A REPORT UPON

UTILITIES AND HOUSING

COLUMBUS URBAN AREA

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October, 1954

City Planning Commission
Franklin County Regional Planning Commission
Columbus, Ohio

Gentlemen:

We are pleased to submit herewith our preliminary report on Housing and Redevelopment and Water, Sewers and Utilities, which constitute the fourth in the series of reports comprised in the preliminary planning program.

The large majority of dwellings in the Columbus area is of good character and well maintained. However, there is a number of areas where existing dwellings have seriously deteriorated and in the worst of these areas the housing is predominantly dilapidated or otherwise substandard. The clearance and rebuilding of such neighborhoods, as presently contemplated in the urban redevelopment program, are essential. Other areas can be rehabilitated gradually.

The present report includes a summary and analysis of housing conditions and indicates the general location and character of critical housing areas within the Columbus community.

The availability of ample water, sanitary sewerage, and storm drainage facilities as well as facilities for garbage disposal are essential to the public health and directly influence the growth and character of the community. These services and current and future improvements are analyzed in relation to the expected Columbus urban growth and to ways and means of promoting the most desirable urban pattern.

During the preparation of these reports we have received the cooperation of many individuals, public officials and public and private agencies. We particularly wish to express our appreciation for the assistance rendered by the Columbus Urban Redevelopment Authority, as well as by the Planning Commission staffs. The recent report on Sewers and Sewage Treatment of the Regional Planning Commission and the 1954 report on the Columbus water distribution system, made by the Pitometer Associates, were quite helpful.

Respectfully submitted,

HARLAND BARTHOLOMEW AND ASSOCIATES

By Russell H. Riley

TABLE OF CONTENTS

LIST OF PLATES

LIST OF TABLES

HOUSING

Introduction

Housing occupies an important place among the factors which shape the character of a community. Areas of blighted or obsolescent dwellings foster progressive community deterioration. The erection of additional housing facilities in more desirable neighborhoods or locations, is accompanied by movement of population from these depressed areas.

The current rate of growth in the local urban area has been estimated at around 2,000 persons monthly, including those who move in and those who move away. This increase in population requires added housing, which will be located in various parts of the city and urbanized area. Good neighborhoods can be planned only as parts of the entire urban community. New homes and areas redeveloped for housing, both public and private, should be located and designed to provide good dwelling units, desirable open space, and protection against heavy traffic and the encroachment of harmful uses. Facilities for shopping and the educational, recreational, cultural, and related services that make for a stable and satisfactory community life must also be provided.

Achievement of these goals requires not only a well-thought-out comprehensive plan but alert, well-informed citizens and public officials all working together.

In the following pages will be found a review and analysis of existing housing conditions in Columbus and the urbanized area. The principal problem areas are outlined showing the location and extent of substandard housing in Columbus. Corrective measures needed to improve the present housing supply are outlined and the role that the redevelopment program should play is indicated.

The findings and suggestions outlined in this report are intended only as an approach to the housing problem. They do, however, clearly reveal that substandard housing problems do exist within the city and adjacent areas and that the current program of redevelopment is both sound and seriously needed.

Minimum Standards for Individual Dwelling Units

It is only within the last twenty years or so that the home and neighborhood have been thought of as individual facets of the entire community. With the realization of the interrelationship between the home, the neighborhood and the

community as a whole, came standards as to their size, construction, layout, and necessary facilities. These standards have continually evolved and moved forward. A general outline of accepted residential and neighborhood standards follows.

The built up urbanized areas of our communities are composed primarily of individual dwelling units. In order that the welfare, security, health and living standards of the people within these areas may be protected, it is necessary that each dwelling unit conform to basic minimum standards.

1. Every Dwelling Unit Should Provide Safe Shelter.

All dwelling units should be constructed in such a manner and of such materials as to safely withstand the elements and the loads that will be imposed on them. Every dwelling should be maintained in a good state of repair.

2. Every Dwelling Unit Should Contain Essential Sanitary Facilities.

A flush water closet is essential in each dwelling unit to minimize the danger of transmitting disease in the disposal of fecal matter. Running water is an elemental requirement for health and cleanliness in every dwelling unit.

3. Every Dwelling Unit Should Have Ample Natural Light and Ventilation.

Health authorities are in agreement that adequate light and ventilation are necessary for every habitable room. Screens are necessary for all outside openings in order to provide protection against flies and other insects.

4. Every Dwelling Unit Should Have Adequate Heating Facilities.

From a health standpoint alone, not to mention comfort, adequate heat is most important for each dwelling unit.

5. Every Dwelling Unit Should Provide Adequate Living Space

As pointed out in some detail later, crowding in residential structures is a major cause of substandard dwelling units. The accepted minimum standard is that no dwelling unit should contain more than 1.5 persons per habitable room.

Desirable Neighborhood Characteristics

The neighborhood is essentially, though not entirely, composed of residential areas. Just as each dwelling unit should meet certain standards in order to provide a wholesome basis for good living, each group of dwelling units or neighborhoods should be developed and maintained to create an attractive residential environment. Certain essential features, as outlined below, are necessary to make the neighborhood a desirable place in which to live and raise children.

1. Similarity of Housing Types

While there are no rigid or prohibitive rules against mixing housing types, if properly related to an over-all neighborhood design, it is generally better to create homogeneous neighborhoods having the same type of housing. The differences in utility sizes needed to service single family homes as opposed to multiple family structures usually dictate separate areas for each type.

2. The Neighborhood Size - Area and Population

The area served by an elementary school is often considered as a convenient and desirable size for neighborhood design. In districts of high population density the neighborhood will, of course, cover a smaller area than in lower density districts. Each neighborhood should be able to support the social, educational, and commercial facilities which serve it. The neighborhood population will vary from 1,000 to 6,000 persons - or about 275 to 1,650 families - the actual size depending on numerous factors such as physical barriers, social and economic considerations, housing types, etc.

3. The Neighborhood Must Have Utilities and Essential Community Services.

Water supply, sanitary sewage disposal, removal of refuse, electricity, communications, fire and police protection are necessary services in all residential areas. Various social and commercial facilities are also needed.

4. The Neighborhood Needs Educational and Recreational Facilities

Good schools, ample school grounds and other facilities for local recreation and social activities are desiderata of modern urban civilization. When supplied on a neighborhood basis, they insure good living conditions and preservation of the desirable neighborhood environment.

5. The Neighborhood Should Have Definite and Recognizable Boundaries

Neighborhood limits are best determined not by arbitrary political lines but by physical boundaries such as major streets, railroads or rivers. Social and economic factors also influence the neighborhood form.

6. The Neighborhood Traffic System

Streets are a part of the over-all community pattern. They should carry high-speed, through traffic around the neighborhood while providing convenient access to each residential area and other parts of the community.

Compliance with these standards in building new homes and residential neighborhoods will pay big dividends in creating a much more attractive living environment, fostering community stability and enhancing property values. The principles are applicable to the rebuilding of older, blighted areas as well as to the development of new neighborhoods in outlying sections of the community.

EXISTING HOUSING CONDITIONS

The housing supply in the Columbus area to date has been almost solely the result of private initiative. Of the 152,652 dwelling units in the urban area as of January 1,195[illegible] only 1,352 of these were public housing.

The urbanized area, and particularly the City of Columbus, is composed of fairly well defined neighborhoods. Most of these neighborhoods were developed prior to the adoption of zoning or subdivision regulations which is reflected in the large amounts of substandard dwelling units found in certain districts. The majority of these substandard housing areas is, as might be expected, found in older sections near the center of the city. This does not mean that age in itself is necessarily the cause of substandard, blighted or slum housing; however, many of the older dwellings were closely built without adequate light and ventilation, and while structurally sound, are not well adapted to modern living or to conversion into multiple units.

Some of the worst housing conditions are found in areas outside of Columbus. A large number of these units was built during the depression when inadequate finances made suitable construction difficult. During the war years it was also difficult to erect the amount and type of housing needed.

Number and Type of Dwelling Units

The following data shows the number, type, and percentage distribution of dwelling units in the City of Columbus and in the urbanized area including Columbus.

Most of these and subsequent data on housing conditions in the city and county are based on the 1950 U.S. Census of Housing and studies made by the Columbus Urban Redevelopment Authority.

Type of Structure	Urbanized Area		Columbus	
	Number	Percent	Number	Percent
1 dwelling unit, detached	68,184	52.3	53,885	51.2
Other (attached dwelling unit, and two-dwelling unit)	30,941	24.7	30,548	30.5
Three & four dwelling unit	13,827	10.7	12,899	12.8
Five to nine dwelling unit	8,526	6.6	7,915	7.7
Trailers	946	.8	349	.5
Number reporting	129,630	100.0	111,721	100.0

Data from 1950 U.S. Census of Housing

One and two-family residences account for 81.9 percent of all dwelling units in Columbus and occupy 83.2 percent of the gross land area devoted to housing development. Due to the predominantly single-family construction in most areas outside the city, there is a slightly higher percentage of single-family, detached units in the urban area as a whole than within the city. As would be expected, Columbus had a higher percentage of multiple-family units than did the entire urban area.

From records of the City of Columbus Building Regulation Department and the Franklin County Regional Planning Commission, an investigation was made of new dwelling construction since the 1950 census inside and outside the city. Between April 1, 1950 and January 1, 1954 there were 23,072 additional dwelling units in Columbus and Franklin County. While this is a very substantial addition to the existing housing supply, it was not sufficient even to adequately house the population added during this same period. The majority of these additional dwellings consisted of new construction, the remainder of conversions. Of the total 23,072 dwelling units added, 10,473 were within the City of Columbus - 9,714 in new construction and 759 in converted buildings. The 12,599 dwelling units added in the urban area outside of Columbus included 10,814 units in new buildings and 1,785 in converted structures.

Table 1 shows the type, number and location of new dwelling construction in the area. It is evident that single-family homes predominate. This condition is true in other urban communities also; favorable financing policies and the Federal Housing Administration's insuring of home loans having promoted construction of single-family homes in recent years.

Number of Rooms Per Dwelling

Table 2 summarizes the number of rooms per dwelling unit in Franklin County and Columbus along with the number, type and percentage distribution of owner occupied and renter occupied accommodations.

While five to six rooms is the most desired size of dwelling only 39.6 percent of the renter occupied units were in this range although 61.9 percent of the owner occupied units had five or six rooms.

