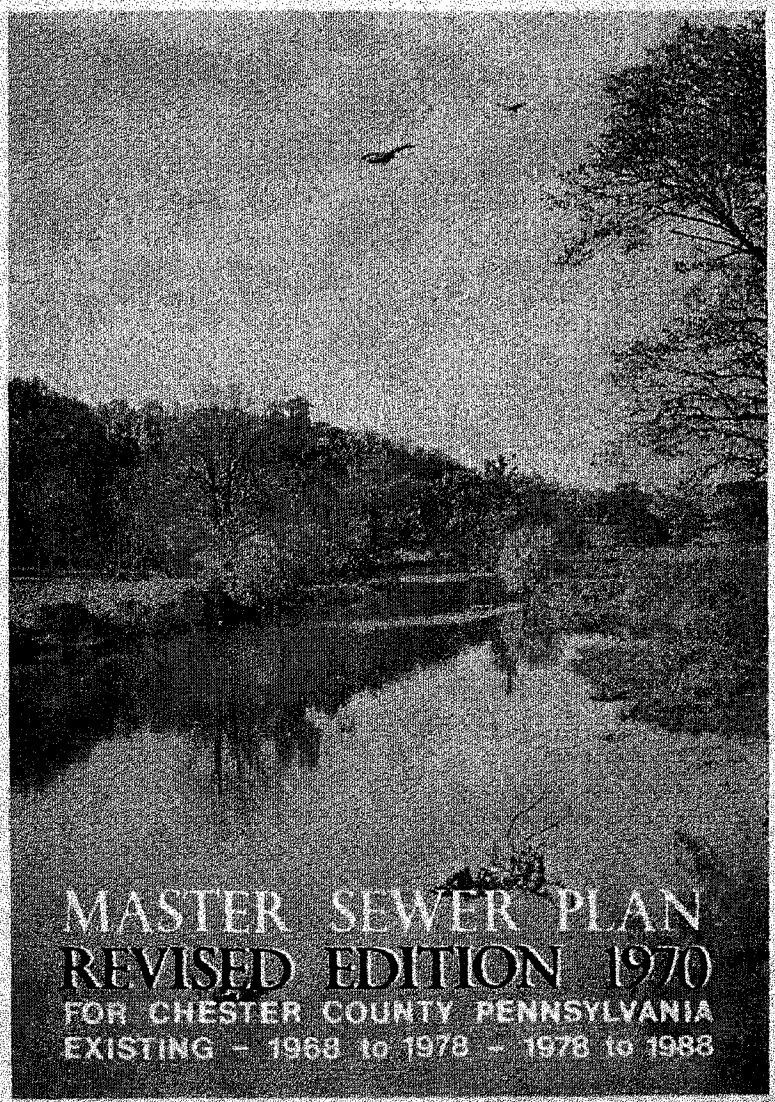
EXHIBIT P4

CHESTER COUNTY ACT 537 PLAN



MASTER SEWER PLAN
REVISED EDITION 1970
FOR CHESTER COUNTY PENNSYLVANIA
EXISTING – 1968 to 1978 – 1978 to 1988

PREPARED BY ROY F. WESTON ENVIRONMENTAL SCIENTISTS AND ENGINEERS
FOR THE CHESTER COUNTY PLANNING COMMISSION
REVISED BY THE CHESTER COUNTY PLANNING COMMISSION 1970

HESTER COUNTY PLANNING COMMISSION
518 NORTH WING COURT HOUSE WEST CHESTER, PENNSYLVANIA 19380

September, 1970

Board of County Commissioners
Court House 518, North Wing
West Chester, Pennsylvania

Re: Reprinting of the Chester County Master Sewerage Plan With Major Amendments

Gentlemen:

In response to the many requests for additional copies, the Chester County Planning Commission has reprinted the Chester County Sewerage Plan, together with the major amendments to date. Also more detailed maps, not previously published, are now included. The Sewerage Plan was originally prepared by Roy F. Weston, Inc., during the 1966-1968 period. It was reviewed and adopted by the municipalities as a general guide following a series of public meetings early in 1968.

The Chester County Planning Commission formally adopted the Sewerage Plan in December 1968. It was subsequently approved by the Pennsylvania Department of Health during 1969; and fully incorporated in the Delaware Valley Regional Plan finally adopted in December 1969. The Plan was one of the first prepared and approved under Act 537, the Sewerage Facilities Act.

Some amendments to the original draft were made at the time of adoption to cover suggestions made during the reviews. A major amendment was recommended by the Commission in April, 1970 on petition of the municipalities involved to recognize a new regional treatment plant on the Schuylkill River in Schuylkill Township in lieu of regional plants at Phoenixville and Upper Merion previously recognized. It is important to recognized these amendments since the original text has not been fully revised.

Since planning is a continuous process it is reasonable to anticipate further amendments. Since the plan was first prepared the state and federal governments are putting increasing emphasis upon greater regionalization - fewer and larger plants - and have particularly proposed greater regionalization for the Schuylkill River. We expect to follow these developments closely. Also it should be emphasized that the 537 Plan was never intended to be a final engineered plan, only a general guideline for more specific engineering studies.

Yours respectfully,

Ellis E. Stern,
Acting Chairman

a

HLH-26009

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF HEALTH

July 30, 1969

SUBJECT: Act 537 Official Plan

TO: All Municipalities in Chester County

The Pennsylvania Department of Health has conditionally approved the "Master Sewer Plan - Chester County" as prepared by Roy F. Weston, Environmental Scientists and Engineers, for the Chester County Planning Commission.

The planning was undertaken on a county-wide basis by authorization of all Chester County municipalities in order that they might satisfy the planning requirements of Act 537, the Sewage Facilities Act. Therefore, your municipality has fulfilled its obligation to plan for the orderly development of sewerage facilities within its boundaries.

In some instances, however, the plan calls for more detailed study in which case arrangements should be made and coordinated through this office since funds are available from the Department of Health to assist you in fully complying with the provisions of Act 537. But in all cases it should be remembered that planning is a continuous process and that the law provides for the updating and revision of plans as may be necessary.

This office will correspond with each municipality and provide individual guidance with respect to implementation of the plan.

