crowds the streets unduly for a few peak hours, imposes demands on the highway system that require a 25 to 40 per cent increase in its capacity over what otherwise would be necessary. To serve Center City commuters the gap would be even greater. While it hardly seems fair, the costs of this expansion are being paid by all users because of the difficulty of arranging any differentials in what various classes of users pay. The only differential costs now suffered by home-to-work motorists are the consequences of congestion.

Joint Benefits. The use of the same costly equipment, space or physical facility for more than one activity results in a sharing of the benefits which have been created by bearing the costs. This idea is very similar to that of load factor, but it is more general. While classes of traffic share the street at the same times of day to create a high load factor, the street also provides:

1. Right-of-way for water, sewer, storm, drain, power, and other services;
2. Light and air to buildings on the frontage;
3. Sidewalk for pedestrian movement and recreation;
4. Hard surface for loading and parking;
5. Access way for police, plus a location for police communications and lighting to assist their operations;
6. Access for fire equipment and other emergency services, and location for accessory equipment;
7. A fire break in case of conflagration;
8. An address for every resident.

The street widths provided in William Penn's original plan

were prompted by the desire for amenity, health and freedom from the spread of fire, not consideration for vehicular access. Much narrower lanes would have sufficed for the transportation needs of the time. Hence, the entire street system in Philadelphia except for its hard-surfaced pavement and traffic control devices can be thought of as costing very little to the transportation system. Such streets are provided regardless of whether the residents of an area walk to work or drive.

Scale of Movement. A certain minimum volume of traffic is necessary to justify any of the more complicated modes of movement and the facilities to carry them. A rail line on a separate, grade-separated right-of-way is undoubtedly the cheapest and fastest way to get from A to B in a city *per seat*, but for efficiency a daily volume of 7,500 persons or more must be willing to pay the fare from A to B.

With larger volumes, larger and more costly installations can be justified and, as a general rule, a lower average cost per seat can be achieved and speed and comfort can be increased because of the greater possibilities of mechanization of operations. In the case of motor traffic facilities, properly designed arterial streets are capable of moving more traffic per square foot of pavement than local streets. A boulevard with separated through-traffic lanes has more capacity than an arterial and an expressway even more capacity.

Because of these technical advantages, a large metropolis may be no more difficult to travel in than a much smaller city. Within the metropolis, the Central Business District can be served in such a way that it is more accessible than all but the closest of lesser centers to each person in the population.

Cost Per Ride. Cost per ride appears a simple test, but becomes very complicated when an attempt is made to compare transportation modes. The same load factor has to be assumed, but experience shows that load factors will be different. What load factor should be assigned to the owner-operated automobile? Its existence is a joint benefit derived from the owner's other activities. What direct costs should be assigned? The driver doesn't get paid, and may even enjoy the trip. If he pays

The Plan for Transportation continued

The Plan for Transportation continued

no parking fee, does not calculate depreciation, and keeps his journey short and confined to conventional streets, his out-of-pocket cost per ride may seem to him to be as low as can be obtained in any public transit. If he drives in a car pool or carries a family member, his cost is even lower.

On the other hand, if he makes a long-distance trip over congested streets to Center City, he is likely to have a true cost much higher than that of a rail line passenger. If extra expressway lanes are built to get the commuting motorist into town, the one-trip driver becomes a very expensive traveller.

Proposed Pattern of Service

It is self-evident that the critical segment of the transportation problem is the home-work trip. The preceding discussion has shown that a number of variables affect the mode of travel chosen by the trip maker. But other variables affect the public policy decision as to the distribution of public monies between different kinds of transport facilities.

The trip maker's objectives may be inferred from his behavior. Insofar as driving his automobile is roughly comparable in out-of-pocket costs and in time to commuter rail or transit, he will drive. Although the objectives of the public agencies include trying to meet the desires of the public, there are two overriding objectives which also reflect a responsibility to the public. The first is that the allocation of public monies to transportation be equitable in comparison to other demands and therefore that an economical system is necessary. The second is that, because the transportation system is a major determinant of the land use structure, the system chosen be one that supports the land use objectives of the Plan. This second objective is closely tied to the strength and potential of the City's economy. For example, the objective of the Plan to maintain a strong and intense Center City is an important factor in the City's economic base; at the scale and intensity planned for Center City, improvement of the rail rapid transit system is essential.

The balance so frequently referred to by the Urban Traffic and Transportation Board lies between these two divergent sets of objectives: the individual trip maker's and the public agencies'.

This balance is achieved in the Plan by dividing the City roughly into three grades of service area in terms of work destination: Center City; the area within five miles of the center but not including Center City; and the remainder of the City and metropolitan area. Each of these areas or zones is characterized by a different level of density; therefore, they differ also in the mode of transportation by which they are most economically served. Thus, the center with its high density exten-

sions is best served by rapid transit and commuter rail lines, the intermediate area by bus or trolley, and the low density peripheral areas by automobile.

The Plan proposes to emphasize each mode of transportation service in its appropriate zone. Clearly, the mix or variety of modes will be greatest in Center City service (subway, commuter rail, bus, trolley, automobile) and least in the outlying zone (automobile and bus). Further, combinations of modes will be encouraged (e.g. by parking lots at outlying rail and subway stations). Because a characteristic of the City, and indeed an objective of this Plan, is the opportunity for a high degree of interchange between all kinds of areas, the transportation system can not be compartmented neatly into mode and area. Each system must be complete and interconnected in itself, and each must be related to other systems, but development and operating policy emphasis should vary, service area by service area.

The proposed system set forth below, rests upon three basic assumptions:

1. That the density patterns proposed in the land use plans are reasonable community objectives.
2. That the quality of the transit ride is or can be brought to a level competitive with the automobile ride, e. g. in speed, comfort and out of pocket costs.
3. That congestion on the arterial streets can be reduced sufficiently to make street transit vehicles competitive.

The system has five overlapping elements:

1. A rail rapid transit system which penetrates the very heart of the City's high density center. It is composed of: (a) the subway system extended and rebuilt; (b) the commuter railroads connected as one system to improve delivery downtown and to improve the economy of the system.
2. An expressway system of radials and loops. The radials extend from the outer reaches of the metropolis or extend beyond to other regional cities and terminate in a Center City Loop. The loops function as cross-town carriers, as by-passes, and as distributors from and between the radials. Because the density of the expressway pattern does not (and cannot) increase as rapidly as the land use densities, its proportionate usage by all travellers decreases toward the center. Because, as will be shown later, it cannot serve the shorter trips, a significant number of automobile and bus trips cannot use it.
3. An arterial street system to serve the medium distance trips, both auto and transit; to serve the expressway system; and to serve major land use concentrations.

MAP 28a—VEHICLE TRAFFIC FLOW

Because the City lacks an adequate arterial system, many flows of arterial volume are found on streets designed only for local traffic.