Occupancy of Dwelling Units

Except during the depression period, home ownership has gradually increased in urban communities during the past fifty years. In 1900 only 36.5 percent of the country's residential structures were owner occupied. By 1920 this figure had risen to 40.9 percent and the next decade of the "roaring twenties" pushed the percentage of home ownership to 46 percent. The degree of home ownership has followed closely the general economic condition of the nation, as indicated by the decline during the depression to a figure of 41.1 percent in 1940. With the war and post-war economic gains, and the mass construction of homes by large builders came a spectacular increase in home ownership. For the first time in the history of the nation, home owners exceeded renters, and in 1950, 53 percent of the dwelling units in this country were owner occupied.

There is no doubt that home ownership is desirable from many aspects. The tradition of home ownership is strong in the United States. The single family home, individually owned, has been found to bring the most stability to the neighborhood and to the community. The single family home also helps to provide satisfactory family accommodations and good living conditions more nearly than does any other type of dwelling.

In the slum and blighted areas of the city the proportion of dwelling units owned by absentee landlords is very high. The lack of the owners' interest in the welfare of these areas together with the tenants' inability or unwillingness to properly maintain them are major factors in residential blight.

The following data reflects 1950 owner and tenant occupancy in the urbanized area of Columbus and certain other Ohio cities. This data was compiled in the U.S. Census of Housing.

Urbanized Area	Number Occupied	% Owner Occupied	% Renter Occupied
Columbus	127,664	51.2	48.8
Toledo	108,077	64.1	35.9
Akron	107,222	66.3	33.7
Dayton	99,549	56.6	43.4
Youngstown	82,224	63.5	36.5

The table reveals that while more than 50 percent of the units in Columbus were owner occupied, this percentage (51.2) was slightly lower than the average for the nation and was considerably lower than in the other listed Ohio cities. This can be partly explained by the fact that the State Capitol and University attract many persons that desire to rent rather than own homes. Further, a substantial number of apartment units was erected during the 1940's to meet housing needs created by war production in the local plants. Columbus is also larger than the other areas and the proportion of renters normally increases in the larger cities.

The 1950 U. S. Census of Housing also revealed that of the 110,048 occupied living units within the City of Columbus, only 47.2 percent were owner occupied. Thus, the large majority of the rental units is in the city rather than in the outlying portions of the urban area.

Overcrowding and Vacancies

The following data compiled from the 1950 U. S. Census of Housing shows the number and proportion of overcrowded and vacant dwelling units in Columbus and four other Ohio communities. In 1950 only Dayton had more overcrowding than Columbus. While the percentage of vacancy was quite similar in all the communities, except Akron, Columbus had the smallest ratio of unoccupied dwelling units for rent or sale.

Overcrowding of Dwelling Units

Urbanized Area	Occupied Dwelling Units	No. of Dwelling Units with 1.51 or More Persons Per Room	% Over-Crowded
Columbus	127,664	4,409	3.46
Toledo	108,077	2,181	2.00
Akron	107,222	2,357	2.18
Dayton	99,549	5,263	5.28
Youngstown	82,224	2,490	3.03

Vacant Dwelling Units

Urbanized Area	All Dwelling Units	No. Vacant Dwelling Units for Rent or Sale	% Vacant
Columbus	129,630	926	.71
Toledo	109,969	801	.73
Akron	109,798	1,246	1.14
Dayton	101,395	798	.79
Youngstown	83,522	631	.76

Owner or renter occupancy of dwellings and the age of residential structures vary somewhat both in substandard and good housing areas. Overcrowding, however, which is defined as more than 1.51 persons per room, is found to a substantial degree only in the blighted and substandard housing areas. According to the 1950 U.S. Census of Housing 3.56 percent of the occupied dwelling units in the City of Columbus were overcrowded. In the older, substandard housing areas overcrowding ranged from 10 percent to 15 percent.

There are two main reasons for overcrowding: (1) the financial inability of a family to afford more space or (2) the lack of available dwelling units. The former explains why so much substandard housing is also overcrowded. Many of the larger, old homes were partitioned off to create a number of smaller inadequate dwelling units.

The amount of available vacant dwelling units would normally be from 4 to 5 percent. Existing vacancies indicate that the housing shortage is nation-wide and that it was particularly severe in Columbus in 1950. According to the 1950 U. S. Census of Housing the country as a whole had 1.7 percent of the total housing supply on the market for rent or sale. The urban area of the State of Ohio had a 1.0 percent vacancy and the City of Columbus had a dwelling unit vacancy of only 0.7 percent.

Age of Dwelling Units

Year Built	Urbanized Area Outside of Columbus		City of Columbus		Total Urban Area	
	Number	%	Number	%	Number	%
1945 or later	3,390	22.3	8,270	8.5	11,660	11.0
1940 to 1944	2,500	16.5	6,375	6.6	8,875	7.9
1930 to 1939	3,220	21.2	10,250	11.7	13,470	12.0
1920 to 1929	4,450	29.5	26,115	26.7	30,565	27.5
1919 or earlier	1,710	10.5	45,250	46.5	46,960	41.6
Total Reporting	15,270	100.0	96,260	100.0	111,530	100.0

Source: 1950 U. S. Census of Housing

The bulk of dwellings built prior to 1920 is found within the present city. In 1920 Columbus had a population of 237,031 to house, the remainder of Franklin County only 46,920. While there are certain areas of old and substandard housing outside the city, it is evident that the bulk of older substandard dwelling units is found within the corporate limits.

Structural and Sanitary Conditions

Housing conditions with respect to their structural characteristics and sanitary facilities vary considerably from one part of the urbanized area to another. Table 3 presents a summary of general housing conditions in Columbus and the urbanized area reported by the 1950 U. S. Census of Housing. Taken as a whole 81.5 percent of the area's dwelling units were adequate. The City of Columbus was slightly lower with 80.8 percent of its housing adequate and the area outside the city was slightly higher with 82.1 percent of its residential units adequate.

The comparatively high percentage of adequate housing existing in the area should not be taken as an indication that the housing problem in Columbus is small or non-existant, for on January 1, 1954 there were over 22,000 dwelling units in Franklin County which were dilapidated and/or lacking running water or private baths. Of this number over 80 percent were found in the City of Columbus.

Prior to April 1, 1950 some 12.5 percent of the urban families in Franklin County, outside Columbus, were residing in substandard dwelling units, doubled up with other families, or in some other way without desirable housing. By January 1, 1954, this figure had increased to 19.7 percent - a 7.2 percent rise. In absolute numbers, the housing problem in Franklin County, outside Columbus, is relatively small when compared with the city's housing needs. The sharp increase in inadequately housed families since 1950, however, indicates that prompt attention should be given to this area. If the trend toward suburban living continues as it has over the past few years - and there is no reason to believe that it will not - the housing situation in this area could become critical.

As of April, 1950 there was insufficient housing to adequately house 18.1 percent of the citizens of Columbus, based on the desirable housing standards outlined at the beginning of this report. By January 1, 1954 this figure had fallen to 15.3 percent, which indicates that while the housing problem is serious in the city some significant gains have been made in improving conditions during the past three years.

The following data from the 1950 U. S. Housing Census shows a comparison of adequate housing units in Columbus with certain other Ohio cities - adequate units are considered as not being dilapidated and having a bath and hot running water.

Urbanized Area	Total Dwelling Units Reporting	No. of Adequate Units	Percent of Total
Columbus	125,665	102,937	82.1
Akron	107,586	89,130	83.7
Toledo	106,805	92,985	86.8
Dayton	98,465	74,447	74.6

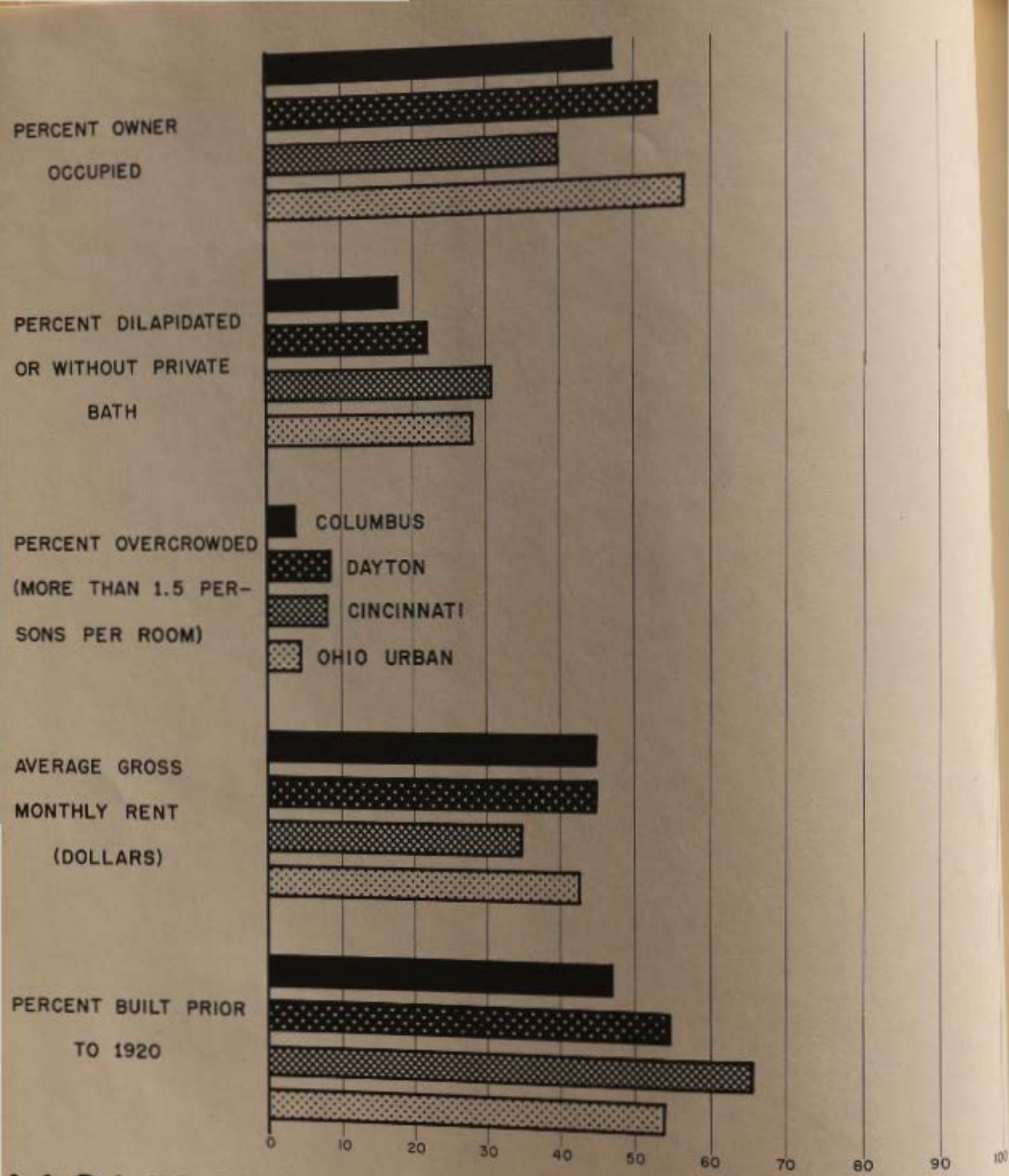
The proportion of adequate housing in Columbus compares rather favorably with the other urban areas. It is slightly lower than either Akron or Toledo, but much better than the conditions in Dayton. However, since the local area contains more dwelling units than the others there is a substantial number (more than 22,000) of inadequate units.