In the meantime, should you have any questions relative to the above, please do not hesitate to contact me.

Very truly yours,

John H. Burton

John H. Burton
Sewage Facilities Coordinator
Human Services - Region I

JHB/mr

Comprehensive Area-Wide Sewerage Plan for Chester County Pennsylvania

The preparation of this report was financially aided through a Federal Grant from the Farmers Home Administration, United States Department of Agriculture, under the Consolidated Act of 1961, as amended.

John F. H. Walker, P.E.
Project Manager

Robert P. Relyea, P.E.
Project Engineer

Prepared by
ROY F. WESTON
Environmental
Scientists and Engineers
West Chester, Pennsylvania

24 June 1968

W.O. 217-02

ATLANTA, GA. NEW YORK, N. Y. PITTSBURGH, PA. WILMETTE (CHICAGO), ILL.

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WALTER B. SATTERTHWAITE, JR.

26 June 1968

Chester County Planning Commission
518 North Wing Court House
West Chester, Pennsylvania 19380 W.O. 217-02

Gentlemen:

In accordance with our Agreement executed 22 June 1966 and a subsequent Addendum to this Agreement executed 6 April 1967, ROY F. WESTON is pleased to submit this Comprehensive Area-Wide Sewerage Plan for Chester County, Pennsylvania.

This Comprehensive Plan is presented as a Stage Development Program for the next two 10-year periods, 1968 to 1978 and 1978 to 1988. It includes recommendations on development of municipal, multi-municipal and regional sewerage service areas. It is based on a compilation and analysis, by ROY F. WESTON, of data on existing facilities, currently proposed sewerage plans, population projections prepared by ROY F. WESTON and others, existing and proposed land use plans compiled by the Planning Commission, demonstrated sewerage needs and various previous reports and analyses. The report includes a projection of future sewage flows, general recommendations with regard to the collection and treatment of this sewage, and discussion of pertinent methods of administering and financing the recommended facilities. Recommendations pertaining to development of regional or multi-municipal sewage service areas are based on serving existing and probable future needs within drainage basins.

We wish to acknowledge the excellent cooperation of all those associated with this study and with the development of this plan. In particular we wish to thank the Planning Commission, its Executive Secretary and the County Planner for the wholehearted assistance and helpful suggestions given during the course of the study. Our appreciation is also extended to the Regional Sanitary Engineer, and to the various municipal officials, private sewage facility owners, and to their consulting engineers, who furnished us with information regarding existing and planned sewage facilities.

Very truly yours,

John F. H. Walker, P.E.
Project Manager

JFHW:ed

BOARD OF COUNTY COMMISSIONERS

THEODORE S.A. RUBINO Chairman

J. CARL EMPIE LOUIS F. WALDMANN

CHESTER COUNTY PLANNING COMMISSION

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W. Wayne Clapp	Assistant Planner
Linda W. Napier (Mrs.)	Assistant Planner
Mildred A. Washington (Mrs.)	Administrative Assistant
Dennis T. Minch	Artist and Illustrator
Beverly H. Baldwin (Mrs.)	Cartographer

Part-Time

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Nancy Logue (Mrs.)	Administrative Secretary
Percy H. Dougherty	Research Analyst
Peter H. Smith	Cartographic Assistant
Douglas Y. Heivly	Cartographic Assistant
Mary Reardon (Miss)	Cartographic Assistant

The following persons also served during part of the 1967-1968 period: Scott Taylor, Paul Beideman, Peter P. Sculthorpe, Kenneth Jordan, Richard McCracken and Stephanie S. Woodrow.

Printing and binding by the Chester County Printing Department
Charles Andress, Supervisor.

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INTRODUCTION

Background

In an Agreement executed 22 June 1966, and under a grant from the Farmers Home Administration, the Chester County Planning Commission retained and authorized ROY F. WESTON to prepare an official Comprehensive Plan for municipal, or public-type, domestic sewerage systems which should be developed, in addition to present systems, to adequately serve the present and probable future needs of Chester County.

However, the Pennsylvania Sewage Facilities Act (Act 537) enacted in 1965 provided that:

> "Each municipality shall submit to the Department (of Health) an officially adopted plan for sewerage systems serving areas within its jurisdiction, within such reasonable period as the Department may prescribe, and shall from time to time submit revisions of such plan as may be necessary."

Under the provisions of the Act the Official Plan shall:

1. Delineate areas in which Community Sewage Systems are in existence and evaluate their potential for increasing services.

2. Delineate areas where sewage systems are planned to be available within a ten (10) year period and in so doing provide for the overall extension of community interceptor sewers in a manner consistent with the needs and plans of whole area and also provide for adequate sewage treatment facilities.

3. Delineate areas where community sewage systems are not planned to be available within a ten (10) year period and evaluate these areas in terms of the suitability of the soil to receive, support and sustain the installation of on-lot sewage disposal systems.

The Department of Health, as well as many of the local officials consequently urged the County to accept responsibility for preparing the "Official Plan" required of the (73) municipalities in Chester County in accordance with provisions of the Act.

As a result an Addendum to the basic Agreement between the Chester County Planning Commission and ROY F. WESTON, executed 6 April 1967, provided for an increase in the scope of work to meet the requirements of the Pennsylvania Sewage Facilities Act (Act 537).

In a subsequent "Guide for Official Plan Review" adopted by the sewage Advisory Committee on 4 December 1967:

a) It was recognized that public sewerage systems can best be designed to serve watersheds which cross municipal boundaries, and

b) Area-wide comprehensive planning, and submission of an area-wide Official Plan by more than one municipality, was encouraged.

Purpose

The purposes of the report are to provide Chester County with a Comprehensive Area-Wide Plan for sewage collection, treatment and disposal facilities, present findings regarding the approximate timing of construction of necessary projects, recommend the general location of proposed facilities and present general methods of financing and operating the proposed facilities.

All of the information and recommendations so provided are intended to serve as an aid and a guide to the planning and construction of sewerage projects in the County:

1. To promote efficient and orderly development of communities within Chester County, and

2. To provide the information necessary to avoid overlapping, duplication, underdesign or overdesign of community sewerage facilities that may be constructed within the area covered by the plan.