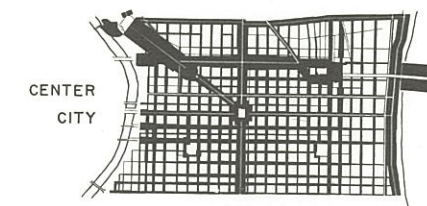
Inefficiency for the motorist, and noise, fumes, and danger to adjoining properties is the result.

In order for residential areas suitable for family living to prosper uninterrupted by heavy traffic flows, arterials should be at least 0.2 miles apart and preferably 0.5 miles apart.

24 HOUR VEHICLE VOLUME

—	5,000
—	10,000
—	20,000
—	30,000
—	50,000

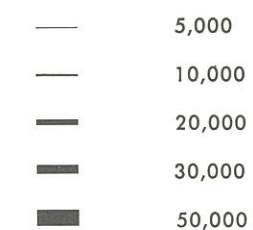
0 5,000 10,000 15,000 20,000 FEET



MAP 28b—CENTER CITY VEHICLE TRAFFIC FLOW

Traffic flow is now distributed quite uniformly over all Center City streets. Completion of the Center City expressway loop with its limited number of exits will lead to greater differentiation in traffic volume from street to street.

24 HOUR VEHICLE VOLUME



4. A surface transit system, mostly on the arterial streets.
5. A local street system to provide access to, and internal circulation within, land use areas. Through traffic, particularly in residential areas would be deliberately discouraged from using these streets.

In terms of service for the home-work trip, the predominant carrier to Center City would be the rail rapid transit system; to work concentrations within the five mile circle and to regional centers therein, the surface transit system supplemented by a significant proportion of automobiles; to work areas outside the five mile loop, the automobile with street transit service for those who cannot drive.

In each area, provision for other modes will be required. And, in any case, trips other than work trips will require automobile facilities. For example, some Center City workers will find driving is more convenient than rail, if they use their car in business, or work at off-peak hours. Shoppers, customers of professional services, and trucks moving goods will use streets and expressways. Contrariwise, in auto territory transit will be required (even as a money-losing service) for those who cannot afford car ownership or cannot drive.

The Expressway System

The proposed pattern of new expressways is much like the existing metropolitan transportation pattern: radial routes fan out in all directions from Philadelphia's Center City. However, the proposed system contains a new element. It provides facilities for high speed—high volume movement around as well as in and out of the heavily built-up center of the urbanized area. Four loops centered around Center City will make this circumferential movement possible: The Center City Loop, the Midtown Loop, The Five Mile Loop, and The Ten Mile Loop. By providing facilities for making circumferential trips which are now tortuous and cannot be served economically by public transportation, the expressway loops will increase the mutual accessibility of the City's outlying centers and sub-centers. In addition they will perform the very practical function of improving the flexibility of the transportation system itself. By providing by-pass routes they will tend to divert traffic from heavily travelled radials in the central areas.

The proposed radial expressways focus on Center City and follow the historical radial pattern. They will channel the

heavy radial traffic which now strains through residential areas and allow it to move at much greater speed and in greater volume than is possible with the present radial arterials.

The Expressway Plan (Map 28) is made up of a basic system of expressways, which is printed in black, and two additional radials and a distributing loop which are printed in grey. The black system is the familiar one which has been the basis of the City's motorways system policy for the past four years. It is a complete system. But although it is functionally complete, it will provide neither the capacity nor the radial spacing which will be demanded by the traffic of 1980.

To fill these needs two additional radial expressways must be added: The North Penn Expressway, whose projected volumes are the highest of any in the system, and the Main Line Expressway, which will fill a large gap in an otherwise equitably-spaced radial expressway network. There is not room to connect either of these into the tight Center City Loop. Therefore, the third grey component is proposed: The Midtown Loop. This loop will distribute traffic from the North Penn and Main Line Expressways and will direct traffic around the over-taxed sections of the Center City Loop.

The other expressways in the system have been espoused by the City since 1955 when the *Plan and Program* of the Urban Traffic and Transportation Board was made public. Of the three loops proposed in 1955, the Center City Loop is mandatory if Center City is to retain its dominant position within the region. It will function to distribute radial traffic destined for downtown locations and to by-pass other traffic around the intense activity of Center City. The Center City Loop is made up of two east-west legs, the Vine Street Expressway and the Crosstown Expressway (which will lie between South and Bainbridge Streets), and two north-south legs, the Delaware Expressway and the Schuylkill Expressway.

Beyond the Midtown Loop (the second-stage grey system which has already been described) lies the Five Mile Loop. It will provide convenient access to the International Airport, the District Centers of Frankford, Germantown, and 69th Street and will link the major industrial areas of Erie Avenue, Allegheny Avenue, Nicetown, and Aramingo to each other and to intra-metropolitan expressways. The Roosevelt Boulevard Extension is the first link of the Five Mile Loop to be constructed. To the east it will be composed of an up-graded Roosevelt Boulevard and the proposed Tacony Expressway,

which will connect to New Jersey over a new Tacony Bridge. West of the completed section it will be composed of the proposed City Avenue By-pass and the proposed Cobbs Creek Expressway.

The Ten Mile Loop will extend well out into the metropolitan region. The short leg which lies within the City will provide immediate access to the Northeast District Center and to the North Philadelphia Airport and the new industrial areas which are being developed near it. It will connect this activity concentration with New Jersey to the east and with Jenkintown and Conshohocken to the west. The Ten Mile Loop will continue south as the Mid-County Expressway, which will serve Media and Chester, and will ultimately cross the Delaware River in the vicinity of Essington.

Two of the radial routes which have been the basis of the City's motorways plan are well known to most Philadelphians. The Schuylkill Expressway, now completed, provides a north-west-southeast channel which extends nearly all the way through the urbanized area of the metropolitan region and serves Center City directly. The Delaware Expressway, whose detailed design is nearly complete, will provide a complementary service in the northeast-southwest direction. It will lie adjacent to the port and industrial development along the Delaware River serving as the boundary between the industrial and residential areas. With its length of fifteen miles inside the City's boundaries, it will improve the accessibility of more Philadelphia locations than will any other expressway. To the south-west this route will continue along the Delaware River merging with the Industrial Expressway below International Airport.

Between these two basic expressways, the Plan calls for others to provide an equitable distribution of service. To the north lies the Northeast Expressway and the North Penn Expressway. To the west is the Cross-town Expressway, which parallels Route 1, and the Main Line Expressway, which makes it appearance for the first time in this Plan.

In order to maintain approximately constant spacing between radials as they approach Center City, and to avoid overloading the inner loops, some of the radials will not go all the way to the center of the system. The Northeast Expressway terminates at the Five Mile Loop, and the North Penn and Main Line Expressways terminate at the Midtown Loop. The other radials, the Schuylkill, the Delaware, and the Cross-town,

MAP 29—EXPRESSWAY AND ARTERIAL SYSTEM

The proposed 95 miles of expressway within the City are designed to provide high-speed high-volume connections between and around major destination areas. They do not make possible direct access to abutting activities. The 500-mile arterial system provides direct access to major activity areas, acts as a collector for expressway trips and as a medium-distance traffic carrier. Both expressways and arterials serve to define land use areas and to remove through-traffic from the City's 2,100 miles of local streets.

