MASTER PLAN

Township of Manalapan
New Jersey

Document
1
two sided

Prepared By:

TOWNPLAN ASSOCIATES
Eleven Tindall Road
Middletown, New Jersey 07748

MANALAPAN TOWNSHIP PLANNING BOARD

RESOLUTION ADOPTING AMENDED MASTER PLAN

WHEREAS, the Planning Board of the Township of Manalapan has undertaken a revision of its Master Plan pursuant to N.J.S.A. 40:55D-28; and

WHEREAS, the Planning Board of the Township of Manalapan has retained Richard S. Cramer, Jr., P.P., A.I.C.P., of Townplan Associates, the Township's Planning Consultant, to prepare an amended Master Plan; and

WHEREAS, the Township Planning Consultant prepared an Amended Master Plan, dated April 1990, and presented that plan to the Planning Board; and

WHEREAS, the Planning Board held a public hearing on the amended Master Plan on May 7, 1990, after complying with the notice requirements of N.J.S.A. 40:55D-13; and

WHEREAS, as a result of comments made by Board Members and members of the public, several revisions and changes were made to the proposed amended Master Plan; and

WHEREAS, the Township Planning Consultant prepared a revised Master Plan, incorporating some of the changes discussed by the Planning Board and by the public during the preceeding months, and presented that plan to the Planning Board in April 1991; and

WHEREAS, a continued public hearing was held by the Planning Board on April 25, 1991, again after compliance with the notice provisions of N.J.S.A. 40:55D-13; and

WHEREAS, the public hearing was closed on April 25, 1991, and the matter was continued for further Planning Board discussion at the meeting on May 23, 1991; and

WHEREAS, the Township Planning Consultant set forth on the record corrections on page 11-3 and on page 15-2 to the Planning Board at its meeting of May 23, 1991; and

WHEREAS, the Planning Board of the Township of Manalapan has deliberated and discussed this matter thoroughly.

NOW, THEREFORE, BE IT RESOLVED by the Planning Board of the Township of Manalapan that it hereby approves and adopts the amended Master Plan as prepared by Richard S. Cramer, Jr., P.P., A.I.C.P., of Townplan Associates, the Township Planning Consultant, dated February 1990, as revised April 1991, and as further corrected May 23, 1991.

BE IT FURTHER RESOLVED that the Township Planning Consultan be and hereby is authorized to prepare complete sets of the revised Master Plan, incorporating all changes adopted by the Planning Board of the Township of Manalapan, and to distribute copies of same to the Planning Board Members and to provide additional copies to the Planning Board administrative office.

BE IT FURTHER RESOLVED that a copy of this resolution, with a copy of the amended Master Plan attached, shall be provided to the County Planning Board by personal service or by certified mail on or before June 23, 1991.

BE IT FURTHER RESOLVED that a copy of this Resolution,

certified to be a true copy by the Secretary of the Planning Board be forwarded to the Township Construction Official, Township Engineer, Township Zoning Officer, Township Clerk, Board of Health, Township Administrator, Township Planning Consultant, Township Tax Assessor, Township Tax Collector, Township Attorney, Township Finance Officer and the Applicant herein within ten (10) days of the date hereof.

This Resolution memorializes an action taken at the regular meeting of the Manalapan Township Planning Board held on 5/24/91, 1991, with a roll call as follows:

THE FOREGOING RESOLUTION WAS:
Offered by: J. McKenna
Seconded by: W. Pytlik

	YES	NO	ABSTAIN	ABSENT
Weiss	(✓)	( )	( )	( )
Weisenberg	(✓)	( )	( )	( )
Pine	(✓)	( )	( )	( )
Patterson	(✓)	( )	( )	( )
Hanlon	( )	(✓)	( )	( )
Kulick	( )	(✓)	( )	( )
J. McKenna	(✓)	( )	( )	( )
Pytlik	(✓)	( )	( )	( )
Nickel	( )	( )	( )	( )
K. McKenna (alt.)	( )	( )	( )	( )
Benjamin (alt.)	( )	( )	( )	( )

The foregoing Resolution of Memorialization was offered by M and was seconded by M , was adopted on roll call by the following vote:

	YES	NO	ABSTAIN	ABSENT
Weiss	( )	( )	( )	( )
Weisenberg	( )	( )	( )	( )
Pine	( )	( )	( )	( )
Patterson	( )	( )	( )	( )
Hanlon	( )	( )	( )	( )
Kulick	( )	( )	( )	( )
J. McKenna	( )	( )	( )	( )
Pytlik	( )	( )	( )	( )
Nickel	( )	( )	( )	( )
K. McKenna (alt.)	( )	( )	( )	( )
Benjamin (alt.)	( )	( )	( )	( )

I hereby certify that the foregoing Resolution was adopted by the Planning Board of the Township of Manalapan at its meeting of 5-23, 1991.

, Secretary

MASTER PLAN

TOWNSHIP OF MANALAPAN
NEW JERSEY

Prepared By:

TOWNPLAN ASSOCIATES
Eleven Tindall Road
Middletown, New Jersey 07748

Adopted: May 23, 1991

RICHARD S. CRAMER, JR., P.P., A.I.C.P.

The original of this document has been signed and sealed in accordance with New Jersey Law.

TOWNSHIP OF MANALAPAN

MONMOUTH COUNTY, NEW JERSEY

TOWNSHIP PLANNING BOARD

ROBERT WEISS, CHAIRMAN

ROBERT WEISENBERG, VICE CHAIRMAN

LORRAINE KULICK, MAYOR
JOHN MCKENNA, COMMITTEEMAN

WALTER BENJAMIN
NOREEN HANLON
KEVIN MCKENNA

WILLIAM NICKEL
ROBERT PATTERSON
STEPHEN H. PINE, SECRETARY
WALTER PYTLIK

SHIRLEY L. SPODAK, ADMINISTRATIVE OFFICER
JAMES H. GORMAN, ESQ., ATTORNEY

JOHN ALLGAIR, P.E. AND BRUCE NEU, P.E., ENGINEERS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

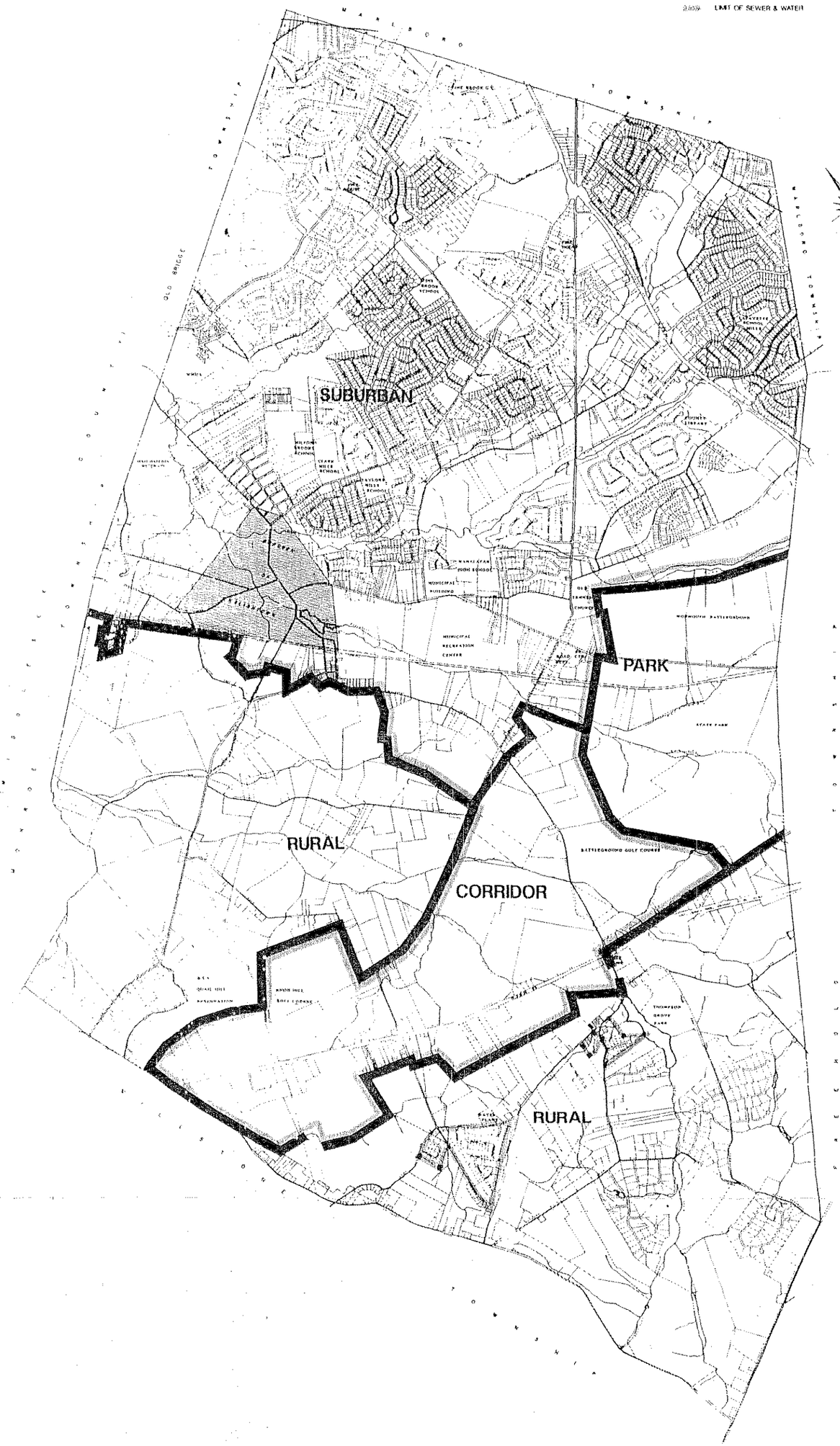
The second half of the twentieth century has been a period of dramatic growth and change for Manalapan Township. In that time, it has evolved from a rural farm community into a residential suburb within the New Jersey - New York Metropolitan Area. Because of its favorable location within the region and access to the Route 9 and Route 33 corridors, continued growth is expected.

While this period of rapid development has created economic opportunity as well as expanded the supply of housing within the region, it has also strained the capacity of public infrastructure, created additional demands for municipal facilities and services, altered the landscape, and impaired natural resources.

In order to guide the projected growth of Manalapan through the year 2010, the township planning board has prepared this Master Plan. In accordance with the New Jersey Municipal Land Use Law, the plan contains written and graphic proposals for the development of the township. The plan elements establish policies for land use, housing, circulation, historic preservation, utilities, community facilities, recreation, conservation, and recycling. Technical analyses undertaken on the township setting, history, population, natural resources, existing land use, and infrastructure have been included in the section entitled Basic Planning Studies. The Township Natural Resource Inventory, prepared in 1976 by Dames and Moore, has been included as an appendix to the plan.

The master plan provides a balance between conserving desirable community features and rural qualities and continued suburban development. This is done by recognizing the locations in the township which have been committed to or approved for development. These are arranged into an area of suburban development in the north and an area of major planned development along the Route 33 corridor. Most residential and commercial growth will occur in these locations (Figure 1). Outside the suburban and corridor areas, rural patterns should be maintained. The rural areas emphasize maintaining extended areas of farmland, open space and natural features. Low residential densities will be required. Since the rural areas will rely upon septic systems, a nitrate dilution model can be used as a guideline for evaluating suitable rural densities.