However, this Comprehensive Plan is neither intended to replace the relatively detailed financial (feasibility) studies normally prepared for municipal bodies by their own engineer, nor are the long-range goals presented in the Plan intended to exclude satisfactory interim solutions to significant sewerage needs of sub-municipal areas.

Therefore, where such detailed financial studies demonstrate technically satisfactory, and financially feasible, alternatives or interim solutions to the regional goals provided herein, this Master Plan can be suitably amended, or the interim facilities approved on a temporary basis subject to their later inclusion in approved regional facilities.

Scope

Previous reports and data have been reviewed, general conditions in the various parts of the County have been examined, and field investigations have been made to obtain necessary information relating to existing sewage facilities and hydraulic and organic loadings on these facilities.

The report contains the findings, conclusions and recommendations based on the study of the following major topics:

1. Past, present and probable future population in the County.

2. General economic condition of the County and the local governmental units.

3. Existing public utilities serving the County including transportation, water, gas, electric and communication facilities, with special emphasis on existing sewerage facilities serving the various municipalities of the County.

4. Natural resources of Chester County as they may affect sewerage needs and proposed sewerage facilities, with emphasis on soil suitability for on-lot sewage disposal systems.

5. Agricultural land use patterns and trends as they relate to present and future sewerage facilities.

6. Topography of the County relating to drainage basins and to the location of regional sewerage systems and treatment facilities.

7. Methods of administering, financing and operating regional sewerage systems.

8. Currently proposed plans for providing services to various Chester County municipalities.

The following specific major components of the Comprehensive Area-Wide Sewer Plan are reported on herein:

1. Connected population and sewage flows in currently-sewered areas.

2. Hydraulic and organic capacity of existing sewage treatment facilities and an estimate of their capability of meeting the future needs of the areas which they serve.

3. Proposed sewered areas and estimated connected populations and sewage flows for the year 1978.

4. Proposals for expansion of existing sewage facilities, including the general locations and the estimated capacities of treatment works, major pumping stations and trunk sewers required through 1978.

5. Proposed sewered areas and estimated connected populations and sewage flows for the year 1988.

6. Proposals for the construction of additional facilities, including the general locations and the estimated capacities of treatment plants, major pumping stations and major trunk sewers required during the 1978-1988 period.

7. Comparison of alternative methods of administering, financing and operating the proposed sewerage facilities including procedures for developing multi-municipal sewer projects where applicable.

Description of Study Area

The Study Area consists of the whole of Chester County as shown on the Planning Areas map. The County is bounded by Lancaster and Berks Counties on the west, by Montgomery County and the Schuylkill River on the northeast, by Delaware County and the State of Delaware on the southeast and by the State of Maryland on the south.

There are 73 minor civil divisions in the County, including one city, several boroughs and many townships, but in the planning of area-wide sewerage systems, the boundaries of these civil divisions have only secondary importance. Of primary concern are the drainage basins in which the various portions of the area to be sewered lie.

A drainage basin is the result of topographic conditions and consists of a land area bounded by ridges or other relatively high ground from which water drains by gravity through ditches, creeks, streams and rivers. In general, a drainage basin is named for the

tributary which drains it. For example, the land area drained by the Delaware River is called the Delaware River Basin.

Chester County lies in portions of six major basins including: Brandywine Creek Basin, Clay Creek Basin, Delaware River Basin, Elk Creek Basin, Octoraro Creek Basin, and the Schuylkill River Basin. The approximate boundaries of these basins are presented graphically on the Planning Areas map. Each basin and its associated tributaries are briefly described as follows:

Brandywine Creek Basin

The Brandywine Creek Basin, with the largest area of any major basin in the County, lies approximately in the middle third of the Study Area. The principal tributaries are the East and West branches of Brandywine Creek.

Brandywine Creek drains in a generally southeasterly direction in the County, then through the State of Delaware to the Delaware River.

Clay Creek Basin

The Clay Creek Basin is the third largest in the County and is drained by the Red Clay and White Clay Creeks and their respective tributaries.

The basin lies in the southeastern corner of the County, abutting the States of Delaware and Maryland, and the creeks drain in a southeasterly direction through the State of Delaware into the Christina River.

Delaware River Basin

The Delaware River Basin, as defined by the Chester County Planning Commission, occupies the smallest portion of the County and lies in the eastern section, abutting Delaware County. The Chester County portion of the basin is drained by Chester, Ridley, Crum and Darby Creeks, all of which flow into and through Delaware County to the Delaware River.

Elk Creek Basin

The Elk Creek Basin lies in the southern part of the County, and extends into the State of Maryland. This basin is the second smallest in the County and drains in a generally southeasterly direction. The major water courses draining the Chester County portion of the basin are Big Elk Creek and Little Elk Creek, which form the Elk River in Maryland. The Elk River flows into Chesapeake Bay.

Octoraro Creek Basin

The Octoraro Creek Basin lies in the western portion of the County, and its major stream, Octoraro Creek, forms part of the boundary line between Lancaster and Chester Counties. This basin is the fourth largest in the County and differs from all the other basins in that it drains toward the southwest into the Susquehanna River in the State of Maryland. All the other basins drain generally in an easterly or southeasterly direction.

Schuylkill River Basin

The Schuylkill River Basin is the second largest in the County and is drained by the Schuylkill River, which flows in a southeasterly direction. However, the tributaries in the County drain toward the Schuylkill River in an easterly direction. The Schuylkill River itself forms the major part of the boundary between Montgomery and Chester Counties.

Table 1 below indicates the County land area, and the percent of total County land area contained in each of the major drainage basins.

Table 1

Major Drainage Basins in Chester County[1]

Name of Basin	Approx. Area Square Miles	Percent
Brandywine	281	37.0
Schuylkill	180	23.7
Clay	102	13.5
Octoraro	74	9.7
Elk	63	8.3
Delaware	60	7.8

[1]Table from Natural Environment and Planning, Chester County Planning Commission, West Chester, Pennsylvania, July 1963.