Comparison of Major Housing Conditions in Certain Ohio Areas

Major housing conditions in Columbus and certain other Ohio areas as of 1950 are graphically shown on Plate 1. In general the conditions in Columbus compared very favorably with those in Dayton and Cincinnati and with the entire urban area of the state. While it had less owner occupancy than the other areas, except Cincinnati, it also has a smaller proportion of substandard living units and of overcrowding. Although the city is larger than Dayton a smaller proportion of the living units had been erected prior to 1920. This primarily reflects the very rapid increase in population growth and in home building that has occurred in Columbus since 1940.

Housing Conditions in Major Sections

Plate 2 shows graphically housing conditions, as of 1950, in major areas in Columbus and the surrounding urban area. Different delineations on each of the four bars indicate renter occupancy, units erected prior to 1920, monthly rentals less than $50.00, and substandard units - no private bath or dilapidated. The height of the bar indicates the percentage of the total number of living units in each area that conforms to these four conditions. While each of the conditions is important, the proportions of substandard units, generally followed by the proportion erected prior to 1920, are the major conditions that indicate areas of bad housing requiring early attention.



HOUSING CONDITIONS-1950

COLUMBUS AND OTHER OHIO CITIES

CITY PLANNING COMMISSION

HOUSING CONDITIONS 1950
IN MAJOR AREAS

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COMMISSION

LEGEND

PER CENT OF DWELLING UNITS

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It is in and near the center of the city that the highest percentage of renters, old buildings, and substandard housing is found. The plate clearly reflects the large proportion of bad housing in the areas now being studied for redevelopment - the Goodale and the Market - Mohawk projects. However, the area containing the largest proportions of substandard and low rental units is just beyond the corporate limits, generally known as the American Addition and located in Clinton Township along Joyce Avenue immediately north of the New York Central yards.

In the newer sections of the city and in most of the suburban communities no indication of bad housing conditions is found. The excellent and desirable character of housing facilities in Upper Arlington and Bexley is clearly indicated on the plate.

There is a surprisingly high proportion of substandard units in the unincorporated portions of the urban area. While this condition is found in most sections, there is a somewhat higher proportion in the areas south and southwest of the city. There is, however, a comparatively small proportion of renter occupancy and of homes erected prior to 1920 in all of the outlying sections. This latter condition reflects the large amount of new construction that has recently occurred in these areas.

With the exception of the American Addition in Clinton Township and a few others that will be discussed in the following section, the majority of the substandard housing is rather widely scattered within the large districts shown on Plate 2. Some of it consists of old farm homes while others are a shack type of structure so frequently found in the fringe areas of large cities.

A major reason for the number of substandard dwellings in the outlying areas is the lack of sewer and water facilities. Thus, many of the homes have neither running water nor baths. While this is not a satisfactory condition, it is not as serious in sparsely settled areas as it is within compactly developed sections.

The plate thus reveals that some bad housing conditions exist beyond the corporate limits, but they are not as extensive or as serious as within the city. A large proportion of these bad outlying conditions could be corrected by extending sewer and water facilities and by enforcing sound regulatory measures.

CRITICAL HOUSING AREAS

The preceding Plate 2 indicated major housing conditions in larger sections of the local urban area. The predominance of substandard dwellings in the older sections of the city (near the central business district) as well as in certain other areas is more clearly revealed by this plate. However, only a portion rather than all of the large districts revealing bad housing facilities could be considered as slums or seriously blighted areas.

These larger tracts were examined in more detail both by a field survey and by a block to block check of the 1950 Census of Housing data. Such analyses were supplemented by studies and other detailed surveys previously made by the Columbus Urban Redevelopment Authority. As a result of such studies the boundaries of the areas containing the worst housing were more clearly defined. The general location and extent of the areas are shown on Plate 3 and the following discussion indicates their general character and condition.

City of Columbus

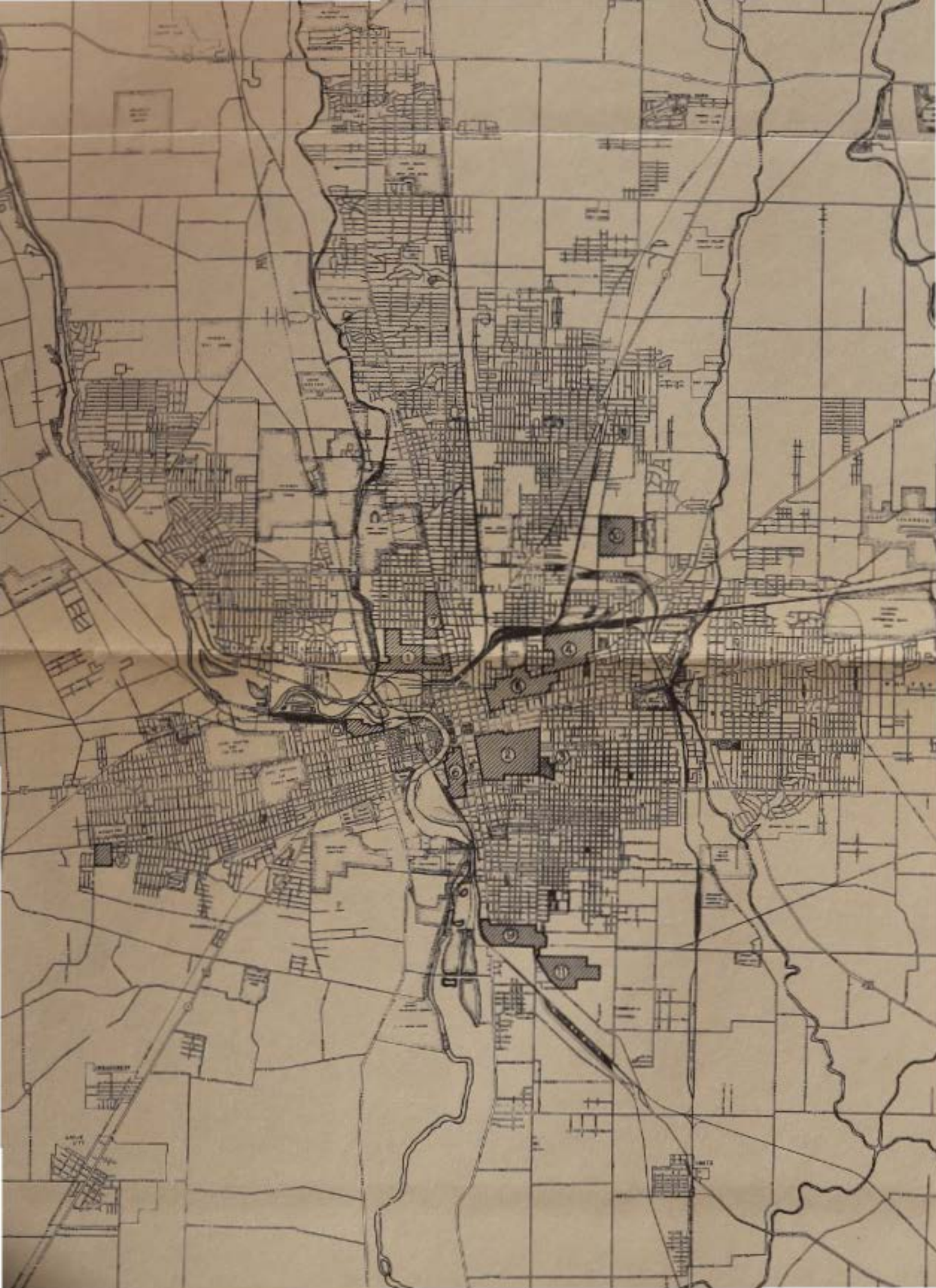
Area 1 - Goodale Area

The Goodale Area lies within Census Tract No. 32 which is bounded generally by the Olentangy River on the west; First Avenue, Harrison and Buttles Avenue on the north; Dennison Avenue on the east; and the Scioto River on the south. The entire census tract has an area of approximately 210 acres of which the section containing the worst housing comprises about 70 acres. Some 70 acres are north of Spruce Street and occupy the northern part of the census tract.

This is one of the areas where the Columbus Urban Redevelopment Authority has made a detailed survey and redevelopment study. Comparison of this area with the city as a whole, as shown in the following table, indicates clearly the need for redevelopment.

	City of Columbus	Area 1*
Percent of substandard dwelling units	17.9	53.0
Percent of dwelling units overcrowded	3.56	10.6
Percent owner occupied dwelling units	46.5	26.0
Percent dwelling units built prior to 1920	46.5	75.0

*These statistics for the entire Census Tract 32 of which the Goodale area is only a part.



CRITICAL HOUSING AREAS

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PRINCIPAL AREAS NEEDING CLEARANCE AND REDEVELOPMENT

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Area 2 - Market-Mohawk Area

The Market-Mohawk area lies in Census Tracts No. 39 and 40, which include all the area between Broad Street and Livingston Avenue from the Scioto River east to Parsons Avenue.

These tracts comprise an area of some 536 acres. The Market-Mohawk area is located in the southwest sector and extends to within two blocks of the major downtown section of the city. While the greater part of Census Tracts No. 39 and 40 contains dwelling units which are more than 50 percent substandard, the Market-Mohawk area of about 250 acres comprises the worst portions of these tracts. This seriously blighted area is bounded on the west by South Third Street, the south by East Livingston Avenue, the east by South and Parsons Avenues and the north irregularly by Chapel, Town and Main Streets. The following table extracted from the 1950 U. S. Census of Housing clearly shows the substandard character of the Market-Mohawk area.