- EXISTING EXPRESSWAYS
- - - PROPOSED EXPRESSWAYS
- • • INTERCHANGES
- • • PROPOSED ADDITIONS TO SYSTEM

0 5,000 10,000 15,000 20,000 FEET



The Plan for Transportation continued

will penetrate to the Center City Loop, which will distribute their traffic.

System Objectives, Characteristics, and Limitations

Diversion. A basic objective of the expressway system is the removal of long-distance through traffic from local streets, so that they can properly perform their functions in the total system. The arterial streets should be made to function well enough to attract medium and short-distance travel away from local streets, and at the same time operate freely enough so that street cars and buses can operate economically.

To accomplish this, the expressway must offer speeds great enough to more than offset the longer distance the motorist may have to travel to use it. Obviously, for this purpose, the larger the number of routes in the system, and the number of entrances on each route, the better the system will work. The greater the difference in speeds, the more effectively a given set of expressways will work. Because of this, an expressway in the older parts of the metropolis, with their crowded, low-speed streets, will accomplish more diversion than an expressway in the suburbs, where the difference between expressway and street speeds is less.

Inter-connection. An expressway cannot be brought to an abrupt end. Its capacity traffic cannot be absorbed by one arterial street, or even by an arterial intersection where three or more outlets are available. Moreover, the expressway stimulates traffic on connecting streets, with the result that such streets quickly reach their capacity. So each expressway route must continue on to distant destinations, or form a complete circle, or terminate in a "T" joint with another expressway route.

Characteristics. The chief characteristic affecting system design is the need for adequate spacing between entrances, exits, and connections with other expressways. The number of radials that converge at the Center City Loop is limited by the space required between their entrances to the loop. Therefore, all radial service required cannot be directly connected with one central loop. This means that some radials terminate at the central loop, others at the next loop, still others at the five mile loop. In effect there are limitations to the density of the expressway pattern. It cannot increase in density proportionate to the increase in trip density as the center is approached. Hence, the need for other transportation facilities increases in importance toward the center of the City.

Controls on the Expressways. The first links in the City's expressway system, such as the Schuylkill Expressway, were

overcrowded shortly after each was opened. This situation should improve as additional links are completed and drivers have alternative routes. But many segment will still be overloaded at the peak of the home-to-work rush, particularly those parts close to Center City which are built on the assumption that the transit system will carry a major part of the load.

As a consequence, some kind of control system is called for. It is believed that a control system can be designed which can count vehicles on all segments, predict jams, and close off entrances, in order to ensure smooth expressway flows. It could be used to ensure that express-buses running to areas not served by the rail transit system would move expeditiously to their destinations.

The Transit Plan

This part of the Comprehensive Plan proposes that the present extensive high-speed transit system be preserved and improved; that existing lines be extended and new ones built in directions not now served.

The street transit system, consisting of bus and street car lines operating on arterial streets, should be re-oriented to provide feeder and distributor service for the high-speed system as a major function. Their second function should be the traditional one of short-length runs into major local-destination areas.

Rapid Transit System. The general distinction between the commuter rail system and the subway-elevated system is retained. There are two separate but related characteristics distinguishing them. The first is that the commuter rail system has a series of branches diverging from a limited number of lines at the terminal, so the trip frequency on the branches is much less than on the subway-elevated system. The second is that the rail commuter lines offer a longer, higher-cost, more comfortable ride.

Full development of high-frequency service on the rail commuter system requires the formation of a corporation or authority at the regional level. Improvements in the subway-elevated system, while it lies largely within the City limits, depend to some extent on the City's contractual relationships with the Philadelphia Transportation Company, which operates all intra-city public transit. Specific proposals for transit system improvement are listed below and shown on Map 29.

Proposals for the Subway System

- Extension of the Broad Street Subway to Pattison Avenue in South Philadelphia, with a station for feeder buses at

Oregon Avenue and a terminal and a park-and-ride facility at Pattison Avenue.

- Construction of a high-speed line along Roosevelt Boulevard and the Northeast Expressway, from Broad Street to Grant Avenue, with several park-and-ride lots at arterial street intersections and a large parking lot and terminal for bus feeder lines directly accessible to the expressways converging on the terminus at Grant Avenue. Express tracks in the Broad Street Subway would be extended north from Erie Avenue, to make it possible for Northeast Expressway trains to become express trains in Broad Street.
- Replacement of the Market Street Elevated by a subway between 69th Street Terminal and 45th Street, and the rebuilding and enlargement of stations between 13th and 2nd Streets.
- Replacement of the Frankford Elevated with a subway line (subway or open-cut) and its extension northeastward to Rhawn Street. Most present park-and-ride and some bus feeder service would be transferred to the faster Northeast Freeway line. New cars and track will reduce running time.
- Development of a high-speed connection from Center City to Eastwick and the International Airport, over a route to be decided after further study. Acquisition of right-of-way in Eastwick and development for subway-surface operation can be accomplished immediately.
- Connection of the Camden Bridge Line with one or more of the lines of the Pennsylvania-Reading Seashore Lines, and improvement of the lines and equipment for through operation into the Locust Street Subway in Center City.
- Addition of escalators or widening of passages in the City Hall Station and Market Street subway concourses, to connect Penn Center directly with East Market Street; improved transfer between Broad Street and Market Street lines.

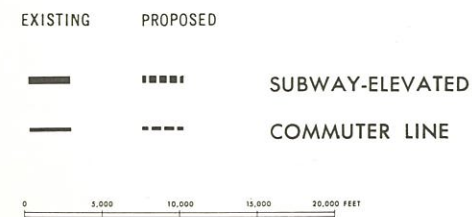
Proposals for the Commuter Railroad System

- The major proposal is to connect the two commuter railroads by a subway under Filbert Street. Thus, the entire network of commuter lines in the metropolitan area would serve two Center City stations, one in Penn Center west of Broad Street and one east of Broad Street in the vicinity of 9th Street. The Reading Terminal would be eliminated. Only minor terminal use would be made of Suburban Station. In addition to making Center City destinations more accessible

MAP 30—RAIL TRANSIT PLAN

The rail transit system proposed here is similar to the expressway system in that high volumes of traffic are carried at high speeds with a limited number of "interchanges" with arterial streets and destination areas. Unlike the expressway system, no loops are proposed. Instead, all lines are radial to the center of the Metropolitan area. Also unlike the expressway system, the major lines are already constructed. Only a few extensions are proposed. An important proposal is the underground connection of the two commuter railroads in Center City.

Not shown on the plan is the modernization of equipment and facilities which will transform the City's 30-50 year old lines into an attractive and efficient system.



to almost all of the growing metropolitan area, operating efficiency and economy would be improved. Execution of this proposal is of critical importance to the planned development of Center City.