Existing Sanitary Conditions

The 1960 Census of Population and Housing reported the following with regard to sanitary conditions in Chester County:

a. Number of families with no bathroom 2,704

b. Number of families using septic tanks or cesspools for domestic wastewater disposal 35,957

c. Number of families not connected to a central wastewater disposal system 38,985

In addition, the Pennsylvania Department of Health reported the following with regard to sanitary conditions in Chester County during 1967:

a. Number of families experiencing difficulties with on-site sewage disposal systems sufficient to create pollution problems (estimated) 500

b. Number of families notified either by State or local health officials either to correct unsanitary conditions or to abate pollution of surface or ground waters (estimated) 500

Chester County has recently established a County Health Department. It is expected that activities of this newly created department will include a substantially improved future record of local pollution and public health problems associated with on-site sewage disposal.

BACKGROUND

Population

Overall County

The Chester County Planning Commission has recently completed a special study which contains new population estimates and projections for the County and its constituent municipalities. A summary of population analyses, estimates, and projections prepared by the Chester County Planning Commission and by the Pennsylvania State Planning Board are shown in Table 2.

The 1960 U. S. Census of Population provided the last complete tabulation of the County's population. The Chester County Planning Commission's report Population and Housing: An Analysis of the 1960 Census summarized population growth in the County as:

> "Since 1940, Chester County reversed a growth rate which had been slower than the nation and the State; and became in the decade of 1950-1960, the fourth fastest growing County in Pennsylvania, with a gain of 51,467, or 32.3%, to 210,608. This was the greatest gain, both numerically and percentagewise, in the County's history. A net gain of one person was added every 102 minutes.
>
> Growth came from both the natural increase (about 48%) and the inward migration (about 52%). Most of the migration came from outside the metropolitan area and State rather than the City of Philadelphia. Despite the inward migration as a whole, there appeared to be some outward migration of young males after high school graduation. The greatest in-migration was in the age groups 25-40."

In 1964 the County Planning Commission made an estimate of April 1964 County population by municipality, using data based on building permits, school enrollments, and tax information. The estimates for the County and its five planning regions are given in Table 3. A net four-year gain of 25,456 persons over the 1960 total of 210,608 yielded an estimated population of 236,065 for April 1964.

Another set of population estimates was prepared by the Pennsylvania State Planning Board based on birth and death statistics. The July 1, 1964 population is estimated at 229,400 and the July 1, 1965 population at 244,000. The Board has also prepared population projections to 1980 based on the mathematical projection of historic population trends for each county in the State. The Board selected the 1950-1960 County population growth rate as the most reasonable basis for projection. The results of this projection are shown in Table 2.

Table 2

Population and Estimates for Chester County, 1960-1990

(in 1,000's of persons)

Planning Area	1960	1965	1970	1975	1980	1990
Chester County[1]	210.6	242.2	280.4	326.6	382.0	
Chester County[2]	210.7	236.6			482.7[4]	
County Subregions[3]						
Upper Main Line	36.7	46.7	63.4	80.1	94.1	109.8
West Chester	36.2	43.1	53.9	67.6	83.1	114.5
French Creek	16.8	18.9	22.0	26.4	31.8	47.2
Phoenixville	26.0	29.7	32.9	36.6	40.7	50.0
Coatesville	34.6	37.4	41.6	47.0	54.5	77.6
Downingtown	19.9	25.1	30.1	36.1	43.4	61.6
Honeybrook	5.1	5.9	7.3	9.2	11.9	21.2
Avon Grove	14.1	16.3	19.4	23.4	29.2	96.0
Kennett	10.7	12.1	14.0	16.4	19.3	26.7
Oxford	10.4	11.6	12.9	15.0	17.4	24.6
COUNTY TOTAL	210.5	246.8	297.5	357.8	425.4	579.2

[1]Taken from THE POPULATION OF PENNSYLVANIA, June 1, 1963
Pennsylvania State Planning Board

[2]"1985 Regional Projections for the Delaware Valley 1967"
Delaware Valley Regional Planning Commission

[3]Population Forecasts, 1960-2010, ROY F. WESTON, Community Planning Division, West Chester, Pennsylvania, October 18, 1967

[4]1985 Population Projection

Table 3

Population Estimates
for
Chester County, 1960, 1964
By Regions

Regions	Population April 1, 1960 U.S. Census	Preliminary Chester County Planning Commission Estimates April 1964	Percent Change April 1960-April 1964
Upper Main Line	36,749	44,214	20.3%
Schuylkill	42,762	47,391	10.8
West Chester	36,199	40,095	10.7
Central	59,671	65,805	10.2
Southern	35,227	38,560	9.4
Chester County	210,608	236,065	12.0

Sources:

1. Chester County Planning Commission, 1964 Annual Report.

The Delaware Valley Regional Planning Commission, successor to the Penn-Jersey Transportation Study, has also projected population for this area. The results of this projection are also shown in Table 2.

The October 18, 1967 report on population prepared for the Chester County Planning Commission by ROY F. WESTON discusses the existing and future population trends. The population projection presented in that report considers the growth of Chester County within the context of the social and economic development of the Philadelphia metropolitan region. It is based on analysis of historic population growth patterns in those suburban counties of the metropolitan areas which have already experienced substantial population growth. It is anticipated that population growth in Chester County will follow a similar pattern in the future, i.e. gradual growth, then a rapid increase, and finally a slowing down of the growth rate. The allocation of population within the County is a function of geographic location and accessibility of the minor civil divisions. The population and growth rates projected for the County and the planning subregions are indicated in Table 2. Supplementary population estimates for 1965 and projections for 1970, 1980, and 1990 are presented in Table 4 for each municipality in Chester County.

Upper Main Line

The Upper Main Line is currently experiencing rapid population growth, which is forecasted to continue until approximately 1980. The growth is great both proportionately and absolutely, with a 200 percent increase in population (to 70,000) projected from 1960 through 1985. Following this rapid growth period, the Upper Main Line area growth is estimated to slow down until a 2010 population of 117,000 is reached.

This subregion, situated in the Chester Valley, is crossed by a major transportation corridor which has made access to Philadelphia and points west relatively easy. Good transportation facilities have enhanced the subregion's ability to attract industry. There is a significant industrial concentration in the Tredyffrin-East Whiteland Township area, and future expansion is likely. This expansion will create additional jobs for the area by 1985.