	City of Columbus	Area 2*
Percent of substandard dwelling units	17.9	57.0
Percent of dwelling units overcrowded	3.56	13.1
Percent owner occupied dwelling units	46.5	8.0
Percent dwelling units built prior to 1920	46.5	75.0

*These statistics are for the entire Census Tracts 39 and 40 of which the Market-Mohawk area is only a part.

The Columbus Urban Redevelopment Authority has made an extensive blight survey of this district and is currently preparing a redevelopment plan therefor.

Area 3 - Children's Hospital Area

This area lies within Census Tract No. 53. It is bounded on the north by Donaldson and Stone Avenue, on the south by Livingston Avenue, on the west by Parsons and on the east by Monroe. Comprising some 23 acres, the Children's Hospital area contains a large number of slum dwelling units as indicated by the following comparisons with the city as a whole.

	City of Columbus	Area 3*
Percent of dwelling units substandard	17.9	57.5
Percent of dwelling units overcrowded	3.56	19.2
Percent owner occupied dwelling units	46.5	18.4
Percent dwelling units built prior to 1920	46.5	84.0

*Data for entire Census Tract No. 53

Area 4 - Leonard Avenue Area

Area No. 4 is bounded on the north by Panhandle; on the south by Mt. Vernon; on the east by Champion Avenue and on the west by St. Clair and Monroe Avenues. Comprising the major part of Census Tract No. 29, it is some 170 acres in area. The following table shows clearly that this area is severly blighted.

	City of Columbus	Area 4*
Percent of dwelling units substandard	17.9	51.0
Percent of dwelling units overcrowded	3.56	10.3
Percent of owner occupied dwelling units	46.5	34.3
Percent of dwelling units built prior to 1920	46.5	53.8

*Data for entire Census Tract No. 29

While the statistics indicate that some of the other substandard areas are more sorely blighted than the Leonard Avenue area, field investigation revealed that this section was one of the worst housing areas in the city.

Statistical analysis and field inspection of existing housing conditions indicate that the worst "housing cancer" is found in the four areas described above. While these areas should be the first to be attacked, there are five other sections where redevelopment will be necessary. These areas are briefly outlined below:

Area 5

This section is in juxtaposition with the southwest corner of the Leonard Avenue area just discussed. It is bounded generally by 17th Street on the east, Neilston Street on the west, Long Street on the south and Grove Street on the north and lies within Census Tracts No. 30 and No. 35. The amount of substandard housing found in these tracts measures 36.6 percent and 47 percent respectively but the degree of blight is much greater than this within the specific area described above.

Area 6

Lying to the west of the Market-Mohawk area in Census Tract No. 40, this area is bounded generally by Wall Street, Short Street, College, and Walnut Street. It will be bisected by construction of the proposed expressway system. Of its 426 dwelling units some 312 are substandard. Blighted dwelling units account for 73.5 percent of this area's housing.

Area 7

This is an area to the north of Goodale Park which is bounded by Fifth Avenue on the north, Hubbard Avenue on the south, High Street on the east and Dennison Avenue on the west. It accounts for almost the entire Census Tract No. 21. The majority of the dwelling units is badly blighted.

Area 8

This is a relatively small area located on the west side of the Scioto River in Census Tract No. 42. It comprises about 100 dwelling units of which some 77 are substandard. The area is bounded irregularly by River and John Streets on the north, Scott Street on the south, Meek Street on the west and Sandusky Street on the east.

Area 9

In contrast with the other areas described above which are near the business district, this section is located at the extreme southern edge of the city in Census Tract No. 61. It is bordered by the Chesapeake and Ohio Railroad to the west, by the city limits on the south and east and by Reeb Avenue on the north. In almost every block in this area well over 50 percent of the dwelling units are substandard.

While the above described areas are the major sections requiring clearance and redevelopment to alleviate present conditions there are other housing areas in the city which, while not yet deteriorated to the same extent, nonetheless contain numerous small sections of blighted housing. For example the area bordered by First Avenue, Fourth Avenue, the Pennsylvania Railroad and High Street contains over 36 percent substandard housing units. There are also several sections of blighted housing on the west side of the Scioto River. One of these is the area bounded by Broad Street on the north, Rich Avenue on the south, Avondale Avenue on the east and Yale Avenue on the west.

Franklin County

As has been indicated, there are considerably more blighted and substandard dwelling units inside the city than in the surrounding areas. However, the "urban" or rural-urban slums found in various parts of the county are equal to some of the worst areas in the city. Following is a brief discussion of these.

As aforementioned, one of the worst slum sections is found in Clinton Township, locally knows as "The American Addition". Here the vast majority of the dwelling units is far below the accepted minimum standards for housing. The area is bounded by Dewey Avenue on the south, 17th Avenue on the north, Parkwood Avenue to the east and Joyce Avenue to the west. On the plate indicating the location of major critical housing areas in the Columbus urban area the "American Addition" is shows as No. 10. There are approximately 250 dwelling units in this section.

Two additional areas of bad housing are located in Marion Township. These are known as the Lewis Addition and the Stambaugh Addition. They are bounded generally by Groveport Pike, Lockbourne Road, Glendover Avenue and the Buckeye Steel Casting Company properties. The section contains some 230 badly blighted dwellings and is designated as area 11 on Plate 3.

Within the county there are two other areas in which the substandard housing can be attributed mainly to poor subdivision design or the inadequacy of the site. In Franklin Township there are some 60 blighted dwelling units in a district known as Burnside Heights. This area is bordered on the North by Sullivant Avenue, on the west by Demorest Road and by new subdivisions to the south and east.

POSSIBLE APPROACHES TO HOUSING PROBLEM

This phase of the initial planning program is primarily intended to check the soundness of the proposed redevelopment projects and to indicate the possible needs for a continuation of such activities. Preceding data in this and other reports has clearly revealed that the current program is entirely sound and logical. The projects are located within those sections where the worst housing conditions now prevail and further, the proposed redevelopment areas conform completely to other phases of the master plan with respect to the Goodale and Mohawk areas. Plates 2 and 3 (as well as several tables) reveal also that there is a number of other areas in which housing conditions are now so unsatisfactory that complete clearance and redevelopment or some other equally satisfactory solution is essential.

Redevelopment Program

Local agencies, especially the Redevelopment Authority, have widely publicised the redevelopment program. Only a summary need be given in this report. The National Housing Act of 1949 provided means for participation of the Federal Government in local housing or redevelopment projects. Wherever a slum, or blighted area is to be cleared and redeveloped by an official local agency the Federal Government acting through the Housing and Home Finance Agency is authorized to assist the project by contributing not more than two-thirds (2/3) of the difference between the cost of acquiring and clearing the site and what can be realized from the sale of the area for redevelopment purposes.

The two important features of such legislation are (1) the possibility of assembling slum properties by a public agency for resale to private developers and, (2) the Federal subsidy in reducing the cost of the resold land so that it can have a sound economic value in the redevelopment program.

Work upon the first local redevelopment project (Goodale area) has progressed to the stage where final plans for redevelopment should soon be approved and land acquisition should follow thereafter. Plate 4 shows the present development in the area as well as the present plan for redevelopment. There can be no question but what the area should be a much more valuable portion of the community after it is cleared and improved in accordance with modern standards.

GOODALE REDEVELOPMENT AREA

POSSIBLE APPROACHES TO HOUSING PROBLEM

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Other Phases of Improving Housing Facilities

While redevelopment should be a major portion of any comprehensive housing program, there are many other steps that should be taken. Because of the limitations of this report the more important can only be mentioned herein but they should be the subject of more detailed study in the future.

Clearance by Private Enterprise

Many old unsanitary homes have been removed and the area used for industry or business. This process should continue in the future and should be facilitated by public agencies.

Rehabilitation

There are extensive sections of the urban area where housing facilities are not good but where their condition does not justify wholesale clearance. In such instances much can be accomplished by large scale repairing and rehabilitating the individual structures. Usually this should be accompanied by making physical improvements in the neighborhood such as repaving, providing sewer and drainage facilities.

Minimum Housing Standards

The adoption and strict enforcement of minimum housing standards is one of the most effective and inexpensive methods of eliminating bad housing. Such regulations contain minimum standards regarding structural conditions, sanitation, light, and cleanliness. Not only must all new dwelling units conform to such standards but all existing units must either be rehabilitated so that they conform or they must be demolished. Such rehabilitation or removal is at the owner's expense.

Preservative Measures

Preceding data revealed that the predominant portion of dwelling units in the Columbus area were in a good condition. Here the major problem is to assure that this condition will be continued in the future. Sound and modern zoning regulations, modern building codes, strong neighborhood organizations and a good standard of public improvements and services are the most important means of achieving this objective.

The above summary clearly reveals the many facets of the housing problem. More detailed study is needed upon this all important subject. Areas needing clearance, rehabilitation or preservation should be defined and classified and a program determined as to the method of improvement and how it should be carried out.

WATER, SEWERS AND UTILITIES

Introduction

The modern city is most dependent upon highly organized systems of public and private utilities and public services to serve the citizens and their many activities. Among the most important of such utilities are an ample supply of potable water and the facilities for sanitation. Since it is no longer possible, under urban conditions of concentrated building construction and high population densities, to use individual sewage disposal devices and individual sources of water supply without imperiling the public health, these facilities must be provided on a collective basis, which is generally regarded as the primary responsibility of local government.

Certain public services, because of their relationship to the physical community and their influence on development, are logical components of the comprehensive plan, at least in the broad aspects of their over-all design and programing of construction. The provision of water and sanitary sewerage in particular tends to shape the pattern of the community and should be coordinated with other elements of the plan. Once installed, these utilities are fixed for many years, and both the location and size should be determined on the basis of future population distribution and density and the future land use pattern. Regulation of water and sewer extensions in different parts of the community provides one of the most effective means of guiding the direction of future growth and, consequently, of bringing about the most logical and desirable community pattern. This, in turn, facilitates the provision of other essential public services with the greatest efficiency and economy.

The rapid growth of the Columbus area during and following World War II, and especially the wartime industrial expansion, coming in a period of a major drouth, so taxed the existing facilities for water supply that a serious shortage occurred, which is now being overcome by construction of the large new reservoir and filter plant on the Big Walnut. Even this, however, will not be sufficient to meet the requirements of the future community of more than 800,000 expected by 1980 or so, and additional water impoundments, purification facilities and distribution mains will be needed if Columbus is to continue to grow and prosper.