- Provision of modern cars for rail commuter operations, using the City's credit for in-City services.
- Provision of large parking area and station at Torresdale, coordinated with increased service made possible by a train turnaround at or north of Torresdale.
- Development of parking spaces at all rail stations.
- Abandonment of the Pennsylvania Railroad service to Norristown, stopping trains on that line at Manayunk and providing more frequent service. Norristown would continue to be served by the Reading Company line.

Arterial Streets System

Streets have a longer history in cities than either expressways or rapid transit, and are much more a part of everyday life. They provide the backdrop for the city man's whole existence. Until recent years, the street was a community playground, work space and market place. In short, a street is more than a traffic facility, and its other functions must be considered as well while working with the details of vehicular movement.

Arterials Defined. An arterial street has several functions. Its chief function is to provide service to medium distance trips at moderate speeds. It feeds and drains the expressway system on one hand and the local street system on the other. It serves abutting land uses and major land use concentration. All regional and intermediate shopping centers, for example, are served directly by the arterial street system. Traffic volumes vary widely because continuity and interconnection is a primary requirement; in general, volumes exceed 7,500 vehicles per day. Usually the arterial includes street transit service.

Perhaps because its street system was so satisfactory to begin with, Philadelphia has lagged behind in adopting new patterns of street lay-out in developing new areas. Not until the Far Northeast Plan was prepared by the Planning Commission was a serious break made with the system in which every street is a through street in a continuous grid pattern. The new system arises from a criticism of the old:

1. The lack of differentiation of block shapes and sizes

or street widths between residential and non-residential areas;

2. The potential penetration of through traffic on every street in the grid;
3. The lack of sufficient capacity to move the growing volume of traffic and to provide parking space on the few main streets, and in the grid streets as well;
4. The excessive number of intersections on through streets implicit in the grid, and the friction created by direct land access to every street;
5. The monotony of miles of grid streets plus identical rows of houses.

The Plan for Arterial Streets carries through two principles: separation of incompatible streets functions, such as fast from slow traffic, moving traffic from parking and loading, pedestrian from auto, commercial from residential; and insulation of incompatible activities on the land from each other: residential, commercial and industrial.

General Criteria and Standards. A system of arterials is made up of a network of streets with different traffic capacities. The primary objective here is to establish a complete network. A more intensive analytic study utilizing origin and destination data, traffic flow data and projections, as well as more detailed information on capacity, will be necessary in order to specify the design standards for each part of the system.

Spacing. Arterials must be sufficiently close so that motorists will not choose to make long trips on local streets. Spacing at 0.7 mile intervals appears to be maximum for convenient automobile travel. Also, they should be close enough so that residents are within walking distance of local transit which it is assumed will travel on arterial streets. An arterial spacing of no more than 0.5 miles apart is necessary for passenger access to transit.

Conversely, major arterials must be sufficiently far apart so that residential areas between them are suitable for family living, uninterrupted by the impact of heavy traffic flows. This requirement includes consideration of both the penetration into residential areas of noise, dirt, fumes, and the danger to children of automobile accidents. For typical medium-density residential areas a distance of three city blocks between major arterials (about 0.2 or $\frac{3}{16}$ mile) is considered minimum to insure livability. A distance of a half mile is desirable to pro-

tect children from the hazards of arterial traffic. With such spacing, in the more densely populated areas of the City at least, no children should have to cross arterials to reach an elementary school or playground.

Spacings required by the several criteria are summarized below. They refer to residential areas of intermediate location and density. They are not applicable to a downtown or an outlying location.

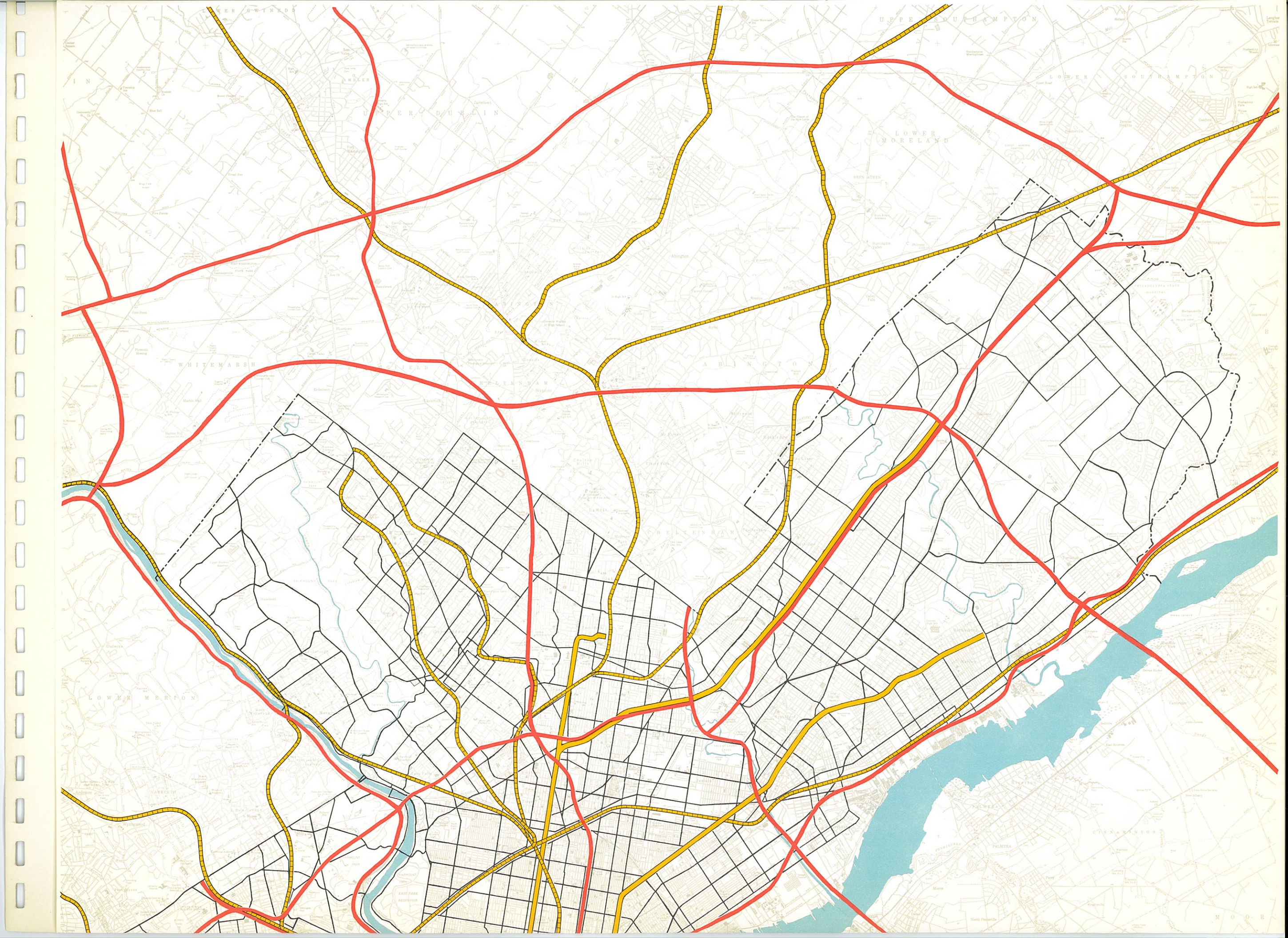
Criterion	Allowable Arterial Spacing
Transportation	
Auto driver	no more than .7 mile
Transit user	no more than .5 mile
Residential livability	
Playground access	at least .5 mile
Quietness standard	at least .2 mile