Commercial services, as well as industrial employment and ready access to Philadelphia, will aid in the rapid growth of the area as a whole, since the individual municipalities, to a relatively large degree, share these advantages. In comparison to the other planning subregions, the Upper Main Line seems likely to grow more rapidly and intensively, with the estimated development density averaging about 1,700 persons per square mile by 1985.

Table 4

Projected Population of Chester County Municipalities

Subregion and Municipality	1965	1970	1980	1990
Upper Main Line Subregion				
Easttown	9,100	11,700	16,400	18,400
Tredyffrin	19,900	26,100	37,400	42,300
Willistown	8,300	11,800	18,300	21,200
East Whiteland	6,500	9,700	15,700	19,900
Malvern	2,900	4,100	6,300	8,000
West Chester Subregion				
West Whiteland	5,800	6,800	9,700	12,600
East Bradford	2,600	3,700	6,400	8,900
West Goshen	9,700	12,400	19,500	28,200
East Goshen	2,300	4,300	8,700	12,700
Pocopson	1,500	2,200	4,000	6,200
Birmingham	500	1,900	5,000	8,100
Thornbury	800	1,600	3,300	5,100
Westtown	3,300	4,300	7,100	9,700
West Chester	16,600	16,700	19,400	23,000
French Creek Subregion				
North Coventry	4,800	6,100	9,600	13,200
South Coventry	1,400	1,900	3,200	5,100
East Coventry	2,700	3,400	5,400	7,500
Warwick	1,500	1,700	2,300	4,100
East Nantmeal	800	1,000	1,700	3,300
East Vincent	6,100	6,200	7,300	10,000
West Vincent	1,600	1,700	2,300	4,000
Phoenixville Subregion				
Schuylkill	4,900	5,000	5,500	7,500
East Pikeland	3,600	3,900	4,500	6,300
Charlestown	2,200	3,300	5,600	7,400
West Pikeland	1,000	2,100	4,300	5,600
Spring City	3,300	3,500	4,100	4,800
Phoenixville	14,700	15,100	16,700	18,400
Coatesville Subregion				
West Caln	2,700	2,900	3,700	6,000
West Brandywine	2,300	2,500	3,200	6,100
West Sadsbury	1,200	1,500	2,200	3,500
Sadsbury	2,200	2,500	3,300	4,600
Valley	3,300	3,700	5,000	7,700
West Fallowfield	1,500	1,700	2,200	4,200
Highland	1,100	1,300	1,900	3,800
East Fallowfield	2,900	3,200	4,100	5,500
Atglen	800	1,100	1,800	2,600
Parkesburg	3,000	3,400	4,700	6,300
Coatesville	13,400	13,400	14,800	16,500
South Coatesville	2,100	3,300	6,100	8,700
Modena	900	1,100	1,500	2,100
Downingtown Subregion				
Upper Uwchlan	1,000	1,600	3,000	4,800
Uwchlan	3,200	4,200	6,400	8,600
East Brandywine	1,800	2,400	3,700	5,900
Caln	7,000	7,500	9,600	13,800
East Caln	800	1,600	3,400	6,400
West Bradford	2,500	3,100	4,600	6,400
Newlin	1,600	1,800	2,400	3,500
Downingtown	7,200	7,900	10,300	12,200

Table 4
(Continued)

Projected Population of Chester County Municipalities

Subregion and Municipality	1965	1970	1980	1990
Honeybrook Subregion				
West Nantmeal	1,400	1,600	2,500	5,000
Honey Brook Twp.	1,700	2,100	3,300	6,500
Wallace	1,200	1,500	2,400	4,300
Elverson	500	1,000	2,200	3,400
Honeybrook Boro.	1,100	1,100	1,500	2,000
Avon Grove Subregion				
West Marlboro	1,000	1,300	2,200	4,000
Londonderry	1,000	1,300	2,200	3,700
London Grove	3,100	3,500	4,900	8,400
Penn	1,200	1,600	2,700	4,700
New Garden	4,500	4,500	5,600	7,800
New London	900	1,200	1,800	3,200
Franklin	900	1,300	2,300	4,100
London Britain	700	1,000	1,900	3,000
West Grove	1,900	2,200	3,200	4,000
Avondale	1,100	1,500	2,400	3,100
Kennett Subregion				
East Marlboro	2,700	3,100	4,400	6,000
Pennsbury	1,400	1,900	3,000	5,000
Kennett	3,500	3,800	4,700	7,000
Kennett Square	4,500	5,200	7,200	8,700
Oxford Subregion				
Upper Oxford	1,100	1,300	2,000	3,600
Lower Oxford	2,800	2,900	3,500	4,900
East Nottingham	2,500	2,600	3,100	4,400
West Nottingham	1,200	1,300	1,800	2,900
Elk	600	700	1,100	1,700
Oxford	3,400	4,100	5,900	7,100

Source: "Population Forecasts, 1960-2010 for Chester County, Pennsylvania", Community Planning Division, ROY F. WESTON, 19 October 1967

West Chester

This planning subregion includes much of the West Chester-Paoli plain, which is generally suitable for urban development. New and improved highway facilities will provide easy access to both the Philadelphia and Wilmington Standard Metropolitan Statistical Areas. Population growth rates will be relatively high for the area as a whole with certain municipalities having much higher rates than the average due to higher potential for growth. Population growth should continue at a sustained rate through 2010, with the largest densities in West Chester and adjoining townships. The planning subregion density will reach approximately 2,000 persons per square mile by that time.