The city itself is completely sewered, although some of the existing mains are overloaded. An extensive system of main trunk sewers, sub-trunks and laterals will be needed, however, to serve the various districts outside the city, and relief of the presently overburdened sewage treatment plant is most imperative. A thorough study of present requirements and proposals for additional sewerage to serve the future urban area were recently completed by the Franklin County Regional Sanitary Survey Committee under sponsorship of the Regional Planning Commission.

While the need for water lines and sanitary sewers is generally recognized, the necessity for adequate storm drainage facilities is not always so apparent. The infrequency of heavy rains and the fewer persons directly affected by poor drainage tend to minimize its importance in the public mind. Adequate disposal of storm water, however, is quite necessary, not only because flooded streets, yards and basements impede traffic and cause inconvenience but also because conditions of dampness or standing water serve as breeding places for mosquitoes and other vermin. Facilities for proper drainage are now considered an appropriate part of each subdivision development, which necessitates the provision of adequate natural drains or a system of storm sewers if the local facilities are to be effective.

It is the purpose of the present report to appraise these utilities in the light of the desirable future population and land use patterns and to suggest ways and means by which the individual projects may be made to further the logical and balanced future community growth. Like the section on Housing, this phase is intended only to indicate the adequacies or major needs of the several utilities rather than to present a complete analysis and long range plan. While there is included a brief description of existing water supply and distribution facilities and proposals for enlargement, it is deemed neither necessary nor desirable to repeat all the details of existing sanitary sewerage and the design factors which were thoroughly treated in the recent sewers and sewage treatment report.

A section is included also on garbage and refuse disposal since this is now an important public service which should be coordinated with other elements of the comprehensive community plan.

WATER SUPPLY

The present Columbus water supply comes primarily from impoundments on the Scioto River although a small supplementary supply is obtained from wells on Nelson Road. However, the large increase in water demand during World War II, coming in the face of a prolonged drouth, and the resulting water shortage emphasized the necessity for new sources of supply, and a new reservoir and treatment plant are now under construction on Big Walnut Creek. In addition to the City of Columbus, two other incorporated communities within the urban area, Worthington and Grove City, have separate public water supplies. The other incorporated areas and parts of the county served by a public distribution system purchase water from the city, with the remainder of the area being served primarily by wells.

Existing Facilities for Water Supply

The O'Shaughnessy Dam and Reservoir are located on the Scioto River in Delaware County about 14.5 miles above the present pumping station. The 1953 capacity was estimated at 5,150 million gallons. The Griggs Dam and Reservoir, some 10 miles closer to the city, had an estimated 1953 capacity of 1,380 million gallons. Raw water from these reservoirs is treated at a purification and softening plant located outside the city on Dublin Road near the Scioto.

The Hoover Dam and Reservoir on the Big Walnut Creek in the northeast part of the county has an estimated capacity of 19,600 million gallons, which can be increased to about 28,000 million gallons through a later addition of crest gates. The treatment plant is to be located west of the creek on Morse Road.

Present Distribution System

Water is presently distributed from the Scioto River station through a 42-inch main, two 36-inch mains and a 12-inch main into five principal service districts or areas, designated as the Central, East, North, West, and Upper Arlington Services. Large storage tanks and booster stations are located at various points strategically placed for service within these areas.

The Central Service includes the "congested value" district and the near east, north, and west sides. There is a number of large mains but no storage tanks in this area.

The East Service embraces an area generally between Main Street and Fifth Avenue east of Parsons Avenue - St. Clair, extending around Bexley to the east limits of the system. Water is supplied to the section from the booster station and a 2.0 million gallon storage tank at Joyce Avenue and from the supplementary wells on Nelson Road when that station is in operation (during the summer months). Equipment at the Joyce Avenue Station consists of three 2-mgd centrifugal pumps.

The North Service includes all the area north of Fifth and 11th Avenues between the Olentangy and Alum Creek. Water is supplied by the Chittenden Avenue booster station and also by the Ackerman Road booster station during periods of high demand. Storage facilities consisting of a 4 million gallon standpipe and two 1 million gallon tanks are located on Karl Road at Oakland Park. The Chittenden Avenue station has three electrically-driven centrifugal pumps of 6.0 mgd each, and the Ackerman Road station three pumps each of 3.0 mgd.

West Service consists of that part of the system generally lying southwest of the Scioto River and west of Ryan Avenue and its extension. The Mound Street booster station with two 5.0 mgd centrifugal pumps and two elevated storage tanks of 1 million gallons each located at the edge of Westgate Park provide service to the area.

The Upper Arlington Service comprises the area generally north of King Avenue and west of North Star Road. It is supplied by the North Star booster station, supplemented by facilities at Ackerman Road. The former has two pumps with a rated capacity of 0.36 mgd each and two pumps each of 0.65 mgd. The storage tank on Zollinger Road has a capacity of 750,000 gallons.

The Big Walnut Water Works will be operated as two separate stations (cross-connected for emergencies) with 48 inch mains leading to the west and south. Connections will be provided to the storage tanks on both Joyce Avenue and Karl Road where water levels will be controlled by the respective overflow elevations.

A new 36 inch main to increase the supply to the West Service is now under construction from the existing Scioto station to Fisher Road and a new booster station is contemplated at Fisher and Hague Avenue. Equipment of the latter will consist of five centrifugal pumps, each with a capacity of 3.0 million gallons per day.

Amount of Water Used and Available

A recent engineering study of the water distribution system (made for the city by Pitometer Associates, Inc.) indicated the following total and maximum daily consumptions as of July, 1953:

Average Daily Consumption	53.0 million gallons
Maximum Daily Consumption	74.5 million gallons
Maximum Hourly Rate	98.4 mgd
Minimum Night Rate	34.9 mgd

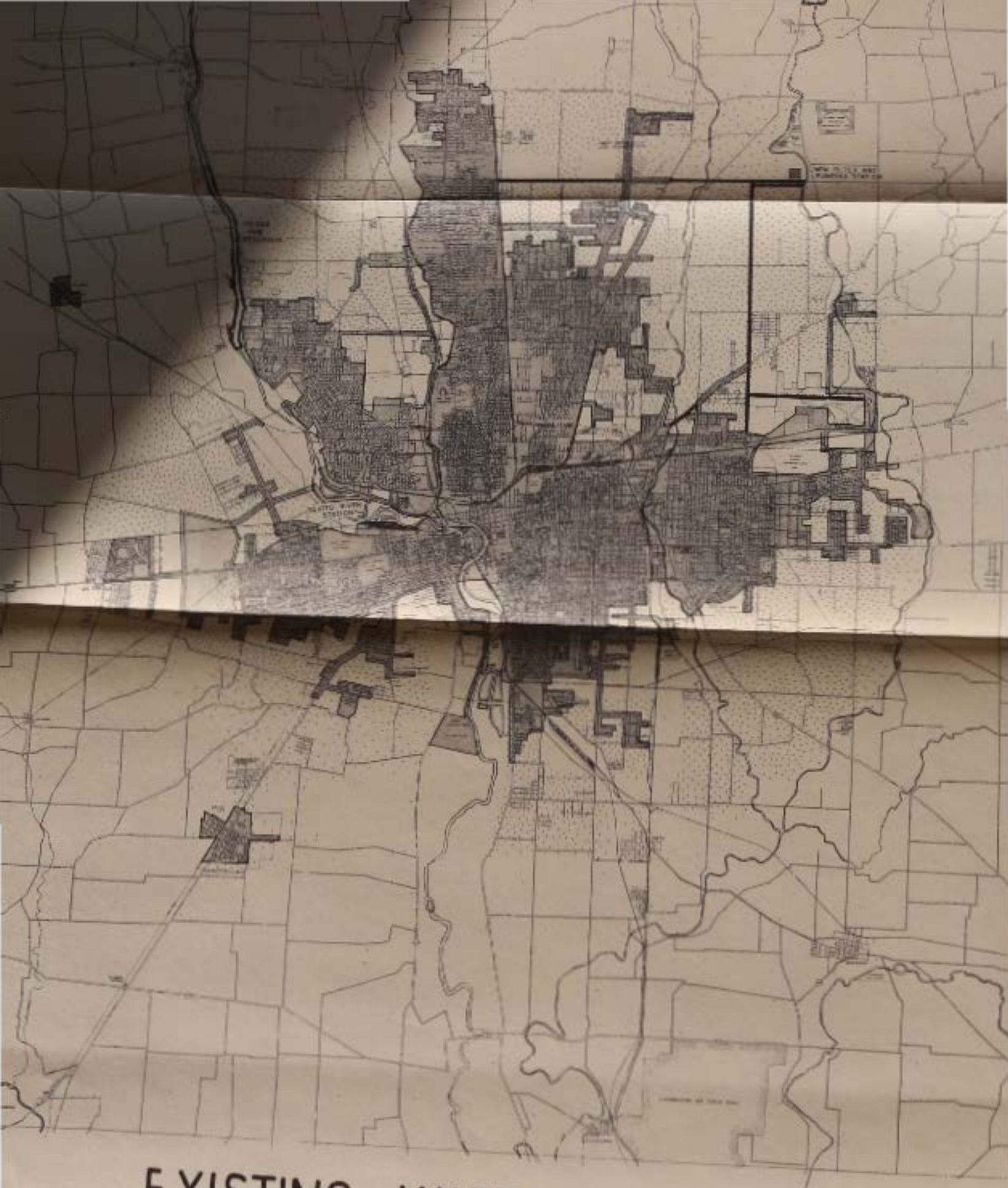
On the basis of records for the first six months of 1954, water consumption is presently running about 1,000,000 gallons per day above the corresponding period of last year. In relation to the population served in 1953, daily consumption amounted to an average of approximately 112 gallons per person and the maximum to nearly 160 gallons, and it is estimated that present water usage is about 116 gallons per person per day.

In meeting this demand, water is supplied principally from the existing Scioto River plant, which is supplemented by the Nelson Road wells. The Scioto River station has a rated filter capacity of 54.0 million gallons per day which can be increased for short periods of overload to 66.0 million gallons per day, provided raw water levels in the reservoirs are sufficient to furnish water at this rate. The Nelson Road wells have a capacity of about 10 million gallons per day but this water is quite hard and expensive to treat.

