MONROE TOWNSHIP
Gloucester County, New Jersey

MASTER PLAN
2004

Adopted By:
MONROE TOWNSHIP
PLANNING BOARD
September 2004
Adopted Pursuant to N.J.S.A. 40:55D-28,
The New Jersey Municipal Land Use Law

J. Timothy Kernan, P.E., P.P., C.M.E.
N.J. Planner License No. 05400

Prepared By:
J. Timothy Kernan, Inc.
Kingsway Commons, Suite 100
935 Kings Highway
Thorofare, New Jersey 08086
(856) 251-9500

kernan
Consulting Engineers

ACKNOWLEDGEMENTS

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Special thanks to Aaron Reisner, Graduate Student at University of Pennsylvania, and Planning Intern at J. Timothy Kernan, Inc., who worked tirelessly with Tim Kernan and the people of Monroe Township to help bring this document together.

DEDICATION

This 2004 Master Plan of Monroe Township is dedicated to Tom Gatti

April 27, 1955 – April 18, 2004

Whose dedication, work ethic, fairness, and understanding of sound planning principles greatly contributed to this undertaking and also to the betterment of Monroe Township.

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I. INTRODUCTION

The 2004 Monroe Township Master Plan has been prepared in accordance with the provisions of the New Jersey Municipal Land Use Law (N.J.S.A. 40:55D-28). It is based on the analyses of existing and future needs and is intended to direct the coordinated, efficient and orderly development of the Township. The Master Plan outlines the community's priorities and preferences that, when incorporated into the development review process, can help ensure a sound land development decision process.

The role of the Master Plan in the land development decision process was established by the Municipal Land Use Law (N.J.S.A. 40:55D-62), which requires that a zoning ordinance may be adopted only after the Planning Board has adopted the land use and housing elements of a master plan, and that all provisions of the zoning ordinance must be substantially consistent with, or designed to effectuate such master plan elements. The 2004 Master Plan sets forth the basic strategies for the coordination of existing land use patterns and future development, to achieve a balance and unified community. It identifies land use constraints and opportunities and serves as a formal statement of Monroe Township's policies regarding future land use and development.

Monroe Township is situated in the southeasterly portion of Gloucester County. It is bordered by Winslow Township, Camden County to the north, Washington Township to the west, Glassboro Borough, Clayton Borough and Franklin Township to the south, and the Atlantic County communities of Buena Vista Township and Folsom Borough to the east. Approximately two-thirds of Monroe Township is located within the Pinelands Area. With an area of approximately 47 square miles and a 2000 population of almost 29,000 residents, Monroe Township is the second largest municipality in Gloucester County in terms of area and population.

Monroe Township contains a diverse land use pattern, containing older, well-established neighborhoods, recently developed suburban areas, rural areas, productive agricultural areas, and extensive woodland and wetland areas. Significant commercial development exists along the Black Horse Pike.

According to the U.S. Census Bureau data, Monroe Township's population increased by almost 106 percent between 1970 and 2000, making it the fifth fasting growing municipality in Gloucester County during that period. However, between 1990 and 2000, the Township's population expanded slightly slower than the population of Gloucester County and the State of New Jersey, rising by 2,264 or 8.5 percent, to a total of 28,967. In comparison, Gloucester County's population and New Jersey's population grew by 10.7 percent and 8.9 percent, respectively, during the same period. Monroe Township was the tenth fastest growing municipality in Gloucester County during the 1990s. TABLE 1 lists population changes from 1970 to 2000 for the State of New Jersey, Gloucester County and all Gloucester County municipalities.

TABLE 1

Population Change 1970-2000						
Municipality	**1970**	**1980**	**1990**	**2000**	**% Change 1970-2000**	**% Change 1990-2000**
Clayton	5,193	6,013	6,155	7,139	37.5	16.0
Deptford	24,232	23,473	24,137	26,763	10.4	10.9
East Greenwich	3,280	4,142	5,258	5,430	65.5	3.3
Elk	2,707	3,187	3,806	3,514	29.8	-7.6
Franklin	8,990	12,396	14,482	15,466	72.0	6.8
Glassboro	12,938	14,574	15,614	19,068	47.4	22.1
Greenwich	5,676	5,406	5,102	4,879	-14.0	-4.4
Harrison	2,661	3,585	4,715	8,788	230.3	86.4
Logan	1,840	3,078	5,147	6,032	227.8	17.2
Mantua	9,643	9,193	10,074	14,217	47.4	41.1
Monroe	**14,071**	**21,639**	**26,703**	**28,967**	**105.9**	**8.5**
National Park	3,730	3,552	3,413	3,205	-14.1	-6.1
Newfield	1,487	1,563	1,592	1,616	8.7	1.5
Paulsboro	8,084	6,944	6,577	6,160	-23.8	-6.3
Pitman	10,257	9,744	9,365	9,331	-9.0	-0.4
South Harrison	1,226	1,486	1,919	2,417	97.1	26.0
Swedesboro	2,287	2,031	2,024	2,055	-10.1	1.5
Washington	15,741	27,878	41,960	47,114	199.3	12.3
Wenonah	2,364	2,303	2,331	2,317	-2.0	-0.6
West Deptford	13,928	18,002	19,380	19,368	39.1	-0.1
Westville	5,170	4,786	4,573	4,500	-13.0	-1.6
Woodbury	12,408	10,353	10,904	10,307	-16.9	-5.5
Woodbury Heights	3,621	3,460	3,392	2,988	-17.5	-11.9
Woolwich	1,147	1,129	1,459	3,032	164.3	107.8
Gloucester County	172,681	199,917	230,082	254,673	47.5	10.7
State of New Jersey	7,171,112	7,365,011	7,730,188	8,414,350	17.3	8.9

Source: 2002 U.S. Census of Population and Housing
Gloucester County Data Book, Gloucester County Planning Department, 1999

As noted in TABLE 1, in addition to having the second largest population of all Gloucester County municipalities, Monroe Township is also the second largest Gloucester County municipality in terms of area. As a result, Monroe Township has a relatively low population density (persons per square mile). Pressures for residential growth are expected to continue in Monroe Township into the foreseeable future because of the availability of developable land and access to utilities. The Delaware Valley Regional Planning Commission projects Monroe Township's population at 41,900 in 2025, an increase of 44.6 percent over the 2000 population.

TABLE 2 lists population densities for 1990 and 2000 for the State of New Jersey, Gloucester County and all Gloucester County municipalities. TABLE 3 lists Delaware Valley Regional Planning Commission's 2000-2025 projected populations for Gloucester County municipalities.

TABLE 2

Population Density 1990-2000					
Municipality	**Land Area (Sq. Mi.)**	**1990 Population**	**Density [1]**	**2000 Population**	**Density [1]**
Clayton	7.17	6,155	858.9	7,139	995.7
Deptford	17.48	24,137	1,380.5	26,763	1,531.1
East Greenwich	14.75	5,258	356.6	5,430	368.1
Elk	19.63	3,806	193.9	3,514	179.0
Franklin	55.99	14,482	258.7	15,466	276.2
Glassboro	9.21	15,614	1,695.2	19,068	2,070.4
Greenwich	9.31	5,102	547.9	4,879	524.1
Harrison	19.15	4,715	246.2	8,788	458.9
Logan	22.75	5,147	226.2	6,032	265.1
Mantua	15.89	10,074	633.8	14,217	894.7
Monroe	**46.54**	**26,703**	**573.8**	**28,967**	**622.4**
National Park	1.00	3,413	3,421.8	3,205	3,205
Newfield	1.70	1,592	936.7	1,616	950.6
Paulsboro	1.96	6,577	3,353.5	6,160	3,142.9
Pitman	2.30	9,365	4,079.7	9,331	4,057.0
South Harrison	15.80	1,919	121.5	2,417	153.0
Swedesboro	0.73	2,024	2,789.1	2,055	2,815.1
Washington	21.37	41,960	1,963.5	47,114	2,204.7
Wenonah	0.97	2,331	2,403.1	2,317	2,388.7
West Deptford	15.89	19,380	1,219.5	19,368	1,218.9
Westville	0.96	4,573	4,748.4	4,500	4,687.5
Woodbury	2.08	10,904	5,241.9	10,307	4,955.3
Woodbury Heights	1.23	3,392	2,760.8	2,988	2,429.3
Woolwich	20.92	1,459	69.8	3,032	144.9
Gloucester County	324.78	230,082	708.4	254,673	784.1
State of New Jersey	7,417	7,730,188	1,042.2	8,414,350	1,134.5

Source: 2002 U.S. Census of Population and Housing
Gloucester County Data Book, Gloucester County Planning Department, 1999

[1] Persons per square mile

TABLE 3

Delaware Valley Regional Planning Commission Year 2025 Population Projections Gloucester County Municipalities						
Municipality	**Census 2000**	**2005**	**2010**	**2015**	**2020**	**2025**
Clayton	7,139	8,150	8,700	9,250	9,700	10,150
Deptford	26,763	25,350	25,950	26,450	27,000	27,350
East Greenwich	5,430	5,550	5,850	6,200	6,600	6,950
Elk	3,514	4,250	4,700	5,300	6,050	7,050
Franklin	15,466	15,800	16,750	17,700	18,750	19,700
Glassboro	19,068	19,900	20,650	21,300	22,900	24,250
Greenwich	4,879	4,900	4,900	4,900	4,900	4,800
Harrison	8,788	10,100	11,400	12,600	13,900	16,850
Logan	6,032	7,000	7,300	7,600	7,650	7,700
Mantua	14,217	13,100	14,000	14,800	15,650	16,400
Monroe	**28,967**	**30,850**	**33,400**	**36,000**	**39,050**	**41,900**
National Park	3,205	3,300	3,300	3,300	3,300	3,300
Newfield	1,616	1,650	1,650	1,650	1,650	1,650
Paulsboro	6,160	6,200	6,100	6,050	5,950	5,850
Pitman	9,331	9,250	9,250	9,200	9,150	9,000
South Harrison	2,417	2,850	3,000	3,400	3,500	3,950
Swedesboro	2,055	2,150	2,250	2,300	2,300	2,350
Washington	47,114	49,650	51,800	54,000	56,000	56,300
Wenonah	2,317	2,350	2,400	2,450	2,500	2,500
West Deptford	19,368	20,950	21,700	22,750	23,900	24,900
Westville	4,500	4,700	4,800	4,850	4,900	4,900
Woodbury	10,307	10,600	10,550	10,400	10,300	10,150
Woodbury Heights	2,988	3,250	3,250	3,250	3,250	3,200
Woolwich	3,032	3,650	5,200	7,250	9,450	11,350
Gloucester County	254,673	265,500	278,950	292,950	308,300	322,500

Source: Delaware Valley Regional Planning Commission

TABLE 4

Age Comparison – Monroe Township 1990-2000				
Age	**1990**	**Percent**	**2000**	**Percent**
Under 5	1,981	7.4	1,908	6.6
5-19	6,150	23.0	6,176	21.3
20-64	15,439	57.8	17,146	59.2
Over 65	3,133	11.8	3,737	12.9
Total	26,703	100.0	28,967	100.0

Source: 1990 and 2000 U.S. Census of Population and Housing

The increasing longevity of the elderly due to medical breakthroughs, improved health care, and greater awareness of healthier life-styles, along with the aging of the "baby boom" generation, have all contributed to a growing elderly population in the United States. This pattern holds true for Monroe Township, where the number of residents over 65 years of age grew by almost 20 percent between 1990 and 2000. In 2000, 3,737 residents of Monroe Township (approximately 13 percent of the total population) were 65 years in age or older. TABLE 4 lists the 1990 and 2000 population by age groups for Monroe Township. As indicated in this table, the largest increases have taken place in the adult (20 and over) age brackets. A further analysis of age figures indicates that the greatest population increase in Monroe Township has occurred in the 35-54 age group. The number of residents in Monroe Township in this age group grew by over 30 percent between 1990 and 2000. This indicates that, while the number of senior citizens living in Monroe Township will continue to grow in the near future, the greatest impact may not be felt for 20 years or more.

The 2004 Master Plan has been developed based upon a number of planning principles and assumptions. The planning principles reflect the priorities and preferences of the community and are intended to guide the implementation of the plan. The planning assumptions essentially attempt to forecast development in the Township by taking into account local and regional development trends, population and demographic data and projections, and anticipated public and private actions. Taken together, the planning principles and assumptions listed below form the basis for creating the goals and objectives that guide the development of land in Monroe Township.

A. PLANNING PRINCIPLES

1. Planning must be comprehensive in nature and direct the coordinated, efficient and orderly development of Monroe Township based on an analysis of present and future needs, and the promotion of the public health, safety and general welfare.

2. Future development must not outstrip the ability of the Township to assimilate such growth. Land use planning should be cognizant of the capacities of community services and facilities, and the proper utilization and conservation of natural resources.

3. Strengthening and diversifying the economic composition of the Township is a priority.

4. Planning and development proposals at the municipal level must be coordinated with the master plans of adjoining municipalities, Gloucester County, the Pinelands Commission and the State of New Jersey.

5. Land use decisions must take into account and be guided by the goals and objectives of the Monroe Township Master Plan.

B. PLANNING ASSUMPTIONS

1. Monroe Township's population grew from 26,703 in 1990 to 28,967 in 2000, with most of this growth occurring during the second half of the decade. It is assumed that the Township will continue to face strong residential development pressure because of the availability of developable land and access to utilities.

2. Monroe Township will continue to be a desirable place to live and work because of its excellent location within the South Jersey region.

3. Pressures for agricultural uses to decline will continue in the Township as future suburban development continues to create increasing operational problems for farm activities, and increasing land value makes the sale of farmland an attractive economic prospect for many land owners.

4. These continuing pressures in favor of residential development will provide a significant inventory of houses in the moderate and middle income ranges.

5. The expanding population base will continue to place stress on the municipality to provide adequate services to all its residents. The Township must, therefore, plan for significantly expanded capital and operating expenditures.

6. Commercial and industrial development activities in the Township will increase to serve the growing population, but overall the Township will remain primarily a residential community. Zoning regulations and ongoing efforts to preserve areas designated as Pinelands will minimize the impact of commercial and industrial development in these areas.

7. Ecologically sensitive lands will continue to be recognized and preserved.

8. The increasing population base will require an expanded recreation system to serve the needs of all citizens of the Township.

9. The elderly population will continue to expand as a percentage of the total Township population. Appropriate housing opportunities will be available to accommodate the Township's elderly population.

10. New development in the Township regardless of its character will be sensitive to the context of existing development.

II. GOALS AND OBJECTIVES

A. GOALS

An important element in the development of the Master Plan is the establishment of goals and objectives by which all future development activity will be measured. These goals and objectives are statements to the preferred living and working patterns within the Township, recognizing the physical, legal and sociological limitations and opportunities that may exist. They describe the best growth strategies and development control mechanisms for the Township, allowing the community to anticipate ultimate population levels, to direct the location of population concentrations, to provide development guidelines for the preservation of open space and environmentally sensitive areas, and to assure direction for community facilities and services to achieve a coordinated and balanced community.

1. OVERALL GOALS OF THE MASTER PLAN

i. Encourage a pattern of compact and contiguous growth within appropriate areas of the Township.

ii. Direct growth to areas where infrastructure capacity is currently available or committed to be available in the future.

iii. Preserve the character of the Township while enhancing the quality of living for all residents in all parts of the Township. This effort involves recognizing the differing needs of bustling commercial centers such as Main Street and quieter residential areas farther from the town's center.

iv. Provide for a variety of residential, commercial, industrial, agricultural, institutional, recreational and conservation uses.

v. Guide future development and community facilities to meet the needs of the residents of the Township, while ensuring that new development is compatible with existing development without degrading the Township's cultural and natural resources.

vi. Recognize the importance of existing residential and commercial centers to the Township's landscape and image.

vii. Preserve the Township's natural and cultural resources that contribute to both the positive image and overall strength of the Township.

viii. Provide for a balanced economic base and a source of employment through utilization of nonresidential lands.

ix. Provide for the safe and efficient movement of goods and people through the Township.

x. Encourage continued efforts to coordinate regional services and conservation efforts.

xi. Recognize that open space preservation must become the responsibility of the Township, and that the agricultural community alone will not be able to continue to ensure that open space will remain in the Township forever.

xii. Establish and maintain the level of community facilities and public services required to satisfy the needs of present and future residents of Monroe Township, and allow for the well planned expansion of these public facilities and services.

xiii. Eliminate the potential for conflicts among dissimilar land uses.

xiv. Prevent development in sensitive environmental areas.

xv. Establish acceptable level of service and/or performance measures for transportation and community facilities and ensure the adequate and timely provision of those facilities in order to support existing and planned development.

B. OBJECTIVES

While the above goals represent the preferred development scenario for the Township, the objectives listed below are specific targets that are to be met in achieving those goals.

1. RESIDENTIAL / COMMUNITY USE OBJECTIVES

a. To ensure decent and affordable housing for all present and future residents of the Township, without regard of their economic status by providing for a full range of housing choices that are affordable to low, moderate, middle and upper income households.

b. To provide for streets, utilities, schools, parks, police and fire protection, and other municipal services sufficient to meet the needs of the residential and commercial areas of the Township.

c. To ensure sufficient space, privacy and convenience in all residential areas to meet accepted standards of community health, safety and welfare.

d. To coordinate future residential and commercial development throughout the Township to form well designed neighborhoods.

e. To ensure that adequate regulatory controls are established to promote appropriate home-based occupations and to protect residential uses and neighborhoods from potential negative impacts.

f. To encourage the development of age-restricted housing to meet the needs of the Township's older population.

g. To encourage the development of planned residential developments.

h. To encourage infill residential development.

2. ECONOMIC DEVELOPMENT OBJECTIVES

a. To concentrate new industrial development in areas with good access to limited access highways and with adequate utility service.

b. To strengthen performance and design standards to ensure that industrial development provides adequate safeguards to protect the environment and to guard against incompatible adjacent uses.

c. To encourage the development of light industry, both as infill development and as new development in appropriate zones.

d. To ensure that industrial sites are located so that they are easily accessible to roadways having capacity sufficient to serve the employee traffic. They should not be located within residential areas, or where traffic must pass through residential streets to gain ingress or egress from the industry.

e. To ensure that industrial uses are developed to good modern standards with adequately-sized sites allowing for future expansion of buildings, adequate off-street parking and loading facilities, and proper setbacks and use of landscaped buffer areas where adjacent to other uses.

f. To encourage planned industrial park settings.

g. To provide for the buffering of adjacent residential uses to protect residents from the effects of traffic, lighting, truck movement, noise, etc. associated with nonresidential development.

h. To provide for a range of commercial activities in appropriate locations where the circulation, utility and community service systems are best suited to handle the resulting volumes.

i. To provide appropriate design controls for small scale commercial development.

j. To encourage good, context-sensitive community design.

k. To provide sufficient area in the Township for the development of planned nonresidential projects.

l. To ensure that business developments are designed with adequate space for off-highway parking, have safe ingress and egress for vehicular movement, minimize hazards to the flow of traffic, and do not impair the desirability of adjacent lands for other uses.

m. To ensure that professional office locations are conveniently accessible to local residents and provide for parking availability that does not conflict with the parking needs of other uses or is detrimental to vehicular safety movements.

n. To promote the adequate provision of employment opportunities and the economic health of the Township.

o. To promote the development of new employment in areas that are convenient to existing housing and public transportation facilities.