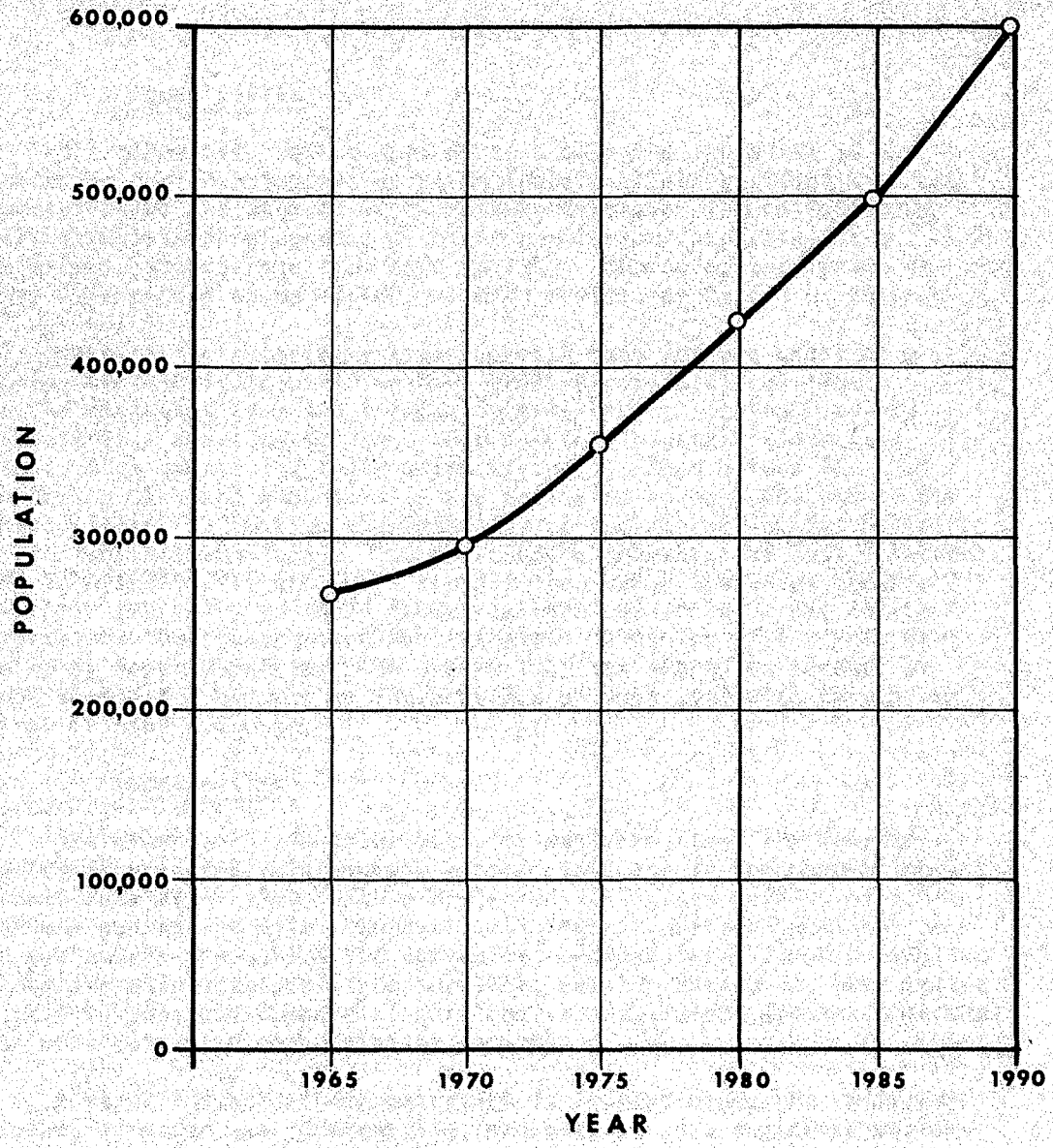
Growth potentials generally are estimated on the basis of the attraction that industrial jobs or service facilities exert on individuals and their preferences for residential location. West Chester Borough and West Goshen Township have high potentials because they are expected to contain, in 1985, an area of relatively concentrated industrial employment, a significant amount of retail and commercial services, and good access to most points within the planning subregion as well as in the Couny, in the Philadelphia, and Wilmington areas. Population in these two municipalities will increase rapidly through 1985. The region as a whole is highly attractive according to the concept set forth in the mathematical model, although West Goshen, Tredyffrin, and West Chester are likely to obtain the greatest growth immediately with a wave effect of growth being felt in successive rings around those municipalities.

French Creek

Industrial and residential development in the subregion is expected to be fostered by the completion of the Schuylkill Expressway Extension. However, this development will not have a significant effect on the area until after 1990, according to the logistic curve projection. Prior to that, population will grow at a slower rate, reaching approximately 38,800 by 1985, a gross density of about 390 persons per square mile.

The excessive slopes and stoniness prevalent in the western part of the subregion will limit development to low densities. More favorable topographic conditions in the eastern half of this planning subregion coupled with better access to employment opportunities will foster greater growth rates. North and South Coventry Townsips will have easy access to Pottstown via an improved Route 100. Expanded industrial employment opportunities in the Phoenixville-East Pikeland-Schuylkill area will be easily accessible from East Coventry Township and East Vincent Township via Route 724, thereby strengthening their potential population growth.

FIGURE 1



PAST, PRESENT AND PROBABLE FUTURE POPULATION CHESTER COUNTY, PENNSYLVANIA

DATA SOURCE: POPULATION FORCAST, 1960-2010 FOR CHESTER COUNTY, PENNSYLVANIA COMMUNITY PLANNING DIVISION, ROY F WESTON, 18 OCTOBER 1967

Phoenixville

The Schuylkill Valley area of this planning subregion is expected to continue to develop as an industrial and residential area. Completion of the Schuylkill Expressway Extension toward Pottstown will stimulate development, with the population increasing at a relatively steady rate from 1960 to 1985. Subregion population in 1985 is expected to be 45,100, with an additional 23,000 by 2010.

Despite the relatively steady growth rate for the areas as a whole, certain municipalities have greater potential for growth, as the estimates from the allocation model show. Spring City and Phoenixville are located close to projected industrial concentrations, thus magnifying their attractiveness. Populations for 1985 in Spring City and Phoenixville are estimated to be 5,200 and 19,000 respectively, reflecting the intensity of the attracting factors of these two municipalities. The surrounding townships of East Pikeland and Schuylkill will grow more rapidly than other townships because of their proximity to these industrial and commercial areas in the subregion. Charlestown and West Pikeland Townships will likely develop at lower densities than the rest of the subregion because of poor access and because of the presence of much land with excessive slope or poor drainage.