FIGURE 1
CONCEPT



BASE MAP

Prepared By: John Allgair
Manalapan Township Engineer

Updated By: TOWNPLAN Associates
November 1989

MANALAPAN TOWNSHIP
MONMOUTH COUNTY, N. J.

SCALE 1"=1000'

TOWNPLAN Associates

BASIC PLANNING STUDIES

GENERAL

In order to develop a revised master plan for Manalapan Township, Townplan Associates has compiled the basic planning studies presented in this report. The studies provide an inventory of conditions and trends which will influence Manalapan's further development. The specific studies undertaken include the following:

- The Township history and the location of its historic sites and structures;
- Characteristics and trends of the Township population;
- Natural resources within the Township with a focus on those features which constrain development or require preservation or protection;
- Inventory of existing land use and changes;
- Review of existing zoning;
- Review of sewer, water, circulation and stormwater infrastructures;

The information in the basic studies indicates that the Township will continue to experience substantial residential development through the next decade. However the supply of developable residentially zoned land will be constrained by the presence of flood plains, freshwater wetlands and the lack of sewerage service. Although more than eleven square miles of the Township remains uncommitted to development, approximately forty percent of that area may be affected by freshwater wetlands and wetlands transition areas. Somewhat more than two square miles are outside of potential wetland locations and within an existing or planned sewer area. Over half of that area (1.2 square miles) is presently zoned for office or office park development.

Additional findings suggested by the basic studies include the following:

- The doubling of population between 1980 and 2010 will be accompanied by increased demands for municipal facilities and services including recreation, public safety, and public works.
- Although the long term trend is toward smaller household size and an aging population, in the short term the increased number of households in Manalapan has been accompanied by an upsurge in births. Births are at their highest level since 1974. This increase will be reflected in school enrollments in the 1990's.

The Township continues to develop as residential community. Although substantial acreage has been zoned to develop an economic base, the commercial uses which have developed are primarily oriented to serving the residential population.

- Farm acreage has declined substantially and will continue to feel development pressures.

- Large portions of the Township will remain unsewered and lack water service. At the same time, these areas drain into potential sources of a potable water supply (Matchaponix and Manalapan Brooks). The nitrate dilution model proposed in the state plan suggests density ranges for unsewered areas in order to maintain water quality. In Manalapan, depending upon aquifer outcrop formations, the suggested densities range from two to twenty acres per dwelling unit.

- Although a number of landmark buildings and sites remain within the Township, present development regulations afford little protection or recognition to them.

- The major natural features constraining development in Manalapan are wetlands, flood hazard areas, steep slopes and stream corridors. Open space, woodlands and fields, and associated wildlife habitat will continue to be diminished by development.

Coordination is needed between the infrastructure planning for sewerage and the Township development plans. Presently, the planned and existing sewer areas omit locations where the Township zoning encourages development.

- As development shifts to the available lands in the southern portion of Manalapan, the Township will experience pressures to intensify residential development or to reallocate lands planned for commercial development to residential uses.

- The Township will be assigned an additional Mount Laurel housing obligation in 1993. Intensification of residential development should only be permitted in conjunction with required set-asides or contributions to help the Township meet its post - 1993 obligations.

- Sources of water supply, treatment and distribution have been identified within the Township's franchise area for future commercial, industrial, office and residential development.

REGIONAL SETTING

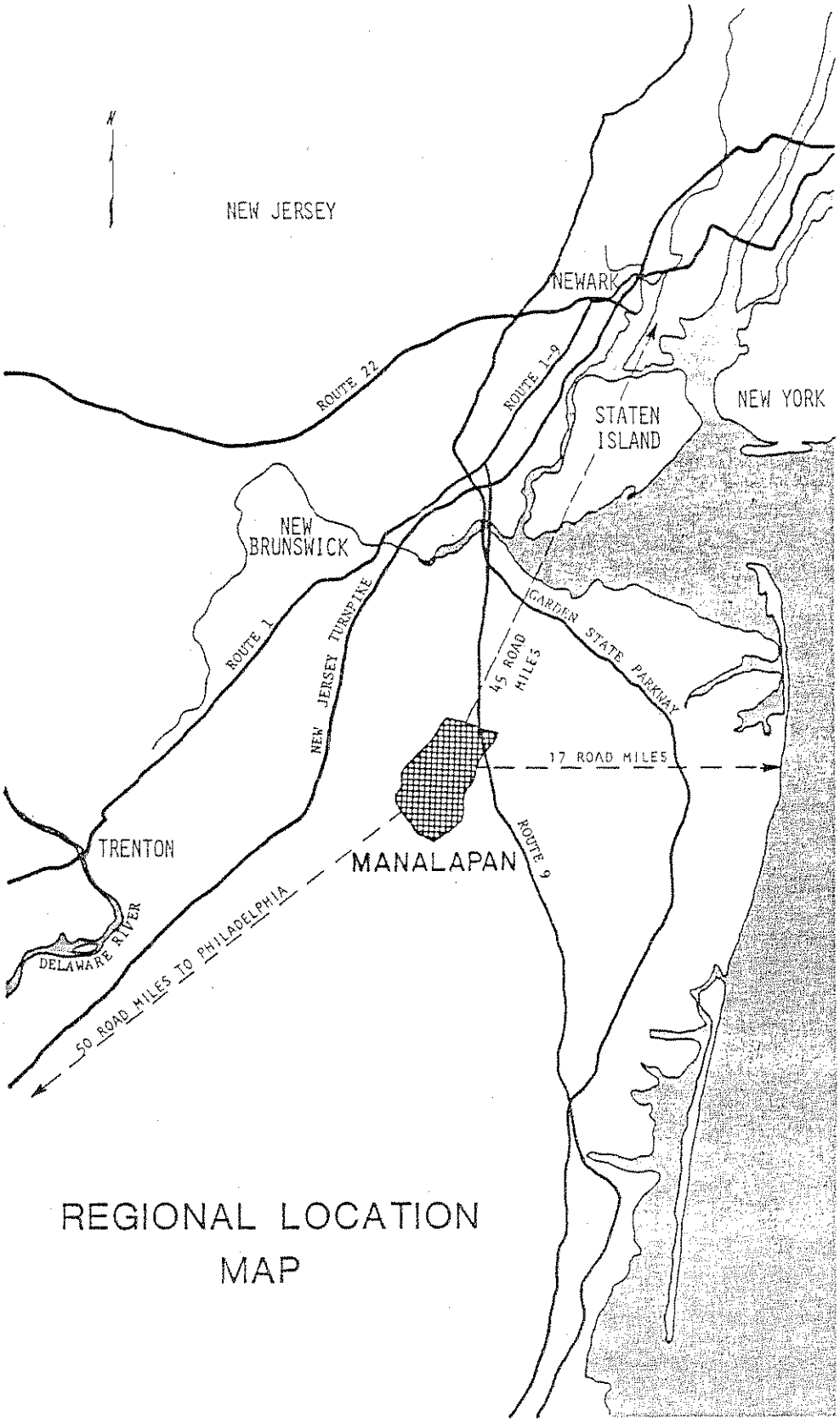
Manalapan Township is a suburban community located on the inner coastal plain in north central Monmouth County (Figure 2). The Township's relatively large size, 30.85 square miles, makes it seventh in area among Monmouth County's 53 municipalities. Lying south of New York City, it is accessible to the highway network which serves the northern New Jersey - New York metropolitan complex.

Manalapan Township's proximity to Newark and New York as well as it picturesque landscape, have influenced development. The first European inhabitants were farmers. Because of their distance from urban centers, they had to be almost entirely self-sustaining. As the region grew, Manalapan benefited from its proximity to the urban markets of Newark and New York City and the improvements in roads that facilitated transportation. These and other factors contributed to the emergence of a market agriculture economy and associated industries in the 19th Century. Today, Manalapan's location and attractive environment has drawn an influx of population seeking homes in a suburban-rural community. Retail, service, and office development has accompanied the population growth.

The regional road network servicing the Monmouth County area has been a major factor in the Township's development. Dualized Route 9 provides access to the Garden State Parkway which extends from New York State south through Monmouth County to Cape May. In addition, Manalapan is crossed east-west by Route 33 providing access to the New Jersey Turnpike at Interchange 8. The Turnpike serves the eastern corridor, which links the metropolitan areas of New York, Philadelphia and Washington, D.C.

The Township shares boundaries with five municipalities and also encircles the Borough of Englishtown. To the north, the Township is bounded by Old Bridge Township and Monroe Township, both of which are located in Middlesex County; to the east, by Marlboro Township; to the south and southeast by Freehold Township; and to the west by Millstone Township.

FIGURE 2



REGIONAL LOCATION MAP

HISTORICAL BACKGROUND

The Lenni Lenape Indians were the earliest residents in Manalapan Township. The name Manalapan, in the Lenape language, means either "land which produces good bread" or "covered swamp with edible roots."

The Lenape Indians maintained a network of trails throughout central Jersey, two of which may have passed through Manalapan Township. The main Indian trail, the Navesink Trail, later called the Burlington Trail by Europeans roughly followed Route 537 and connected oyster beds in the Navesink and Shrewsbury Rivers with permanent settlements in Burlington County. The second trail, approximated by Route 9, extended from the mouth of the Raritan River to Cape May. In addition to the plentiful source of oysters and clams along the coast the Lenape Indians practiced a method of agriculture called "slash and burn". The Lenape planted maize (corn), as well as popcorn, lima beans, squash, pumpkins, bottle gourd, jerusalem artichokes, and sunflowers.

The Raritan River basin, which includes Manalapan, was settled by Scottish immigrants in the mid 1660's. After George Carteret, the proprietor of the Province of East Jersey, died in 1680, the Province was sold to a group of Quakers. The group consisted of a number of Scots which vigorously encouraged immigration from Scotland. In 1683, they established Perth Amboy as the major port of entry.

Englishtown and Millhurst were the earliest sites of European settlement. Both settlements developed around mill sites which provided the milling of grain into flour, an essential service to the farmers of Manalapan. The mill at Englishtown was originally called "Sharp's Mill", and the mill at Millhurst was known as "Craig's Mill". Manalapan's most notable landmark has been the Tennent Church or the "Presbyterian Church of the Town of Freehold". After the formation of the congregation in the 1660's, its first meeting house was constructed at the Old Scots Burying Ground, on Gordon's Corner Road near Wyncrest Road in Marlboro. During the early 1700's the congregation built a new meeting house on White Hill, the location of the present church today. A tavern known as the Bear Tavern, was operated by Caroline Gordon from her house in Gordons Corner in 1828.

During the American Revolution, Manalapan was the site of a major battle between a large British supply caravan and the Continental Army. Although the outcome of the battle was inconclusive, it was one of the first encounters between the British and Continental forces which did not result in a British victory.

Prior to 1848, Manalapan Township had been part of Freehold Township, with Englishtown the major village center for Manalapan.

The first Englishtown school was established in 1817, and was held in the Old Tavern House, presently the Hulse Funeral Home. It was later moved to "No Chance" at the end of Water Street.
Manalapan grew around a hotel, which was called Hannah Claytons Inn in 1844. It was located in Manalapan Village at the end of Smithburg-Manalapan Road, where it crosses Route 33. In 1856, the Manalapan Presbyterian Church was organized. John Hunt opened a store in 1860 and a blacksmith shop was opened by 1873. These were followed by the opening of a Post Office in 1880.