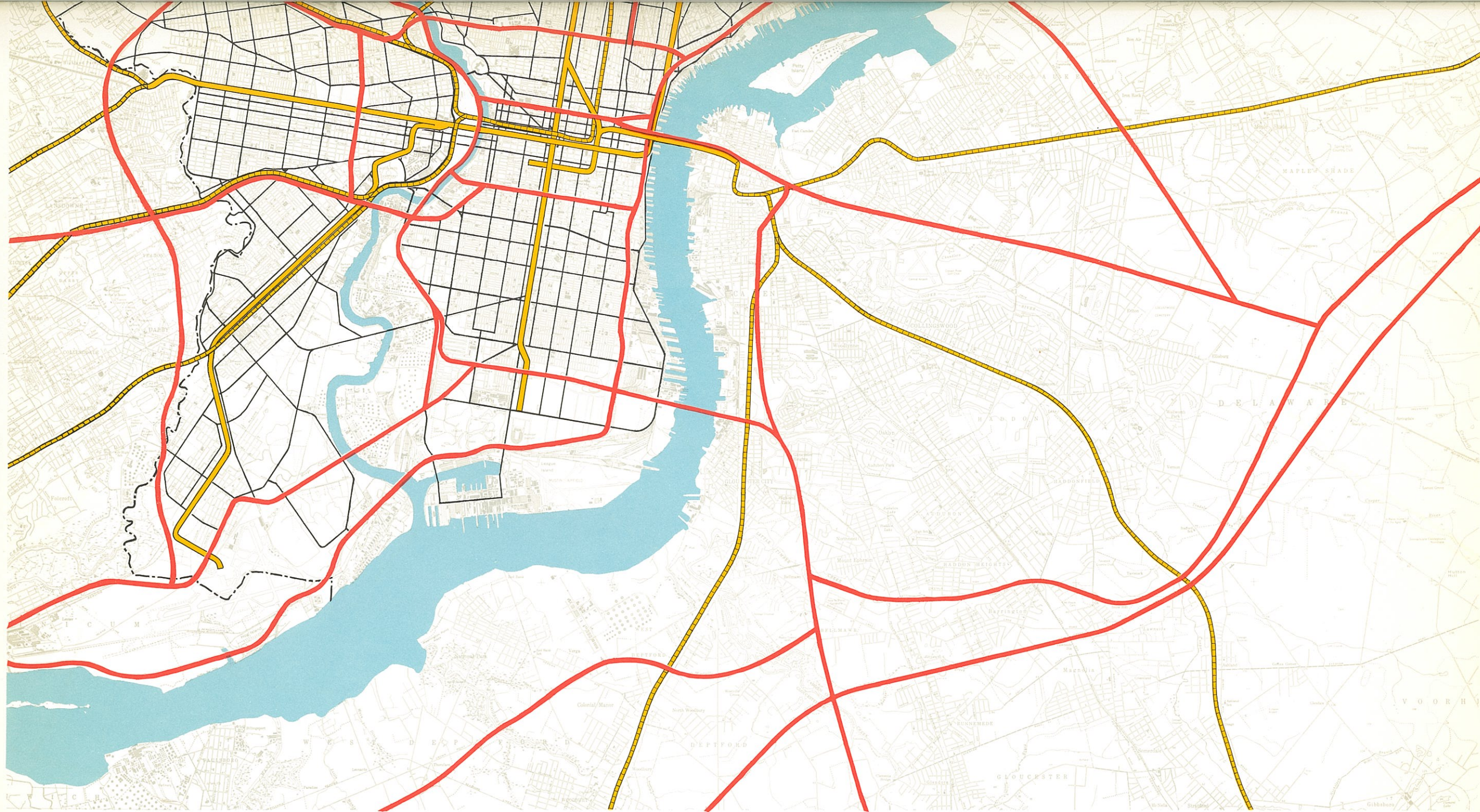
The spacing of arterials will be significantly different depending on whether one-way or two-way streets are designated. Since one-way streets are generally narrower than two-way streets for a given capacity, they form smaller barriers in residential neighborhoods. As a result, it is permissible to have a one-way pair separated by the 0.2 mile minimum spacing. The traditional one-way arterial pair separated by one block is not desirable in residential areas because it creates unbearable conditions for residential land sandwiched between the two flows.

Transit Service. If the arterials are to carry transit vehicles and if they are to give reasonable service to residents of an area, the distance from the passenger's home to the transit stop should not exceed about $\frac{1}{4}$ mile. Therefore, where the arterials are two-way streets, a total interval of about $\frac{1}{2}$ mile is acceptable. Where they are one-way streets, a shorter interval is required.

Details of the problem of relating arterials to living-space in residential areas have been discussed in the chapter on Residence.

The Arterial Streets Plan. The Arterial Streets Plan designates existing streets, and the general location of proposed streets or street improvements, that will provide a complete system of through streets of city-wide importance. It does not specify the exact type of street or its capacity, only indicating a functional distinction between the arterial and local street.





PHILADELPHIA CITY PLANNING COMMISSION—MARCH 1960

THE PLAN FOR TRANSPORTATION

0 5,000 10,000 15,000 20,000 FEET

- EXPRESSWAYS
- ARTERIAL STREETS
- RAPID TRANSIT LINES
- - - COMMUTER RAILROAD LINES

Through widening, favorable light controls, and other engineering devices, these arterial streets will be given higher traffic capacity and greater speed than other streets in the same area, thus attracting a greater number of motorists, other than strictly local traffic, to them. They will become the main feeder streets for the expressway system.

The relation between the arterial street plan and the plan for free standing commercial uses is an important one. Because service to abutting commercial uses reduces the traffic flow on the arterial, frontage roads should be built in these locations.

Because of their high efficiency one-way streets are proposed in some of the dense urban areas. But in choosing arterials among the streets of a one-way system, streets three to five blocks apart have been designated for improvement as arterial pairs, in order to avoid the traffic impact on as much residential frontage as possible. The area between them corresponds to the minimum size residential area discussed above.

The proposed arterial system is included on the expressway plan map shown earlier (See Map 28).

Local Streets. The purpose of a local street is to provide access to the property abutting it. Other traffic should be discouraged from using it. Reduction of traffic on local streets requires two different kinds of action. The first has been previously discussed. The improvement of arterial streets to a level at which their capacity can absorb the medium length trip and induce these drivers to use the arterial. The second is to reduce the unnecessary use of local streets by favoring the needs of the pedestrian and service to abutting property over the needs of traffic flow. This would be accomplished by the redesign of streets in redevelopment areas and the design in new areas specifically aimed at this objective. Techniques include: interrupting the continuity of local streets; closing streets in redevelopment areas; using cul-de-sacs and loop streets where appropriate; and reducing the number of local-arterial intersections.