3. CONSERVATION OBJECTIVES

a. To conserve and manage natural resources within the Township.

b. To protect State, regional and local areas of critical environmental concern.

c. To protect life and property from the effects of natural hazards, such as flooding, winds, wildfires and unstable lands.

d. To permanently preserve environmentally sensitive land as open space, to the greatest extent practicable.

e. To provide access to open space, stream corridors and woodlands through a system of pedestrian walkways and greenways.

f. To manage surface drainage to minimize the danger of flooding and to preserve water quality.

g. To preserve the rural nature and agricultural base of the RD, AG and FD zoning districts by maintaining appropriate development density levels in such zones and ensuring compliance with the Pinelands Comprehensive Management Plan at N.J.A.C. 7:50 in Pineland areas.

h. To protect prime agricultural lands from encroachment by development through a combined system of limiting density, ensuring sections of agricultural land are preserved through deed-restriction and other preservation tools made available through the Municipal Land Use Law.

i. To promote energy conservation.

j. To include a thorough review of environmental issues in all future applications for development.

k. To develop policies to preserve trees, especially specimen or landmark trees, while being sensitive to the rights of private property owners.

l. To facilitate the proper preservation and restoration of the aesthetic qualities of the Township.

4. OPEN SPACE AND RECREATION OBJECTIVES

   a. To preserve appropriate undeveloped areas of the Township as open space.

   b. To ensure that open space planning plays an important role in developing the character, location, magnitude and timing of growth and development in the Township. To use open space as an organizing element that connects neighborhoods to each other and serves as the connective tissue for the Township.

   c. To give priority to preserving large contiguous tracts of forests and lands containing unique areas of environmental sensitivity.

   d. To identify and protect the habitats of threatened and endangered species of wildlife and vegetation and to control the character, location and magnitude of growth and development in and adjacent to such habitats to avoid direct and indirect impacts on threatened or endangered species.

   e. To promote and encourage the protection of privately owned tracts of open space, wetlands, agricultural lands, or forest lands through easement purchase, deed restrictions, clustered development design, transferable development rights, and other appropriate planning techniques.

   f. To locate open space as close as possible to the populations they serve, and encourage passive public recreational use of such lands, where appropriate.

   g. To identify potential sites for creating new active recreational fields and an active recreational complex.

   h. To establish additional neighborhood park sites to serve the recreational needs of the community.

   i. To develop a unified contiguous open space and recreation system throughout the Township based on natural features and the location of suitable sites.

   j. To provide for a range of recreational facilities and activities for all age groups and interests.

   k. To provide for the maintenance and rehabilitation of existing parks and open space while linking all community facilities in an effort to maximize their use and enjoyment.

   l. To encourage the development of recreational facilities that meet the active and passive needs of all residents of Monroe Township

   m. To keep current with active recreational trends and needs of Monroe Township residents and to meet those needs by providing ample amounts of active recreational opportunities.

   n. To promote a system of linear parks that provide passive recreation, natural corridors and pedestrian linkages between and among commercial, cultural and residential neighborhoods.

5. COMMUNITY FACILITIES OBJECTIVES

   a. To continue to provide facilities and services needed without overburdening the taxpayers of Monroe Township.

   b. To protect the substantial investments in public facilities that already exist and plan for new facilities to serve residents in a timely, orderly and efficient manner.

   c. To ensure that those public facilities and services necessary to support development are adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.

   d. To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for future development.

e. To support the extension of utility service to the Regional Growth zoning districts and all non-Pinelands areas of the Township.

f. To ensure that all development provides for the needs and impacts generated by such development. When determined necessary by the Township, using fair and reasonable standards and techniques approved and authorized by the State of New Jersey, developers should be required to make related on-site, off-site and off-tract improvements and/or pay their pro-rata share of the cost of providing such related and necessary facilities, improvements and services.

g. To provide for the special needs of the elderly and disabled.

h. To carefully consider the costs and benefits of any utility extension to ensure that such extension promotes the logical and orderly extension of development adjacent to existing development.

i. To encourage existing development to tie into new utility extensions.

j. To encourage the maximum recycling effort from all Township residents as well as from all businesses in the Township.

k. To elevate the location of fire protection facilities within the areas where new land development will occur.

l. To encourage the preservation of historical and cultural sites.

6. CIRCULATION OBJECTIVES

a. To establish safe and convenient transportation routes to serve existing and future land uses.

b. To provide for the orderly and efficient movement of people and goods throughout the Township.

c. To protect through zoning existing transportation routes from development that exceeds the capacity of the road system.

d. To encourage the efficient use of existing major transportation routes as much as possible and to avoid the construction of new arterials where it is determined to be imprudent.

e. To carefully design new roads to be multi-modal and thus to enhance and facilitate the movement of motor vehicles, pedestrians, bicyclists, and other traffic.

f. To encourage the development and use of public transit.

g. To support mixed use development patterns that encourage multimodal transportation options and thus reduce overall automobile trips.

h. To provide for a road network that separates through traffic from local traffic and directs through traffic to the regional roadway network.

i. To continue to provide for the development of a walkway and bikeway system that will provide connections throughout the Township by utilizing separated pedestrian walkways and bike paths along roadways and along stream corridors, greenways and open space areas where possible.

j. To encourage that commercial areas along major highways are designed to provide for common entrances to reduce the number of highway access points.

k. To ensure that adequate off-tract street improvements are made to accommodate the increased vehicular movements caused by the development of vacant land.

III. LAND USE PLAN

A. EXISTING LAND USE

The purpose of the land use plan element of the master plan is to determine the general arrangement and development intensity of future land uses in the community. As such, the land use plan element has the broadest scope of all plan elements, and is the most important element of the master plan because it establishes the basic physical form of the community. Although not a requirement of the land use plan element itself, the Municipal Land Use Law (N.J.S.A. 40:55D-62) requires that every municipal zoning ordinance or any amendment or revision to the zoning ordinance, "shall either be substantially consistent with the land use plan element and the housing plan element of the master plan or designed to effectuate such plan elements."

The Municipal Land Use Law (N.J.S.A. 40:55D-28b) defines the contents of the land use plan as:

- Taking into account and stating its relationship to a statement of objectives, principles, assumptions, policies and standards upon which the constituent proposals for the physical, economic and social development of the municipality are based; taking into account the other master plan elements; and taking into account natural conditions, including but not necessarily limited to, topography, soil conditions, water supply, drainage, flood plain areas, marshes, and woodlands; and

- Showing the existing and proposed location, extent and intensity of development of land to be used in the future for varying types of residential, commercial, industrial, agricultural, recreational, educational and other public and private purposes or combination of purposes; and stating the relationship thereof to the existing and any proposed zone plan and zoning ordinance; and

- Showing the existing and proposed location of any airports and the boundaries of any airport safety zones delineated pursuant to the "Air Safety and Zoning Act of 1983"; and

- Including a statement of the standards of population density and development intensity recommended for the municipality.

Monroe Township contains a diverse land use pattern. With about two thirds of the Township consisting of Pinelands, it boasts a significant number of wetlands, forest, productive agricultural and rural resources. The Non-Pinelands portion of the town contains older, well-established neighborhoods, recently developed suburban areas, as well as significant commercial development along the Black Horse Pike.

Currently, land within Monroe Township is classified into 26 different zoning districts, 20 of which are within the Pinelands Area of the Township. Within the portion of the Township located outside the Pinelands Area, there are three residential zoning districts (R-2, R-30 and R-40), two commercial districts (CC and NC) and one business park district (BP). Because the Pinelands and Non-Pinelands portions of the town have significantly different planning needs, this document addresses them separately.

1. NON-PINELANDS AREA

Approximately 70 percent of the Non-Pinelands Area of the Township is located in the Suburban Residential Option (R-2) zoning district. This zone has undergone extensive development during the past decade, and based upon the number of recently approved residential units and the number of applications currently pending before the Planning Board, this growth is expected to continue well into the current decade. The R-30 and R-40 residential zoning districts are located in an area that is generally bordered by the Black Horse Pike, Main Street, Lindale Avenue and Poplar Street. This area, which is for the most part completely developed, is characterized by smaller residential lots, generally 10,000 square feet or less, and higher density than the R-2 zone.

Most of the commercial development within the Non-Pinelands Area of the Township is located in the Community Commercial (CC) zoning district that straddles the Black Horse Pike. Smaller CC zones are located along small portions of Route 322, Glassboro-Berlin Road and Sicklerville Road, and at several key intersections. A small neighborhood commercial (NC) zone is located at the intersection of Route 322 and Fries Mill Road. This zone, which is currently undeveloped, is intended to house retail businesses and personal service establishments that are clearly designed to serve the immediate neighborhood.

The Business Park (BP) zoning district was created following the adoption of the 1989 Master Plan Reexamination Report. This zoning district consists primarily of the former R-20S zoning district, which had included both residential and light industrial as permitted uses. The 1989 reexamination report noted that strong residential development pressure had resulted in potential conflicts within the R-20S zone. It was felt that these conflicts would increase if the rate of non-residential development in the zone increased as projected. Thus, the Business Park (BP) zoning district was designated for non-residential uses only. The BP zoning district permits various types of non-residential planned developments, such as commercial, office, warehouse and light industrial development. However, with the exception of Scotland Run Golf Course, significant non-residential development has not occurred in the BP zone.

2. PINELANDS AREA

Land in the Pinelands Area of the Township is classified into 20 different zoning districts within four Pinelands management areas. The Forest Areas (FD-10 and FD-40 zoning districts) occupy approximately seven square miles along the Township's easterly border, extending generally along the Great Egg Harbor River from Malaga-New Brooklyn Road to the Atlantic County line. Approximately 65 percent of this land is located within the State's Winslow Wildlife Management Area. Forest Areas are the largest and most environmentally sensitive management area in the Pinelands Protection Area. They serve to provide a suitable ecological reserve for the maintenance of the Pinelands environment. Residential development in the Forest Areas is generally limited to minimum 10 acre lots in the FD-10 zone and 40 acre lots in the FD-40 zone. While some agricultural-related development is permitted in the FD-10 zone, non-residential development, with the exception of forestry, is greatly restricted. Development in the Forest Areas in Monroe Township has occurred primarily within the FD-10 zone, and has taken place as strip development along the area's few existing roads.

Agricultural Production Areas are areas of active agricultural use, together with adjacent areas of prime and unique agricultural soils or soils of statewide significance, which are suitable for expansion of agricultural operations. There are two Agricultural Production Areas (AG zoning district) within Monroe Township. The larger of the two areas is generally bordered by Janvier Road, Corkery Lane, Malaga-New Brooklyn Road and the Franklin Township line. The other Agricultural Production Area is located east of the Black Horse Pike, between Corkery Lane and Williamstown-Winslow Road. In order to maintain agriculture as an essential element of the Pinelands Area, the level and type of development is controlled in Agricultural Production Areas to prevent incompatible land uses from infringing upon these important land resources. Residential development in the AG zone is permitted at a density of one unit per 40 acres, with all units clustered on one acre lots, and the remainder of the parcel permanently dedicated for agricultural uses through recordation of restrictions on the deed to the parcel. The maximum permitted density is increased to one unit per 10 acres if the dwelling is accessory to an active agricultural operation and other conditions are met. Little development has occurred within the Agricultural Production Areas of Monroe Township.

There are six Rural Development Areas (RD-R, RD-A, RD-RR, RD-RS, RD-I and RD-C zoning districts) within Monroe Township. These areas are transitional in nature, fragmented by existing development and agricultural uses. Because these areas are relatively undeveloped, they are important from a cultural, visual and ecological standpoint. Rural Development Areas represent a balance of environmental and developmental values that is intermediate between the pristine Forest Areas and existing growth areas; however, some areas may be suitable for limited future development subject to strict adherence to the Pinelands Commission's environmental performance standards.

The largest of the Rural Development Areas in Monroe Township encompasses the southwesterly portion of the Township. This area extends from just below "the lakes" to the Atlantic County line, and from east of the Black Horse Pike to the Franklin Township line. Within this Rural Development Area, properties along the Black Horse Pike are located in the Rural Development Industrial (RD-I) and Rural Development Commercial (RD-C) zoning districts. Residential development is greatly restricted in these zones, with principal permitted uses generally being related to agricultural, forestry or recreational activities. Some light industrial, wholesale distribution and retail sales and service uses are conditionally permitted in these zones. The remainder of the land within this Rural Development Area is located in the Rural Development Residential Receiving (RD-RR) or Rural Development Residential Sending (RD-RS) zoning districts. Residential dwellings on one acre lots are permitted in the RD-RR zone, provided that the owner of the lot proposed for development acquires sufficient vacant contiguous or noncontiguous land that, when combined with the acreage of the lot proposed for development, equals at least five acres. All land to be preserved as open space under this development option must be located within the RD-RR or RD-RS zones.

Three smaller Rural Development Areas are located in Monroe Township. These areas are all zoned as Rural Development Agricultural (RD-A) districts. They include an area bordered by Tuckahoe Road, Franklinville-Williamstown Road, Corkery Lane, Janvier Road and the Franklin Township line; an area located east of Malaga-New Brooklyn Road and north of "the lakes"; and an area located generally east of Malaga-New Brooklyn Road, and extending from approximately Corkery Lane north to Williamstown-New Brooklyn Road. Residential development is permitted in the RD-A zone at a gross density of one unit per eight acres. Generally, the only non-residential uses permitted in the RD-A zone are those that are related to agriculture.

The final Pinelands management area located in Monroe Township is the Regional Growth Area. Regional Growth Areas are areas of existing growth or lands immediately adjacent thereto that are capable of accommodating regional growth influences while protecting the essential character and environment of the Pinelands. Unlike the other management areas, Regional Growth Areas are essentially those areas

where the Pinelands Comprehensive Management Plan encourages development. These areas are spatially limited in comparison to the total land area comprised in the Pinelands National Reserve, creating, in effect, specific nodes for new development to take place.

The Regional Growth Areas in Monroe Township include much of the developed area of Williamstown proper, extending from the Pinelands Area boundary, which transects the Township in the vicinity of Williamstown, to Malaga-New Brooklyn Road. East of Malaga-New Brooklyn Road, a Regional Growth Area extends along the Black Horse Pike to an area south of Whitehall Road. The area in the vicinity of "the lakes" is also classified as a Regional Growth Area. There are currently 11 zoning districts within the Regional Growth Areas. Conventional single-family development is permitted in the residential zoning districts of the Regional Growth Areas (RG-MR, RG-20, RG-30, RG-40, RG-PR) at a density of 1.25 units per acre, with a minimum lot size of 27,500 square feet. The maximum density may be increased to 2.25 units per acre with the use of Pinelands Development Credits. Cluster development is permitted in most Regional Growth Area residential zones, provided the development is comprised of at least 20 single-family detached or twin/two-family dwelling units. The minimum lot size for cluster developments is 10,000 square feet for detached units and 17,500 square feet for twin/two-family units, provided the maximum densities permitted for conventional developments are not exceeded. At least 25 percent of the total gross acreage of the project site of cluster developments must be reserved as open space.

Within the Regional Growth Planned Residential District (RG-PR), a maximum gross density of 3.75 units per acre is permitted, provided the development site contains a minimum of 25 acres. The maximum permitted gross density may be increased to 7.4 units per acre with the use of Pinelands Development Credits. Townhouses and flats (condominiums) are also permitted as part of a planned residential development, at a maximum net density of 12 units per acre and 16 units per acre, respectively, provided that the density of the entire development does not exceed the maximum permitted gross density (3.75 (or 7.4) units per acre).

There are six zoning districts within the Regional Growth Areas that permit non-residential development (RG-NC, RG-CC, RG-LI, RG-PC, RG-PO and RG-TC). Generally, with the exception of the RG-TC zone, the differences among these zones, with regards to permitted uses and bulk requirements, are insignificant.

The Regional Growth Town Center (RG-TC) District includes the older downtown portion of Williamstown. This area has long provided the focus of community identification for the residents of the Township, containing both the municipal government facilities and central business district. Surrounding the central business district are a number of older neighborhoods. These areas are well established and generally built out. Zoning requirements for the RG-TC zone are intended to encourage the revitalization and redevelopment of the central business district, protect existing residential neighborhoods and encourage the rehabilitation of older housing, and to encourage, to the extent possible, new housing, particularly for senior citizens, where access to community facilities and shopping is the greatest.

B. PROPOSED LAND USE PLAN

The proposed land use plan establishes the basic physical form of the Township and provides the direction to the Township's Land Management Ordinance that will implement that physical form. As such, the proposed land use plan has been developed to assist in the daily land use decision-making process of the Township and to guide the future well being of the community.

The proposed land use plan seeks to promote the goals and objectives outlined in the 2004 Master Plan. Consequently, land use changes described below are recommended. However, these recommendations will not become operational until amendments to the Land Management Ordinance needed to implement the changes are proposed by the Planning Board and enacted by the Township Council.

1. NON-PINELANDS AREA

a. RA, Residential Age-Restricted District

GOAL: *Guide future development and community facilities to meet the needs of the residents of the Township, while ensuring that new development is compatible with existing development without degrading the Township's cultural and natural resources.*

OBJECTIVE: *To encourage the development of age-restricted housing to meet the needs of the Township's older population.*

The increasing longevity of the elderly due to medical breakthroughs, improved health care, and greater awareness of healthier life-styles, along with the aging of the "baby boom" generation, have all contributed to a growing elderly population in the United States. This pattern holds true for Monroe Township, where the number of residents 55 years of age or more grew by 26 percent between 1990 and

2000. In 2000, 6,584 residents of Monroe Township (22.7 percent of the total population) were 55 years of age or older, as compared to 5,216 residents (19.5 percent of the total population) in 1990. An analysis of the census age figures indicates that the greatest population increase in Monroe Township has occurred in the 35-54 age group. The number of residents in Monroe Township in this age group grew by over 30 percent between 1990 and 2000. This indicates that, while the number of senior citizens living in Monroe Township will continue to grow in the near future, the greatest impact may not be felt for 20 years or more.