Today, although farms continue to operate in Manalapan, the introduction of the automobile has changed Manalapan from a rural farm community to a suburban residential community with a large commuting population. Retail and service firms have replaced the industries of the 19th Century.

During the 1980's, property values increased substantially due to a strong regional economy, improved transportation systems, and Manalapan Township's location within the New york metropolitan region. These factors combined with developable land have contributed to rapid growth.

Historical Structures

Manalapan's history has given the present generation an environment that is architecturally and culturally significant. The houses, farms, fields and villages of the past are the bearers of Manalapan's history and heritage. Important Manalapan sites have been listed in the Monmouth County Historic Sites Inventory. This inventory was undertaken in accordance with the National Historic Preservation Act of 1966, which identifies, recognizes, and preserves historic properties through a historic preservation fund. The County Inventory also assessed the eligibility of Manalapan's site for inclusion on the National Register of Historic Places. The results are shown on Table 3-1, "Monmouth County Historic Sites Inventory Township of Manalapan". The location of Manalapan Township historic sites are identified also in Figure 3, "Manalapan Township Historic Sites".

1. Monmouth Battlefield - The site located in both Manalapan and Freehold Township lies between State Route 33 and Craig Road directly along Manalapan's eastern border. The site recently established as Monmouth Battlefield State Park, serves as a historical focal point, preserving the scene of the battle and some of the open space which characterized Manalapan at the time. The State Park contains many buildings that date back to the mid 1800's and are representative of late eighteenth century styles in Manalapan. Included in these buildings is the Old Tennent Church (1-5) one of the most important buildings in Monmouth County. The rest of the sites include the John Conover House (1-1), a farm complex on Freehold-Englishtown Road (1-2), the Rev. A. P. Cobb House (1-3), and

the Sutfin-Solomon House (1-4) which was very close to the center of the Battle of Monmouth.

1-1. John Conover House - N. side Freehold-Englishtown Road, 0.4 mile E. of Tennent Road. This building is an unusually large highly designed example of the Federal Style in Monmouth County. The building is a two and one-half story farmhouse with clapboard siding and gabled roof. It is notable for its unusual door enframement and 6/6 sash windows with slender mullions and plain surrounds. The house was owned by Sheriff John M. Perrine and his wife during much of the nineteenth century.

1-2. Farmstead - N. side Freehold-Englishtown Road, 0.3 mile W. of Wemrock Road. The farm complex consists of five significant historic structures including a farmhouse, constructed in the early nineteenth century, wagonshed, constructed in the second half of the nineteenth century, smokehouse, and three connected barns and a grain silo, which were constructed in the nineteenth century. The house, is a framed building consisting of two and one-half stories with clapboard siding. The house is a product of several additions over the years and is presently boarded up and near collapse. It was owned by Dr. J. C. Tomson during the second half of the nineteenth century.

1-3. Rev. A.P. Cobb House - S. side Freehold-Englishtown Road, 0.7 mile E. of Tennent Road. This house is an unusually highly designed example of the Italianate Style in Manalapan. The building is a three story residence constructed in 1870. The house includes a flat roof with a cupola and clapboard siding. This was the Tennent Church Parsonage during the Rev. A. P. Cobb's pastorate.

1-4. Sutfin - Solomon House - S. side Freehold-Englishtown Road, 0.7 mile W. of Wemrock Road. This house is a two and one-half story residence with a five bay asymmetrical plan. As with other historic structures in the area it is a product of several additions over time. It was originally constructed as a one and one-half story one room cottage in 1770.

1-5. Presbyterian Church of Freehold - S.E. corner of Tennent Road and Craig Road. This is one of the most significant buildings in Monmouth County. Its construction in 1751-2 introduced the high Georgian Style to Central Monmouth County. It was constructed in 1751 on the site of an earlier church built in 1731, for a congregation formed in 1705. The church reportedly did service as a hospital for the wounded troops of Washington's Army during the Battle of Monmouth. The building has changed little since its original construction and is in an excellent state of preservation.

2. Joseph Forman House - E. side Amberly Road West, N. of Covered Bridge Development Recreation Building. This is a one and one-half story 3 bay cottage built in the early eighteenth century. Having undergone numerous alterations all that probably remains of the original structure is the framing. Also, known as the "Malchapoina", the house was the birth place of General David Forman, an influential Revolutionary War Commander.

3. James English House - 8 Browning Place. This building is a two and one-half story Greek Revival farmhouse, constructed in 1885. The most notable feature of the house is the side and transom lights framed doorway, which is approached by brick steps and sheltered by a square post, hip roof portico.

4. Daniel Dubois Farm - N. side County Route 537, 0.6 mile E. of Smithburg Road (at the end of gravel drive). The farm consists of three significant historic structures which include the farmhouse, constructed in 1842, barn and wagon shed, constructed in the mid and late nineteenth century respectively. The house, is a two story frame residence. It is considered a typical example of the stylistically simple farmhouses which were built in Manalapan during the first half of the nineteenth century. The house includes a Gable roof and close end wall eaves and utilizes an Italianate three bay porch in front. The site is surrounded by pasture and gently rolling hills. The house has a small brook and pond located in the front and is separated from the road by woodland.

5. Farmstead - N. side County Route 537, 0.2 mile W. of Thompson Grove Road. The farm complex contains three significant historic structures including, a farmhouse constructed in 1840, and wagonshed and barn which were both constructed in the second half of the nineteenth century. The farmhouse utilizes a five bay form with a three bay Italianate porch. Significantly, behind the complex is the site of the Thompson stone house which was destroyed in 1966. The Thompson house served as the first Freehold town meeting and may be an important archeological site.

6. Robert Craig House - N. side Craig Road, adjacent to Washington's Advance, (at end of gravel driveway). This is a good example of the stylistically simple, yet large farmhouse which characterizes construction in Manalapan during the mid-nineteenth century. Originally a three bay farmhouse, it was later expanded to a five bay form with Greek Revival Elements. Robert E. Craig owned the house for the most of the second half of the nineteenth century. Craigs have lived in this section of Manalapan since the early eighteenth century.

7. Farmstead - S. side Craig Road, 0.55 mile W. of the U.S. Route 9. This farm complex consists of four significant historic structures including two farmhouses, the first constructed in the mid-nineteenth century and the second constructed during the late nineteenth early twentieth century, a wagon shed and barn both built during the second half of the nineteenth century. Both farmhouses are typical of the Vernacular building found in Manalapan area as well as the general layout of the farmstead. The farm was owned by Hendrick P. Conover in 1851, by John W. H. Conover in 1873, and by W. H. Reid in 1887.

8. S. Side Craig Road, 2 miles W. of U.S. Route 9 - This building is an early nineteenth century two and one-half story residence. Although the building has had several additions the early section exhibits characteristics found in Federal Style buildings. With later alterations the building illustrates an interesting combination of styles with a Federal south facade and an Italianate north facade. The house was owned by J.I. Bowne in 1851 and by W. C. Bowne for much of the remainder of the nineteenth century.

9. Chicken House - 10 Gordon's Corner Road. This is a typical example of chicken houses that were built in Monmouth County beginning in the 1920's. It is a one story structure with a two story central portion with Gable roof.

10. James English House - 42 Gordon's Corner Road. As with many houses in the area, this structure is a composite of several additions over time. The original section, a traditional one and one-half story cottage built in 1740, was altered to include a full two stories and a large Federal three bay section in 1800. The house is a good example of houses built by prosperous families in the Manalapan area during the eighteenth-early nineteenth century.

11. Reid Family House - N.W. side of Iron Ore Road, 0.35 mile S.W. of Mount Vernon Road, at end of driveway. The house, built in 1839 is a good example of stylistic updating that has occurred in many of the houses in Manalapan. The original house, characteristic of Federal and Greek Revival forms was later expanded with the addition of a two bay section with Victorian/Italianate detailing.

12. N.E. end of LaValley Road in Quail Hill Boy Scout Camp - This building is a two and one-half story Georgian residence with Italianate alterations built in 1770. Included in the house is a Gable roof and clapboard and split shingle siding. Surrounded by woodlands, the house is part of the Quail Hill Boy Scout Camp, which includes a number of modern buildings. Owned by J. Van Dorn during the second half of the nineteenth century, it was reportedly built by a member of the Anderson family, who were among the original residents of Manalapan.

13. N.E. corner Main Street and ConRail RR Tracks - This is a two story Italianate Style residence, constructed in 1810. The house includes Gable roof, projecting eves with paired brackets and a paneled freeze, 6/6 sash windows with small projecting intels and a small transom light above the doorway. The house was owned by J. M. Perrine in 1860 and by C. D. Craig in 1873 and 1889.

14. S.W. corner Main Street and ConRail RR Tracks - This is a railroad siding complex which contains two significant historic structures. These include a small office building, constructed between 1916 and 1920 and a grain elevator, constructed during the same period. This is a good example of the railroad sidings which were located all along the railroad lines that ran through Monmouth County. The Freehold and Jamesburg Railroad was built in 1853 and was the first in Monmouth County.

15. W. side Main Street, 0.15 mile N. of Millhurst Road - This s a two and one-half story Georgian Style residence with Colonial Revival alterations, constructed in 1791. This is a well-maintained example of the substantial residences built in Manalapan during the later eighteenth century. Careful landscaping and closely cropped hedges surround the house. Originally owned by James Rue throughout much of the second half of the nineteenth century it was sold to the Tennent Church for uses as a parsonage on October 22, 1881.

16. E. Ely House - E. side Millhurst Road, 0.5 mile S. of Main Street at end of long driveway. This is a two and one-half story Italianate residence, constructed in 1865. It is notable for its clustered, Italianate porch posts, wide bracketed eaves, 2/2 sash windows with segmental heads and paired central bay windows. The site was owned by E. Ely in 1860 and 1873.

17. J. M. Quackenbush House - N.W. side Morganville Road, 0.5 mile N.E. of Gordon's Corner intersection. This two and one-half story residence, constructed in 1860, illustrates the use of Italianate elements on the traditional five-bay rectangular form which were common in Monmouth County in the mid nineteenth century. Located on a large agricultural lot, the house sits on a small rise close to the road. The farm was owned by J. M. Quackenbush in 1873 and 1889. Members of that family owned a number of farms in the area.

18. N.E. side Smithburg Road, 0.8 mile N.W. of County Road 537 - This is a two and one-half story Traditional residence, constructed in the mid-late eighteenth century with additions during the nineteenth century. It was the millhouse for one of the early mill sites in the Township. It has a narrow profile I form which reflects the English construction techniques common to western Monmouth County.

19. Woodville A.M.E. Church - N.E. side Smithburg Road, 0.25 mile S.E. of Lamb Lane. This building is a small Traditional church built in 1836. It has been a focal point for Manalapan's black community since the early nineteenth century and is the oldest black church in the County.

20. N. side State Route 33, 0.5 mile W. of Woodward Road - This two and one-half story Federal residence, constructed in 1820 is typical of a large number of highly designed farmhouses found in Manalapan. The house consists of a Gable roof, clapboard siding and a notable highly designed central bay which includes a classical doorway enframement with side lights, flanked by attenuated pilasters, surmounted by a four light transom with early eliptical tracery and projecting cornice. (Note: the building is scheduled for demolition as part of the Knob Hill Development).