Parking

Meeting the needs of automobile transportation, both from the standpoint of traffic movement and from the standpoint of improving residential areas, requires parking facilities as well as movement facilities.

Parking facilities are required both at, or in the vicinity of,

the place of residence and at the other termini of automobile trips: work areas, shopping areas, transfer points, and so forth.

The area of most intense demand is Center City. The Plan proposes a total of 43,600 off-street spaces downtown, 16,600 of which are in new parking garages.

Space is proposed for 170,000 off-street parking spaces at the regional, intermediate and local commercial centers proposed, and for 135,000 at the free standing locations proposed: a total of 305,000. The actual number eventually provided will depend on a number of specific design and development variables but in round numbers the Plan will provide for 300,000 off-street spaces at the commercial locations proposed in the Plan.

At mass transit transfer points the Plan proposes two large parking areas, and a number of smaller areas. One is at the southern terminus of the Broad Street subway extension: 1,200 cars. The other large one is at the terminus of the Northeast extension: 4,000 cars. Other park and ride stations on the railroad commuter lines are planned for 250 to 500 cars.

The Industrial Land Use Plan is based upon a set of floor area ratio standards which will provide space for employee parking consistent with the transportation policy set forth earlier in this chapter. Thus, in the Far Northeast the standards imply one space per employee. In industrial zones I and II, on the other hand, major reliance on mass transportation will be required. In zones III and IV, floor area ratios of 0.6 and 0.5 will approximate one space per employee.

Airports and Port

Generally speaking, any urban transportation system has two aspects: the daily circulation requirements for people and goods within the urban area; the longer distance inter-city and inter-regional movement requirements. Almost all elements of a transportation system are used for both purposes but two are characterized by the latter: the airports and the port.

Airports. With the aid of nationally known consultants, a master development plan for International Airport has been prepared. It includes the extension of existing runways, the construction of a parallel instrument runway, the enlargement of the present terminal facilities, the construction of a substantial number of service or maintenance hangars, and the development of air related industries on adjoining land. The Plan

is designed to meet the City's estimated air travel needs for 6,000,000 to 10,000,000 passengers per year in 1975 as compared to 2,000,000 in 1959. It will keep Philadelphia's facilities competitive with those of other large metropolitan cities. Construction of the planned improvements will complete the development of International Airport because when these facilities are fully utilized the maximum acceptance rate for a single air field will have been reached.

The plan for North Philadelphia Airport is based on a projection of need for private and company owned aircraft, limited passenger service and for air cargo shipment. It provides for runway extensions, new terminal facilities, and development of air related industry.

Helicopter travel will undoubtedly increase rapidly, both for travel within the metropolitan area and, more importantly, for travel between cities in the 50 to 250 mile distance range. Recommendations for a system of heliports and helistops within the City have been received from a consulting firm and are now undergoing technical review based on an estimated yearly passenger movement of 674,000 by 1980. Upon conclusion of this review a heliport system will be incorporated in the Comprehensive Plan.

Port. The Delaware River Port has recorded the largest tonnage increase of any seaport in the United States in the last decade and a half. Although second to New York, the gap is narrowing, and the Port now leads the country in foreign tonnage. Modernization of that section of the Port lying in the City is proposed in accordance with a development plan prepared by consultants to the Department of Commerce. The proposals fall into three groups.

First, the removal of several derelict piers in the vicinity of Center City and their replacement by a major recreation development is proposed. This has been referred to in the chapter on Recreation.

Second, the modernization, including in one instance conversion to a semi-marginal berthing facility, of several sound piers is proposed.

Finally, a series of large acreage marginal berthing facilities south of Packer Avenue is proposed. These will provide Philadelphia with a major cargo handling facility based upon the most modern requirements for berthing, containerized cargo handling, and trans-shipment.