When the Big Walnut Creek facilities are completed and in operation this station will have a rated capacity of 48.0 million gallons per day, with a short period overload capacity of some 72 mgd. However, because of the necessity to release certain flows to the Big Walnut plant of the Columbus and Southern Electric Company, it is possible that these quantities may be reduced somewhat in actual operation, particularly over prolonged periods of low rainfall, although the amount of water to be released to the Electric Company has not yet been definitely determined.

Area Served

The area presently served by the public water supply is shown on Plate 5 which also indicates by appropriate symbols the 1954 distribution of population and expected future growth.



EXISTING WATER SERVICE

LEGEND

AREA SERVED BY EXISTING FACILITIES
MAJOR MAINS UNDER CONSTRUCTION OR PLANNED
EXISTING AND PLANNED PUMPING STATIONS
ONE DOT REPRESENTS 50 PERSONS OF 1954 POPULATION
CIRCLE REPRESENTS 50 PERSONS OF 1954 - 1980 INCREASE

It is obvious that practically all the population within the present Columbus urban area is served, the population study conducted earlier indicating a water service of 99 percent or more to the 1954 population. The extension of mains has generally kept pace also with subdivision development. The only subdivisions of any consequence without water consist of a few scattered and sparsely developed areas located along U.S. 62, northeast of the city; to the south and west of Lincoln Village (which has water); and south of the city on both sides of Williams Road, where existing development is spotty and rather poor. Two existing communities at the edge of the urban area, however, are completely without a public water supply. These are Obetz and Urbancrest, to the south and southwest respectively, and since these communities depend on individual septic tanks or other disposal devices, serious health problems have been created.

Extension of water has generally accompanied the platting of new developments in the county, as indicated by the irregular service areas in parts of the community. Since most of these areas are contiguous to the city or other existing development and relatively little scattering of subdivisions has occurred, as noted in the population report, past policies and practices in making water extensions have been generally sound and satisfactory and should be continued on the basis of encouraging logical extensions of the existing community.

Existing Deficiencies

The water shortage experienced during or following World War II indicated that the city was outgrowing its existing supply, which will soon be augmented by that from the new Big Walnut Creek facilities. This will probably be adequate for the next fifteen years or so, as discussed later, but additional water supplies will be needed to serve the expected 1980 population.

The present Dublin Road water works is in need of substantial rehabilitation which is long overdue, but this will have to await the putting into operation of the Big Walnut Creek plant. Many of the existing water mains are too small, and, in addition, carrying capacities were found by the recent engineering study to have been reduced by deposits of calcium carbonate. Some of the existing local mains are only 4 inches in diameter, which is too small for modern service, particularly for firefighting and replacement with larger mains will be required. Elimination of dead-end, 6inch mains and reinforcement of the existing grid generally in several sections of the city are also needed.

Future Requirements

Based on an estimated population of about 820,000 within the future water service area (assuming some 10,000 as served by independent water systems at Worthington, Grove City, et al.) and assuming further that the total average domestic and commercial water consumption will gradually increase from the present 116 to about 140 gallons per person per day (due to expected increases in industrial consumption) approximately 115 million gallons would be required on a typical day by about 1980. It is assumed in this estimate that no large water-consuming industries will move into the Columbus area or if so, that they will locate to the south of the city where substantial well fields can be used to replace or supplement the city supply. On the same basis as the above, the following estimated daily and hourly rates are shown in comparison with estimates for 1968 prepared in the 1954 engineering study:

	1968	1980
Average Daily Consumption	82.0 mg	115 mg
Maximum Daily Consumption	115.0 mg	150 mg
Maximum Hourly Consumption	161.0 mg	205.0 mgd

To meet this demand, the city will have after completion of the Big Walnut facilities, the following water supplies:

	Normal	Short-time Overload
Scioto River Station	54.0 mgd	66.0 mgd
Big Walnut Creek Station	48.0 mgd	72.0 mgd
Nelson Road Wells	10.0 mgd	10.0 mgd
	112.0 mgd	148.0 mgd

Since the water from the Nelson Road station is very hard and expensive to treat, it should preferably not be used except during emergencies, especially the summer dry period, and probably should not be considered a part of the normal supply. Under exceptionally dry conditions also, the Scioto River supply would be somewhat diminished. While the Big Walnut Creek facilities may be affected by the flow to be released to the Electric Company, this has not yet been determined definitely, and this situation would be materially helped by discharge into the Big Walnut of the effluent from the sewage treatment plant to be located at the confluence of the Big Walnut and Alum Creeks.

In any event it would appear that with the completion of the new Hoover Dam, reservoir and filter plant and the rehabilitation of the existing Scioto River plant, an adequate supply of water (slightly over 100 million gallons per day) will be available for a community of 700,000 or more, and consequently that the facilities now existing or under construction would serve satisfactorily until about 1970. Thereafter, however, additional water storage reservoirs and treatment facilities will probably be needed. Preliminary examinations have indicated that new impoundments are feasible on the Scioto River in the vicinity of Bellepoint and on Mill Creek west of the Scioto (both in Delaware County north of the existing O'Shaughnessy Reservoir), as well as along the Big Darby Creek. Substantial quantities of underground water are available also in the well fields to the south of the city although the latter water would require relatively expensive treatment to make it suitable for domestic uses.

It has been estimated on the basis of rather general and incomplete appraisals of the water potential in the Columbus area that adequate supplies could be obtained to support a community of 1,000,000 or more - which would extend somewhat beyond the growth expected within the next twenty-five to thirty years. However, a detailed study both of potential sources of supply and of efficient utilization of such supplies will be required to determine the best means of meeting water requirements after the demand reaches the limits of the projected Big Walnut reservoir and filter plant. A comprehensive study of this problem on a regional basis, along the lines of the recently completed sanitary sewer and sewage treatment survey, is to be undertaken by the latter committee under sponsorship of the Franklin County Regional Planning Commission.

SANITARY SEWERS

The need for public sanitation begins with urbanization. Sewage disposal is not a problem on open farm land where dilution is easy and few people are affected, but lack of proper facilities can create a serious menace to health in cities, towns or villages where houses are closer and a community or individual water supply is subject to contamination. Even relatively spacious development is not always satisfactory from a sanitation standpoint if soil conditions or underground strata are unfavorable to good sewage disposal, and in such instances a system of underground conduits must be used. In any event, sanitary sewerage to carry off domestic and industrial wastes to a common point for treatment and conversion into a non-putrescible state is by far the most general and satisfactory method of sewage disposal.

Early sewage disposal in Columbus consisted of open ditches to conduct the wastes either to the Olentangy or Scioto Rivers or to one of their tributaries. The first "sewer" was built in 1841, and the present system has its beginning around 1850 when the city had a population of some 17,000. By 1880, some 23 miles of sewers had been built, and like other communities of that period, the city discharged all its raw waste either directly or indirectly into one of the two rivers.

As a result of the consequent river pollution and various attempts to correct it, including construction of an interceptor to divert the discharge to the south of the city proper, a sewage treatment plant of some 20 million gallons per day capacity was built and placed in operation in 1909. Located on the present site, this plant soon proved inadequate in size and after various expedients was enlarged to a capacity of 30 million gallons per day during the first World War. This too was soon inadequate and a new treatment plant was planned close to but west of the existing structure. The new plant, put in operation in 1938 after several years' construction had a capacity of 50 million gallons per day. In 1950, this was enlarged to its present 60 mgd capacity. Four years later, the treatment plant is again overloaded by some 20 percent, and work has begun on increasing its daily capacity to 80 million gallons. Still further expansion will be needed to keep up with expected future sewage volumes, and it is evident that long-range planning of these facilities is necessary if the problem is ever finally solved.

Early sewer construction in the city was entirely of the combined sanitary-storm drainage type. After completion of the first sewage treatment plant in 1909, however, practically all new sewer extensions were made on a separate basis and there are no combined sewers of recent construction. However, some of the original combined trunk mains are still in use.

Existing Sewerage Conditions

Area Served

Plate 6 shows the area served by the existing sanitary sewers, together with the 1954 population distribution and the estimated 1954-1980 increase. The proposed trunk sewers and treatment plants to be described later are also shown on this plate.

The City of Columbus is now completely sewered except for one or two small or inconsequential areas and city facilities have been extended into many of the incorporated or unincorporated areas around the city. Bexley, Grandview Heights, Marble Cliff, Valley View, Upper Arlington, Riverlea, Worthington and Whitehall all discharge their sewage into the Columbus system for treatment and other areas such as Amvets Village, Lincoln Village and smaller subdivisions to the north, south and southwest are likewise connected into city sewers.

On the other hand, several sections are inadequately sewered. For example, sewerage is lacking in Marion Township south of Refugee Road except for the line along Parsons Avenue and south High Street to the present sewage treatment works, and the older districts south and west of Lincoln Village are without sanitary sewerage. While sewers are now under construction in New Rome, neither Urbancrest nor Obetz at the edge of the urban area has sanitary sewerage, and conditions in both these villages present serious health problems.

Existing Deficiencies

Many of the existing sewers are overloaded, in some cases due to the connection of downspouts and basement drains into the sanitary system. This is true not only in certain districts inside the city where original sewers are inadequate in capacity due to unforeseen increases or the inter-connection of additional mains, but also in several areas at the edge of the community. One of these is the district north of the city and east of the Olentangy River, where the existing

trunk sewer is overloaded, both outside the city and for a considerable distance south of the present corporation line. Relief of this condition will require a new trunk sewer paralleling the present main along the east bank of the Olentangy River as proposed in the sewer report. Existing mains in many sections of the city itself are overloaded, such conditions being particularly bad in north and west Columbus. In several instances relief may be provided through the proposed new trunk sewers; in other cases, more local facilities will be necessary.

Proposed Sewerage Improvements

A comprehensive sewers and sewage treatment study embracing the present and future Columbus urban area was recently completed by the Regional Planning Commission through a survey committee composed of representatives of the appropriate city and county departments, the Palnning Commissions, the Chamber of Commerce, Citizens' Research, and two engineering firms - Burgess and Niple and The Jennings-Lawrence Company - who served as consultants. Extending over a period of some two years, this survey covered the requirements of the Columbus community for the next twenty-five years or more - or up to the year 1980 - which is the same period included in the various other phases of the comprehensive plan. The recommendations of the study are summarized below.