21. Farmstead - N.W. corner State Route 33 and Millhurst Road. This farm complex consists of three significant historic structures including, a farmhouse, constructed in the mid-eighteenth century, wagonshed, constructed in the late nineteenth century and barn constructed between 1920-1930. This site is significant in the fact that it is one of the more intact and active farm sites in the Township. The orderly character of the building layout with its well defined house and farm area are characteristics that were generally found in the past. The farm had several owners during the second half of the nineteenth century; T. V. Conover owned it in 1851, Livingston Dubois in 1860, J. R. Dubois in 1873 and J. H. Probasco in 1889.

22. Farmstead - S. side State Route 33, 0.2 mile east of Smithburg Road. This farm complex consists of three significant historic structures including a farmhouse constructed between 1835 and 1850, a wagonshed and barn both constructed in the nineteenth century. The house a two and one-half story Greek Revival Style is a very good example of the substantial residences built during the mid nineteenth century in the southern section of Manalapan. This section was among the earliest areas to be settled in Manalapan. The farm was owned by C. A. Ellis in 1851, by J. F. Hunt in 1860 and 1873, and by D. A. Vanderveer in 1889.

23. George L. Hunt House - S. side State Route 33, 0.6 mile W. of Woodward Road. This is a two and one-half story Federal style house with Italianate alterations. When the house was first built in 1820, it was among the largest in what is now Manalapan Township. Italianate elements include wide eaves with paired brackets, a three-bay bracketed porch, and the narrow-width clapboards. It was owned by George L. Hunt, until his daughter and son-in-law, Mary T. and Livingston Dubois, purchased it is 1868.

24. 196 State Route 33 - This is a late eighteenth century two and one-half story substantial residence with Federal detailing and Italianate alterations. The house includes a Gable roof, wide eaves with double brackets and a porch which extends across the entire front of the structure. John Rue Perrine purchased the house between 1837 and 1841, and owned it through 1889.

25. Clifford Snyder Grist Mill - W. side Sweetman's Lane, 0.3 mile S. of State Route 33. This building is a three story mill, constructed in 1877. One of about half a dozen grist mills remaining in Monmouth County, its only one of two which have not been converted to another use. Originally called Craig's Mill, it is one of the earliest mill sites in the Township. It is one of the earliest mill sites in the Township. It is notable for its use of rolling machinery in the milling process, an improvement over the earlier grindstone process. It is among the last mills in the County to cease operation and was still operating in 1929.

26. Thompson Grove School - N.E. side Thompson Grove Road, 0.1 mile NW of County Route 537. Built in 1857, this is one of at least three nearly identical one room school buildings in Western Monmouth County. Although located in Manalapan, it was part of the Freehold Township school system. (Note: The building was demolished in 1990).

27. S.W. corner Tracy Station Road and Pergolaville Road - This is a typical example of a Victorian Vernacular house common in Manalapan. It is a late nineteenth early twentieth century, two and one-half story residence. The site is in a cluster of houses once known as Mount Vernon, and were part of the village area of Englishtown. The site was owned by C. Applegate throughout the second half of the nineteenth century.

28. Stillwell Farm - W. side of U.S. Route 9, 0.1 mile N. of Pine Brook Road. This farm complex consists of three significant historic structures including a farmhouse, constructed in 1850, barn, constructed in the mid-nineteenth century and wagonshed, constructed in the late nineteenth century. The house, notable for its state of preservation is a good example of a transitional five-bay Greek Revival/Italianate farmhouse. The original 176 acre tract, located along Route 9, was purchased by Joseph Stillwell in 1839 and has remained in the Stillwell family ever since. Today, it is one of the largest stretches of agricultural land along U.S. Route 9 in Manalapan.

29. N.E. corner Wickatunk Road and Morganville Road - This is a two and one-half story five-bay house with Greek Revival elements, constructed in 1797 with additions between 1810 and 1820. Used as a Tavern for much of the nineteenth century, it was originally called the Bear Tavern according to the 1828 Thomas Gordon map. By 1840 it was being run by Caroline Gordon, who operated it through 1887.

In addition to the sites identified as noteworthy by the Monmouth County Inventory, the Manalapan Planning Board recognizes the following as significant local landmarks:

30. Dreyer House - S. side of Freehold Englishtown Road. This is an 18th century farmhouse. The surrounding farm acreage was approved for subdivision in 1989.

31. Millhurst School - S.W. corner, intersection of Route 33 and Millhurst Road. This one-story 20th century school building is notable for its well-proportioned design, slate hip roof, architectural treatment, and red brick construction.

32. Landmark Corridor - The approaches to Tennent along Freehold-Englishtown Road, Main Street and Tennent Road provide access to the Monmouth Battlefield and to Old Tennent Church. The visual character of the corridor should be protected or enhanced in recognition of the national significance of these sites.

TABLE 3-1

MONMOUTH COUNTY HISTORIC SITES INVENTORY
MANALAPAN TOWNSHIP

INVENTORY #	ADDRESS	NRHP ELIGIBILITY
1326-1	Monmouth Battlefield	Yes
1326-1-1	John Conover House N. side Freehold-Englishtown Road 0.4 mile E. of Tennent Road	Yes
1326-1-2	N. side Freehold-Englishtown Road 0.3 mile W. of Wemrock Road	District
1326-1-3	Rev. A.P. Cobb House S. side Freehold Englishtown Road 0.7 mile E. of Tennent Road	Yes
1326-1-4	Sutfin-Solomon House S. side Freehold-Englishtown Road 0.7 mile W. of Wemrock Road	District
1326-1-5	Presbyterian Church of Freehold (Old Tennent) SE corner Tennent Road and Craig Road	Yes
1326-2	Joseph Forman House E. side Amberly Road W., North of Covered Bridge Development Recreation Building	No
1326-3	James English House 8 Browning Place	Possible
1326-4	Daniel Dubois Farm N. side County Route 537, 0.6 mile E. of Smithburg Road	Possible
1326-5	N. side County Route 537, 0.2 mile W. of Thompson's Grove Road	No
1326-6	Robert Craig House N. side Craig Road, adjacent to Washington's Advance	No
1326-7	S. side Craig Road, 0.55 mile W. of US Route 9	No
1326-8	S. side Craig Road, 2 west of US Route 9	Possible
1326-9	10 Gordon's Corners Road	No
1326-10	James English House 42 Gordon's Corner's Road	Yes
1326-11	Reid Family House NW side of Iron Ore Road, 0.35 mile S.W. of Mount Vernon Road	No
1326-12	N.E. end of LaValley Road	Yes
1326-13	N.E. corner Main Street and ConRail Tracks	No

TABLE 3-1 (CONT'D)

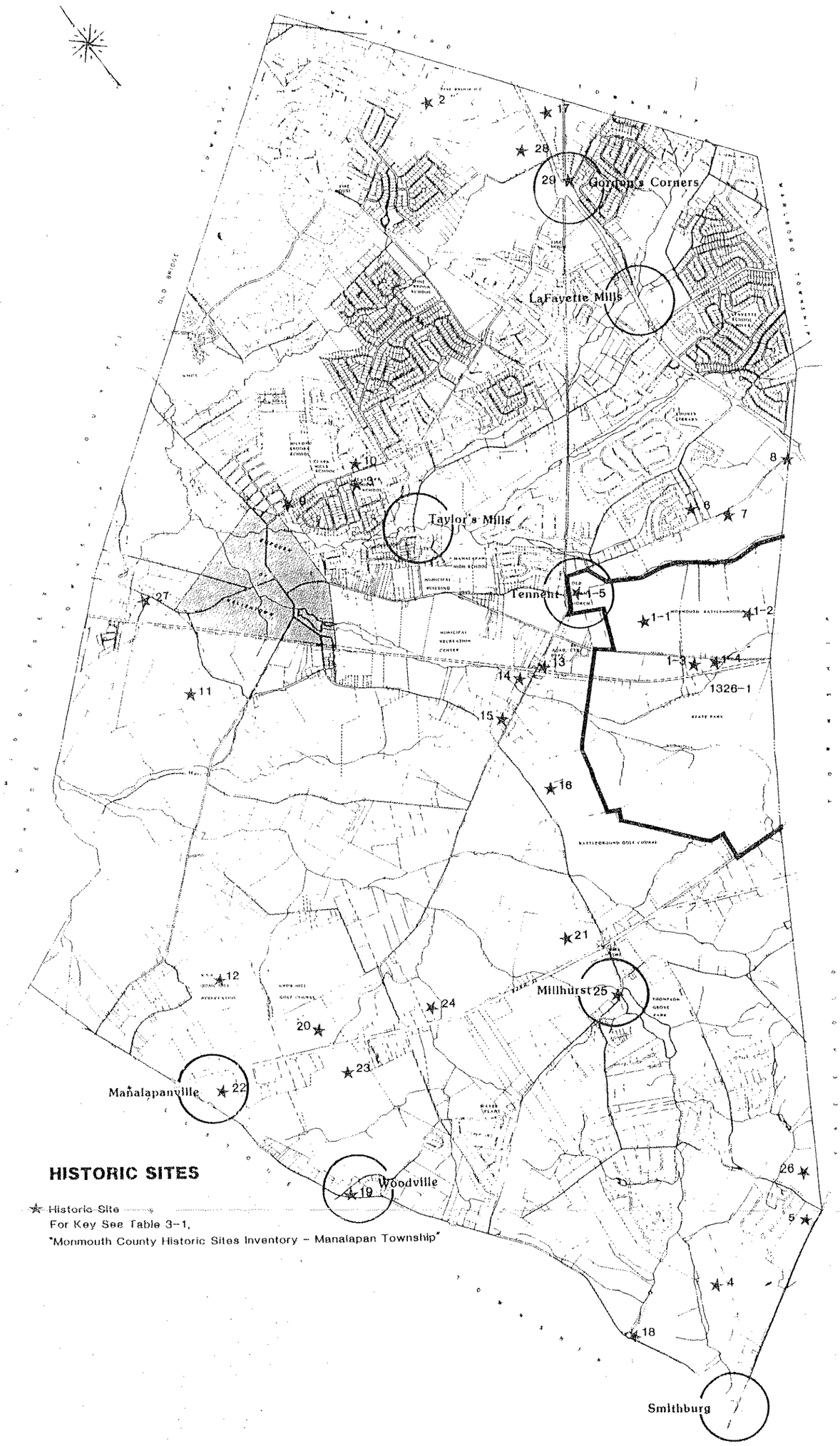
MONMOUTH COUNTY HISTORIC SITES INVENTORY
MANALAPAN TOWNSHIP

INVENTORY #	ADDRESS	NRHP ELIGIBILITY
1326-14	S.W. corner Main Street and ConRail Tracks	No
1326-15	W. side Main Street, 0.15 mile N. of Millhurst Road	Yes
1326-16	E. Ely House E. side Millhurst Road, 0.5 mile S. of Main Street	Possible
1326-17	J.M. Quakenbush House N.W. side Morganville Road, 0.5 mile NE of Gordon's Corner's Road	No
1326-18	NE side Smithburg Road, 0.8 mile NW of County Route 537	Possible
1326-19	Woodville A.M.E. Church NE side Smithburg Road, 0.25 mile of Lamb Lane	No
1326-20	N. side State Route 33, 0.5 mile W. of Woodward Road	Yes
1326-21	N.W. corner State Route 33 and Millhurst Road	Yes
1326-22	S. side State Route 33, 0.6 mile E. of Smithburg Road	Yes
1326-23	George L. Hunt House S. side State Route 33, 0.6 mile W. of Woodward Road	Possible
1326-24	196 State Route 33	No
1326-25	Clifford Snyder Grist Mill W. side Sweetman's Lane, 0.3 E of State Route 33	Yes
1326-26	Thompson Grove School NE side Thompson Grove Road, 0.1 mile N. of County Route 537	Possible
1326-27	S.W. corner Tracy Station Road and Pergolaville Road	No
1326-28	Stillwell Farm W. side U.S. Route 9, 0.1 mile N. of Pine Brook Road	Yes
1326-29	NE corner Wickatunk Road and Morganville Road	Possible

Source: Monmouth County Historic Sites Inventory Summary Report 1980-1984

Completed By: Townplan Associates

FIGURE 3



HISTORIC SITES

★ Historic Site
For Key See Table 3-1,
"Monmouth County Historic Sites Inventory - Manalapan Township"

BASE MAP
Prepared By: John Algeir
Manalapan Township Engineer
Updated By: TOWNPLAN Associates
November 1989

MANALAPAN TOWNSHIP
MONMOUTH COUNTY, N. J.