It is recommended that a new zoning district be created to promote residential development on appropriately located tracts of land, especially designed to meet the special housing needs of older persons, with special emphasis on their particular physical and social needs and without isolating these populations. These zones should be proximate to shopping areas, government institutions, community services, and healthcare as much as possible. Towards that end the parcels of land assembled for these developments must be of sufficient size to permit the unified development of tracts of land with primary access to the principal or collector roads of the Township.

As illustrated in FIGURE 13 the proposed Residential Age-Restricted (RA) Districts include properties on Fries Mill Road and Glassboro-Cross Keys Road currently in the CC and BP zones; properties on Herbert Boulevard and Prosser Avenue currently in the R-2 zone; properties surrounded by Tuckahoe Road, Scotland Run, Flozella Gardens, and the proposed Commercial (C) zone; and Holiday City, an existing age-restricted development, currently in the R-2 zone.

b. R-1, Residential District

GOAL: *Preserve the character of the Township while enhancing the quality of living for all residents in all part of the Township. This effort involves recognizing the differing needs of bustling commercial centers such as Main Street and quieter residential areas farther from the town's center.*

GOAL: *Recognize the importance of existing residential and commercial centers to the Township's landscape and image.*

OBJECTIVE: *To ensure that professional office locations are conveniently accessible to local residents and provide for parking availability that does not conflict with the parking needs of other uses or is detrimental to vehicular safety movements.*

OBJECTIVE: *To encourage good, context-sensitive community design.*

OBJECTIVE: *To provide appropriate design controls for small scale commercial development.*

The R-30 and R-40 residential zoning districts are located in an area that is generally bordered by the Black Horse Pike, Main Street, Lindale Avenue and Poplar Street. The size of these zones have been reduced in the past, as zoning amendments intended to encourage commercial development along Sicklerville Road and Main Street have been implemented. These zoning districts, which are characterized by smaller residential lots, generally 10,000 square feet or less and higher density than the R-2 zone, are for the most part completely developed.

It is recommended that a new zoning district be created entitled "R-1" to better recognize the developed nature of the R-30 and R-40 zones, and to better address pressure for new commercial development, and infill and redevelopment residential development within the current R-30 and R-40 zones. The recommended boundaries of the new R-1 Residential District can be found in FIGURE 13 and include the current R-30 and R-40 zones. Bulk requirements should be similar to those currently in place for the R-30 zone (minimum 10,000 square foot lots).

In addition to the residential development currently permitted in the R-30 and R-40 zones, it is recommended that the new R-1 zone include community commercial uses as a conditional use on lots with frontage on Main Street (Crosskeys-Willaimstown Road), subject to the following general standards listed below. Specific requirements shall be addressed through the ordinance process.

ii. Uses shall front on Main Street, with principal access to that street and with parking on the side and/or rear. Buildings shall address the street with a suggested 20 foot maximum front setback with the goal of creating a defined street edge for Main Street.

iii. The design and scale of any building must conform to the residential character of the area.

iv. The use will not detract from the character of the neighborhood.

v. The property is suitable for the intended use.

vi. The use will service the best interests of the Township.

vii. There will not be any noise and lighting situations adversely affecting adjacent residential properties.

viii. All of the area, yard, building coverage, buffer, height, parking, sign and general requirements of the Commercial (C) District and other applicable requirements of the Land Management Ordinance shall be met except as otherwise modified herein.

ix. It is recommended that the side setback be a maximum of 10 feet.

c. R-2, Suburban Residential Option District

GOAL: *Encourage a pattern of compact and contiguous growth within appropriate areas of the Township.*

GOAL: *Recognize that open space preservation must become the responsibility of the Township, and that the agricultural community alone will not be able to continue to ensure that open space will remain in the Township forever.*

OBJECTIVE: *To promote the development of new employment in areas that are convenient to existing housing and public transportation facilities.*

OBJECTIVE: *To coordinate future residential and commercial development throughout the Township to form well designed neighborhoods.*

Residential uses were previously permitted within the area that currently contains the Business Park (BP) zoning district. As a result, there are existing dwelling units located throughout the zone. Two areas, in particular, within the existing BP zone are predominately residential in nature, and, as such, are not suitable for non-residential business park development. Therefore, it is recommended that the R-2 zone be expanded to include properties with frontage along the southerly side of Pitman-Downer Road; and properties within the existing residential neighborhood located west of Tuckahoe Road and north of Cross Keys Airport, as depicted in FIGURE 13 "Proposed Zoning Map".

Reevaluating the R-2 zone provides the opportunity to address the issue of ground water supply and other issues related to the Township's diminishing stock of green space. Recent housing design trends have led to the construction of homes that create higher amounts of impervious surface, increase the amount of stormwater runoff, diminishing the amount of groundwater recharge and effectively causing a groundwater shortage. An increasing number of property improvements have also contributed to this problem.

If R-2 development is allowed to continue at the present density, it may result in an overly developed built environment. Structures placed too close together will obstruct the view-shed around water bodies, litter open vistas with unnecessary clutter detracting from the Township's rural character, and disrupt the critical mass of open land necessary to maintaining a healthy environment for wildlife and agricultural production. In order to halt this damaging trend, future development should include larger areas of green space and open space as well as avoid creating too much impervious surface.

Additionally, high density lots require the regrading of the entire lot area in order to effectuate appropriate lot drainage. As a result, preservation of existing natural features (i.e. woodlands) cannot be achieved effectively under the current 20,000 square foot minimum lot size requirement.

For these reasons it is recommended that the maximum density for this zone be lowered to 1.0 unit per acre and the minimum lot area be raised to ¾ acre (32,670 square feet). This lower density and larger lot size should produce the larger areas of open space necessary for boosting groundwater recharge; allow designers the greater flexibility necessary for grading and the protection of natural features; and further the other open space goals mentioned above. For this reason the open space requirement can be eliminated.

However, designated open space remains a valuable asset. Formally protecting open space safeguards water quality, provides animal and plant habitat, preserves rural character, and reduces the cost of providing municipal services. (Natural Lands Trust, 2001) Developers have a number of development design techniques for increasing the amount of open space, such as clustering and coving (see the box on coving below for more guidance). Therefore in order to encourage the use of these techniques and the voluntary commitment of open space, an alternative set of requirements should be available for "Clustered Development" in the R-2 District. Such development would receive a "density bonus" of 25% in exchange for a commitment of 35% of the land as dedicated open space. It should be noted the ordinance amending Chapter 175, Section 125 Open Space, would remain effective, limiting the wetlands that may count toward the open space requirement to 50% of the requirement.

A reasonable minimum lot area for Clustered Development is 17,500 square feet (approx 0.4 acres). This size limitation provides an appropriate amount of open space for each lot without being overly restrictive on those who opt for clustered development. Also, as the Township approaches its build-out limits, the vast majority of R-2 homes built prior to 2001 sit on lots zoned at the former minimum of 13,000 square feet. Since 2001 several projects have been built with the current minimum 20,000 square foot lots. This change to 17,500 square foot minimums encourages a new category of property size for residents in the R-2 District, ensuring that a sufficient variety of property types is available to residents in these districts in the future.

Additionally, to ensure that Clustered Development has the desired effect of attaining a significant amount of open space, a minimum gross development tract size of 20 acres is recommended. This tract size should allow most landholders with usable land to exercise this Clustered Development option if they choose. ***Additionally, at least 5 acres of the land dedicated to open space must be upland, suitable for some form of active recreational usage, and located towards the center of the development.***

Coving[1]

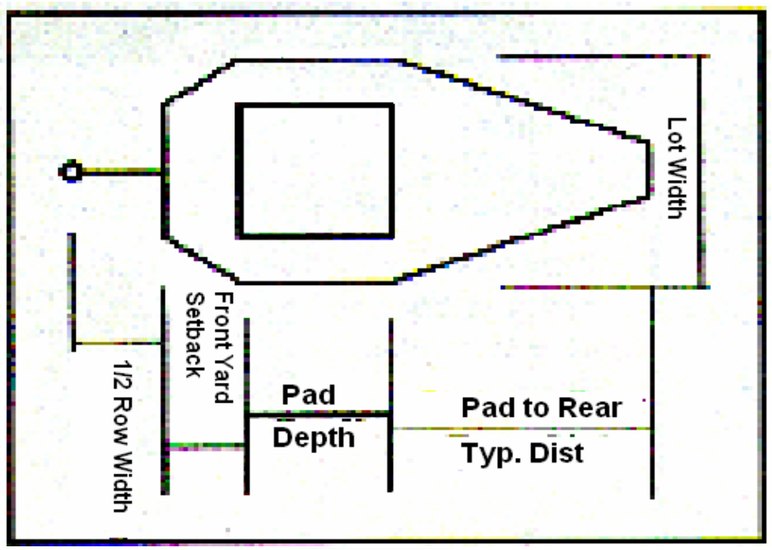

Figure A

Coving represents an alternative method of subdivision design. Because each lot must be uniquely designed, coving involves more complex processes than standard platting, however it can produce a more aesthetically pleasing, efficient, and cost-effective end result.

By utilizing streetscapes that follow the natural topography of the land as well as non-parallel lots with varying setbacks, this method allows developers to use larger average lots sizes and fewer total lineal feet of roadway while maintaining the same number and density of lots that a traditional subdivision design would provide. By making the position of street centerlines dependent on the layout of homes instead of the other way around, a designer has the freedom to create large areas of community open space behind homes and increase the amount of green space in front without a loss of privacy between lots.

Method:

1. Because coving involves more complex mathematics than traditional design, a spatial model that graphically represents minimum lot area and building footprints is recommended for initial lot layout. Most lots should not conform to the traditional rectangular shape because they will sit at irregular angles to one another. Lot setbacks can be increased in comparison with traditional design giving homes a stately feel. Minimum lot widths can be reduced because non-parallel lot layout allows non-standardized distances between home fronts, potentially increasing the separation between homes to over 300 feet. (See Figure A). Lots should be placed along natural land contours while giving particular attention to the view from the interior of the home.

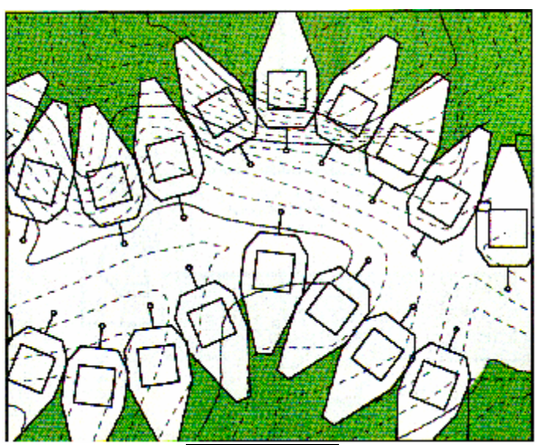

Figure B

2. Street centerlines can also be placed graphically. A perpendicular line can be drawn outward from each lot-front depicting half a minimum street width based on local ordinances. A centerline should then be drawn going between or intersecting with the end of each line.

The designer should strive to create gentle curves. To keep the street from winding too much or getting too tight, a minimum curve radius of at least 150 feet should be used. Non-rectangular lots fitted to a curve instead of straight line should allow the designer to reduce the amount of pavement by reducing the number of cul-de-sacs.

3. Using the laid out lots as a guide, the designer establishes the setback lines. On the outside of a curve, setback lines should be minimized while on the inside they can be set to traditional platting standards.

4. The designer establishes lot lines keeping in mind that lot borders need not emanate perpendicularly from the street.

5. Finally, the homes are set on the lots and the lot borders and setbacks are adjusted if necessary.

For more detailed information on coving, see:
Harrison, R. “Coving: A new concept in subdivision design.” *CE News*. January, 2004.

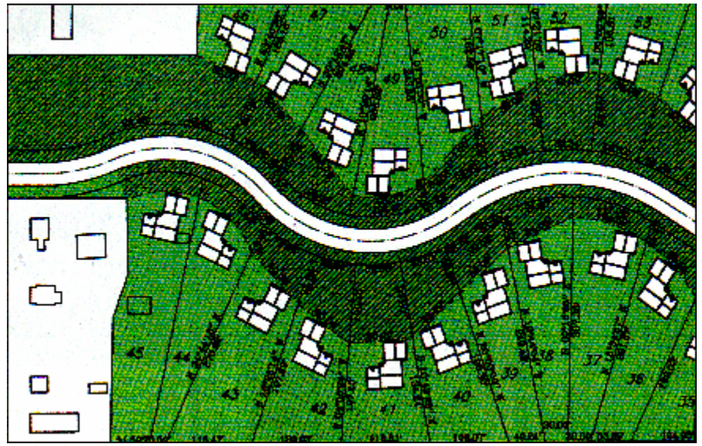

Figure C

d. Office Use on Main Street

GOAL: *Preserve the character of the Township while enhancing the quality of living for all residents in all parts of the Township. This effort involves recognizing the differing needs of bustling commercial centers such as Main Street and quieter residential areas farther from the town's center.*

OBJECTIVE: *To ensure that professional office locations are conveniently accessible to local residents and provide for parking availability that does not conflict with the parking needs of other uses or is detrimental to vehicular safety movements.*

It is recommended that professional and general offices, medical and legal offices, real estate and insurance offices be permitted as a conditional use in the R-2 Suburban Residential Option District, subject to the following standards:

i. Uses shall front on Main Street, with principal access to that street and parking on the side and/or rear .

ii. The design and scale of any building must conform to the residential character of the area.

iii. The use will not detract from the character of the neighborhood.

iv. The property is suitable for the intended use.

v. The use will service the best interests of the Township.

vi. There will not be any noise and lighting situations adversely affecting adjacent residential properties.

vii. All of the area, yard, building coverage, buffer, height, parking, sign and general requirements of the Commercial (C) District and other applicable requirements of the Land Management Ordinance shall be met except as noted otherwise herein.

e. Commercial District

GOAL: *Provide for a balanced economic base and a source of employment through utilization of nonresidential lands.*

OBJECTIVE: *To provide appropriate design controls for small scale commercial development.*

OBJECTIVE: *To encourage good, context-sensitive community design.*

There are currently two commercial zoning districts within the Non-Pinelands Area of the Township. Most of the existing commercial development is located in the Community Commercial (CC) zoning district that straddles the Black Horse Pike. Smaller CC zones are located along portions of Route 322, Glassboro-Berlin Road and Sicklerville Road, and at several key intersections. A small neighborhood commercial (NC) zone is located at the intersection of Route 322 and Fries Mill Road. This zone, which is currently undeveloped, is currently intended to house retail businesses and personal service establishments that are clearly designed to serve the immediate neighborhood. Given the location of this zone at a major intersection of a State highway and County road, and the lack of significant residential development in the immediate area, the zone is more suitable to house regional retail businesses than the permitted neighborhood-oriented uses. Therefore, it is recommended that a single commercial zone be created that includes the current CC and NC zones. The new Commercial (C) District should include newly generated bulk requirements that reflect the scale of the commercial target market and the fabric of the existing community.

It is also recommended that the following areas be included in the C zone, as depicted in FIGURE 13, "Proposed Zoning Map:".

i. Properties along Sicklerville Road, from the Black Horse Pike north to the Winslow Township line.

ii. Properties located at the southeasterly corner of Glassboro-Cross Road and Pitman-Downer Road.

iii. The current CC zone located between Clayton Road and Franklinville-Williamstown Road, west of Tuckahoe Road should be extended south along Franklinville-Williamstown Road and Tuckahoe Road to accommodate the proposed County Veterans Cemetery and to provide opportunity for commercial development to serve visitors to the cemetery.

iv. Properties fronting on the westerly side of Fries Mill Road, between the proposed RA zone and Pitman-Downer Road.

v. Properties fronting on the westerly side of Fries Mill Road, between the existing CC zone at Route 322 and the Monroe Township/Borough of Glassboro line, with the exception of those lots that also front on Arlington Drive.

vi. The existing CC zone at the intersection of Fries Mill Road and Route 322 should be expanded east and south to include Block 14101, Lots 1.01, 5, 6 and 7.

vii. Properties fronting on the easterly side of Fries Mill Road that were not part of the Hunter Woods, Tall Oaks, Longwood or Wildsprings residential developments.

viii. Minor adjustments to the current CC zone along the Black Horse Pike are recommended to implement the Planning Board's goal of a commercial zone along the entire frontage of that roadway, while taking into consideration the existing pattern of development.

f. BP, Business Park District

GOAL: *Provide for a balanced economic base and a source of employment through utilization of nonresidential lands.*

GOAL: *Provide for a variety of residential, commercial, industrial, agricultural, institutional, recreational and conservation uses.*

OBJECTIIVE: *To provide sufficient area in the Township for the development of planned nonresidential projects.*

i. To implement the Planning Board's goal of providing for additional opportunities for economic development along the Township's major thoroughfares, it is recommended that the existing BP zone be expanded to include additional properties along Route 322, west of Tuckahoe Road. (see FIGURE 13).

ii. The completion of an interchange to the Atlantic City Expressway on Berlin-Cross Keys Road increases the opportunity for economic development in the northeasterly corner of the Township. To better take advantage of this opportunity, it is recommended that the area located along Berlin-Cross Keys Road, immediately south of the Winslow Township line, be designated as a BP zone. (see FIGURE 13).

g. R-3, Residential 3 District

GOAL: *Preserve the character of the Township while enhancing the quality of living for all residents in all parts of the Township.*

OBJECTIVE: *To encourage good, context-sensitive community design.*

A section of the current Suburban Residential Option District (R-2) in the northwest corner of the town contains a number of lots with similar characteristics. These lots are larger than 3 acres in size with narrow road frontage, and front yard setbacks typically in excess of one hundred feet. These traits give the area a rural character which residents have come to appreciate.

In an effort to preserve this rural character, the creation of a new district, entitled Residential 3 District (R-3) is recommended. This district would have all of the same regulations as the current R-2 zone with the following exceptions:

- A maximum of one dwelling shall be allowed on any lot.
- The minimum lot area for any use shall be 3 acres.
- The minimum front yard/building setback for any dwelling shall be 125 feet.
- The minimum side yard setback shall be 20 feet.
- The minimum driveway setback shall be 10 feet.
- The minimum rear setback shall be 50 feet.
- The minimum lot width/frontage shall be 200 feet.

As depicted in the proposed zoning map, (FIGURE 13) this area extends roughly from the Washington Township border south to the edge of the Commercial District along Glassboro-Williamstown Road, and from the Glassboro Borough border east to the edge of Orchard Estates.