Coatesville

The growth of industrial activity westward along the Chester Valley is expected to stimulate a rapid increase in the population growth rate after 1980, with a projected 2010 gross density of 1,300 persons per square mile. However, this density pattern will not be spread evenly throughout the subregion, because certain municipalities along the main transportation corridor, running east-west, have better access to jobs and commercial services, and therefore greater potential for more concentrated population growth.

A major industrial concentration is located along the railroad-highway corridor near Coatesville, and extends in a segmented manner to the west near Parkesburg. Commercial services developing in response to initial population growth will enhance the potential for population growth of this group of municipalities along the corridor. Excessive slopes and minimal direct access to employment opportunities and commercial services will tend to lower the growth potential in the southern townships. Population growth for the eastern and central portions of the area is expected to be the most rapid because of the existing industrial facilities and their proposed expansion.

Initially, the various boroughs and the City of Coatesville are likely to grow most rapidly, but increasing pressure on their ultimate population-holding capacities will force population expansion into adjacent townships such as Caln, Valley, and East Caln.

Municipalities to the west, including Atglen, will grow at slightly slower rates because of their relatively less advantageous location and smaller local existing industrial and population bases. Other small communities could grow more rapidly (South Coatesville and Modena) because of better accessibility to major subregional industrial and commercial concentrations in Coatesville, and because of available vacant land within the Boroughs.

Downingtown

This area will be affected by the growth of the adjacent Upper Main Line and Coatesville planning subregions as well as by internal expansion factors. Population growth will be most rapid after 1980, with the most significant growth occurring in the municipalities close to existing urban concentrations such as West Chester and Downingtown. Densities will increase, with projected 1985 and 2010 gross densities for the area being approximately 660 and 1,342 persons per square mile, respectively.

Municipalities lying astride the main east-west transportation corridor of the County will have the more favorable potentials for growth. This is due to improved transportation routes such as Highways 30 and 100 and to the increased growth of industries. Downingtown and East Caln are projected to grow by large percentages by 1985. The large and expanding industrial concentration in this area will be a major factor in the population increase. New industry forecasted in Uwchlan Township near the Downingtown interchange of the Pennsylvania Turnpike will be the main reason for the large percentage population growth in that township. Other townships with smaller populations are expected to grow at a slower rate and thus will contribute only a minor part of the subregion's population change.

Difficult slope and drainage conditions and the absence of ready access to employment centers and commercial services account specifically for the lack of growth potential in Newlin and West Bradford Townships.

Honeybrook

At present, the area is considered good for commercial farming and is remote from urban growth influence. Past population trends have been very moderate with, the population in the subregion increasing from 3,316 persons in 1920 to 5,112 persons in 1960. Forecasts for 1985, based on the logistic curve, indicate 15,800 persons in the area, a 250% increase in 25 years. However, these estimates may not be reached in the time period because of the strong agricultural traditions in the area and stronger growth influences elsewhere in Chester County.

The subregion estimates were allocated according to the individual municipalities' potentials for growth. Because the local highways intersect at the boroughs, a significant potential for growth was indicated by the forecast method. However, it is anticipated that much of the population expansion will actually take place nearby in the townships. This is exemplified by Honeybrook Borough gaining 800 persons in 20 years (1965-85), in contrast to Honey Brook Township which is expected to gain 4,800 persons in the same time period. Although the number of persons allocated to the individual municipalities appear substantial and represent a large percentage change, it is anticipated that this subregion's population gain will be less than that of any of the other subregions studied in Chester County.

Avon Grove

This subregion lies within the sphere of influence of New Castle County, Delaware. Present density is approximately 150 persons per square mile and is expected to increase to 330 persons per square mile by 1985, and to about 1,100 persons per square mile in 2010. Routes 1 and 41 will offer better access to industrial concentrations and opportunities in West Chester, Kennett Square, and Wilmington. In conjunction with current industrial employment in West Grove and Avondale, the potential for growth in the central areas will be strengthened.

London Grove, New Garden, and Penn Townships, as well as West Grove and Avondale, are expected to grow most rapidly and in greatest absolute amounts. The boroughs of West Grove and Avondale contain industrial and commercial service employment that will create increased growth potential. Since these boroughs are limited in the amount of persons they can accommodate, the population attracted to them by their industries will extend to surrounding townships, resulting in a marked increase in the population of London Grove, New Garden, and Penn Townships. Other townships will grow at somewhat slower rates.

Kennett

This subregion has already been affected by the growth of New Castle County, Delaware, and Delaware County, Pennsylvania. Growth from 1950 to 1960 occurred at a 28 percent rate. Future growth will follow this pattern, with the population growth rate increasing after 1980. Present density is approximately 280 persons per square mile, while 1985 and 2010 gross densities are expected to be about 530 and 1,100 persons per square mile, respectively, reflecting the growth influence of the surrounding areas as well as the growth potential of the area itself.

Significant concentration of industry in Kennett Square (81.2 percent of the planning subregion's manufacturing industry employment) constitutes the largest factor in Kennett Square's potential attractiveness. Other factors contributing to the Borough's potential for growth include a significant group of commercial services and its central location, with good access to points in and around Chester County. Within the subregion, the townships along an improved U.S. Route 1 will grow because of improved accessibility to Delaware County and other positive attraction forces within Chester County. Percentage growth rates should be relatively uniform throughout the subregion, but the largest absolute growth potential will be in Kennett Square. The expected result is a 1985 gross population density of about 8,400 persons per square mile. Natural features should not appreciably limit population growth in the area except for some constraints in Pennsbury Township due to excessive slopes, marshlands and flood plains.

Oxford

This is a predominantly agricultural area, relatively far from major urban influences. It had a 1960 gross density of approximately 140 persons per square mile. Densities for the area as a whole are expected to double by about 1985 and double again by 2010. This growth projection is a product of the logistic curve projection method and assumes that growth will occur in much the same manner in the future as during the 1940-1960 period.

The greatest growth potential is expected to occur along the major transportation corridor (U.S. Route 1), with major emphasis on the Oxford Borough area. This Borough is expected to have the greatest growth, both proportionally and absolutely, because of its projected development of industrial and commercial advantages. Oxford's population is expected to approach 7,100 by 1985, an increase of almost 100 percent over 1960. Natural terrain features such as excessive slope will lessen population potential in the western townships, resulting in a somewhat lower level of development. As a result, this subregion as a whole should experience a relatively slow rate of growth, compared to other County planning regions.