TOWNPLAN Associates

POPULATION

Manalapan Township, has experienced a population growth rate during the past two decades which is more than eight times the growth rate for either Monmouth County or the State of New Jersey. Monmouth County was the fourth fastest growing County in New Jersey from 1980 to 1987. Development within Monmouth County has shifted inland to areas where large amounts of vacant land are still available. While Monmouth County is expected to continue to grow, Manalapan Township population is predicted to increase at a rate three time that of the County. The composition and characteristics of Manalapan's population are changing. These changes can be an important consideration in planning for the future needs of the Township in terms of residential, commercial, office, recreational, public facilities and other land uses.

The changing composition of the population resulting from the increasing birth rate, increasing elderly population and declining household size is import in terms of future planning of land uses and community facilities. Manalapan, with 10.4 percent of its population 65 and over, has experience a significant increase in its aging population since 1970. Manalapan has also experienced an increasing youthful component of its population. Together, these trends create a need to plan for a changing population composition and for a periodic monitoring of changes in immigration patterns and age characteristics.

Population trends within Manalapan Township are influenced by a variety of factors including national, state and regional economic conditions, social changes and government policy. Changing birth rates, changing employment trends and consumer preferences, the availability of land and other factors can affect future development within the Municipality.

As updated census data for population and housing become available, the Planning Board should monitor population growth and composition and review its planning program to determine how the needs and desires of the present and future residents of Manalapan Township may be changing.

Source of Data

The demographic data used in this analysis is derived from a variety of sources. The United States Department of Commerce, Bureau of the Census, provides data on general population characteristics relative to persons, households, families and housing units. The New Jersey Department of Labor and Industry, Office of Demographic and Economic Analysis, annually compiles demographic data and provides estimates on a variety of population characteristics at the state, county and municipal levels. Additional information is also available from the Monmouth County Planning Board.

Historical Population Trends: 1920 to 1980

Manalapan Township has experienced a rapid and constant growth pattern since 1920, with the largest increase occurring between 1960 and 1970. The United State census of 1920 recorded a total population of 1,080. By 1930, the population reached 1,464 an increase of 35.6 percent.

During the decade between 1930 and 1940, Manalapan Township population increased at a significantly faster rate than Monmouth County and the State of New Jersey. In 1940, the population reached 1,900, a 29.8 percent increase compared to the 9.5 percent increase for the County, and 2.9 percent increase for the State. The Great Depression of the 1930's contributed to low birth rates and reduced immigration resulting in the lowest nation-wide population increase in the history of the Census.

Between 1940 and 1950, the resident population of Manalapan increased significantly by 65.1 percent. Over the same period, Monmouth County and New Jersey population increased by 39.7 percent and 16.2 percent respectively. These increases reflected the post-war building and baby booms.

In the 1950's Manalapan continued to experience rapid (27.2 percent) growth to a total of 3,900 by 1960. In comparison, Monmouth County population increased by 48.4 percent, showing a significant faster growth rate than the Township.

The population of Manalapan jumped between 1960 and 1970, increasing to 14,049 or a total of 252.1 percent. The Garden State Parkway and other regional highway improvements, as well as the continued movement of population from urban areas to newly developing suburbs is largely responsible for the increase in population growth.

During the last decade, 1970 to 1980, the County and State population growth rates began to stabilize. In contrast, Manalapan Township population continued to increase to 18,914 or 34.6 percent and is expected to continue to rise. Table 4-1, "Historic Population Trends: 1920 - 1980 Manalapan, Monmouth County, New Jersey", summarizes the Township, County and State population trends from 1920 to 1980.

Population Trends: 1980 to 1987

Between 1980 and 1987, the Manalapan resident population has steadily increased, with the exception of 1982, according to annual Official State Population Estimates by the New Jersey Department of Labor. The Manalapan estimates indicate a significant increase of 40.1 percent over the seven year period. by comparison, as shown in Table 4-2, "Resident Population: 1989 - 1987 Manalapan, Monmouth County, New Jersey", the State and County populations have shown seven year increases of 4.2 and 10.0 percent respectively.

Components of Population Change: 1960 - 1987

Population change is comprised of two components: natural change and migration. Natural population change can be determined by comparing the number of resident deaths with the number of resident births for a given time period. The natural resident population increases or decreases and the migration of population into or out of a municipality determine the overall population change.

Natural population begins with resident births which are recorded annually. During the 1960's 1,329 resident births were recorded in the Township, yielding a mean of 133 births per year over the 10 year period. During the 1970's, the number of resident births in the Township ranged from a high of 245 in 1970 to a low of 126 in 1979. The total number of births during that decade was 1,765 yielding annual mean of 177 births. This was an increase of 33.1 percent over the previous decade. Between 1980 and 1988, the mean number of births increased to 188 annually ranging from a high of 251 in 1988 to a low of 122 in 1980.

The second component of natural population change is the number of resident deaths. The number of deaths has been surpassed by the number of births in Manalapan Township every year since 1960. The result has been a natural increase in population. During the 1960's there were 909 fewer resident deaths than births yielding a mean of 42 deaths annually. The mean number of resident deaths during the 1970's increased to 56 annually. The mean for the 1989 0 1988 period was 94 annually. Since the number of deaths has increased significantly compared to increased in births during the 1980 - 1988 period, the natural population increase continued but at a lower rate than during the 1970's. Table 4-3, "Natural Population Changes: 1960 - 1988 Manalapan Township", provides the number of births and deaths and resulting natural population change for each year between 1960 and 1988 and cumulative totals for the decades of the 1960's and 1970's, and the 1980 - 1988 period.

Net migration into or out of a community can be calculated by comparing the natural population change with the total population change. During the 1960's, the natural population increase of 909 residents resulted in a net in-migration of 9,150 residents. The natural population increase during the 1970's compared with the net population increase of 4,865 for the decade, resulted in a net in migration of 3,659 residents. During the period of 1980 through 1988, the Monmouth County Planning Board estimated a population increase of 7,050 residents. Since there was a natural population increase of 846 over that period, the net change was an in-migration of 6,204 residents. Table 4-4, "Nature of Population Change: 1960 - 1988" summarized the components of change for the Township population.

Population Characteristics

The general characteristics of the Township population can be determined from the U.S. Census of Population for 1970 and 1980. These characteristics include age, sex, race, occupation, levels of educational attainment, and income.

Age Distribution - The 1980 Census recorded the median age of Manalapan Township residents as 32.9. this is just slightly older than the median age of Monmouth County and New Jersey residents: 32.3 and 32.2 years respectively. The Manalapan population has been "aging" since 1970 when the median age was recorded as 21.2 years. This can be further documented by comparing 1970 and 1980 census data by age group. As shown in Table 4-5, "Population by Age: 1970 - 1980 Manalapan Township", the Township population under age 15 decreased while the 35 and over age groups increased.

The 1970 Census recorded the 5-14 age group (elementary school age) as the largest age group, representing 28.4 percent of the total population. The second largest group was the 25-34 age group (child bearing age) which represented 19.4 percent of the total population. The smallest age groups were the 55-64 group and the 18-24 group which represented 3.5 and 3.7 percent of the total population respectively. When the 15-17 (high school age) and 18-24 year age groups are combined to form a comparable age group spanning the ten year age cohort, it represents only 8.3 percent of the total 1980 population.

The 1980 Census again recorded the 5-14 age group as the largest in the Township, representing 20.9 percent of the total population. The second largest age group was the 35-44 age group which represented 17.3 percent of the total population. The age group which showed the largest increase since 1970, was the over 65 group with a total increase of 257.2 percent. The 55-64 age group also showed a significant increase over the comparable 1970 age group; 245.9 percent.

The increase in the senior citizen population, the in-migration of young adults into the Township and the reduction in the under 15 age groups combined to produce an aging population between 1970 and 1980.

Sex - The Manalapan Township population in 1980 was 51.2 percent female and 48.8 percent male, while the populations of Monmouth County and New Jersey were somewhat less evenly divided. The County population was 51.9 percent female and 48.1 percent male while the New Jersey population was 52.0 percent female and 48.09 percent male. The number of females and males in Manalapan Township are almost equal until age 30, when females start to out number men due to a longer life span. Table 4-6, "Population by Gender: 1980 - Manalapan Township", compares male and female populations for the Township, County and State.

Race - The 1980 Census recorded the population of Manalapan Township as 93.5 percent white and 5.2 percent black. The remaining residents in the Township, accounting for 1.3 percent of the total 1980 resident population, included American Indian, Japanese, Chinese, Filipino, Korean, Asian Indian, and Vietnamese. Races not listed above were categorized as "other". These figures contrast with the County percentage of 89.6 percent white and 8.5 percent black. All other races accounting for 1.9 percent of the total County population. Table 4-7, "Population by Race: 1980 - Manalapan Township and Monmouth County", provides the number and percentage of the total population represented by race for the Township and County in 1980.

Education - Manalapan Township had a significantly higher percentage of college educated residents than either the County or the State in 1980. U.S. Census figures show that 45.9 percent of Manalapan Township residents aged 25 and over have attended college as compared with 37.5 percent for the County and 31.5 percent for the State.

The 1980 Census indicates that levels of educational attainment for the State as a whole have increased over the past decade. Table 4-8, "Level of Educational Attainment: 1980 - Manalapan, Monmouth County and New Jersey" summarizes the highest level of education completed by Township, County and State residents in 1980.

Occupations - The 1980 Census recorded occupations of residents of the Township. The majority of the Manalapan working population is employed in managerial/professional/technical occupations (42.1 percent). Significant numbers of the working population are also employed in support/clerical occupations (18.2 percent); sales occupations (14.4 percent); and production (8.1 percent). Only 6.3 percent of the employed residents work as transporters/handlers, or laborers; and less than one percent are employed in the farming, forestry, fishing or related industries.

Levels of educational attainment are directly related to occupational distribution. In general, a population with a high percentage of college graduates can be expected to have a higher percentage of the population in managerial, professional and technical occupations than in those occupations which do not require an advanced education.