Pre-existing, non-conforming lots as of the date this zoning ordinance is adopted should be grandfathered. These lots should be subject to the rules governing R-2 zones with the exception that only one dwelling should be allowed per lot. R-2 rules governing bulk standards should apply regardless of any expansion, destruction, or rebuilding these lots may undergo.

The following lots in this zone are 3 acres or larger:
Block 15401: Lots 1, 2, 3, 4, 5, 6, 9, 11, 12, 13, 14, 15, 20, 21, 22, 29, 30, 31, 32
Block 15402: Lots 5, 6, 7, 14, 15
Block 15403: Lots 3, 4, 5, 7, 18, 23, 24, 25, 27
(Note: These parcel numbers are listed based on measurements listed in "Realty Atlas for Gloucester County, NJ, Map Volume 2, 27th Ed.", 1994.)

h. Glassboro-Cross Keys Road Commercial Overlay (CO)

GOAL: *Provide for a variety of residential, commercial, industrial, agricultural, institutional, recreational and conservation uses.*

OBJECTIVE: *To provide for a range of commercial activities in appropriate locations where the circulation, utility and community service systems are best suited to handle the resulting volumes.*

While the R-3 zone seeks to protect the rural, residential character of this corner of the Township, this effort should not preclude compatible forms of commercial development along the Glassboro-Cross Keys Road corridor. It is recommended that small scale commercial development along Glassboro-Cross Keys Road should be allowed as a conditional permitted use within the boundaries of the Commercial Overlay in the R-3 zone (see FIGURE 13) ***It is recommended that this overlay have the same bulk requirements as Commercial zones with special exceptions for properties fronting on Glassboro-Cross Keys Road.***

2. PINELANDS AREA

a. RG-RA, Regional Growth Residential Age Restricted District

GOAL: *Guide future development and community facilities to meet the needs of the residents of the Township, while ensuring that new development is compatible with existing development without degrading the Township's cultural and natural resources.*

OBJECTIVE: *To encourage the development of age-restricted housing to meet the needs of the Township's older population.*

As noted above, there is a need in Monroe Township for housing especially located and designed to meet the special housing needs of an aging population. To address this need in the Pinelands Area of the Township, two Residential Age-Restricted (RG-RA) Districts are proposed in the Regional Growth Area. As noted in FIGURE 13, one area is located on Whitehall Road, just south of Victory Lake, an area currently located in the RG-20 zone. The second proposed RG-RA zone is located on the southerly side of Corkery Lane, north of the Black Horse Pike. This area is currently located in the RG-PR zone. The RG-RA zones should be subject to the following standards:

i. The recommended minimum tract area for age-restricted developments in the RG-RA zones is 20 acres.

ii. Development within these zones should not exceed a maximum gross density of 3.75 units per acre, with a permitted increase to 7.4 units per acre with the use of Pinelands Development Credits in an amount sufficient to account for the proposed increase in accordance with the regulations thereto, provided the applicant can demonstrate that the planned age-restricted development project will not result in any negative fiscal, physical or environmental impacts; that the planned development will comply with all Township design and performance standards for such uses as contained within the Land Management Ordinance; and that the planned age-restricted residential development contributes positively to stated Township goals, including the promotion of orderly growth, the development of a community-wide open space system and the development of the necessary infrastructure to support and maintain such new growth.

iii. While it is anticipated that single-family detached and/or two-family (twin) units will be the dominate housing type in the age-restricted developments, single-family attached (townhouse) units and flats (condominiums) should also be permitted in the age-restricted developments, in the following proportions and at the specified net design densities:

Gross Type	Maximum Density	Maximum Percentage	Density
Single Family Detached	3.75	50	6
Townhouses	3.75	70	12
	Up to 7.4	80	12
Condominium Flats	3.75	20	16
	Up to 7.4	40	16

iv. Not more than 25 percent of the gross tract acreage of the project site shall be covered by impervious surfaces, and a minimum of 35 percent of the gross tract acreage of the project site shall be reserved as common open space.

v. All units in an age-restricted residential development shall conform to the area, yard and bulk requirements developed for the RG-RA district.

vi. Design standards should be developed.

b. RG-C, Regional Growth Commercial District

GOAL: *Guide future development and community facilities to meet the needs of the residents of the Township, while ensuring that new development is compatible with existing development without degrading the Township's cultural and natural resources.*

OBJECTIVE: *To provide for a range of commercial activities in appropriate locations where the circulation, utility and community service systems are best suited to handle the resulting volumes.*

There are currently four commercial zoning districts within the Regional Growth Area of the Pinelands Area of the Township that provide for similar types of development. It is recommended that these zoning districts, the Regional Growth Community Commercial (RG-CC) District, Regional Growth Neighborhood Commercial (RG-NC) District, Regional Growth Planned Commercial (RG-PC) District and the Regional Growth Planned Office (RG-PO) District, be combined into a single, Regional Growth Commercial (RG-C) District. Community commercial, neighborhood commercial and planned commercial uses should be the principal permitted uses in the new RG-C district. Assisted-living facilities should be permitted within the RG-C zone, provided the property to be developed is located west of Malaga-New Brooklyn Road, has a minimum of 300 feet of frontage along the Black Horse Pike, and conforms to the requirements listed in § 175-161H of the Land Management Ordinance.

In addition, light industrial, manufacturing, and wholesale distribution and warehouse facilities should be permitted within the RG-C zones as a conditional use, subject to the following standards:

i. The property to be developed shall be located east of Malaga-New Brooklyn Road.

ii. No noxious, offensive or hazardous use shall be permitted unless adequate provision is made to reduce and minimize such objectionable elements. The use shall be required to meet or exceed all governmental standards governing said elements.

iii. Should the proposed use raise questions of public health, safety or welfare, the Board may bring in consultants and other independent experts, as the Board deems necessary, for their evaluation and opinion. The cost of any independent consultant or expert shall be borne by the applicant from the escrow fees posted.

iv. No building may be erected, altered or used and no premises may be used in or within 100 feet of a residential district or use.

v. No occupancy permit shall be granted to a proposed new use without first conforming to the requirements for site plan approval.

vi. Site design shall require maximum attention to proper site design considerations, including the location of structures and parking areas, proper ingress and egress, development of an interior street system, architectural design, landscaping and the compatibility of any proposal with the natural foliage, soils, contours, drainage patterns and the need to avoid visual intrusions and performance nuisances upon adjacent uses.

vii. At least the first 30 feet adjacent to any street line and 20 feet adjacent to any lot line shall be planted and maintained in lawn area or ground cover or landscaped with evergreen shrubbery and shall be separated from the parking area by suitable curbing as determined by the Township's Land Management Ordinance and the Planning Board during site plan review.

viii. No merchandise, products, waste equipment or similar material or objects shall be displayed or stored outside except for outdoor storage of mobile equipment.

ix. All portions of the property not utilized by buildings or paved surfaces shall be appropriately landscaped.

x. A minimum buffer area of 50 feet in width shall be provided along any common property line with a residential district or use in accordance with § 175-93 of the Township's Land Management Ordinance.

xi. Parking shall be as required by § 175-123 of the Township's Land Management Ordinance.

xii. Each activity shall provide for off-street loading and unloading with adequate ingress to and egress from streets and shall provide such areas at the side or rear of the building. Each space shall be at least 15 feet by 40 feet, and one space shall be provided for every 8,000 square feet of gross floor area or fraction thereof in each building. There shall be no loading or unloading from the street.

xiii. There shall be at least one trash and garbage pickup location provided for each building, which shall be separated from the parking spaces by the storage of trash and/or garbage in a steel-like, totally enclosed container located in a manner to be obscured from view from parking areas, streets and adjacent residential uses or zoning districts by a fence, wall, planting or combination of the three.

xiv. All such developments shall comply with the Schedule of Limitations with respect to minimum requirements for area, setback and coverage.

c. RG-20, Regional Growth Residential District 20

GOAL: *Guide future development and community facilities to meet the needs of the residents of the Township, while ensuring that new development is compatible with existing development without degrading the Township's cultural and natural resources.*

OBJECTIVE: *To coordinate future residential and commercial development throughout the Township to form well designed neighborhoods.*

The original development in the vicinity of Victory and Timber Lakes ("the lakes") resulted in the construction of single-family dwellings on very small lots. The housing originally planned for the seasonal recreational opportunities afforded by the lakes was eventually converted into year round use. This was followed by the additional construction of year round housing, most of which continued to occur on the established small lot pattern. The RG-20 zoning district was developed to ensure that development in "the lakes" area did not overburden the practical carrying capacity of the land. As a result, while the core area of "the lakes" is substantially developed at relatively high densities, more recent development has occurred within the RG-20 standards. With the exception that cluster development is not permitted, the use and bulk requirements of the RG-20 district are identical to the requirements of the Regional Growth Moderate Residential (RG-MR) District. Since the Planning Board has found that it would be beneficial to the Township to permit cluster development in "the lakes" area, it is recommended that the current RG-20 zone be incorporated into the RG-MR zone, as depicted on the Proposed Zoning Map. Cluster development would become a principal permitted use in "the lakes", but with no increase in the maximum permitted density.

d. RD-I, Rural Development Industrial District

GOAL: *Provide for a variety of residential, commercial, industrial, agricultural, institutional, recreational and conservation uses.*

OBJECTIVE: *To encourage the development of light industry, both as infill development and as new development in appropriate zones.*

OBJECTIVE: *To strengthen performance and design standards to ensure that industrial development provides adequate safeguards to protect the environment and to guard against incompatible adjacent uses.*

Currently, properties along the Black Horse Pike, within the Rural Development Area, are located in the Rural Development Commercial (RD-C) District or the Rural Development Industrial (RD-I) District. Since the uses permitted in each of these zoning districts are essentially the same, it is recommended that the existing RD-I zone be incorporated into the RD-C district. In addition, agricultural processing facilities should permitted in the RD-C district, subject to the provisions of § 175-160D(1).

e. Office Use on Main Street

GOAL: *Preserve the character of the Township while enhancing the quality of living for all residents in all parts of the Township. This effort involves recognizing the differing needs of bustling commercial centers such as Main Street and quieter residential areas farther from the town's center.*

OBJECTIVE: *To ensure that professional office locations are conveniently accessible to local residents and provide for parking availability that does not conflict with the parking needs of other uses or is detrimental to vehicular safety movements.*

It is recommended that professional and general offices, medical and legal offices, real estate and insurance offices be permitted as a conditional use in the Regional Growth Residential (RG-40) District, the Regional Growth Planned Residential (RG-PR) District, the Regional Growth Town Center (RG-TC) District and the proposed Regional Growth Commercial (RG-C) District, subject to the following standards:

i. Uses shall front on Main Street, with principal access to that street and parking on the side and/or rear.

ii. The design and scale of any building must conform to the residential character of the area.

iii. The use will not detract from the character of the neighborhood.

iv. The property is suitable for the intended use.

v. The use will service the best interests of the Township.

vi. There will not be any noise and lighting situations adversely affecting adjacent residential properties.

vii. All of the area, yard, building coverage, buffer, height, parking, sign and general requirements of the RG-C District and other applicable requirements of the Land Management Ordinance shall be met.

f. Regional Growth Area Density Reduction

GOAL: *Preserve the Township's natural and cultural resources that contribute to both the positive image and overall strength of the Township.*

OBJECTIVE: *To conserve and manage natural resources within the Township.*

The Pinelands Comprehensive Management Plan, at N.J.A.C. 7:50-5.28(a)7ii, provides an opportunity to Pinelands municipalities to reduce the total number of dwelling units assigned by the Plan by as much as 10 percent, provided that the Pinelands Development Credit program requirements of the Plan are met relative to the adjusted dwelling unit total and provided further that the adjustment is consistent with land tenure patterns, the character of portions of the regional growth area, the provision of infrastructure and community services, and the natural resource characteristics of the area. It is recommended that the Planning Board pursue the permitted 10 percent density reduction by compiling data necessary to justify the reduction, and submitting a formal request for approval of the lower density to the Pinelands Commission.

g. Proposed Pinelands Management Area Change

GOAL: *Guide future development and community facilities to meet the needs of the residents of the Township, while Ensuring that new development is compatible with development without degrading the Township's cultural and natural resources.*

OBJECTIVE: *To identify potential sites for creating new active recreational fields and an active recreational complex.*

Monroe Township has acquired a 38-acre parcel (Block 9402, Lot 2), located north of the intersection of Blue Bell Road and Malaga-New Brooklyn Road, with the intent of using the parcel as an active recreation site. However, the municipally-owned parcel is located within an Agricultural Production Area, where active recreation is not a permitted use. It is recommended that in pursuit of the use of this parcel, the Planning Board submit a formal request to the Pinelands Commission for a management area change. Under this proposal, the municipally-owned parcel would be re-classified and included in the Rural Development Agricultural (RD-A) District. To offset the reduction in the Agricultural Production Area, two areas located adjacent to the Agricultural Production Area but currently within the Regional Growth Area should be re-classified as an Agricultural Production Area and a Rural Development Agricultural (RD-A), respectively.

C. GENERAL RECOMMENDATIONS

1. It is recommended that § 175-163.1 of the Land Management Ordinance be deleted. This provision permits single-family detached dwellings as a conditional use in non-residential zoning districts. It was enacted in 1990 to provide some reasonable use of land in instances where scattered dwelling units had existed in non-residential zoning districts, and where property was purchased for the express purpose of constructing a single dwelling unit. Under this provision, an existing dwelling was considered a permitted use if a valid certificate of occupancy had been issued prior to January 1, 1989. A proposed dwelling unit would be permitted if the parcel was owned by the applicant or a member of his immediate family prior to January 1, 1989; and the size of the tract was not greater than 2.5 times the required lot size for residential development.

   The inclusion of residential uses in non-residential zoning districts is no longer appropriate in Monroe Township, given the zoning district line adjustments recommended in this plan that are intended to better ensure that residential neighborhoods are located within residential zoning districts, and the Planning Board's goal of providing for economic development in non-residential zones.

2. Development design standards contained in the Land Management Ordinance should be amended to provide consistency with the New Jersey Residential Site Improvement Standards (N.J.A.C. 5:21).

3. It is recommended that property code requirements for commercial and industrial uses, especially those uses located on the Black Horse Pike, be upgraded to allow for increased enforcement.

D. READING RAIL TRACK BICYCLE PATH PROJECT

GOAL: *Provide for a variety of residential, commercial, industrial, agricultural, institutional, recreational and conservation uses.*

OBJECTIVE: *To continue to provide for the development of a walkway and bikeway system that will provide Connections throughout the Township by utilizing separated pedestrian walkways and bike paths along roadways and along stream corridors, greenways and open space areas where possible*

OBJECTIVE: To *provide for a range of recreational facilities and activities for all age groups and interests.*

OBJECTIVE: *To support mixed use development patterns that encourage multimodal transportation options and thus reduce overall automobile trips.*

OBJECTIVE: *To promote energy conservation.*

Funded by a grant, Monroe Township recently completed a 3.5 mile stretch of bicycle path along the former Reading Railroad track. The asphalt path currently runs from Blue Bell Road near Virginia Avenue, west through southern Williamstown, ending at Fries Mill Road. A Gloucester County grant currently under consideration proposes to connect this path to the Borough of Glassboro.

If managed properly, this project offers a number of potential benefits to the Township. The bicycle path represents a safe means of providing bicyclists a dedicated right of way, isolated from pedestrian and automobile traffic. Besides its recreational value, it potentially offers a mode of traveling between townships without an automobile. The bicycle path could also potentially serve as an engine for economic development. As usage increases, the areas adjacent to the bicycle traffic will likely rise in commercial value.

All of these benefits can be maximized if the path is treated as part of a larger bicycle circulation system. For this reason it is recommended that all properties abutting the path are required to allow connecting streets or access ways to the bicycle path. Also, every attempt should be made to connect the path to neighboring townships as well as to other areas in Monroe appropriate for bicycling.

E. BUILD OUT ANALYSIS

TABLE 5*

Change in Commercial Development Build Out Potential			
	Existing Square Footage	Additional Square Footage Projected by Zoning	Total Build Out Potential (Sq. Ft.)
Existing Plan	2,300,000	32,687,728	**34,987,728**
Proposed Plan	2,300,000	42,344,126	**44,644,126**

The zoning changes recommended in this plan would increase the commercial build out potential by approximately 9.6 million square feet, amounting to a 28% increase over the existing plan's build out potential. (See TABLE 5) This change stems largely from new Commercial zones along major roadways and the expansion of Business Park zones in the Non-Pinelands area.

TABLE 6*

Change in Residential Development Build Out Potential					
	Remaining Developable Acreage	Existing Residential Units	Approved, Uncompleted Units	Additional Units Projected by Zoning	Total Build Out (Units)
Existing Plan	13,903	10,539	2,201	9,567	**22,307**
Proposed Plan	13,479	10,539	2,201	8,037	**20,777**

The new plan decreases the potential residential build out by an estimated 1,530 units or approximately 7%. (See TABLE 6) This difference largely results from a decrease in permitted density in the Suburban Residential Option (R-2) zone as well as the preservation of over 300 acres of residential land through the creation of the Residential 3 (R-3) zone.

According to the Monroe Township Construction Office, there were 240 residential certificates of occupancy issued in 2002 and 281 issued in 2003 for an approximate average of 260 additional homes per year. If this trend continues the town will reach the above proposed build out in approximately 40 years.

TABLE 7*

Change in Age Restricted Development Build Out Potential					
	Existing Age Restricted Units	Approved, Uncompleted Units	Additional Units Projected by Zoning	Total	% of Total Residential Build Out
Existing Plan	803	653	0	**1,456**	6.6%
Proposed Plan	803	653	2,221	**3,677**	17.9%

The addition of Residential Age-Restricted zones results in a projected increase of approximately 11.3% in the share of the potential housing stock designated age-restricted (adult). The 2000 U.S. Census shows the 55+ age bracket comprising about 20% of the town's population. Therefore, the average expected persons per age-restricted unit is between 1.5 and 2.

*Figures in this section are estimates based on the following assumptions:

- Existing commercial square footage refers to an estimate of commercial building coverage based on 2002 aerial photos from NJ Department of Environmental Protection's IMAP website.
- Future commercial development is based on an estimated average building coverage of approximately 8,500 sq. ft/acre per zoning standards.
- The Township contains an estimated 2,137 acres of undeveloped wetlands outside of any preserved area.
- Airports, landing strips, and airport hazard zones were not considered in this analysis.
- The new Commercial Overlay in the R-3 zone along Glassboro-Cross Keys Road was not included as developable commercial land.
- The number of existing residential units was calculated by adding the current number of developed residential tax parcels (9,504 according to Tax Assessor Bruce Coyle) to the estimated additional number of units in apartment buildings and other residences that contain multiple units as derived from the 2000 U.S. Census (1,035).
- Mobile homes represent 1,129 residential units according to 2000 U.S. Census Data.
- The projected number of units for each plan was calculated based on the amount of developable acreage in each residential zone multiplied by the appropriate density factor for each zone plus the number of uncompleted housing units currently approved for construction (1,921).
- Projections based on zoning assume all future development will take the form of the primary permitted use of the zone it lies within (i.e. all future development in age-restricted zones is age-restricted housing).