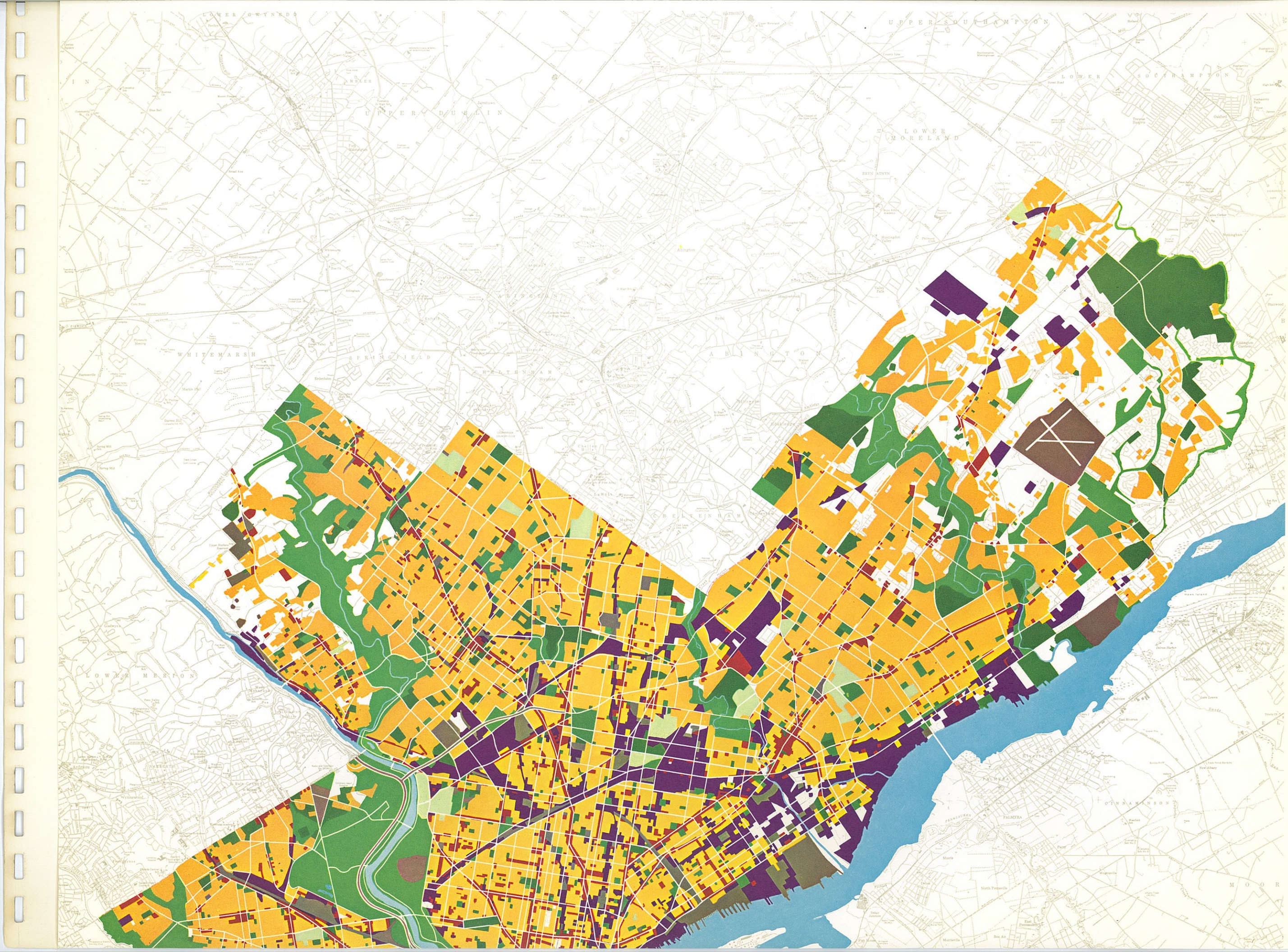
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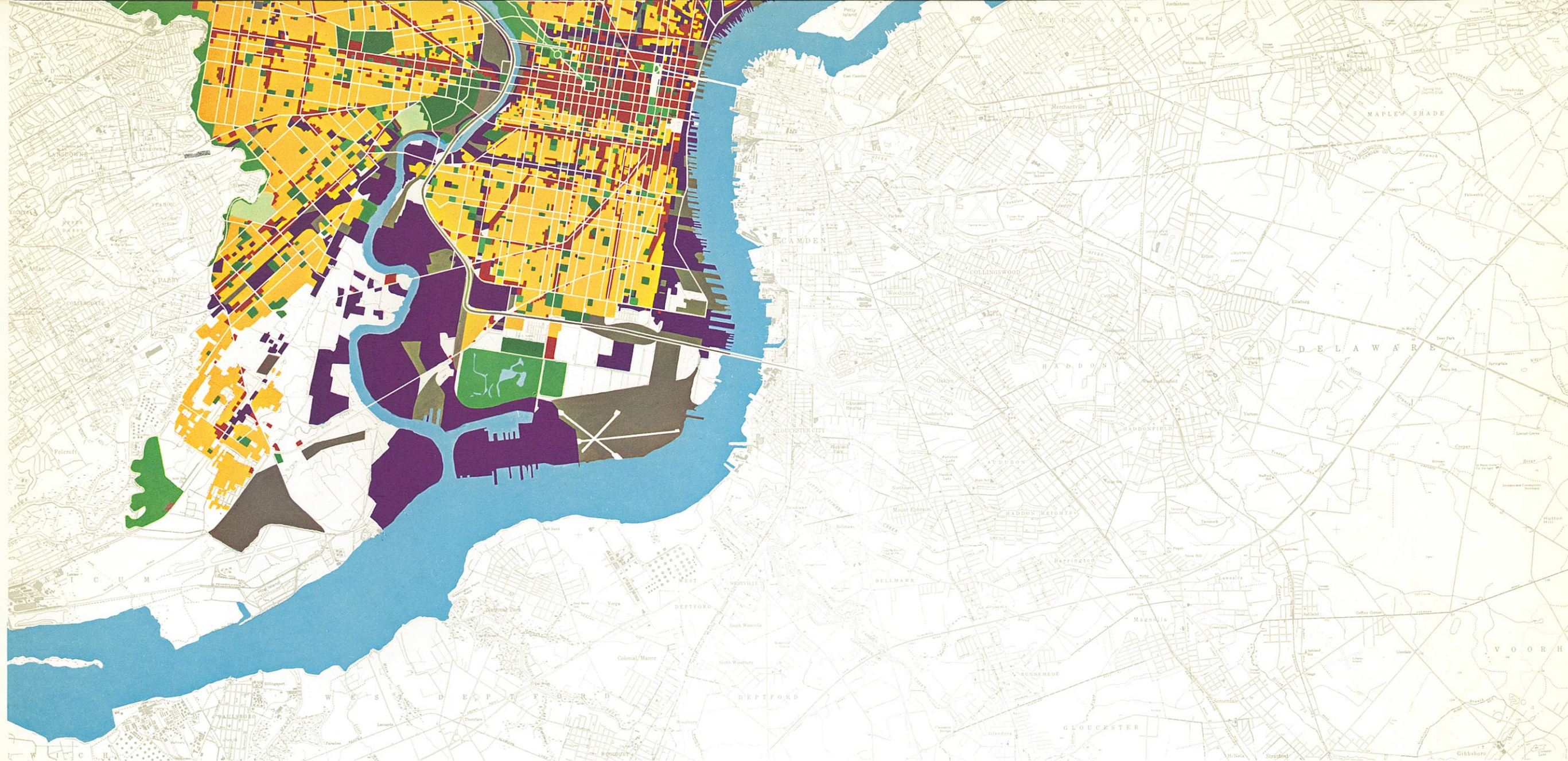
TITLE Comprehensive plan for the
city of Philadelphia.

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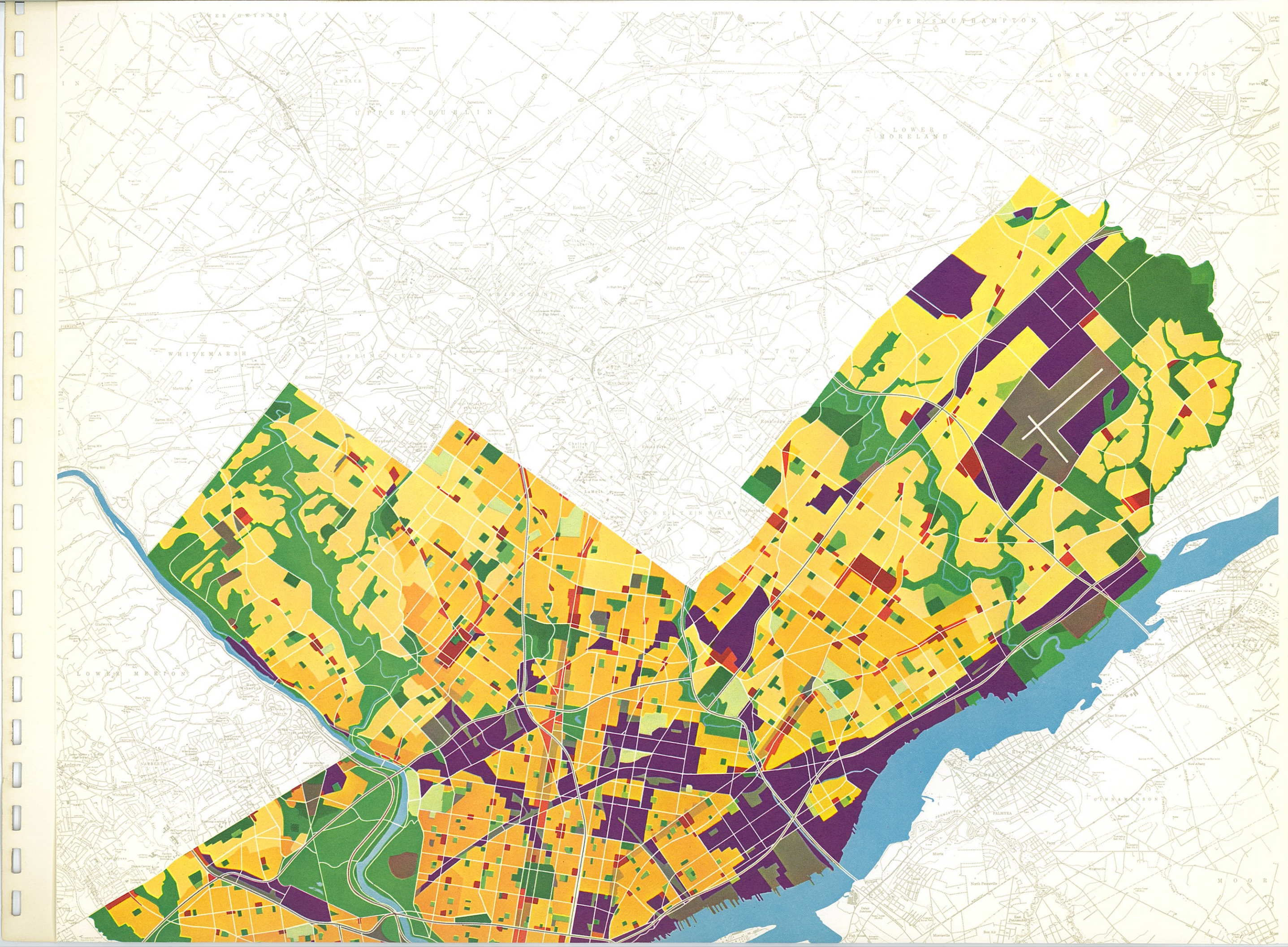