The occupational distribution in Manalapan Township is generally similar to that of the County, however, Manalapan has a somewhat higher percentage of residents employed in managerial and professional occupations and slightly smaller percentages in technical, production and operative occupations. Table 4-9, "Occupational Distribution: 1980 - Manalapan Township and Monmouth County", presents the number of jobs held by Township and County residents in each occupation and the percentage share they represent.

Income - The median household income of Manalapan Township residents was greater than Monmouth County and New Jersey residents in 1980. The median was $28,450 for Manalapan Township, $21,061 for Monmouth County and $19,801 for the State.

The per capita income of Township residents in 1980 was $8,969 which was higher than the per capita income of the County ($8,539) and the State ($8,128). Per capita income is the calculated average amount of income available per person.

Income levels are affected by educational attainment, occupation and age. Education and occupation are related to earning power and higher incomes for workers while income generally declines after retirement. The high percentage of Manalapan residents employed in managerial and professional occupations accounts for a higher median income level than the County and State. Table 4-10, "Household Income: 1979 - Manalapan, Monmouth County, New Jersey", contains the distribution of households income levels for households within the Township, County and State.

Population Estimates and Projections

Population estimates for 1988 and projections for 1995 and 2010 for Manalapan Township and Monmouth County were prepared by the Monmouth County Planning Board in 1989. The estimates for the Township for 1988 show a 37.27 percent increase compared to a 9.67 percent increase for the County since 1980. The Manalapan Township population is expected to increase by 64.81 percent between 1988 and 2010 reaching a total resident population of 42,792. In comparison, Monmouth County is projected to increase 18.75 percent during the same period (Table 4-11).

TABLE 4-1
HISTORIC POPULATION TRENDS: 1920 - 1980
MANALAPAN, MONMOUTH COUNTY, NEW JERSEY

YEAR	MANALAPAN TOWNSHIP		COUNTY OF MONMOUTH		STATE OF NEW JERSEY	
	CENSUS	PERCENT CHANGE	CENSUS	PERCENT CHANGE	CENSUS	PERCENT CHANGE
1920	1080		104209		3155900	
1930	1464	35.6%	147209	41.3%	4041334	28.1%
1940	1900	29.8%	161238	9.5%	4160165	2.9%
1950	3137	65.1%	225327	39.7%	4835329	16.2%
1960	3990	27.2%	334401	48.4%	6066782	25.5%
1970	14049	252.1%	461849	38.1%	7168164	18.2%
1980	18914	34.6%	503173	8.9%	7364158	2.7%

Source: U.S. Census of Population, 1920 - 1980
Compiled By: Townplan Associates

TABLE 4-2

RESIDENT POPULATION: 1980-1987
MANALAPAN, MONMOUTH COUNTY, NEW JERSEY

YEAR	MANALAPAN TOWNSHIP		MONMOUTH COUNTY		NEW JERSEY	
	ESTIMATE	PERCENT CHANGE	ESTIMATE	PERCENT CHANGE	ESTIMATE	PERCENT CHANGE
1980	18914		503173		7365011	
1981	20595	8.9%	507069	0.8%	7408000	0.6%
1982	20112	-2.3%	511413	0.9%	7430000	0.3%
1983	20238	0.6%	514913	0.7%	7468000	0.5%
1984	22564	11.5%	521902	1.4%	7511000	0.6%
1985	23464	4.0%	531287	1.8%	7561000	0.7%
1986	25346	8.0%	542446	2.1%	7620000	0.8%
1987	26496	4.5%	553600	2.1%	7672000	0.7%
1980-87		40.1%		10.0%		4.2%

Sources: (1) United States Department of Labor, Bureau of the Census, 1980 Census of Population.
(2) New Jersey Department of Labor, Office of Demographic and Economic Analysis, 1981-1987 Population Estimates, revised through OCT. 1988, and 1987 Provisional Estimate prepared OCT. 1988.

Compiled By: Townplan Associates

TABLE 4-3

NATURAL POPULATION CHANGES: 1960-1988
MANALAPAN TOWNSHIP

YEAR	BIRTHS	DEATHS	NATURAL CHANGE
1960	104	37	67
1961	109	50	59
1962	85	48	37
1963	92	31	61
1964	104	37	67
1965	107	39	68
1966	152	36	116
1967	145	40	105
1968	209	54	155
1969	222	48	174
TOTAL 1960-1969	1329	420	909
1970	245	38	207
1971	205	60	145
1972	208	51	157
1973	213	45	168
1974	198	58	140
1975	156	68	88
1976	141	51	90
1977	131	75	56
1978	142	49	93
1979	126	64	62
TOTAL 1970-1979	1765	559	1206
1980	122	83	39
1981	139	63	76
1982	163	79	84
1983	136	94	42
1984	188	108	80
1985	224	92	132
1986	225	103	122
1987	250	110	140
1988	251	120	131
TOTAL 1980-1988	1698	852	846
TOTAL 1960-1986	4792	1831	2961

SOURCE: New Jersey Department of Health, Center for Health Statistics: 1960-1988
COMPILED BY: Townplan Associates

TABLE 4-4

NATURE OF POPULATION CHANGE: 1960-1988
MANALAPAN TOWNSHIP

	1960-1969	1970-1979	1980-1988
BASE POPULATION (1)	3990 (1960)	14049 (1970)	18914 (1980)
NATURAL CHANGE (2)			
TOTAL BIRTHS	1329	1765	1698
TOTAL DEATHS	- 420	- 559	- 852
NATURAL CHANGE	909	1206	846
NET MIGRATION			
TOTAL POPULATION CHANGE	10059	4865	7050
NATURAL CHANGE	- 909	- 1206	- 846
NET MIGRATION	9150	3659	6204
NET POPULATION CHANGE			
BASE POPULATION	3990	14049	18914
NATURAL CHANGE	+ 909	+ 1206	+ 846
NET MIGRATION	+ 9150	+ 3659	+ 6204
NET POPULATION	14049 (1970)	18914 (1980)	25964 (3) (1985)

Source: (1) United States Census of Population: 1960, 1970 & 1980.
(2) New Jersey Department of Health, Center for Health Statistics: 1960-1985 birth and death statistics.
(3) Monmouth County Planning Board 1989.
Compiled By: Townplan Associates

TABLE 4-5

POPULATION BY AGE: 1970-1980
MANALAPAN TOWNSHIP

AGE (YEARS)	1970 NUMBER	1970 PERCENT	1980 NUMBER	1980 PERCENT	CHANGE: 1970-1980 NUMBER	CHANGE: 1970-1980 PERCENT
UNDER 5	2096	14.9%	1138	6.0%	-958	-45.7%
5-14	3992	28.4%	3954	20.9%	-38	-1.0%
15-17	647	4.6%	1514	8.0%	867	134.0%
18-24	518	3.7%	1261	6.7%	743	143.4%
25-34	2722	19.4%	2204	11.7%	-518	-19.0%
35-44	2085	14.8%	3272	17.3%	1187	56.9%
45-54	947	6.7%	1904	10.1%	957	101.1%
55-64	490	3.5%	1695	9.0%	1205	245.9%
65+	552	3.9%	1972	10.4%	1420	257.2%
TOTAL	14049	100.0%	18914	100.0%	4865	34.6%
MEDIAN	21.2		32.9			

Source: U.S. Department of Commerce, Bureau of the Census, 1970 Census of Population, "General Population Characteristics: New Jersey", October 1971.
N.J. Department of Labor, Office of Demographic and Economic Analysis, "1980 Census of Population and Housing, Municipal Profiles; Vol. 1: Characteristics of Persons", January 1982.
Compiled By: Townplan Associates

TABLE 4-6

POPULATION BY GENDER: 1980
MANALAPAN, MONMOUTH COUNTY, NEW JERSEY

GENDER	MANALAPAN NUMBER	MANALAPAN PERCENT	MONMOUTH COUNTY NUMBER	MONMOUTH COUNTY PERCENT	NEW JERSEY NUMBER	NEW JERSEY PERCENT
MALE	9225	48.8%	241857	48.1%	3533012	48.0%
FEMALE	9689	51.2%	261316	51.9%	3831811	52.0%
TOTAL	18914	100.0%	503173	100.0%	7364823	100.0%

Source: 1980 Census of Population.
Compiled By: Townplan Associates

TABLE 4-7
POPULATION BY RACE: 1980
MANALAPAN TOWNSHIP & MONMOUTH COUNTY

RACE	MANALAPAN NUMBER	MANALAPAN PERCENT	MONMOUTH COUNTY NUMBER	MONMOUTH COUNTY PERCENT
WHITE	17689	93.52%	450988	89.63%
BLACK	975	5.15%	42704	8.49%
AMER. INDIAN	6	0.03%	587	0.12%
JAPANESE	0	0.00%	362	0.07%
CHINESE	98	0.52%	1699	0.34%
FILIPINO	45	0.24%	864	0.17%
KOREAN	33	0.17%	548	0.11%
ASIAN INDIAN	55	0.29%	1423	0.28%
VIETNAMESE	7	0.04%	237	0.05%
OTHER	6	0.03%	3761	0.75%
TOTAL	18914	100.00%	503173	100.00%

SOURCE: 1980 Census of Population, STF I

TABLE 4-8
EDUCATION ATTAINMENT (PERSONS 25 YEARS AND OLDER): 1980
MANALAPAN, MONMOUTH COUNTY & NEW JERSEY

YEARS COMPLETED	MANALAPAN NUMBER	MANALAPAN PERCENT	MONMOUTH COUNTY NUMBER	MONMOUTH COUNTY PERCENT	NEW JERSEY NUMBER	NEW JERSEY PERCENT
ELEMENTARY 0-8	1035	9.4%	40107	13.1%	797935	17.7%
HIGH SCHOOL 1-3	1004	9.1%	39206	12.8%	670414	14.9%
HIGH SCHOOL 4	3939	35.7%	111433	36.5%	1615424	35.9%
COLLEGE 1-3	2174	19.7%	48625	15.9%	594434	13.2%
COLLEGE 4+	2895	26.2%	65862	21.6%	826040	18.3%
TOTAL	11047	100.0%	305233	100.0%	4504247	100.0%

SOURCE: 1980 U.S. Census of Population, STF VI
COMPILED BY: Townplan Associates

TABLE 4-9
OCCUPATIONAL DISTRIBUTION: 1980
MANALAPAN TOWNSHIP & MONMOUTH COUNTY

OCCUPATION	MANALAPAN JOBS	MANALAPAN PERCENT	MONMOUTH COUNTY JOBS	MONMOUTH COUNTY PERCENT
Managerial	1740	23.7%	30801	14.3%
Professional	1191	16.2%	34097	15.8%
Technical	159	2.2%	7209	3.4%
Administrative Support/Clerical	1333	18.2%	37235	17.3%
Sales	1054	14.4%	26252	12.2%
Private Household Services	22	0.3%	1353	0.6%
Protective Services	59	0.8%	3767	1.8%
Other Services	469	6.4%	19951	9.3%
Farm/Forest/Fish	55	0.7%	2257	1.0%
Production/Craft/Repair	598	8.1%	24449	11.4%
Machine Operators, Etc.	197	2.7%	12095	5.6%
Transportation/Material Moving	316	4.3%	8714	4.0%
Handlers/Laborers	145	2.0%	7007	3.3%
TOTAL	7338	100.0%	215187	100.0%