IV. HOUSING PLAN

GOAL: *Guide future development and community facilities to meet the needs of the residents of the Township, while ensuring that new development is compatible with existing development without degrading the Township's cultural and natural resources.*

OBJECTIVE: *To ensure decent and affordable housing for all present and future residents of the Township, without regard of their economic status by providing for a full range of housing choices that are affordable to low, moderate, middle and upper income households.*

New Jersey Courts have determined that the State Constitution dictates that all municipalities in the State plan and zone with the intent, in part, to provide a realistic opportunity for individuals within a geographic region who are classified as being of low and moderate income to have affordable housing opportunities. In furtherance of that goal, the legislature has created The Council on Affordable Housing (hereafter referred to as COAH), an agency responsible for identifying needs, and overseeing the implementation of that Constitutional mandate.

Monroe Township has been a voluntary participant in the affordable housing process since COAH's inception in the early 1980's and has previously submitted and obtained Substantive Certification for its housing plans from COAH.

On December 6, 1995, Monroe Township received substantive certification of its current Housing Plan from the New Jersey Council on Affordable Housing (COAH). This substantive certification was scheduled to expire on December 6, 2001. However, because COAH had not adopted its third round methodology by that time, the Township requested an extension of substantive certification. The requested extension was approved by COAH on December 12, 2002, extending the Township's certification for one year after the effective date of COAH's third round methodology and rules.

The current valid Housing Plan can be found in the Township's "Master Plan Elements Reexamination Report and Revisions, December 1989". As of that printing the Township had been allocated a total fair share of 446 affordable housing units by COAH, and a significant number of affordable units had already been constructed in the years leading up to 1989 through the Farmer's Home Administration.

The current status of the COAH obligation on the Housing Plan is that there is a precredited need of 554 units with prior cycle credits of 256 units and current adjustments of 156 units. This results in a need to provide 142 affordable units. The Township's plan has zoned adequate land to allow for private development of these 142 units. The Township's Regional Growth Planned Residential district (RG-PR) consists of 4,584 acres in the Pinelands Comprehensive Management Plan. It has access to water and sewer service and density ranges from 3.75 to 7.4 units per acre. Forty percent of the units in developments in this zone must be multifamily and six percent of these will be affordable. At minimum density, 142 affordable units could be developed. As of August, 2004, no affordable housing in this zone has been reported.

V. CONSERVATION PLAN

A. INTRODUCTION

Monroe Township contains a significant number of natural open spaces. These resources play a significant role in determining the quality of life in Monroe. They help to determine the viability of community life and should be considered in all aspects of planning from residential neighborhoods to positioning Monroe for retention and expansion of commerce. In addition to providing large areas of farmland, these open spaces generally consist of areas with steep slopes, steam corridors, flood hazard areas, freshwater wetlands, and surface waters. Such lands should be conserved and regulated in order to limit disturbances which would create adverse impacts for the wider community. The recommended actions for conserving these natural features are described here.

B. CONSERVATION GOALS & OBJECTIVES

Many of the overall goals and objectives of the Master Plan relate to how we should look at environmental issues as the Township moves forward, both as steward of environmentally sensitive areas and as manager of smart growth, sustainable development.

1. GOALS OF THE CONSERVATION PLAN

a. Encourage a pattern of compact and contiguous growth within appropriate areas of the Township.

b. Guide future development and community facilities to meet the needs of the residents of the Township, while ensuring that new development is compatible with existing development without degrading the Township's cultural and natural resources.

c. Preserve the Township's natural and cultural resources that contribute to both the positive image and overall strength of the Township.

d. Recognize that open space preservation must become the responsibility of the Township, and that the agricultural community alone will not be able to continue to ensure that open space will remain in the Township forever.

e. Eliminate the potential for conflicts among dissimilar land uses.

f. Prevent development in sensitive environmental areas.

2. CONSERVATION OBJECTIVES

g. To conserve and manage natural resources within the Township.

h. To protect State, regional and local areas of critical environmental concern.

i. To protect life and property from the effects of natural hazards, such as flooding, winds, wildfires and unstable lands.

j. To permanently preserve environmentally sensitive land as open space, to the greatest extent practicable.

k. To provide access to open space, stream corridors and woodlands through a system of pedestrian walkways and greenways.

l. To manage surface drainage to minimize the danger of flooding and to preserve water quality.

m. To preserve the rural nature and agricultural base of the RD, AG and FD zoning districts by maintaining appropriate development density levels in such zones and ensuring compliance with the Pinelands Comprehensive Management Plan at N.J.A.C. 7:50 in Pineland areas.

n. To protect prime agricultural lands from encroachment by development through a combined system of limiting density, ensuring sections of agricultural land are preserved through deed-restriction and other preservation tools made available through the Municipal Land Use Law.

o. To promote energy conservation.

p. To include a thorough review of environmental issues in all future applications for development.

q. To develop policies to preserve trees, especially specimen or landmark trees, while being sensitive to the rights of private property owners.

r. To facilitate the proper preservation and restoration of the aesthetic qualities of the Township.

C. RECOMMENDATIONS

1. STEEP SLOPES

The measurement of slope consists of the elevation change with respect to a given distance, (such as 15' over 100', which is a 15% slope). Land in Monroe Township is generally flat, but sloping ground occurs in a few areas. If a slope is greater than 15%, the erosion hazard increases substantially. Where steep slopes are stripped of vegetation, adjacent lands and water bodies may be inundated with sediment during rainstorms. This also harms wildlife habitats and degrades water quality. Soil erosion is exacerbated, and soils then become thin and have low natural fertility. Slopes greater than 10% also can pose problems in designing building sites, roads, and parking areas.

2. FLOOD HAZARD AREAS

The flood hazard areas within Monroe Township have been identified and mapped by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance Program. Flood hazard areas are the subject of flood plain regulations that control construction consistent with the National Flood Insurance Program.

Municipal design standards should require that uses which are especially vulnerable to damage by flooding be located outside of the flood hazard area, and that such areas be set aside as permanent open space.

3. STREAM CORRIDORS

A stream corridor is an area consisting of both a stream channel and the areas of vegetation that extends along each side of the channel. The protection of these corridors is an objective of the State Planning Act NJSA 52:184-196 et seq.

Soils and vegetation located along the stream corridors perform important natural functions that maintain the ecological and hydrological balance of the surface water systems. These functions include:

- Runoff and flood control
- Stream bank and streambed erosion control
- Wildlife habitat protection

- Groundwater recharge

Stream corridors are among the most valuable natural resources in Monroe Township which, if not managed properly, can result in flooding and the loss of important environmental, aesthetic, and recreational resources. Stream corridor management places primary emphasis on water quality protection and enhancement and on the protection of natural resources located along the stream corridor. Floodplain management also places emphasis on the protection of the man-made environment from flood hazards. With proper management, a stream corridor can serve as a buffer to filter sediment and pollution produced by development, as well as farming. It can also provide a margin of safety for adjacent neighborhoods from flood and erosion hazards.

Streams are divided into two categories: perennial and intermittent. Perennial streams flow year-round while intermittent streams flow only during storms and certain seasons. Both are important to the protection of the ecological and hydrological balance of the stream system.

In order to protect stream corridors, buffers should be established along each bank. The recommended minimum is 65′ on each bank (or a total of 130′), with the following additional factors to be considered:

- Flood hazard area: Areas should be sufficiently wide to include the 100 year flood plain.
- Steep slope: Consider extending buffer beyond the top of the slope, where stream banks have slopes greater than 15%.
- Sediment control: Where disturbance is occurring near the stream, a buffer of up to 150′ on the side of the disturbance should be considered.
- Nutrient removal: Where nutrients are proposed to be applied to the land, a buffer of up to 150′, on each side of the stream should be considered.
- Habitat (aquatic): Where aquatic habitats are identified, setbacks of wooded vegetation of up to 80′ should be considered on each side.
- Habitat (terrestrial): Wildlife corridors and wintering areas should have a setback of wooded vegetation of 100′ to 300′ on each side.

4. FRESHWATER WETLANDS

Freshwater wetlands are vital links in the ecological system. Wetlands are typically delineated on the basis of the following three parameters:

- Hydrology: Soil is inundated either permanently or periodically, at mean water depths less than or equal to two feet, or soil is saturated to the surface at some time during the growing season of the prevalent vegetation.
- Vegetation: Prevalent vegetation consists of plant species adapted to anaerobic soil conditions.
- Soil: Soils present are classified as hydric, or possess at least two characteristics that are associated with anaerobic soil conditions.

Note that, in establishing an area as wetland, only two of the above three parameters must be met.

Future plans for roads and streets should minimize additional disturbances to the Township's wetland areas, as defined by NJDEP.

5. GROUNDWATER

Monroe is currently experiencing significant growth in the form of suburbanization. This type of growth typically increases water runoff and often degrades water quality. Best Management Practices in protecting water quality and enhancing groundwater recharge are recommended.

6. AGRICULTURE

Based on the Gloucester County General Soils Maps (1960) approximately 50%-60% of the Township is in the Aura-Sassafras-Downer Association which the U.S. Department of agriculture would deem as "prime" for farm production. Protection of agribusiness through Right to Farm ordinances, Farmland Preservation Plans, erosion control methods, and appropriate vegetation buffers between farms and adjacent land uses are recommended.

7. TREE PRESERVATION

Woodlands, forests and other areas of tree cover provide vital benefits to the environment of the community. These areas are documented as providing significant benefits to protecting water quality, reducing storm water runoff and associated erosion and helping to modulate micro climate suburbanization often destroys forests and woodlands in order to meet development requirements for providing roads, house pads and usable yard areas. It is recommended that smart development can be accommodated and the positive benefits of forests, woodlands, and individual trees retained. A tree preservation ordinance is recommended to facilitate this effort.

8. WELL PROTECTION

Protection of the Township's water supply is of primary importance. Pollutants from runoff can migrate into aquifers if not mitigated. It is recommended that wellheads be identified and a program for protecting the areas against various forms of infiltration of pollutants be implemented.

9. TRANSFER OF DEVELOPMENT RIGHTS

Under current pressures of development it is difficult to acquire and protect all those areas deemed to be environmentally significant. In the past public acquisition of land through state and local programs has been one of the tools available to communities to set aside critical land areas. Recently, the state of New Jersey has added another tool in the form of allowing Transfer of Development Rights programs. It allows communities to exercise smart growth initiatives and sustainable development by protecting critical habitats and open space as well as farmland and transferring development to appropriate areas of the community that have sufficient infrastructure and developable land area. The township should consider this as one method of achieving protection of woodlands, farms, and other open space.

D. NATURAL CHARACTERISTICS / ENVIRONMENTAL FEATURES

1. TOPOGRAPHY

The topography of Monroe Township is characteristic of the prevailing land form of the Atlantic Coastal Plain. This low lying plain is characterized by flat or gently rolling topography with minimal relief. Elevations range from less than 80 feet above sea level in the vicinity of Hospitality Lake, at the easterly-most end of the Township, to over 170 feet above sea level between Berlin-Cross Keys Road and Prosser Avenue, at the northerly-most end of the Township. The general topography of Monroe Township is shown in FIGURE 5.

Steep slopes are land areas with slopes greater than 15 percent. Steep slopes include natural swales and ravines, as well as man-made areas, such as those created through mining for sand, gravel or fill material, or through road grading. The only steep slopes within Monroe Township are associated with the several active and former sand and gravel quarries operating in the Township.

Preservation of steep slopes controls soil erosion, protects up-slope lands, minimizes pollution of surface waters, reduces flooding, preserves stream banks, and maintains water flow in headwaters. The removal of vegetation on steep slopes often results in increased surface runoff and erosion of the slopes. The increased soil erosion results in increased turbidity and sedimentation in streams, which reduces the productivity and flood water storage capacity of the stream.

2. SOILS

List and Description of Each Soil Type:

The *Soils Survey of Gloucester County, New Jersey* identifies four general soil areas within Monroe Township, containing a total of 28 soil types representing 14 soil series and two mapping units. Each general soil area contains a characteristic pattern of soils, although some soils occur in more than one area.

The location of each soil type is shown in the Gloucester County Conservation District Soil Survey Manual. Each of the general soil areas located within Monroe Township is described below:

Westphalia-Nixonton-Barclay Association – The soils of this general soil area lie in a broken, irregular belt, four to six miles wide, and includes the northwesterly portion of the Township, adjacent to Washington Township. It contains hills capped with gravelly soils. Drainage of the area is towards the Delaware River. In higher places, the water table is below depths of 10 to 20 feet, while in lower areas, water is at the surface.

The Westphalia soils occupy about 60 percent of this general soil area. Nixonton and Barclay soils, composed mainly of fine sand, are the dominant soils on the remaining 40 percent. The Westphalia, Nixonton and Barclay soils are progressively wetter in the order named.

Aura-Sassafras-Downer Association – This general soil area occupies almost all of Monroe Township southeast of the Westphalia-Nixonton-Barclay association, with the exception of the areas adjacent to stream channels. Most of the slopes in this area are broad and gentle. Within Monroe Township, this general soil type drains to the Atlantic Ocean.

The well-drained Aura soils occupy about 70 percent of this general soil area. The Sassafras, Downer and other soil occupy the rest. Woodstown, Dragston, Fallingston and Pocomoke soils, wet soils that have a high water table in winter, occur less extensively in this general soil area.

Muck-Alluvial Land-Fallingston-Pocomoke Association – This general soil area contains inland wet soils that occur in nearly level, narrow, wet areas along streams. Muck makes up about 50 percent of this general soil area, with Alluvial land and Fallsington, Pocomoke and minor soils making up most of the remainder. Also included in this general soil area are the Pasquotank, Bayboro, Leon and St. Johns soils, all of which are wet to very wet.

Lakeland-Lakewood-Lakehurst Association – This small, nearly level general soil area occurs in the southeasterly corner of the Township, at elevations below 100 feet above sea level. The soils have developed from sands and their surface layers have been leached gray to some extent. The Lakeland, Lakewood and Lakehurst soils are dominant in this area. Water enters and drains through the Lakeland and Lakewood soils at an excessive rate. The same is true of the Lakehurst soil, except that the water table rises to within 20 to 30 inches of the surface during winter and is within four(4) to six (6) feet during drier seasons.

Limitations for Development:

Improving the use of soils is one of the most important problems and challenges in the management of natural resources. Virtually all human activities are concerned with or located on plots of different soils. The success or failure of foundations, farming operations, forestry, recreation, waste disposal, and nearly all development is greatly dependent upon the nature and properties of the soils. The *Soils Survey of Gloucester County, New Jersey* provides information regarding the suitability of various soil types for typical suburban development. This information, prepared for use by suburban landowners, planners and developers, shows some of the advantages and disadvantages that might be expected when attempting to develop different groups of soils. The suitability of soils located within Monroe Township for suburban development is provided in the Township's EIS.

Agricultural Land Classification:

Land classification is the grouping of soil types primarily on the basis of their capability to produce common cultivated crops and pasture plants without deterioration over a long period of time. Capability units, into which soils are grouped, have similar potentials and limitations. Soil types that are included in a capability unit are sufficiently uniform to produce similar kinds of cultivated crops and pasture plants, require similar conservation treatment and management, and have comparable potential productivity.

With the capability classification, soils are grouped at three levels, the capability class, subclass and unit. The capability classes are designated by Roman Numerals I through VIII. Class I includes soils that have few limitations, the widest range of use, and the least risk of damage when they are used. Soils in the other classes have progressively greater natural limitations, with Class VIII consisting of soils that are so rough, shallow, wet or otherwise limited that they do not produce worthwhile yields of crops.

Subclasses indicate major kinds of limitations within the classes. Within Monroe Township, most of the classes there can be up to three (3) subclasses. The subclass is indicated by adding a small letter, *e*, *w*, or *s* to the class numeral. The letter *e* indicates that the main limitation is risk of erosion unless close growing plant cover is maintained, the letter *w* indicates that water in or on the soil will interfere with plant growth or cultivation; the letter *s* indicates that the soil is limited mainly because it is shallow, droughty or stony.

Within the subclasses are the capability units, which are groups of soils that are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Capability units are generally identified by numbers assigned locally. Soils are classified in capability classes, subclasses and units without consideration of major and generally expensive land forming that would change the slope, depth or other characteristics of the soil.

The six (6) classes in the capability system and the subclasses and units related to soils in Monroe Township are described below:

Class I: Soils that have few limitations that restrict their use.

(No subclasses)

Capability Unit I-1: Deep, nearly level, well-drained sandy loams.

Soils in Capability Unit I-1 include:
Downer Sandy Loam, 0 to 2 percent slopes (DsA)
Sassafras Sandy Loam, 0 to 2 percent slopes (SrA)

Class II: Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe: Soils that have a moderate risk of erosion if they are not protected.

Capability Unit IIe-1: Gently sloping, deep, well-drained sandy loams.

Soils in Capability Unit IIe-1 include:
Downer Sandy Loam, 2 to 5 percent slopes (DsB)
Sassafras Sandy Loam, 2 to 5 percent slopes (SrB)

Subclass IIs: Soils that have moderate limitations of droughtiness or shallowness.

Capability Unit IIs-1: Nearly level to gently sloping, somewhat droughty soils that are subject to wind erosion.

Soils in Capability Unit IIs-1 include:
Downer Loamy Sand, 0 to 5 percent slopes (DoB)
Sassafras Loamy Sand, 0 to 5 percent slopes (SfB)

Capability Unit IIs-2: Nearly level to gently sloping, well-drained soils, shallow to a firm horizon.

Soils in Capability Unit IIs-2 include:
Aura Sandy Loam, 0 to 5 percent slopes (ArB)
Aura-Sassafras Sandy Loam, 0 to 5 percent slopes (AuB)

Subclass IIw: Soils that have moderate limitations because of excess water.

Capability Unit IIw-1: Deep, nearly level to gently sloping, moderately well drained to somewhat poorly drained soils that have a loamy sand surface layer.

Soils in Capability Unit IIw-1 include:
Woodstown and Dragston Loamy Sand, 0 to 5 percent slopes (WoB)
Woodstown and Klej Loamy Sand, 0 to 5 percent slopes (WtB)

Capability Unit IIw-2: Deep, nearly level to gently sloping, moderately well drained to somewhat poorly drained soils that have a loam or sandy loam surface layer.