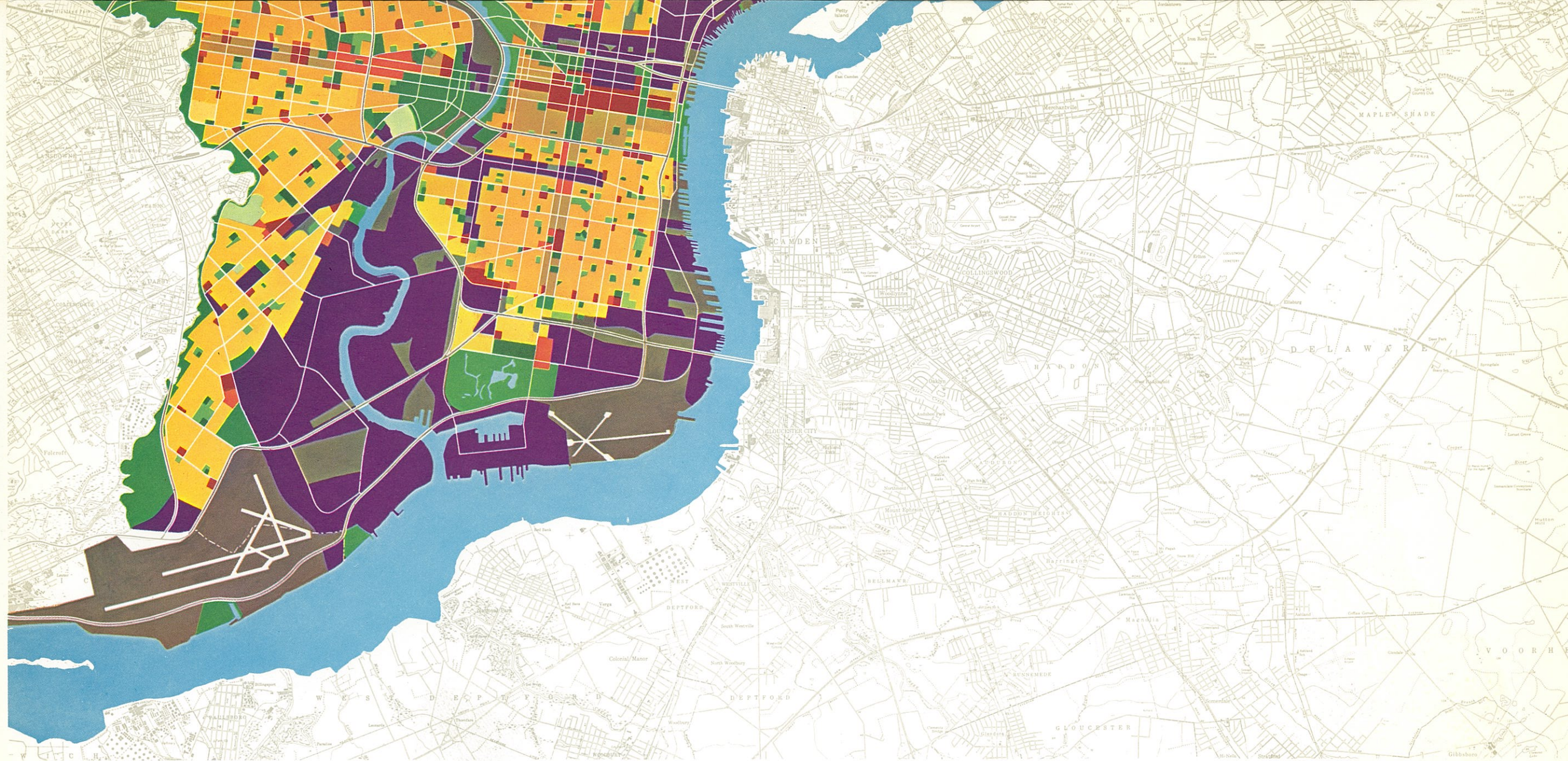
PHILADELPHIA CITY PLANNING COMMISSION—MARCH 1960

THE EXISTING LAND USE

0 5,000 10,000 15,000 20,000 FEET

- RESIDENCE
- COMMERCE
- RECREATION
- INSTITUTIONS
- CEMETERIES
- INDUSTRY
- TRANSPORTATION & UTILITIES
- EXPRESSWAYS
- ARTERIALS





PHILADELPHIA CITY PLANNING COMMISSION—MARCH 1960

THE COMPREHENSIVE PLAN THE PHYSICAL DEVELOPMENT PLAN FOR THE CITY OF PHILADELPHIA

0 5,000 10,000 15,000 20,000 FEET

- RESIDENCE** (Dwelling units per net residential acre)
 - under 20
 - 20 to 39
 - 40 to 59
 - 60 and over
- COMMERCE**
 - CENTERS
 - FREE STANDING
- RECREATION**
 - PLAYGROUNDS & PLAYFIELDS
 - PARKS
- INSTITUTIONS**
- CEMETERIES**
- INDUSTRY**
- TRANSPORTATION & UTILITIES**
 - EXPRESSWAYS
 - ARTERIALS