Recommended New Trunk Sewers

Trunk sewers are proposed for two main purposes:

1. To provide relief for presently overloaded trunk sewers.

2. To provide new trunk sewers for future urban areas.

The general locations of these trunk sewers are shown on Plate 6, together with the boundaries of their respective drainage districts and include the following:

(A) The Big Run Trunk, which will serve the area south of Frank Road, Clime Road and Broad Street, east of Norton and North of Rensch Road. This sewer will provide future relief, as required, for the Frank Road and West Broad Street trunk sewers.

(B) The Scioto Main Trunk, which will provide relief to the Central Avenue area, as well as carry sewage contributed by the proposed West and East Scioto trunk sewers.

(C) The West Scioto Trunk designed to serve the area north of the Pennsylvania Railroad west of the New York Central Railroad and Smiley Road, south of Davidson Road and East of the Hilliard-Rome Road.

(D) The East Scioto Main Trunk serving the area north and east of the Scioto River, north to Bethel Road, east to Reed Road, Andover Road and Cambridge Boulevard.

(E) The Olentangy Trunk serving the Olentangy watershed north of Goodale Boulevard, extending to and beyond Worthington.

(F) The Alum Creek Trunk, designed to serve the areas in the Alum Creek watershed from the proposed new treatment plant on the south to the north edge of Franklin County.

(G) The Big Walnut Trunk serving all of the Big Walnut Creek watershed between the proposed new sewage treatment plant and Morse Road.

(H) and (J) Three trunk sewers, which will serve the area south of Williams Road between the Scioto and Big Walnut Creek, extending south generally to State Route 665.

Proposed Treatment Plants

The existing sewage treatment plant with a rated capacity of 60 million gallons per day is to be enlarged to 80 million gallons per day. This will provide more adequate treatment of the present volume of sewage (more than 70 mgd) until a new plant can be constructed. After the new plant is built, the present plant will be ample in size to serve the area west of the Olentangy-Alum Creek divide.

A new sewage treatment plant is proposed near the confluence of Alum and Big Walnut Creeks for handling the sewage from the area east of the Olentangy-Alum Creek divide.

This plant is to be designed so that additional capacity can be provided without difficulty in the future, and an initial capacity of 35 million gallons per day is proposed. It is estimated that this will be adequate to serve the contributing area until 1970, whereupon enlargement may be required.

Sewage from the area south of Williams Road would require an additional plant to be located on the Scioto River north of the Village of Lockbourne. A capacity of 2 million gallons per day is considered adequate.

The approximate locations of the proposed treatment plants are shown on Plate 6.

Relation of Proposed Sewers to the Future Population Pattern

In the design of the proposed main trunk sewerage system, an anticipated 1980 urban population of approximately 815,000 was used. This is slightly lower than the estimate of 830,000 persons contained in the population report. However, the actual design provided a factor of safety of 50 percent and the resulting design population of more than 1,250,000 should be more than sufficient both to take care of any reasonable increase in the expected future population and to compensate for any reasonable underestimate of the per capita sewage (120 gallons per day domestic and commercial) should water consumption exceed this figure.

It is evident from Plate 6 that the proposed sewers could drain an area substantially larger than the expected 1980 Columbus community. The only district in which future population of normal urban densities might be expected to locate beyond the drainage district boundaries shown on the plate is in Perry Township north of Bethel Road, and the land in this district, while generally flat, slopes gently toward the proposed East Scioto Trunk sewer and could undoubtedly be drained thereby. On the other hand, several of the proposed mains serve areas which extend well beyond the 1980 population pattern indicated on Plate 6. For example, the Olentangy and Alum Creek Mains would provide service to the north all the way to the Franklin County line; the proposed Big Walnut trunk serves an area between the New York Central and Morse Road extending nearly to Black Lick Creek; and the proposed Big Run and West Scioto sewers have potential drainage districts which go well beyond probable future growth within the next twenty to thirty years southwest or west of the city.

In the construction of these main sewers, as pointed out hereinafter, and particularly in the provision of sub-trunk and lateral facilities, great care should be taken to avoid over-construction or over extension of specific sewers and the scattering of population which such over extension would abet. Careful programming of sewer construction on the other hand, can be made to further the desirable development of each section of this area.

Development and Programming of the Proposed Sewers

Programming of construction of the proposed sewers should be designed: first, to provide relief of existing overloaded main sewers, and particularly of the present sewage treatment plant; and second, to provide additional sewerage facilities insofar as possible in those areas around the city which constitute logical extensions of existing development. Thus, the construction of new sewers should be made to foster the orderly growth of the community and a rounding out of the community pattern, rather than to abet the scattering of subdivisions by utility extensions through substantial vacant areas or to encourage unbalanced growth - such as has already occurred to the north - through over extension in a particular direction.

In consideration of the above, it is suggested that the new trunk sewer construction be carried out generally as outlined below:

(1) The proposed southeast sewage treatment plant on Big Walnut and Alum Creeks along with the new Alum Creek Trunk Sewer (F) should be given high construction priorities. Due to the need for relief of existing overloaded sewers and conditions of property flooding in Bexley, East Columbus and parts of Whitehall, this main should be constructed at least as far north as Columbus-Millersburg Road, which would also open up for development a large area southeast of the city. The new sewage treatment facilities are badly needed to provide relief for the existing overloaded plant. The Alum Creek trunk sewer could later be extended as far north as Morse Road to provide for sewerage in the large sector between Stelzer Road and the city south of Morse Road.

(2) After completion of the new sewage treatment plant, additional capacity would be available at the existing plant for better service in the western drainage area. This would make possible the relief of overloaded sewers in parts of

West Columbus, Grandview Heights, and Upper Arlington through construction of the Scioto Trunk (B) and East Scioto Trunk (D). The latter would also provide for drainage of the area north of Upper Arlington.

(3) Early construction of the Beulah Road trunk sewer (E-1) south of Morse Road will also be desirable to provide adequately for this rapidly growing district north of the city. This will have to await relief of the present treatment plant, however, since the sewage will be discharged into existing mains in the western drainage area. Extension north of Morse Road should be deferred for a number of years to encourage growth of closer-in areas in other parts of the community.

(4) After completion of the Scioto Trunk, an outlet will be available for the main trunk sewers serving the northwest sector. The West Scioto Trunk (C) should be constructed initially not farther than Roberts Road, which would provide an outlet for the tributary trunks (C-1) and (C-2).

(5) The Olentangy Main Trunk Sewer (E) will be needed partly for relief of the existing main interceptor sewers serving north Columbus and Worthington and partly for service of the Olentangy drainage area to the west in Perry Township. Because of the already excessive prolongation of the community northward, it is not desirable that this sewer be extended beyond Worthington.

(6) Due to the present health problem in Obetz, it is imperative that sanitary sewerage be provided for this community as soon as possible. It is located, however, where treatment will be required at a new plant on the Big Walnut north of the Village of Lockbourne, construction of which would not be justified ordinarily for many years. Should the current promotional activities for new industries in the Obetz area succeed in bringing about a large-scale industrial and residential development, new sanitary sewers will be required, and part of the proposed Norfolk and Western trunk (j) might be constructed, although a problem will arise as to duplication of future treatment facilities unless extension can be justified to the proposed south treatment plant. In any event, development in this area should be carefully controlled through regulation of sewer extensions as well as by zoning, so as to avoid the scattering which has already taken place in Marion Township to the north.

Completion of the above trunk mains and the concomitant sub-trunks and laterals would provide service in an area adequate to accommodate the growth of the Columbus community for many years. Construction of the remainder of the proposed trunks should be deferred until existing serviced areas have been utilized, and new sewers are needed to provide additional developable land. Most of these, particularly to the south, should not be required for many years.

Administration of Water and Sewer Facilities

Preceeding data clearly reveals that many new facilities and extensive additions to the existing sewer and water systems are needed both now and in the future. These new and enlarged facilities will not only require large financial expenditures, but they present difficult problems as to what agency or agencies will be responsible for their installation, maintenance and operation.

In the past, the City of Columbus has provided practically all of the sewer and water facilities in the local area. The city operates the only sewage treatment facilities, and with the exceptions of the Worthington and Grove City water plants, it controls the source of water and owns the distribution system within the Columbus area. Within recent years, developers have been responsible for installing and financing water mains and sewer laterals within individual subdivisions, yet these are actually extensions of the city's system. In other instances, particularly where large trunk lines need to be extended to serve areas larger than an individual subdivision, the county has authorized the establishment of water or sanitary sewer districts wherein the property is taxed to finance the cost of the improvements.

The above methods of providing these essential facilities have generally been satisfactory, particularly since much of the urban area is now served by both water and sewers. However, two major problems still remain from these practices. One is the rather large area that is unserved with water and sewer facilities, which is usually in sections where the development is so scattered that the cost of providing same is almost prohibitive. This problem may become more difficult in the future, particularly if development tends to scatter widely, and indicates the necessity of insuring compact and logical extension of new development close to existing facilities. The second problem is the opposition of property owners in the county districts to financing the large main or trunk lines that are needed to serve property that will eventually be developed beyond the district.

There is also another local problem, namely, the announced intention of the city not to permit extension of its sewer and water facilities until after the area has been annexed to Columbus. While there is much logic in this policy, it naturally results in much opposition, and poses two potential difficulties, namely; (a) the threat of incorporating small communities so that they cannot be annexed by the city, and (b) the possibility of developing individual water and sewer plants in the small communities.

The difficulties of securing adequate and coordinated development in a large and rapidly growing urban area such as Columbus when many different political agencies are responsible for portions of such development have been demonstrated in many metropolitan districts. Under such a political pattern, it is very doubtful that the individual systems would become an integral portion of a comprehensive development such as has been planned by the Regional Planning Commission for the trunk line and treatment plants. It is fortunate that so few incorporated communities now exist in the Columbus area.

One of the major needs confronting the Columbus area is the provision of a comprehensive system of water and sewer facilities that is adequate to serve existing and potential future growth. The State of Ohio has provided adequate legislation whereby this can be accomplished. The problem is thus one of securing local agreement upon the best method. Since it is legally possible to reach a sound solution, the major problem is that of overcoming local prejudice and jealousy. This is always difficult in an area as large as Columbus, yet is not impossible, and the potential benefits more than outweigh the difficulties.

STORM DRAINAGE

The ever expanding areas of brick and concrete in American cities have greatly increased the amount of storm water runoff. Thus, many heavy rains of short duration which would not have created a drainage problem a half century ago, are now an important consideration in urban design and must be provided for through underground sewerage or drainage ditches if pools of standing water or even surface flooding, are to be avoided. Furthermore, this is not a problem which can be solved piecemeal in small local portions of the community; a well developed system of trunk and lateral sewers is as essential in storm drainage as in sanitary sewerage, particularly in the closely built, heavily urbanized areas with little remaining open land.