Soils in Capability Unit IIw-2 include:
Woodstown and Dragston Sandy Loam, 0 to 5 percent slopes (WsB)

Class III: Soils that have severe limitations that reduce the choice of plants or require moderate conservation practices, or both.

Subclass IIIe: Soils that have a severe risk of erosion if they are cultivated and not protected.

Capability Unit IIIe-1: Deep, well-drained, moderately sloping sandy loams.

Soils in Capability Unit IIIe-1 include:
Aura-Sassafras Sandy Loam, 5 to 10 percent slopes (AuC)

Capability Unit IIIe-2: Moderately sloping soils that have dominantly a thick loamy sand surface layer and a sandy loam subsoil.

Soils in Capability Unit IIIe-2 include:
Sassafras Loamy Sand, 5 to 10 percent slopes (SfC)

Subclass IIIs: Soils that have severe limitations of moisture capacity or of tilth.

Capability Unit IIIs-1: Nearly level to gently sloping, well-drained soils that have a loamy sand surface layer.

Soils in Capability Unit IIIs-1 include:
Aura Loamy Sand, 0 to 5 percent slopes (AmB)

Subclass IIIw: Soils that have severe limitations because of excess water.

Capability Unit IIIw-1: Nearly level, poorly drained and very poorly drained, permeable or moderately slowly permeable loamy soils.

Soils in Capability Unit IIIw-1 include:
Fallingston Loam (Fa)
Fallingston Sandy Loam (Fd)
Pasquotank Fine Sandy Loam (Pa)
Pocomoke Sandy Loam (Ps)

Class IV: Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe: Soils that have a very severe risk of erosion if they are cultivated and not protected.

Capability Unit IVe-1: Deep, well-drained, permeable soils that are moderately steep or are moderately sloping and severely eroded.

Soils in Capability Unit IVe-1 include:
Aura-Sassafras Sandy Loam, 5 to 10 percent slopes, severely eroded (AuC3)

Subclass IVs: Soils that have very severe limitations of low moisture capacity or other soil features.

Capability Unit IVs-1: Nearly level to moderately sloping, very sandy, droughty, infertile soils.

Soils in Capability Unit IVs-1 include:
Landland Sand, 0 to 10 percent slopes (LdB)

Class V: Soils that have little or no erosion hazard but have other limitations that make regular cultivation impractical and that limit their use largely to woodland or wildlife food and cover.

Subclass Vw: Soils that are impractical to use for cultivation because of excess water and infertility.

Capability Unit Vw-1: Nearly level, poorly-drained to very poorly-drained, infertile sands.

Soils in Capability Unit Vw-1 include:
Leon Sand (Lo)
St. Johns Sand (Sa)

Class VII: Soils that have very severe limitations that make them unsuited to cultivation without major reclamation, and that restrict their use largely to grazing, woodland or wildlife.

Subclass VIIe: Soils very severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability Unit VIIe-1: Moderately steep and steep, generally permeable soils.

Soils in Capability Unit VIIe-1 include:
Sassafras Soils, 15 to 40 percent slopes (SsE)

Subclass VIIs: Soils very severely limited by moisture capacity or other soil features.

Capability Unit VIIs-1: Deep, nearly level to gently sloping, loose, sandy, infertile soils.

Soils in Capability Unit VIIs-1 include:
Lakehurst Sand, 0 to 5 percent slopes (LaA)
Lakewood Sand, 0 to 5 percent slopes (LeB)

Subclass VIIw: Soils very severely limited by excess water.

Capability Unit VIIw-1: Wet soils subject to frequent overflow and very wet organic soils.

Soils in Capability Unit VIIw-1 include:
Muck (Mu)

In addition to the above capability classifications, soils within Monroe Township are important farmland soils if they have been classified as prime, unique or of statewide importance by the U.S. Department of Agriculture. Farmlands of statewide importance include those soils in land capability Class II and III that do not meet the criteria as *Prime Farmland*. These soils are nearly *Prime Farmland* and economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce yields as high as *Prime Farmland* if conditions are favorable. Farmland of local importance include those soils that are not prime or of statewide importance and are used for the production of high value food, fiber or horticultural crops. Important farmland soils within Monroe Township are listed below and cover approximately 50%-60% of the Township.

Prime Farmlands

Aura Loamy Sand, 0 to 5 percent slopes (AmB)
Aura Sandy Loam, 0 to 5 percent slopes (ArB)
Aura-Sassafras Sandy Loam, 0 to 5 percent slopes (AuB)
Downer Loamy Sand, 0 to 5 percent slopes (DoB)
Downer Sandy Loam, 0 to 2 percent slopes (DsA)
Downer Sandy Loam, 2 to 5 percent slopes (DsB)
Sassafras Sandy Loam, 0 to 2 percent slopes (SrA)
Sassafras Sandy Loam, 2 to 5 percent slopes (SrB)
Woodstown and Dragston Loamy Sands, 0 to 5 percent slopes (WoB)
Woodstown and Dragston Sandy Loam, 0 to 5 percent slopes (WsB)

Unique Farmlands (if being used for special crops)

Muck (Mu)
St. Johns (Sa)

Soils of Statewide Importance

Aura-Sassafras Sandy Loam, 5 to 10 percent slopes (AuC)
Downer Loamy Sand, 0 to 5 percent slopes (DoB)
Downer Sandy Loam, 2 to 5 percent slopes (DsB)
Fallingston Loam (Fa)
Fallingston Sandy Loam (Fd)
Pasquotank Fine Sandy Loam (Pa) (drained)
Pocomoke Sandy Loam (Ps) (drained)
Sassafras Loamy Sand, 0 to 5 percent slopes (SfB)
Sassafras Loamy Sand, 5 to 10 percent slopes (SfC)
Woodstown and Klej Loamy Sands, 0 to 5 percent slopes (WtB)

Soils of Local Importance

Aura-Sassafras Sandy Loam, 5 to 10 percent slopes, severely eroded (AuC3)

E. PHYSIOGRAPHY, GEOLOGY, AND GROUND WATER RESOURCES

1. DESCRIPTION OF THE PHYSIOGRAPHY AND GEOLOGIC FORMATIONS

Monroe Township lies entirely within the Atlantic Coastal Plain physiographic province, a geologic province bordered by the Atlantic Ocean and the Piedmont Province on the Appalachian Mountains, and extending from Massachusetts to Florida. This low lying plain is characterized by flat or gently rolling topography with minimal relief.

The Coastal Plain of New Jersey has been divided into three (3) physiographic subdivisions: an inner lowland that has elevations generally located below 100 feet above sea level; an inner upland where elevations range to nearly 400 feet (but generally do not exceed 200 feet in Gloucester County) above sea level; and an outer lowland located at elevations that are below 100 feet above sea level. In southern New Jersey, the inner upland forms the drainage divide for streams flowing west to the Delaware River and Delaware Bay, and stream flowing east to the Atlantic Ocean. In Monroe Township, this divide generally follows the alignment of Tuckahoe Road from Cross Keys in Washington Township, to Star Cross in Franklin Township. Runoff from land west of Tuckahoe Road flows to the Delaware River/Bay, while land east of Tuckahoe Road drains to the Atlantic Ocean.

Monroe Township is underlain by relatively unconsolidated sand, silt and clay layers from the Quarternary, Tertiary and Cretaceous Ages. The Cretaceous and Tertiary sediment dip slightly to the southeast. The edges of these formations form northeast tending bands, with the oldest layers intersecting the land surface near the Delaware River, and progressively younger formations exposed towards the southeast. In the subsurface, these formations constitute a wedge of sediments that thickens seaward.

Marine seas inundated what is now Monroe Township in late Cretaceous time. During this period, a reoccurring pattern of marine invasion and withdrawal developed. Consequently, the late Cretaceous time deposits in the area were largely marine or marginal marine in nature. Marine inundations continued into Tertiary time, but were not as extensive as those in the Cretaceous Period. Early tertiary deposits are marine in origin. Middle and late tertiary deposits are either beach or deltaic deposits and constitute the Kirkwood and Cohonsey Sand formations that underlie Monroe Township.

During the early Pleistocene Time of the Quarternary Period, sands and gravels of fluvial origin were deposited in areas of what is now Monroe Township. The Bridgeton Formation, which underlies areas of higher elevation in the vicinity of Williamstown, is composed of these deposits.

The sea withdrew from southern New Jersey as the Wisconsin ice sheet advanced into the northern parts of Pennsylvania and New Jersey. There is no evidence that the glaciers covered Monroe Township, but they played a part in its geologic history, as sands, silts and clays were deposited by the glacial melt waters.

The Cohansey Sand is the primary geological formation underlying Monroe Township. The lithology of this formation, which has a depth in Monroe Township of up to 250 feet, ranges from Clayey Quartz Silts to Gravelly Quartz Sand. The Cohansey Sand overlies the Kirkwood Formation, which crops out northwest of Monroe Township.

The Cohansey Sand is overlain by the Bridgeton Formation, which occurs as a capping gravel on the highest elevations, where it is a gravelly sand.

2. GROUND WATER RESOURCES

a. Description of Major Aquifers

Large quantities of ground water are present within pore and void spaces of the unconsolidated sediments that underlie Monroe Township and the Coastal Plain of New Jersey. These underground water sources are known as aquifers.

Public supply wells draw from these Aquifers. The water contained within these aquifers is called “Ground Water”. This Ground Water moves from **high** to **low** pressure, typically from high elevations, to points of low pressure (pumping wells & surface water bodies). An active well creates a low point to active water flows. The more time a well is active, the greater the distance from where water will flow through the aquifer to the active well. The amount of time it takes a specified particle of ground water to flow to an active pumping well is called *time of travel* (TOT). The distance the water has to travel to get to the well from the time pumping is initiated is directly related to the TOT. The distance the water has to travel varies by well depending on such factors as rate of pumping and various aquifer characteristics (i.e. porosity, trangressivity, aquifer thickness and hydraulic gradient). Each Well Head Protection Area (WHPA) is broken down into three (3) sequential

tiers based on the TOT component. These tiers are used to assess the risk of contamination to the well by placing a higher rank on pollution sources, prevention and remedies to the tiers for each well. Well Head Protection Areas for Monroe are outlined on FIGURE 11.

The Kirkwood Formation and Cohansey Sand contain aquifers in Monroe Township. The Kirkwood Formation crops out northwest of Monroe Township, thickens downdip to form a wedge-shaped unit. Because the Kirkwood Formation is overlain by the Cohansey Sand, it is a minor aquifer in Monroe Township. The Cohansey Sand is preferred to the Kirkwood Formation because of its shallower depth.

The Cohansey Sand is one of the important aquifers in southern New Jersey. It has no confining beds overlying it. Consequently, most of the formation, if not all, is under water table conditions. Areas of higher elevation are capped with the younger Bridgeton Formation, but it is in hydraulic continuity with the Cohansey Sand.

b. Ground Water Quality

Aquifers are recharged with water from precipitation that percolates through pervious land surfaces and becomes part of the flow of ground water. As such, land use activities on the surface often have a direct relationship to the quality of ground water resources. Uses such as underground storage tanks, septic systems, sanitary landfills, leaking drums, road salt piles, industrial lagoons, and surface impoundments are often identified as major sources of ground water contamination in New Jersey.

While the water from the Cohansey Sand is generally of good chemical quality, contaminant levels in excess of the NJDEP's Safe Drinking Water Maximum Contaminant levels in private wells have been reported in several areas of the Township. This contamination, which included volatile organic compounds (VOC's) and Mercury, has been reported in private wells in the vicinity of Crystal Lake, Winslow Road, the East Woods development, Rex Avenue and Cecil.

The New Jersey Private Well Testing Act requires sampling of private drinking water wells for contamination whenever a property is sold. This law, which went into effect on September 14, 2002, requires that well water be tested for total coliform, Nitrates, Iron, Manganese, pH, Lead and all Volatile Organic Chemicals (VOC) for which maximum contaminant levels have been established by State regulations. These contaminants include such substances as Benzene, Trichloroethylene and Mercury. In addition, since March 14, 2004, landlords who rent property with drinking water supplied by private wells must also test the water quality of the wells every five (5) years, and share the results with their tenants within 30 days of receiving the test results. Landlords must also provide the test results to all new tenants.

As a result of sand mining activities there is the potential for impact to groundwater quality. Environmental damage can result from rainwater falling on land disturbed by mining, which results in erosion and sedimentation. The runoff from these disturbed areas often drains into nearby waterways and imposes a significant impact to water quality.

The impact to surface water is minimized through the use of Best Management Practices (BMP's). This is assured through the permitting required for all mining facilities. A General Permit for discharge of storm water is obtained in conjunction with the Soil Erosion and Sediment Control Certification from the local Soil Conservation District. This General Permit requires the implementation of a Stormwater Pollution Prevention Plan (SPPP), regular inspections, annual reports and certifications. The SPPP will include two (2) parts, the first dealing with the construction site waste control, and the second with soil erosion and sediment control. The waste control portion of the SPPP will outline the requirements for materials management as a means to prevent or reduce waste and waste handling. The soil erosion and sediment control portion will be governed by soil erosion and sediment control plan or other local requirements.

Those mining activities located in the Pinelands area of the Township are subject to requirements set forth by the Pinelands Commission as well as those discussed above.

F. SURFACE WATER RESOURCES

1. WATERSHEDS/SUBWATERSHEDS

A north-south running ridge through the Williamstown area is a major watershed divide that essentially divides the surface drainage area patterns in the Township into two (2) directions. To the east of the ridge, streams generally flow eastward into the Great Egg Harbor River, which ultimately discharges into the Atlantic Ocean. To the west of the ridge, waters flow southward to the Maurice River, which ultimately discharges into the Delaware Bay; or westward to the Mantua Creek, which flows to the Delaware River.

The watershed boundary between the Great Egg Harbor River and Maurice River drainage basins forms the boundary of the Pinelands Protection Area located within Monroe Township. The requirements of the Pinelands Comprehensive Management Plan apply to those areas lying within the watershed of the Great Egg Harbor River, one of the major rivers of the Pinelands National Reserve. The major tributaries of the Great Egg Harbor River within Monroe Township include: Four Mile Branch, Duck's Nest Stream, Squankum Branch and Hospitality Branch. These streams are part of a larger network of tributaries that originate in and around Monroe Township to form the headwaters of the Upper Great Egg Harbor River.

Three (3) major tributary streams in Monroe Township combine to form the headwaters of the Maurice River. These streams: Little Ease Run, Beaverdam Branch and Scotland Run are located to the west of the north-south running ridge.

Streams and their watersheds are shown in FIGURE 7.

2. STREAMS

a. Stream Classifications

All freshwaters in New Jersey are classified under the New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B), as shown in FIGURE 7, to reflect assigned designated uses consistent with the Federal Clean Water Act's Clean Water Swimmable and Fishable Goals. Swimmable implies that waters are to have a sanitary quality that will support primary contact recreation. Fishable means that waters must be of a quality that supports a healthy and diverse community of aquatic life, and that the fish and shellfish harvested from these waters must be edible and free of pathogens and toxic substances. More detail concerning NJDEP surface water quality can be found in FIGURE 6.

All streams within the Pinelands Area of Monroe Township are classified as Pinelands Waters (PL). In all PL waters the designated uses are:

- Cranberry bog water supply and other agricultural uses;
- Maintenance, migration and propagation of the natural and established biota indigenous to the Pinelands' unique ecological system;
- Public potable water supply after conventional filtration treatment and disinfection;
- Primary and secondary contact recreation; and
- Any other reasonable uses.

The area of the Township located below Williamstown-New Brooklyn Rd. and where Tuckahoe Road meets Glassboro-Williamstown Road (Rt. 322) is located within the Pinelands Protection Area (see FIGURE 4), the waters within this area have been designated as Pinelands (PL) Waters. Pinelands waters are defined as all waters within the boundaries of the Pinelands Area, except those waters designated as FW1 in Surface Water Quality Standards (SWQS) (N.J.A.C. 7:9B). Pinelands waters are considered Outstanding National Resource Waters of the State by the New Jersey Department of Environmental Protection (NJDEP).

All streams located outside the Pinelands Area of Monroe Township are classified as FW2-NT. All streams that are not designated as PL or FW1 waters are classified as FW2 waters.

As noted above, PL waters are those fresh waters located within the Pinelands Area. FW1 waters are those fresh waters that are to be maintained in their natural state of quality (set aside for posterity) and not subject to any man-made wastewater discharges or increases in runoff from anthropogenic activities. These waters are set aside for posterity because of their clarity, color, scenic setting, other characteristics of aesthetic value, unique ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resources(s). The "NT" designation refers to those fresh waters that are generally not suitable for trout because of their physical, chemical or biological characteristics, but are suitable for a wide variety of other fish species.

In all FW2 waters the designated uses are:

- Maintenance, migration and propagation of the natural and established biota;
- Primary and secondary contact recreation;
- Industrial and agricultural water supply;
- Public potable water supply after conventional filtration treatment and disinfection; and
- Any other reasonable uses.

In addition to the above, the portions of Beaverdam Branch and Little Ease Run that are located within the boundaries of the Glassboro Wildlife Management Area are classified as FW2-NT(C1), designating the streams as "Category One Waters" (C1). Category one (C1) waters are those waters designated for purposes of implementing antidegradation policies set forth for the protection from measurable changes in water quality characteristics because of their clarity, color, scenic setting, other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource(s). Category one waters may include:

- Waters classified as FW2 trout production waters and their tributaries;
- Surface waters classified as FW2 trout production, or FW2 nontrout that are upstream of waters classified as FW2 trout production;
- Shellfish waters of exceptional resource value; or
- Other waters and their tributaries that flow through, or border, Federal, State, county or municipal parks, forests, fish and wildlife lands, and other special holdings.

The Little Ease Run has been designated by the Surface Water Quality Standards (SWQS) as FW1. As such, these waters are to be maintained in their natural state of quality and not subjected to any man-made wastewater discharges or increases in runoff from anthropogenic activities. FW1 waters are set aside for posterity due to their clarity, color, scenic setting, and other characteristic of aesthetic value, unique ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources and are considered to be Outstanding National Resource Waters of the State by the NJDEP (N.J.A.C. 7:9B).

The Squankum Branch of the Great Egg Harbor River has been designated as a National Wild and Scenic River. The Wild and Scenic Rivers Act (Public Law 90-542, October 2, 1968) provides for the establishment of a system of rivers to be preserved as free-flowing streams available for public use and enjoyment.

b. Water Quality Standards

The New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B) establishes water quality criteria for surface water resources based on the surface water classification of the resource. Surface water classifications for Monroe can be found in the Township's ERI.