NOTE: "Jobs" refers to the number of municipal or county residents, respectively, employed in each occupation. The place of employment is not necessarily within the respective municipality or county.
SOURCE: 1980 Census of Population, STF IV
COMPILED BY: Townplan Associates

TABLE 4-10

HOUSEHOLD INCOME: 1979
MANALAPAN, MONMOUTH COUNTY, NEW JERSEY

HOUSEHOLD INCOME	MANALAPAN	MONMOUTH COUNTY	NEW JERSEY
0-4,999	3.9%	9.2%	10.7%
5,000-9,999	8.3%	12.6%	13.2%
10,000-14,999	8.0%	12.6%	13.3%
15,000-19,999	9.0%	12.8%	13.4%
20,000-24,999	9.9%	12.3%	12.5%
25,000-29,999	15.3%	10.5%	10.4%
30,000-34,999	13.7%	8.6%	7.9%
35,000-39,999	9.2%	6.0%	5.5%
40,000-49,999	12.2%	7.3%	6.3%
50,000-74,999	8.7%	5.8%	4.9%
75,000+	1.8%	2.3%	1.9%
TOTAL	100.0%	100.0%	100.0%
MEDIAN INCOME	$28,450	$21,061	$19,801
PER CAPITA INCOME	$8,969	$8,539	$8,128

Source: 1980 Census of Population, STF VII
Compiled By: Townplan Associates

TABLE 4-11

POPULATION ESTIMATES AND
PROJECTIONS 1980 - 2010

MANALAPAN TOWNSHIP

	1980 CENSUS	ESTIMATE 1988	PROJECTIONS 1995	2010	PERCENT CHANGE 1980 - 1988	1995 - 2010
MANALAPAN	18914	25964	34547	42792	37.27	64.81
MONMOUTH COUNTY	503173	551851	608450	655322	9.67	18.75

SOURCE: Monmouth County Planning Board 1989
COMPILED BY: Townplan Associates

NATURAL RESOURCES

Introduction

Environmental features and natural resources have an ongoing influence on the planning and development of Manalapan Township. In 1976, the Township Environmental Commission compiled a Natural Resource Inventory. The inventory addresses geology, topography, flood plains, soils, and historical sites. This inventory, which is reprinted as an appendix to the master plan, is updated in this section with information on soils, wetlands and vegetation.

MANALAPAN TOWNSHIP SOILS

The original Manalapan Township Natural Resources Inventory utilized the Monmouth County Soil Survey revised through 1975 to describe soils within the Township. Since then, the Monmouth County Soil Survey has been updated and was re-published in jApril 1989. Several changes have occurred in the classifyuing and naming of different soil series within the County. Those changes affecting soils which occur in Manalapan Township are summarized below.

Previous Series Name	Current Series Name
Alloway	Elkton
Matlock	Colemanton
Delanco	Hammonton
Donlonton	Adelphia
Manalapan	Humaquepts
Howell	Keyport
Lincroft	Colts Neck
Monmouth	Collington
Pocomoke	Fallsington
St. John's	Atsion-Atsion Variant
Rutledge	Fallsington-Atsion-Atsion Variant
Eatontown	Tinton

The following soils series occur within Manalapan Township and were not previously described in the Natural Resource Inventory compiled in 1976:

1. Humaquepts: This series consists of somewhat poorly drained to very poorly drained soils on flood plains. These soils are derived from sandy or loamy sediments of fluvial origin. The seasonal high water table typically occurs between the surface and a depth of 1.5 feet.

2. Atsion: This series consists of poorly drained soils occuring in depressional areas and on broad flats. These soils were formed in acid, sandy, Coastal Plain sediments. The seasonal high water table occurs between the surface and a depth of 1 foot. The Atsion Variant are phases of soils which have a glauconitic substratum, and are similar to the Atsion soil in use and management. The previous St. John's series was remamed to either Atsion or Atsion Variant.

3. Fallsington-Atsion-Atsion Variant: The previous Rutledge series has been regrouped to either one of these three series.

4. Downer: This series consists of well drained soils on uplands and terraces. The soils are usually sandy loams exhibiting moderately rapid permeability and a seasonal high water table of greater than 6 feet.

5. Manahawkin Muck: This series consists of very poorly drained soils on lowlands and swamps. This organic soil formed in acid, organic material from woody plants. The seasonal high water table typically occurs between the surface and a depth of 1 foot.

6. Pemberton: This series consists of moderately well drained and somewhat poorly drained soils on uplands. They were formed in acid, loamy, Coastal Plain Sediments. The seasonal high water table typically occurs at a depth between 1 and 4 feet.

7. Pits, Sand, and Gravel: This is not an actual soil series but a mapped unit consisting of areas that have been previously excavated for sand and gravel. On-site investigation is necessary to evaluate soils existing in areas of this mapped unit.

8. Udorthents: This series consists of well drained to somewhat poorly drained soils which have no horizonation. The soils occur in areas which have been altered either by filling, excavation, or covered by impermeable surfaces. On-site investigation is necessary to evaluate soil capability.

WETLANDS

Section 404 of the Federal Clean Water Act defines wetlands as "Those areas that are inundated or saturated by surface 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. Wetlands generally include swamps, marshes, bogs, and similar areas.".

Development in freshwater wetlands is regulated by the United States Environmental Protection Agency under Section 404 of the Clean Water Act (33 U.S. 1344) and the New Jersey Department of Environmental Protection Under the Freshwater Wetlands Protection Act (N.J. State Laws of 1987, Chapter 156). Not only are activities within wetlands area regulated, but they are also subject to transition area requirements which, according to a decision by the Appellate Division of the Superior Court, are to be implemented July 1, 1988. This regulation requires a buffer adjacent to jurisdictional freshwater wetlands. The width of the buffer depends upon the resource value of the wetland which is based on water quality and endangered species habitat.

Wetlands are delineated using a three parameter approach which is based on the evaluation of on-site conditions for evidence of hydric soil, hydrophytic vegetation, and wetland hydrology. Actual field delineation of freshwater wetlands must be in accordance with the Federal Interagency Committee for Wetland Delineations' Manual for Identifying and Delineating Jurisdictional Wetlands, January 1989.

However, published information can be utilized to indicate the potential for wetlands on a particular property. Such background data can include United States Topographic Maps, National Wetland Inventory Maps, and County Soil Surveys.

The National Wetland Inventory (NWI) classifies soil into hydric groups based upon the degree of association with wetlands which each soil series generally exhibits. By definition, Group I soils nearly always display consistent hydric conditions. Group II soils display consistent hydric conditions in most places, but additional verification is needed. Group III soils display consistent hydric conditions in a few places and additional verification is needed.

GROUP I	GROUP II	GROUP III
Colemantown	Atsion	Hammonton
Elkton	Fallsington	Kaj
Humaquepts	Shrewsbury	
Manahawkin Muck		
Sulfaquents and Sulfihemists		

The USDA Soil Conservation Service has classified particular soil phases as hydric due to their association with local topography. For example, the NWI does not list the Adelphia series as hydric, but the SCS classified a certain phase of the Adelphia series as hydric due to its association with local swales and depressions. The following list outlines additional soil phases determined to be hydric by the Soil Conservation Service of Monmouth County.

AeA - Adelphia loam, 0-2% slopes
FnA - Freehold loamy sand, 0-5% slopes
FsA - Freehold loam, 0-2% slopes
HnA - Holmdel sandy loam, 0-2% slopes
HwB - Hooksan sand, 0-5% slopes
KeA - Keyport sandy loam, 0-2% slopes
KvA - Kresson loam, 0-5% slopes
LaA - Lakehurst sand, 0-2% slopes
PeA - Pemberton loamy sandy, 0-5% slopes
SlA - Sassafras loam, 0-2% slopes

The Hydric Soils Map (Figure 4) is a graphic representation of these three different Hydric Soil Groups plus additional hydric soil series as determined by the USDA Soil Conservation Service.

The presence or absence of hydric soils on the map does is not conclusive as to the presence or absence of freshwater wetlands on any particular site. A jurisdictional wetland must also meet the hydrophytic vegetation and wetland hydrology criteria. The map should be consulted as a guide for the potential presence of one wetland parameter. Actual field investigation is necessary to determine to presence or absence of wetlands.

In addition to the potential presence of freshwater wetlands, hydric soils present other constraints to development. Hydric soils are also associated with shallow depth to water table, slow permeability, and frequent flooding. These conditions restrict the development of structures with basements, foundations and septic systems. Hydric soils have a high potential for frost action which can damage foundations as moisture moves into the freezing zone of the soil. Frost heave and low soil strength during thawing also cause damage to pavements and other rigid structures. Septic systems should not be placed in soils that exhibit slow permeability or are subject to frequent flooding. These conditions can affect the absorption of effluent by inhibiting its distribution into the septic tank absorption field.

Hydric soils in Manalapan Township are located primarily within stream floodplains and local swales and depressions. Significant portions of the northern half of the Township have already been developed. Some hydric areas depicted on the map may no longer exist. However, the southern half of the Township has not been as significantly developed. Most of the hydric soil areas depicted on the southern half of the Township still remain.

Another constraint to development in northern Manalapan Township are acid soils. These soils have been identified in the April 1989 Monmouth County Soils Survey.

VEGETATION

Vegetation is an important component of the natural community. It performs such essential functions as preventing soil erosion, restoring oxygen to water and the atmosphere, providing food and shelter to wildlife and human communities, and by cleansing the atmosphere by filtering dust, gaseous components, and other pollutants.

The natural distribution of vegetation is based on many environmental factors. On the broad scale, vegetation is influenced by climate, geology, and soil parent material. Locally, vegetation types are based on topography, local soil associations, and hydrology.

The undeveloped portions of Manalapan Township generally consist of farmlands, old growth mature forest, and early successional forest growth on lands which were previously farmed. Manalapan Township is located within the Inner Coastal Plain which generally has excellent soils for farming. Little natural growth still remains in this part of New Jersey. Essentially all lands within Manalapan Township have been disturbed at some time or another, some just more recently than others.

The older mature forested woodlands of Manalapan generally exhibit both upland and lowland vegetation. Typical upland vegetation is characterized as Mixed Oak Upland Forest with such dominant species as:

TREES	UNDERSTORY	HERBS
White oak	Dogwood sp.	May apple
Red oak	Arrowwood	Jack-in-the-pulpit
Black oak	Sassafras	False solomon's seal
Beech	Spicebush	Aster sp.
Red maple	Japanese honeysuckle	

Areas within the Township which have been previously disturbed, primarily by farming, are dominated by successional plant communities. The dominant species here include:

TREES	UNDERSTORY	HERBS
Red Maple	Sumac sp.	Goldenrod sp.
Sweet gum	Dogwood sp.	Broom sedge grass
Black cherry	Blackberry	Ground cedar
Sassafras		

If left undisturbed, the successional forest type will become dominated by those species found in the mature upland forest.

Vegetation found in the lowlands of Manalapan Township can be classified as Palustrine Forested Broad-leaved Deciduous. This means that the vegetation species are influenced by freshwater marshes, bogs and swamps. These areas are dominated by such species as:

TREES	UNDERSTORY	HERBS
Red Maple	Sweet pepperbush	Sensitive fern
Sweetgum	Highbush Bluberry	Skunk cabbage
Pin oak	Spicebush	Soft rush
Sourgum	Winterberry	Sedge sp.