The generally flat topography of the Columbus site is not conducive to natural surface drainage, and a system of underground mains is usually needed to carry off the water. In the early development of these facilities inside the city such drains were combined with sanitary sewers, but this practice was abolished after the turn of the century and separate mains are now provided for storm runoff. Many existing downspouts and basement drains, however, are still illegally connected to the sanitary sewers, which overload the latter and add to the volumes of sewage at the already overloaded treatment plant. Construction of additional storm sewers and elimination of all illegal connections to the sanitary facilities are essential to remedy this condition.

In outlying sections of the community, surface runoff is generally handled now by the existing streams and other natural drainage channels or by open ditches, if it is provided for at all. Consequently, there are many small low-lying areas without adequate drainage where ponds of standing water are frequent during certain periods of the year. With the gradual extension of street paving and more intensive building development, the need for storm drainage in these outlying areas will become progressively more acute. The solution of the problem will depend on the formulation of a regional master plan for major storm sewers, as recommended below and a long-range program of sewer construction.

Need for an Overall Master Drainage Plan

In view of the many storm drainage problems in urbanizing areas outside the city, it is recommended that an overall survey similar to the recent sewers and sewage treatment study be conducted on a regional basis to evaluate these

problems. Such a survey should have as its object the development of an integrated system of storm drainage facilities for the entire future Columbus urban area. Once developed and adopted, this master plan for storm drainage should be used as a guide in the programming and construction of future storm drainage facilities by public agencies and private developers.

The cost of constructing the principal storm sewers and of improving other major drainage channels should be assessed equitably on all benefited property owners. Local storm drainage facilities in new subdivisions should be installed by the developer. The latter is not feasible, however, without prior provision of trunk sewers, drainage ditches or other suitable channels into which the local facilities can drain. The whole problem of adequate storm drainage throughout the Columbus area, therefore, depends on the development of an adequate overall system of drainage facilities into which the various smaller areas can be fitted.

Unless this is done, most of the future growth of the city will occur in areas where these matters are handled piecemeal - on a local basis or not at all - and either individual drainage problems will remain to plague the community or adequate storm sewerage facilities will ultimately be provided at very high costs.

There is one type of storm water improvement that should be continuously observed even in advance of preparing the comprehensive plan, namely the protection of existing streams and natural drainage channels from encroachment and restriction. This can be accomplished by requiring adequate easements along the channel when the area is subdivided or in some instances such easements might be secured in advance of subdividing. Many economies can be effected if the more important streams are retained as open channels rather than to be replaced by underground pipe and, even if the smaller natural drainage swales are to be replaced by pipe eventually, the easements will provide a logical right of way for such underground construction.

GARBAGE AND REFUSE DISPOSAL

The collection and disposal of garbage and refuse are recognized as another essential public service. From the old-fashioned open dump to the modern sanitary fill, many improvements have been and are continually being made in handling such waste. Among these are the individual garbage disposal units now coming into use in both residences and commercial establishments which may eventually necessitate modification of the whole public collection and disposal system. Development of additional disposal facilities in the future should anticipate these and other changes.

Methods of Collection and Disposal

The collection and disposal of garbage and other wastes in cities is determined to a large extent by the size of the community and existing conditions therein. Recent surveys indicate that insofar as collection is concerned, most American cities now favor the use of publicly owned trucks and public employees, although some of the smaller communities still depend on contract services for this purpose. The licensing of private individuals or firms to make collections has certain drawbacks since such collectors are difficult to control and may be irregular in performance or in the handling of the waste disposal, which often results in the creation of unsanitary conditions. Among the various methods of garbage and refuse disposal are:

Feeding of Garbage to Hogs

This practice is almost universally frowned upon due to the dangers to public health from such diseases as trichinosis. It is commonly prohibited during the warmer periods of the year although the Ohio State Department of Agriculture may issue special permits to feed cooked garbage to hogs.

Open Dumps

Open dumps are also generally unsatisfactory, even when burning is continuous. The amount of combustible waste is seldom sufficient to burn the garbage adequately, and such dumps tend in many cases to create a public nuisance as well as a menace to health due to the breeding of rodents and insects.

Garbage Grinding

The grinding of garbage by individual units in restaurants and homes is growing in popularity. Such garbage can be flushed into the sewers where it is ultimately handled at the sewage treatment plant. Collected garbage is also transported, ground and treated at sewage disposal plants in a few cities. This method of disposal has obvious advantages where the garbage can be handled without seriously overburdening the treatment plant, but would not now work satisfactorily in Columbus where the existing sewage treatment facilities are already overloaded.

Incineration

Disposal of burnable waste in municipal incinerators is common practice, and recent developments in furnace construction have made possible the disposal of both garbage and rubbish, including some non-burnables, by incineration. Furthermore, the salvaging of the residue from incineration has been found practicable in some cities. For example, completely mechanized incinerator operations in Atlanta, Georgia, have shown a net profit. The construction cost of an incinerator is substantial, currently running from $2,000 to $2,500 per ton day capacity for conventional types and up to $4,500 or more per ton day for the more highly mechanized facilities. Operating costs are variable, depending on the incinerator design and material handled. Ordinarily, the cost of incineration is greater than that of other methods of garbage disposal.

Sanitary Fill

Where land is available and soil conditions satisfactory, the "sanitary fill" provides an efficient means of disposing of both garbage and other waste, and has come into wide use. The garbage or refuse is systematically dumped, spread, compacted and then covered with a layer of earth. The area used for such a fill should be located at least 500 feet from the nearest residence.

The sanitary fill method of disposal has a number of specific advantages; combined garbage and refuse collection is possible; disposal sites may be located closer to the center of the collection district to reduce hauls, several sites being used simultaneously; the equipment required is of general utility and does not involve an excessive investment; the operation is economical and often of value in the reclamation of waste land. For the latter purpose, the owners of private property will sometimes permit such fills

so that no land cost is involved. Low areas such as ravines, swamps or gravel pits are particularly suitable for sanitary fill if sufficient earth is available for cover and adequate drainage is possible, but level areas can be used also where earth cover is available.

The sanitation aspects of the land fill method of disposal have received considerable study, particularly in New York City. Rodent and vermin control, pollution of water courses, effects on ground water, etc., were thoroughly investigated, and a board of experts appointed to study land fill operations reported favorably on these conditions and found no hazards to the public safety or health.

The area required varies from 0.75 to 1.5 acres per 10,000 persons per year for a compacted fill of 6 feet. (A layer of garbage-refuse having a depth of six feet and two feet of earth cover compact to a depth of about six feet.) While this amounts to a substantial acreage in a large city over a period of years, a number of smaller areas can be used simultaneously in different parts of the community.

Present Collection and Disposal in the Columbus Area

The City of Columbus operates its own trucks for the collection of all types of garbage and refuse, garbage and other burnable wastes being collected weekly and rubbish or other non-burnable refuse once a month. The single incinerator located on Short Street now used for burning is badly overloaded and an existing incinerator on McKinley Avenue is being rehabilitated for purposes of relief. Consideration is also being given to the construction of a third incinerator in the northeast section of the city when and if additional territory is annexed in this part of the community.

Non-burnable wastes are trucked to city dumps in the land excavation areas on McKinley Avenue in the vicinity of Fisher Road and near Trabue Road. While an attempt is made to keep this material covered, it is not entirely successful and the fill has many of the aspects of an open dump.

Franklin County also maintains garbage and refuse collection and disposal facilities which are operated mainly in the territory south and east of the city. Collections are provided on a weekly basis for all types of waste, separation being unnecessary since the sanitary fill method of disposal is used. The existing fill site is located southeast of the city off Alum Creek Drive, and is adequate to last for a number of years at the present rate of coverage. A second fill site is under consideration on Innis Road, when and if

the county collection service should be provided in the large section northeast of the city, which will depend on the future of this area from an annexation standpoint.

Most of the other incorporated communities surrounding the city have contractural arrangements with private operators for weekly garbage and rubbish collection, and several of these private collectors are permitted to dump the material in the existing county sanitary fill off Alum Creek Road. The village of Hilliard, among others, has been using the county fill, which necessitates an extremely long haul from the point of collection. Domestic wastes from Grandview Heights are deposited in a sanitary fill located north of Roberts Road, and Upper Arlington utilizes a sanitary fill in the quarries area.

Summary and Recommendations

Incineration is a quite common and effective means of garbage disposal. However, the existing Short Street incinerator, in addition to being badly overloaded, necessitates extremely long hauls from parts of the city, and in this respect is not efficient. While rehabilitation of the McKinley Avenue plant will relieve the existing incinerator and shorten the hauls from West Columbus, construction of a new incinerator as proposed in the Linden area is needed to help balance transportation distances in the northern segment of the community. Whether or not existing territory is annexed to the north and east, it is most desirable that the present long hauls from North Columbus and Linden be eliminated or curtailed. Unless the proposed new incinerator is constructed to the north, it is recommended that sanitary fills be established in this section for the disposal of garbage as well as rubbish, thereby eliminating long hauls to either the Short Street or McKinley Avenue plants.

In any event it would be desirable to provide several sites for sanitary fills in different sections of the community for the disposal of non-burnables so that reasonably short and well balanced systems of refuse collection and disposal could be put into effect. There are many low-lying sites along the streams and in other areas which could be used for this purpose, which would not interfere with ultimate use of such sites for recreation or park purposes. The present city dumps should also be covered more adequately or transferred to sites where greater cover is available. All open or semi-open dumps should be avoided, and only the sanitary fill method of disposal used in the future.

The present system of garbage and refuse collection and disposal in the county is largely the result of the initiative and research activities of the Regional Planning Commission, which developed cost estimates and proposals for sanitary districts and fills covering the county in 1950. This system should be continued and extended, particularly by locating new fill sites to reduce the length of haul. Wherever possible, the joint operation of such sites by the county, city and adjoining incorporated communities would be desirable for greater efficiency in providing service in particular segments of the community. (The existing sanitary fill off Alum Creek Road is already used by a number of private operators serving the Columbus Area.) The 1950 report of the Regional Planning Commission made general recommendations for a number of sanitary fill sites and specific locations in the future should be selected in accordance with the general land use plan and the Commission's cooperation and advice.