Area Economic Condition

As a result of an urbanizing pressure exerted by major metropolitan centers in the area, Chester County can no longer be described as having an agriculture-based economy supplemented by some heavy industry. The County's economic base is rapidly becoming diversified, as the activities of the Philadelphia and Wilmington metropolitan economies extend outward.

One indication of this trend can be found in the U. S. Department of Commerce, Office of Business Economics report, Growth Patterns in Employment by County: 1940-1950 and 1950-1960. This report shows a greater employment growth in Chester County than the national average. From 1940 to 1950, the number of jobs in Chester County increased by 14,017 -- 1,467 more jobs than the County's share of the national average growth rate. From 1950 to 1960, the total employment increase was 17,415 -- 7,960 more than the County's share.

The County employment level has continued to rise, and the increase in employment has been accompanied by a shift in its composition. Employment through the 60's in the fields of Transportation, Retail Trade, Finance, and Services has grown faster than in such other fields as Agriculture, Mining, Construction, Manufacturing, and Wholesale Trade. This shift, although slight, seems to mark the beginning of a period of urbanization for the region.

Existing Public Services

Transportation

Chester County is located near the center of the densely settled urban region or megalopolis that extends approximately from Boston to Washington; it also lies astride the major transportation routes between Philadelphia and the west. Urban land uses, such as heavy industrial and high-density residential, are concentrated mostly along the major transportation corridors that link the Philadelphia and Wilmington metropolitan areas to other parts of the country.

The Lincoln Highway (U.S. Route 30), the Pennsylvania Turnpike, the Pennsylvania Railroad main line, U.S. Routes 1, 202, 322 and Pennsylvania Routes 10 and 41 are the major transportation routes through the County. The principal market and industrial centers in the County have grown along these routes at major road junctions, river crossings and stream confluences. The older centers of urbanization include Phoenixville, Spring City, Downingtown, Coatesville, Parkesburg, Kennett Square, Oxford and West Chester, the focal point of the County's internal road system.

The eastern part of the County, which is closest to Philadelphia, is rapidly becoming urbanized as new industrial and residential land uses have spread outward from the city. The pressure of urban development is greatest near the commuter routes to Philadelphia, i.e., the Pennsylvania Turnpike, Schuylkill Expressway and Pennsylvania Railroad. Paoli has been the hub of development for many years, as this community is an important railroad terminal and interchange.

To a lesser extent, the south central area is also feeling developmental pressure from the growth of Wilmington and Chester. The older urban areas in the County are also growing, thereby increasing the burden on the transportation systems.

The new industrial and residential growth pattern is significantly different from that of the older urban areas. These older towns and centers tend to be densely built up in a gridiron pattern with residential, commercial, and industrial land uses all within walking distance of each other. The new urban development pattern is automobile- and highway-oriented. Residences are located on larger lots, and commercial and industrial structures are usually on one level, surrounded by large parking areas. Factories and warehouses no longer locate only along railroad freight lines; in many cases they rely exclusively on trucks for freight service. Most future high-density residential and industrial land development can be expected to take place along the major transportation corridors near, but not necessarily in, the existing urban centers.

Other Community Facilities

The growth of the County will mean an increase in the size and location of the various public service and community facilities. In the past, most churches, libraries, schools, and other facilities have been located within the relatively densely populated boroughs. Now, some are being constructed in the outlying townships to serve both new and old areas of population. This new location trend is caused by the scarcity, and consequent higher value, of land within the cities and boroughs. In addition to local service facilities, the County also has some regional facilities; these include the Valley Forge Army Hospital, the Coatesville Veterans Hospital, State facilities (Embreeville State Hospital, Pennhurst State School, etc.), private institutions (Roger-Graves School for the Blind, etc.), colleges and universities (West Chester State College, Immaculata College, Lincoln University, etc.), and semi-private institutions (Downingtown Industrial School, the Church Farm School, etc.). A complete listing of the existing community facilities, public utilities, and roads in the County is presented in the Atlas of Chester County map series prepared by the County Planning Commission. The Commission's Annual Report contains an up-to-date survey of highway construction programs and local land use plans.

The number of residents in institutions, approximately 3.7 percent, constitutes a far higher percentage of the total population than the average for Pennsylvania or for the Philadelphia Standard Metropolitan Statistical Area. In addition, about 4,271 residents (2.0 percent of total population) of Chester County lived in group quarters in 1960.

The community facilities will have to be expanded and supplemented to meet population growth both in the County and the region. It is probable that in most cases such facilities will be located in areas where substantial tracts of open land are available. Such a pattern of growth would significantly affect both the technical and economic feasibility of providing public utility services, such as water and sewage, in the areas in which these community facilities are to be located.

Natural Resources

The type and rate of growth of any area and the problems generated by that growth are, at least in part, a function of the natural resources or the natural environment with which that area is endowed. The natural resources which can be expected to exert significant effect on growth in Chester County include its air, climate, topography, soils, minerals, and water. The availability and accessibility of these resources to significant population, commercial, and industrial centers must be evaluated to determine the magnitude and direction of the effects they will exert in the future.

These environmental characteristics should be considered first in light of the effects on the potential residential and commercial development, and then from the standpoint of the sewer needs they generate as this development occurs. Through such a method of evaluation it should be possible to develop a generalized, regional plan. The relevance of such a plan lies in its usefulness as a guide in the development of detailed plans for smaller subregions, as the specific needs of localized areas become apparent.

Water

Possibly the most significant resource from the standpoint of sewer needs is water. Generally, a plentiful supply of readily-obtainable, good-quality water encourages high water use rates and consequently greater wastewater treatment and disposal loads.

Surface Water

The major source of water currently supplied by public water systems to consumers in Chester County is surface water. This water is obtained from various reservoirs located both within and outside the County. Additional surface water supply reservoirs proposed to supplement these systems would increase the supply rate capability for the area currently served. All but one of these proposed reservoirs are to be located in Chester County; the exception is the Newark Project proposed by the U.S. Corps of Engineers. There are, of course, other reservoirs and direct river pumping facilities which,