Surface water quality criteria for Pinelands (PL) waters are as follows:

(i) PL waters shall be maintained as to quality in their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent.

(ii) For Nitrate-Nitrogen a level of 2 mg/L shall be maintained in the surface waters unless it is shown that a lower level must be maintained to protect the existing surface water quality.

(iii) A pH level between 3.5 and 5.5 shall be maintained unless it is demonstrated that a pH level outside of that range is necessary to protect the existing/designated uses.

(iv) The water quality criteria for existing discharges are the water quality criteria contained in "Surface Water Quality Standards" as adopted in March 1981, except that:

(v) The criteria for Nitrate-Nitrogen and pH noted above in (a) apply instead of the 1981 criteria; and

(vi) The criteria for phosphorous and toxic substances established for FW2 waters apply instead of the 1981 criteria.

As noted above, all surface waters in the non-Pinelands Area of Monroe Township are classified as FW2-NT, with the exception of the segment of Beaverdam Branch and Little Ease Run that are located within the Glassboro Wildlife Management Area. Those stream segments, while classified as FW2-NT waters, are also classified as Category One (C1) Waters.

According to the State Surface Water Quality Standards, Category One (C-1) Waters shall be protected from any measurable changes to the existing water quality. Water quality characteristics that are generally worse than the water quality criteria, except as due to natural conditions, shall be improved to maintain or provide for the designated uses where this can be accomplished without adverse impacts on organisms, communities or ecosystems of concern.

Water quality criteria, applicable to FW2-NT waters, are listed in the Township's ERI.

3. Flood Hazard Areas

Flood hazard areas are those areas subject to flooding during a 100-year storm (the flood from a storm that would be expected to occur once every 100 years), as mapped by the Federal Emergency Management Agency (FEMA). Flood hazard areas within Monroe Township can be found in FIGURE 7.

There are two (2) components to the flood plain – the floodway and the flood fringe. The floodway is the inner area that includes the stream or lake bed where water normally flows. During a flood the floodway is the area where the flood waters are deepest and move the fastest. The flood fringe is the outer area where the flood waters move the slowest.

Flood hazard areas are critical elements of the natural ecosystem, providing flood storage capacity, physical and biochemical water filtration, primary productivity and wildlife habitats. As such, flood hazard areas should be preserved in their natural state with native or adapted forest vegetation.

Any construction in a flood plain is subject to regulation under the Flood Hazard Area Control Act, N.I.S.A. 58:16A-50 et seq. and is implemented at N.J.A.C. 7:13. Under these rules any development within the flood hazard area requires a Stream Encroachment Permit or a Letter of Non-Applicability from the New Jersey Department of Environmental Protection (NJDEP). Copies of the rules as well as Permit applications are available on the NJDEP Land Use Regulation Program's website: www.nj.gov/dep/landuse.com .

G. WETLANDS AND WETLAND BUFFERS

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation. Wetlands possess three (3) essential characteristics: hydrophytic vegetation, hydric soils and wetland hydrology. Each of the three (3) characteristics must be present for an area to be identified as a wetland.

Wetlands in New Jersey are protected under the New Jersey Freshwater Wetlands Protection Act, N.J.S.A. 13:9B and its implementing rules at NJAC 7:7A. In addition, this law also protects transition areas or freshwater wetlands buffers. The Freshwater Wetlands Protection Act requires NJDEP to regulate proposed activities in wetlands.

Wetlands and their associated buffers are important for a number of reasons, including:

- Protection of our drinking water by filtering out chemicals, pollutants, and sediments that would otherwise clog and contaminate waters.
- Wetlands provide natural flood control by soaking up runoff from heavy rains and snow melts.

- During droughts wetlands release stored flood waters.
- Wetlands provide critical habitats for a major portion of the State's fish and wildlife.
- Wetlands provide open space for recreation and tourism.

Hydrophytic vegetation refers to plant life adapted to growth and reproduction under periodically saturated root zone conditions during at least a portion of the growing season. Of the nearly 7,000 vascular plant species that have been found growing in the United States, only about 27 percent are species that nearly always occur in wetlands (obligate plant species) under natural conditions. This means that the majority of the plant species growing in wetlands also grow in nonwetlands in varying degrees.

Hydric Soils refer to soil that, in its undrained condition, is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of Hydrophytic Vegetation. The National Technical Committee for Hydric Soils has developed criteria for Hydric Soils and a list of the Nation's Hydric Soils. This list of Hydric Soils, published by the U.S. Department of Agriculture, Soil Conservation Service, identifies the following soils that are found in Monroe Township as hydric: Fallingston Loam (Fa), Fallingston Sandy Loam (Fd), Pasquotank Fine Sandy Loam (Pa), Pocomoke Sandy Loam (Ps), Leon Sand, (Lo) and St. Johns Sand (Sa).

Wetland hydrology refers to the permanent or periodic inundation or saturation of the soil. Wetlands have a presence of water for one (1) week or more during the growing season. This regular saturation typically creates anaerobic conditions in the soil, which affect the types of plants that can grow and the types of soils that develop. All wetlands usually have at the minimum a seasonal abundance of water.

In New Jersey, Freshwater wetlands are divided into three (3) classifications, each based on a resource value.

1. A freshwater wetland of exceptional resource value is a freshwater wetland that:
   - Discharges into FW1 or FW2 trout production waters or their tributaries;
   - Is a present habitat for threatened or endangered species; or
   - Is a documented habitat for threatened or endangered species, and which remains suitable for breeding, resting, or feeding by these species during the normal period these species would use the habitat.
2. A freshwater wetland of ordinary resource value is a freshwater wetland which does not exhibit any of the characteristics of a exceptional resource value wetland, and which is:
   - An isolated wetland that is smaller than 5,000 square feet in area, and has development covering more than 50 percent of the area within 50 feet of the wetland boundary;
   - A drainage ditch;
   - A swale; or
   - A man-made detention facility in an area that was upland at the time the facility was created.
3. A freshwater wetland of intermediate resource value is a freshwater wetland not defined by the State as exceptional or ordinary.

   The State of New Jersey, through the Department of Environmental Protection (NJDEP) and/or the Pinelands Commission, regulates most activities within freshwater wetlands and adjacent transition areas. Freshwater wetland transition areas are essentially a buffer adjacent to most wetlands that serve as an ecological transition zone from uplands to freshwater wetlands that is an integral portion of the freshwater wetlands ecosystem, providing temporary refuge for freshwater wetlands fauna during high water episodes, critical habitat for animals dependent upon but not resident in wetlands, and slight

variations of freshwater wetland boundaries over time due to hydrologic or climatologic effects. Transition areas also provide a sediment and storm control zone to reduce the impact of development upon wetlands and wetland species.

Within non-Pinelands Areas, transition areas are 150 feet wide adjacent to freshwater wetlands of exceptional resource value, and 50 feet wide adjacent to freshwater wetlands of intermediate resource value. Non-Pinelands activities in this area may require a Transition Area Waiver from the NJDEP. A transition area is not required adjacent to a freshwater wetland of ordinary resource value. Transition areas are 300 feet wide adjacent to freshwater wetlands within the Pinelands Area and are permitted through the Pinelands Commission, not the NJDEP.

Freshwater wetlands, as mapped by the New Jersey Department of Environmental Protection, are shown in FIGURE 8. Only an official determination from NJDEP, known as a "Letter of Interpretation" (LOI), can identify for sure if there are freshwater wetlands on a particular property. An LOI verifies the presence, absence, or boundaries of freshwater wetlands and transition areas on a site.

As outlined in NJAC 7:7A-2.3, wetlands are to be identified using a three-parameter approach. That is hydrology, soils and vegetation.

The potential for Vernal Habitats is found across the Township of Monroe. These habitats are confined wetland depressions that hold water for at least two (2) months in a row, between March and September, and are unsuitable for the breeding of fish populations. As of 2004, the NJDEP has not certified any vernal pools in the Township of Monroe, Gloucester County, NJ.

The NJDEP has recently enacted new legislation to protect vernal pools. In conjunction with the recently adopted vernal habitats protocols, the NJDEP is providing mapping to help in identifying the vernal habitats so far identified and certified by the NJDEP. According to the NJDEP Land Use Regulation Program, the mapping is not exact and will be updated and refined on an ongoing basis as more vernal habitats are certified. More detailed information on a particular vernal habitat can be obtained by contacting the Land Use Regulation Program at LURWEB@dep.state.nj.us

H. VEGETATION

1. DOMINANT PLANT SPECIES

Originally, virtually all of Monroe Township was forested. The northwesterly portion of the Township supported a forest of mixed hardwoods consisting mainly of Oak, Yellow Poplar, Chestnut, Hickory, Beech, Ash, Sweetgum and Red Cedar. Within the southeasterly portion of the Township, the forest was predominantly Pitch Pine, mixed with Oak, Shortleaf Pine, Chestnut and Scattered Hickory. Dominant trees in wetland areas included Atlantic White Cedar, Red Maple, Blackgum, various Oaks and Sweetbay Magnolia.

As agriculture became an important industry in Monroe Township, the amount of forest lands declined. This decline continued as the Township became more densely developed. The northwesterly portion of the Township has been the most heavily developed; and, consequently, much of this area is now composed mainly of urban and suburban lands. The southeasterly portion of the Township contains the least disturbed forests and agricultural lands.

As described below, there are a number of naturally-occurring vegetation types in Monroe Township, as well as old fields, cultivated lands and urban and suburban areas.

a. Wetland Vegetation Types

i. **Marshes** are herb dominated wetlands. They are generally flat, with a deep, silty substrate and a high organic matter content. The most important plant species in marshes are spatterdock, arrow arum, arrowhead and wildrice. Other common species are sweetflag, narrow-leaved cattail, water hemp, pickerelweed, knotweed and smooth burmarigold. Reed grass is common on higher ground.

ii. **Bogs** occur in areas that have poor water drainage. These waters are quite acidic, which contributes to the buildup of deep layers of peat. In many cases, the peat is composed entirely of dead sphagnum moss that is the dominant ground cover. Trees are not common, although a few individual trees may grow on higher ground. The leatherleaf is the most common shrub along with other shrub members of the Health family. Other plants commonly found in bogs are cranberry, blueberry, grasses and sedges, ferns, orchids, sundews and pitcher plant.

iii. **Maple-Gum Forests** are also commonly found on poorly drained soils. The dominant trees are red maple, blackgum, white cedar and sweetbay magnolia. The drainage characteristics in these habitats vary greatly, and there is a corresponding diversity of other tree species. Generally, there is a dense shrub layer consisting of sweetpepper, highbush blueberry, swamp sweetbells, mountain laurel, sheep laurel, dangleberry, inkberry, swamp azalea and winterberry. Sphagnum moss is the most common ground cover in sunnier spots.

iv. **Cedar Swamps** are often considered among the most beautiful forests in New Jersey, typically occurring in pure stands of white cedar. Cedar forests tend to occupy the wettest locations. Although the largest cedar stands are already gone, cedar swamps were once the most extensive swamp forest type in the Pinelands. In marginal areas, the species composition of cedar swamps take on aspects of the maple-gum swamp.

b. Upland Forest Types

i. **Oak Forests, Oak-Pine Forests** and **Pine-Oak Forests** that occur on drier, better sites than the forested wetlands, are forests typical of the New Jersey Pinelands. The mix of trees are delineated on the basis of whether oaks or pines are the predominant tree species: pine trees are nearly absent in oak forests, conspicuous but less abundant than oaks in oak-pine forests, and more common than oak in pine-oak forests. Most forested uplands in Monroe Township are inhabited by oak-pine forest rather than the pine dominated pine-oak forest. This is primarily due to the natural forest succession process, which favors the establishment of an oak-dominated forest. Pine trees are often the first species to become established in cleared or burned areas, where there is little accumulation of plant litter. Oak seedlings will not appear until a substantial amount of litter accumulates. However, pines will no longer grow from seed where there is a substantial accumulation of plant litter. Consequently, pine trees tend to dominate the upland forest initially, but given time, oaks will naturally replace them.

   Pitch pine and short leaf pines are most common in the Pinelands Areas, while Virginia pine is most common in the northwesterly portion of the Township. White pine trees occur as plantings throughout the Township. Common oaks include chestnut oak, white oak, blackjack oak, black oak, post oak and scarlet oak. Scrub oak is a common shrub that forms a dense, continuous understory in some areas in the southeasterly half of the Township. In the northwesterly portions of the Township, the oak forests also contain tulip trees, beech and hickory.

ii. **Pine Forests** are naturally occurring stands of Virginia pine, pitch pine or shortleaf pine. Until the stands are 30 to 40 years old, the understory vegetation is almost nonexistent.

iii. **Black Cherry-Sassafras Woodlands** are essentially found in the late stage of old field succession on well-drained sites. Tree species consist mainly of the sun-loving, somewhat weedy species. These species mainly include black cherry and sassafras, but also include pines, red cedar, tree-of-heaven and black locust. The understory is common composed of grapes, greenbrier, winged sumac, blackberry and various grasses and annual herbs.

2. **Scrub Vegetation Lands** are areas scattered throughout Monroe Township composed of shrubs, vines, small trees and herbs. These often dense areas contain sassafras, black cherry, arrowood, silky dogwood, greenbrier, poison ivy and Virginia creeper. Ground cover in these areas consists of a variety of grasses, sedges and small herbaceous plant species.

3. **Agricultural and Open Lands** include old fields, pastures, croplands and orchards that are located throughout the Township. Vegetation consists mainly of annual and perennial herbs and grasses. Shrubs and trees are found mainly along roads and fence rows, as well as on mature old fields. These areas of Monroe Township have experienced the strongest development pressure, and much of this land cover type has been lost to recent development, particularly in the non-Pinelands areas of the Township.

4. **Surface Waters** typically contain such species as fragrant waterlily, spatterdock, duckweed, bladderwort and other aquatic vascular plants that occur in, and adjacent to open waters. In addition, most plants listed in the above description of marsh habitats may be found rooted along the margins of the many lakes, ponds and streams of Monroe Township.

5. **Urban and Suburban Areas,** while containing large areas of impervious surfaces, also support a wide variety of plant species. Within urban areas, such as Williamstown, plants undergo the process of establishment and succession in almost any spot that provides sunlight and protection from mechanical injury. A few of the many plant species common in urban areas include mulberry, ragweed, beggarsticks, chickweed, goosefoot, chickory, honeysuckle, knotweed and coarse grasses. Suburban areas, such as the more recently-developed portions of the Township, are characterized by fairly widely spaced housing with lawns and ornamental plantings, as well as a wide variety of naturally-occurring tree and shrub species.

6. **Threatened and Endangered Species**

   Endangered species are those plants that are in immediate danger of extinction throughout all or a significant portion of their range. Its peril may result from the destruction of habitat, change in habitat, over exploitation by people, predation, an adverse inter-specific competition or disease. Threatened species are those species that are likely to become endangered in the foreseeable future. Threatened and Endangered plant species found in Monroe Township's EIS.

   It is important to note not all of the plant species listed are known to occur in Monroe Township, but they are included because detailed studies to identify populations of many species are sketchy or lacking for certain areas.

I. WILDLIFE

1. DOMINANT ANIMAL SPECIES

Monroe Township is home to a wide range of wildlife species. While some species are evident by their visibility throughout the Township, others are rarely seen by humans even though substantial populations may exist. The extensive development that has occurred in Monroe Township over recent years has had a significant impact upon wildlife by reducing suitable habitat for various species. It is expected that some displaced species will die due to the loss of habitat, others will move to more suitable habitat elsewhere in the Township, still others will adapt more readily to development. Animal Communities that may be found in the Township are listed in Monroe Township's EIS.

Reptiles also occur in wet habitats; however, they more commonly live in drier habitats. With the exception of the dusky salamander and red-backed salamander, all of the amphibians that may be found in Monroe Township depend upon some form of open water for reproduction.

While most mammals expected to be found in Monroe Township also utilize drier habitats, many of the larger mammals, such as white-tail deer, foxes and raccoons, have large territories and may utilize several habitats. Developed areas generally contain species such as the Norway Rat and House Mouse, Gray Squirrel and other small mammals, Raccoons and opossums are also not uncommon in developed areas.

2. THREATENED AND ENDANGERED SPECIES

Endangered wildlife species are those plants that are in immediate danger of extinction throughout all or a significant portion of their range. Threatened species are those that are likely to become endangered in the foreseeable future. Threatened and endangered wildlife species that may be found in Monroe Township are listed in the Township's ERI.

J. LANDSCAPE PROJECT PRIORITY HABIATS

The Landscape Project is a pro-active, ecosystem-level approach for the long-term protection of imperiled species and their important habitats throughout the State. The project was initiated in 1994 by the N.J. Division of Fish and Wildlife's Endangered and Nongame Species Program (ENSP) to document the value of different habitats throughout the State. These habitats are then ranked according to their importance. The top ranking is designated for habitat areas where there has been a documented occurrence of one (1) or more species on either the Federal or State Threatened and Endangered Species List, and where the habitat type has been identified as a *Critical Habitat* , in that the habitat is sufficient to support these identified species. Another category identifies *Areas of Special Concern,* for areas in New Jersey with documented occurrences of species of special concern. *Suitable Habitat* is identified for lands deemed suitable for those species included in higher categories but for which there are no documented sightings.

The Landscape Project centers on "landscape regions" that have similar ecological properties with regard to their plant and animal communities. Using a database that combines location information of imperiled and priority species with land-use / land-cover data, the Landscape Project has identified and mapped areas of critical importance for imperiled species within Monroe Township as well as for each landscape region.

Landscape Project Critical Habitat Maps (see FIGURE 10) were developed to provide scientifically-sound information that is easily accessible to everyone. Critical Area Maps can be incorporated with planning and protection programs at all levels of government to provide the basis for proactive planning, zoning and land acquisition projects. The information the Landscape Project supplies can be used for planning purposes before any actions, such as proposed development, resource extraction or conservation measures, occur. Proper planning with accurate, legally and scientifically sound information will likely produce less conflict, less wasted time and funds, in the attempt to resolve threatened and endangered species problems.

Landscape Project data for Monroe Township identifies critical habitat for Emergent Wetlands, Forested Wetlands, Forests, and Grasslands. Rankings in Monroe Township are a result of State Endangered Species Red-Shouldered Hawk and Barred Owl Habitats.

K. REGIONAL AIR QUALITY

Exposure to air pollutants is a widespread problem throughout the entire State. These pollutants come from a wide variety of sources, including traditional industrial and utility sources, smaller manufacturing and commercial sources, mobile sources (such as cars, trucks and buses), residential activities (such as oil burning for home heating and house painting), and construction activities. Within Monroe Township, however, the majority of air pollutants are generated by motor vehicle traffic.

Traffic-related air pollutants fall into two general categories: **gaseous pollutants** such as carbon monoxide (CO), unburned hydrocarbons (HC), nitrogen oxides (NO_x), sulphur oxides (SO_x) and photochemical oxidants; and **particulate pollutants** such as carbon particles, lead compounds, vaporized motor oils, rubber, asbestos and metals. Excessive concentrations of these air pollutants in the atmosphere are known to have an impact on human health and welfare, to wildlife, vegetation, water quality and climate. Development proposals involving sensitive receptors (residences, schools, hospitals, recreation/sports areas, etc.) should be examined carefully to determine potential air pollutant impacts.

The Federal Clean Air Act directed the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS), defining maximum allowable ambient concentrations for particulates, carbon monoxide, ozone, nitrogen dioxide, and lead. In addition to the NAAQS, the New Jersey Department of Environmental Protection (NJDEP) also established standards for each criteria pollutant. The State standards are identical to the NAAQS for most pollutants.

Air quality standards define a limit for the atmospheric concentration of airborne contaminants, and are established for the purpose of protecting the public health and welfare. These standards are derived from scientific studies of the effects produced by various exposures to specific pollutants. The National and New Jersey Ambient Air Quality Standards are divided into Primary and Secondary Standards. The Primary Standards define air quality levels intended to protect the public health with an adequate margin of safety. The Secondary Standards define levels of air quality intended to protect the public welfare from any known or anticipated adverse effects of a pollutant. Welfare in this context includes damage to buildings, plants and animals, and impairment of visibility.

Monroe Township is located within the Metropolitan Philadelphia Air Quality Control Region, which includes Burlington, Camden, Gloucester, Mercer and Salem Counties in New Jersey. In addition, NJDEP maintains various monitoring sites throughout the State to measure the concentration of the criteria pollutants. Data from monitoring sites located throughout this region indicate that the area is in attainment of all air quality standards except ozone. Of the 15 ozone monitoring sites that were operated during 2001, nine (9) recorded levels above the one-hour standard at least once during the year.

Ozone is a byproduct of the photochemical reaction of hydrocarbons with the oxides of nitrogen. Overexposure to ozone may cause damage to the respiratory tract. Automobile emissions are the largest single source of ozone pollution. Other sources of ozone are power plants, chemical plants, dry cleaners, and paint shops. Typically, the highest concentrations of ozone occur on the warm sunny days from May through September.

The air quality monitoring site closest to Monroe Township is located at Ancora State Hospital, in Winslow Township, Camden County. This monitoring site contains sensors to monitor three of the criteria pollutants: carbon monoxide (CO), ozone (O_3) and sulfur dioxide (SO_2). The 2001 data from this monitoring site are on file with the Township. This data shows that air quality at the Ancora State Hospital monitoring site was within the National and State standards for each of the pollutants sampled during 2001.

Radon is a radioactive gas that results from the breakdown of naturally occurring uranium in rock and soil. This is an odorless, tasteless and invisible gas that can only be detected by specialized tests. Radon gas enters homes through ground openings such as small openings around pipes and cracks in the foundation. The NJDEP has identified the Township of Monroe to have moderate radon potential (Tier 2). The NJDEP has shown the average radon level in the Township to be 1.86 pCi/l.

It is important to note that radon levels vary from home to home and it is recommended by the NJDEP that all homes be tested. Both the NJDEP and the Environmental Protection Agency (EPA) suggest that action to mitigate a home be taken if test results indicate radon levels of 4.0 pCi/L or more. This will decrease the risk of developing lung cancer caused by radon exposure.

L. NOISE

Sound is the propagation of pressure waves through the air, caused by a vibration or disturbance. The sound may be pleasurable or annoying. If the noise is annoying, it is generally referred to as noise.

Community noise is a mixture of varied, unrelated sounds. The sources of these sounds are numerous, but the primary concerns are transportation noise, industrial noise and noises typical of community living. The loudness of the sound is a combination of all these community noise sources.

Noise can be measured directly in terms of decibels (dB) of sound pressure experienced at given distances from the noise source. These are usually expressed as A-weighted decibels (dBA) to approximate the actual range of sounds perceived by the human ear. Common indoor and outdoor noise levels are listed below.

Frequency, loudness and duration are important considerations when dealing with sound. The combination of these characteristics determine if the sound is pleasant, informative or annoying. *Frequency* refers to the tonal quality of noise and is the number of oscillations per second of a periodic wave. The units of frequency, hertz (Hz), are equivalent to cycles per second. The human ear filters out low and high frequencies on the A-weighted scale.

The Sound Pressure Level (SPL), or amplitude, is a measure of the strength or magnitude of the pressure wave of sound and is described in decibels. It is important to note that the sound pressure level does not add algebraically, but logarithmically. This relationship is especially important when considering that the human ear also performs in a logarithmic manner. Consequently, when the noise source is doubled, a three decibel increase occurs, and a healthy ear perceives a change in intensity. While a 10 decibel change in the noise level might be perceived as a doubling of noise to the same ear, this is actually a ten (10) fold increase in the noise source.

The *duration* of the sound is also important. If a sound lasts only for a fraction of a second (impulse noise), it may be briefly disturbing, but usually would not interfere with ongoing activities. However, activities can be affected, if noise persists for long periods.

In 1974, the New Jersey Department of Environmental Protection (NJDEP) promulgated noise regulations to control noise from stationary commercial and industrial sources, pursuant to the Noise Control Act of 1971. These regulations established the following maximum noise levels, when measured at or within the property line of any receiving properties:

Outdoors:

Residential Properties		Non-Residential Properties
7:00 am – 10:00 pm	10:00 pm – 7:00 am	24 Hours
65 dBA	50 dBA	65 dBA

Indoors:

Residential Properties		Non-Residential Properties
7:00 am – 10:00 pm	10:00 pm – 7:00 am	24 Hours
55 dBA	40 dBA	55 dBA

Impulsive sound (either a single pressure peak or multiple pressure peaks that has a duration of less than one second) may not exceed 80 decibels at all times.

On December 23, 1997, The Monroe Township Council adopted a noise ordinance (Chapter 213), which includes the above noise level standards, as well as the following restrictions:

a. Non-commercial or non-industrial power tools and landscaping and yard maintenance equipment shall not be operated between the hours of 8:00 pm and 8:00 am, unless such activities can meet the applicable limits set forth in the above tables. All motorized equipment used in these activities shall be operated with a muffler. At all other times, the limits set forth in the above tables do not apply to non-commercial or non-industrial power tools and landscaping and yard maintenance equipment.

b. Commercial or industrial power tools and landscaping and yard maintenance equipment, excluding emergency work, shall not be operated on a residential property or within 250 feet of a residential property line when operated on commercial or industrial property, between the hours of 6:00 pm and 7:00 am on weekdays, or between the hours of 6:00 pm and 9:00 am on weekends or federal holidays, unless such activities can meet the limits set forth in the above tables. In addition, commercial or industrial power tools and landscaping and yard maintenance equipment, excluding emergency work, utilized on commercial or industrial property shall meet the limits set forth in the above tables between the hours of 10:00 pm and 7:00 am. All motorized equipment used in these activities shall be operated with a muffler. At all other times, the limits set forth in the above tables do not apply to commercial or industrial power tools and landscaping and yard maintenance equipment.

c. Construction and demolition activity, excluding emergency work, shall not be performed between the hours of 6:00 pm and 7:00 am on weekdays, or between the hours of 6:00 pm and 9:00 am on weekends and federal holidays, unless such activities can meet the limits set forth in the above tables. All motorized equipment used in construction and demolition activity shall be operated with a muffler. At all other times, the limits set forth in the above tables do not apply to construction and demolition activities.

d. Motorized snowblowers, snow throwers and lawn equipment with attached snow plows shall be operated at all times with a muffler.

e. An exterior burglar alarm of a building or motor vehicle must be activated in such a manner that the burglar alarm terminates its operation within five minutes for continuous airborne sound and 15 minutes for impulsive sound after it has been activated.

f. Personal or commercial vehicular music amplification or reproduction equipment shall not be operated in such a manner that it is plainly audible at a residential line between the hours of 10:00 pm and 8:00 am.

g. Personal vehicular music amplification equipment shall not be operated in such a manner as to be plainly audible at a distance of 50 feet in any direction from the operator between the hours of 8:00 am and 10:00 pm.

h. Self-contained, portable, hand-held music or sound amplification or reproduction equipment shall not be operated on a public space or public right-of-way in such a manner as to be plainly audible at a distance of 50 feet in any distance from the operator between the hours of 8:00 am and 10:00 pm. Between the hours of 10:00 pm and 8:00 am, sound from such equipment shall not be plainly audible by any person other than the operator.

Noise measurements should be taken by a qualified person. NJAC 7:29-2.11 states, "….a person shall be considered qualified to make noise measurements if such person completes a noise certification course, and is recertified, at least once every two years, at a noise certification course which is offered by the Department of Environmental Sciences of Cook College, Rutgers, the State University."

Requirements for equipment needed to measure noise, as outlined in NJAC 7:29-2.6(a), are as follows:

i. Sound level meters:

   i. Measurements of continuous sound shall be made either with a Type 1 (Precision) or a Type 2 (General Purpose) sound level meter manufactured to the requirements of ANSI S1.4-1971 specification for sound level meters (see N.J.A.C. 7:29-2.12(a)2) or its successor.

ii. Measurements of impulse sound shall be made with a Type 1 (Precision) or with a Type 2 (General Purpose) sound level meter equipped for measuring peak values and manufactured to the requirements of IEC Publication 651 (1979) "Sound Level Meters" (see N.J.A.C. 7:29-2.12(a)3) or its successor.

iii. Measurements of sound by octave bands shall be made with a sound level meter with octave band frequency filter set that conforms to the requirements of Class II as specified in ANSI S1.11-1966 (R-1976) "specification for octave, half-octave, and third-octave band filter sets" (see N.J.A.C. 7:29-2.12(a) 1).

j. Calibrators used should be those recommended by the manufacturer of the sound level meter.

k. Other equipment:

i. A wind screen, as recommended by the sound level meter manufacturer.

ii. A wind speed measuring instrument including a range of five to 15 miles per hour (2.2 to 6.7 meters per second) with plus or minus two miles per hour (plus or minus 0.9 meters per second) accuracy.

iii. Optional equipment including a flashlight or miner's lamp, a microphone extension cable an extension pole with microphone holder, a headphone equipped with a plug to fit the sound level meter, a tape measure or an optical distance indicator for determining distance, a compass for determining direction or, alternatively, a suitable map of the vicinity, and a thermometer for determining ambient temperature.

M. KNOWN CONTAMINATED SITES AND BROWNFIELDS

The New Jersey Brownfield and Contaminated Site Remediation Act (N.J.S.A. 58:10B-1 et seq.) defines Brownfields as "any former or current commercial or industrial site, currently vacant or underutilized and on which there has been, or there is suspected to have been, a discharge of a contaminant." The revitalization of such areas, once thought to be unusable, has become a cornerstone of New Jersey's Smart Growth Initiative, making the redevelopment of urban areas, older suburbs and rural towns more viable and attractive to developers. It is important to note not all contaminated sites are Brownfield sites and not all Brownfield sites are contaminated.

The Department of Community Affairs (DCA) employs the Eight (8) Goals of the State Planning Act and the State Development and Redevelopment Plan (klState Plan) to encourage Smart Growth through the reuse of land. In addition the DCA, through The Office of Community Affairs, helps Brownfield projects through a variety of funding programs and technical programs.

In May 2001, the Gloucester County Board of Chosen Freeholders instituted a Brownfields/Redevelopment Program to help municipalities plan and implement the redevelopment of Brownfield sites. As part of this program, the County has created a database of every Brownfield location, as part of an effort to help municipalities create redevelopment opportunities in these underutilized areas.

The Gloucester County Department of Economic Development has identified over 300 Brownfield locations throughout the County. The location of Brownfield sites in Monroe Township, as identified by Gloucester County, are shown in FIGURE 9.

The NJDEP's 2001 Known Contaminated Sites (KCS) List has identified a total of thirty-four (34) sites in Monroe Township. This list includes the status and the date that the site entered a remediation program and can be found on the NJDEP's website www.state.nj.us/dep/srp .

The NJDEP also maintains a list of available Brownfield sites at the Brownfield Site Mart. The Brownfields Site Mart is designed to make it easier for developers to locate and build on land in cities and towns, while preserving the state's dwindling inventory of open space. Remediating and returning possibly contaminated commercial or industrial sites to productive use is a "Smart Way to Grow".

The NJDEP's Brownfield Sites Mart does not currently list any properties in Monroe Township. If a vacant site in the Township needs an investor, the site can be nominated on the Brownfield Mart Website at: www.njsitemart.com .

For a Brownfield Site to be nominated, the following information must be provided:

1. Property Type - Former or Current Commercial or Industrial Site
2. Property Owner Type – Public or Private
3. Owner's First and Last Name or Name of Organization
4. Name of Authorized Representative
5. Relationship to Owner
6. Owner's Address, City, State, Zip, Phone # & Email
7. Contact's Address, City, State, Zip, Phone # & Email Site Name
8. Site Description
9. Site County (search field)
10. Site Municipality (search field)
11. Site Address, City, Zip Code, Block & Lot
12. Site Current Zoning
13. Transaction Type
14. Property Size in Acres
15. Property Size Range (search field)
16. Any Land Use or Deed Restrictions
17. Any Tax Lien on Property
18. Public Water Availability
19. Electric Availability
20. Gas Availability
21. Public Sewer Availability

N. UTILITIES

Monroe MUA provides public sewer and water service to the Township. The sewage is conveyed to the Gloucester County Utilities Authority for treatment. The MUA operates six (6) active wells for drinking water pumping from the Cohansey Strata. More information can be obtained from the Monroe MUA website www.monroemuanj.com.

The Monroe Township Public Works Department is responsible for all residential trash pick-up, recycle pick-up, leaf collection, and snow removal on public roads. The Public Works Department is not responsible for the collection of commercial trash or construction debris.

Energy is provided by Connective Power Delivery and South Jersey Gas.

VI. RELATIONSHIP OF THE MASTER PLAN TO OTHER PLANS

GOAL: *Eliminate the potential for conflicts among dissimilar land uses.*

OBJECTIVE: *To ensure sufficient space, privacy and convenience in all residential areas to meet accepted standards of community health, safety and welfare.*

OBJECTIVE: *To provide for the buffering of adjacent residential uses to protect residents from the effects of traffic, lighting, truck movement, noise, etc. associated with nonresidential development.*

OBJECTIVE: To concentrate *new industrial development in areas with good access to limited access highways and with adequate utility service.*

A. NEW JERSEY DEVELOPMENT AND REDEVELOPMENT PLAN

This Master Plan appears to compliment the goals and intentions of the New Jersey Development Redevelopment Plan of 2004, which is in the Cross Acceptance negotiation stage in Gloucester County as of the writing of this text (see attached State Plan Areas map). As it currently stands, the State Plan recognizes the sensitive nature of the Township's Pinelands and protected areas as well as the suburban character of the non-Pinelands areas as it has been described herein. No discrepancy is anticipated between the two plans.

B. NEIGHBORING TOWNSHIPS

1. WASHINGTON TOWNSHIP

Bordering Monroe Township to the northwest along Glassboro-Cross Keys and Cross Keys- Berlin Roads, Washington Township abuts the following zones: R-2, C, RA, and BP. Two highway commercial zones lie across from the northern Monroe R-2 zone along Glassboro-Cross Keys Road. They are meant to enhance future residential development. While they remain largely undeveloped, it is our opinion that the zoning potentially conflicts with the low density residential use existing and zoned for on the Monroe side of Glassboro-Cross Keys Road. As Monroe develops on this edge, design treatments and setbacks for housing should reflect the potential adverse impact of highway commercial development on the Washington Township side. Doing so may mean requiring greater setbacks for new housing or providing physical buffers to the street.

Other Washington zones bordering Monroe include Planned Residential (PR-3) and Rural (R), both of which are intended to preserve low density development. Aside from the above, the zoning schemes are compatible.

2. WINSLOW TOWNSHIP

Winslow Township borders Monroe along much of its northeastern border from Berlin-Cross Keys Road to the border of the Borough of Folsom. About two thirds of this border lies within the Pinelands. In this area, a long stretch of Winslow Township's Recreation and Conservation zone abuts Monroe's two Forest Districts. Outside of the Pinelands, Monroe has a number of different zones along this border: R-2, RA, C, and BP. Much of the Non-Pinelands area on the Winslow township side consists of a Recreation and Conservation zone. Other zones include low density residential, minor commercial, and public. Potential conflicts between zones on opposite sides of the border are mitigated by a river running along the border: The Four Mile Branch of The Great Egg Harbor River. Development on both sides is precluded by this stream and its surrounding wetlands, and therefore no zoning conflicts are anticipated.

3. BOROUGH OF FOLSOM

   Folsom borders Monroe along a 3,500 foot stretch of land in the eastern half of the southeastern edge of Monroe. The Monroe side contains a FD-40, RD-C, and a very small stretch of RD-RR. The Folsom side also contains only forest and rural development zones. All of the zones on both sides are rural in character and therefore the zoning is compatible.

4. BUENA VISTA TOWNSHIP

   Bordering Monroe Township along the southeastern edge, immediately south of Folsom, Buena Vista Township abuts Monroe's Rural Development Residential Sending and Rural Development Residential Receiving districts. Buena Vista's zones are Pinelands residential and Rural Development residential. This zoning is compatible.

5. FRANKLIN TOWNSHIP

   Franklin Township borders Monroe along much of its southern border. The bulk of the zones along the Monroe-Franklin border lie within the Pinelands boundary and are thus zoned compatibly. Monroe's Rural Development zones abut agricultural lands and open space. Outside the Pineland Boundary, on the Monroe side an R-2 zone faces an open space zone on the Franklin side. The plans for the two communities are consistent with each other.

6. BOROUGH OF CLAYTON

   Clayton Township borders Monroe along an 8,000 foot (approx.) stretch of Monroe's southern border, the length of which is zoned R-2 on the Monroe side. Corresponding zones on the Clayton side include open space, agricultural and medium density residential.

7. BOROUGH OF GLASSBORO

   Glassboro borders Monroe to the west along Monroe's southern border. The area is mostly zoned R-2 along with small sections of BP and C on the Monroe side facing a large "Public & Quasi Public zone" on the Glassboro side.

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