ENDANGERED SPECIES

The New Jersey Natural Heritage Program has compiled a list of potential threatened and endangered vertebrate species in Monmouth County. The list gives information about each species, such as common name, latin name, federal status, state status, county occurrence, and habitat comments. It can be inferred from this list that those species with preferred habitats common to Manalapan Township have the potential to occur within the Township. Those species include:

Common Name	Scientific Name
Barred Owl	Strix varia
Black Rail	Laterallus jamaicensis
Bobolink	Dolichonyx oryzivorus
Bog Turtle	Clemmys muhlenburgii
Cooper's Hawk	Accipiter cooperii
Grasshopper Sparrow	Ammodramus savannarum
Merlin	Falco columbarius
Mud Salamander	Pseudotriton montanus
Northern Harrier	Circus cyaneus
Pied-billed Grebe	Podilymbus podiceps
Pine Snake	Pituophis melanoleucus
Red-shouldered hawk	Buteo lineatus
Savannah Sparrow	Passerculus sandwichensis
Short-eared Owl	Asio flammeus
Upland Sandpiper	Bartramia longicauda
Vesper Sparrow	Pooecetes gramineus
Wood Turtle	Clemmys insculpta

The New Jersey Natural Heritage Program list of Potential Threatened and Endangered Vertebrate Species in Monmouth County can be found in the Appendix. Information concerning actual historic sitings in a particular site in Manalapan Township may be obtained by contacting the NJDEP New Jersey Natural Heritage Program in Trenton.

STEEP SLOPES

Slope limits the use of land and is a major consideration in land use planning. Slope is given in percent and is expressed by vertical change over distance. For example, a 10 foot elevation change over 100 feet of horizontal distance (10/100) is a ten (10) percent slope.

Slope is a prime factor in runoff and erosion. The steeper the slope, particularly over ten (10) percent, the greater the erosion hazard. Where steep slopes are denuded of vegetation, adjacent land and water bodies may be inundated with sediment during each rainstorm. Among the results are losses of wildlife and degraded water quality.

All slopes greater than ten (10) percent pose problems in designing roads, parking lots and driveways. When denuded of vegetation, slopes greater than ten (10) percent fail to form small surface depressions or swales, which trap sediment. This makes these steep areas highly erodible and poses hazards to adjacent areas which could be inundated with sediment. Slopes greater than fifteen (15) percent are potentially critical environmental impact areas. On these slopes, the soils are often thin and have low natural fertility. For most purposes, they should be left in their natural condition or maintained in grass or tree cover.

FLOOD HAZARD AREAS

The flood hazard areas of Manalapan have been identified and mapped by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance Program. The FEMA mapping was completed in 1977. a portion of the mapping for the Pine Brook was revised in 1987. A discussion of floodways and flood hazard areas is included in the Appendix within the Natural Resources Inventory.

The Matchaponix Brook and the Manalapan Brook were studied by the NJDEP Flood Hazard Reports No. 17 and No. 8, respectively.

STREAM CORRIDORS

A stream corridor is a stream and the areas of vegetation that extend along each side of the stream from its origin in the uplands to where it connects with another body of water. The protection of stream is an objective of the State Planning Act (N.J.S.A. 52:184-196 et. seq.). This section on stream corridor protection is derived from the technical appendix of the Preliminary State Development and Redevelopment Plan.

Streamside soils and vegetation in the stream corridors (particularly trees) provide important natural functions that maintain the ecological and hydrological balance of the surface water systems. These include:

- Runoff and flood control;
- Sediment control;
- Streambank and streambed erosion control;
- Nutrient uptake;
- Habitat protection; and
- Groundwater recharge.

Streams are some of the most valuable resources in Manalapan Township. Mismanagement can create flooding and water supply hazards, as well as loss of important aesthetic and recreational resources which help define the local quality of life.

Stream corridor management places primary emphasis on water quality protection and enhancement (through the control of non-point sources of pollution, such as erosion and sedimentation), and on protection of natural and cultural resources in the stream corridor. Floodplain management, which places emphasis on the protection of people and structures from flood hazards, also is part of stream corridor management. With proper management, a stream corridor can serve as a buffer zone to filter sediment and pollution produced by suburbanization and other land uses such as agriculture and timber harvesting. It can also provide a margin of safety for adjacent populations from flood and erosion hazards. The usefulness of a vegetated corridor along streams applies to many water resource issues, as well as wildlife, recreation, and aesthetic considerations. The corridor's role is to maintain the ecological and hydrological balance in the stream.

Streams are divided into different types--perennial and intermittent. perennial streams flow year-round from their source to their mouth. Intermittent streams flow only during storms or in certain seasons. They are dry a large part of the year. Both are important to the protection of the ecological and hydrological balance of the stream system. The stream corridor recommendations should consider all streams mapped on both the USGS 7.5 minute topographic map quadrangles and the soil survey maps published by the USDA Soil Conservation Service.

During high-flow conditions, sediment, nutrients and other pollutants can be readily transported from intermittent streams into the perennial stream network. In terms of water resources and aquatic habitat, intermittent streams are less critical, in some respects, than perennial streams. Intermittent streams are less important than perennial streams in terms of fish cover, aquatic food supply, and shade for water temperature control. A well-vegetated cover of grass, shrubs, and trees along intermittent streams will help control non-point pollution. The application of fertilizers and pesticides should be prohibited in these areas. Wooded cover is preferred.

BUFFER REQUIREMENTS

In order to protect stream corridors, buffers should be established from each bank. The recommended minimum width is sixty-five (65) feet with the following additional factors to be considered:

Flood Hazard Area	Areas should be sufficiently wide to include the 100-year floodplain.
Steep Slope	On reaches of a stream with slopes greater than 10 percent, consider extending the buffer beyond the top of the slope.
Sediment Control	Where disturbance is occurring near the stream, a buffer of at least 65 feet and up to 150 feet should be considered.
Nutrient Removal	Where major sources of nutrient are proposed, a distance of at least 65 to 150 feet should be considered.
Habitat (Aquatic)	A setback of wooded vegetation should be at least 50 to 80 feet.
Habitat (Terrestrial)	For deer wintering areas and wildlife corridors, a setback of wooded vegetation of 100 to 300 feet should be considered.

FIGURE 4

HYDRIC SOILS MAP

GROUP 1 HYDRIC SOIL

GROUP 2 HYDRIC SOIL

GROUP 3 HYDRIC SOIL

SOURCE: MONMOUTH COUNTY SOIL SURVEY, APRIL 1988
COMPILED BY: T & M ASSOCIATES

NOTE: THIS MAP DEPICTS GENERALIZED LOCATIONS OF HYDRIC SOIL GROUPS. ACTUAL LOCATIONS MAY VARY BASED UPON A SURVEY OF FIELD CONDITIONS.

BASE MAP
Prepared By: John Allgair
Manalapan Township Engineer
Updated By: TOWNPLAN Associates
November 1989

MANALAPAN TOWNSHIP
MONMOUTH COUNTY, N. J.

TOWNPLAN Associates

EXISTING LAND USE

Since the start of a period of rapid population growth in 1960, Manalapan Township has become increasingly suburbanized. Although still diverse in its land use, Manalapan's overall patterns and trends typify a community at the metropolitan fringe undergoing the transition from a rural to a suburban municipality. North of the Conrail freight line which, from east to west, bisects the Township, the suburban pattern predominates. Access to Route 9, the main link to employment centers to the north, and the availability of sewerage and public water, have stimulated the development of curvilinear residential subdivisions that tie into a network of county and municipal collector roads. Route 9 itself has developed as a strip commercial highway lined by shopping centers, offices, and retail and service uses. Smaller nodes of office, retail, and services have developed at Union Hill Road abutting Marlboro Township and at Yorktown at the intersection of Pease Road and Gordons Corner Road. A complex of civic buildings - town hall, post office, high school, and recreation lands - has developed west of Tennent, at the intersection of Taylors Mills Road and Freehold-Englishtown Road.

South of the rail line to Route 33, the Township's development pattern remains rural. However, development pressures, Mount Laurel litigation, and the prospect of sewer and water service will

extend the suburban pattern east of Millhurst Road and along the Route 33 corridor.

South of Route 33, farms, fields, and wooded areas are being rapidly converted into low density single family subdivisions that rely upon on-site wells and septic systems.

West of Millhurst Road and north of Woodward Road, land use continues to be characterized by a rural pattern typified by agricultural uses, woodlands, fields, and scattered single family residences.

A detailed study of existing land use in Manalapan Township was undertaken by Townplan Associates in the summer of 1989. Tax maps, assessment data, aerial photography and a field survey of the Township were utilized to identify existing land use. Information from the survey is shown in Figure 5, Existing Land Use and compiled on Table 6-1. The 1989 survey can be compared to data collected by the Monmouth County Planning Board in 1974 and presented in Table 6-2. Land use and change in Manalapan Township is profiled below.

RESIDENTIAL

Information on residential land use was gathered for single family, single family in construction, two family, multi-family, multi-family in construction and home occupation/home professional uses.

Residential development accounts for 31 percent of all land use in Manalapan. Its acreage has more than doubled since 1974.

Single Family & Two Family

Single family dwellings account for 85.73% of all residential land in Manalapan. This figure increases to over 94% once on going construction of single family homes is included. Two family homes account for 0.10% of all land in Manalapan.

Multi-Family Attached Development

Multi-family homes in Manalapan consist primarily of low-rise attached dwellings concentrated in three areas. The largest area is Covered Bridge, an adult residential community surrounding Pine Brook Golf Course off of Route 9. Additional development of multi-family homes (Oak Knoll and My-Ben) is existing or proposed on Pension Road southeast of the Englishtown Auction. Along Craig Road, a large multi-family development (Southfield Estates) is currently under construction. These multi-family areas will account for 5.24 percent of residential land in Manalapan. Since 1974, multi-family acreage has increased over 100 percent.

Home Occupation/Home Professional

This category is the smallest residential land use in Manalapan. It comprises 0.19 percent of all residential land and 0.06% of all land.

COMMERCIAL

Commercial land use in Manalapan is divided into two categories: retail, which includes retail use, services and shopping centers; and office, which includes administrative offices, business and professional uses. Combined, this is 3.0 percent of all land use in Manalapan. Commercial acreage has nearly doubled since 1974.

Retail

Retail use comprises 83.54 percent of all commercial land in Manalapan. The Route 9 corridor, which includes the Manalapan Mall, is the major shopping area on Wilson Avenue. Other major shopping areas include the Englishtown Auction. Smaller, neighborhood retail and service areas are located at Yorktown, along Route 33, in Tennent, and on Union Hill Road near Marlboro.

Office

Offices are located in conjunction with retail commercial locations in the Township. In addition, a large office park (Craig Corporate Park) is under construction south of Craig Road. A second office park (JCC) has been proposed on the north side of Craig Road. Office uses account for 0.51% of all land in Manalapan.

PUBLIC LAND

Public land includes parks, Board of Education property, streets and roadways, and other public buildings and land. Public acreage has increased substantially since 1974.

Parks

The majority of the Monmouth Battlefield State Park lies within Manalapan and accounts for 6.54% of total land use. The Monmouth County Parks and Recreation Department has one area within Manalapan known as the Pine Brook Golf Course. This facility is an 18 hole course located off of Route 9 adjacent to the Covered Bridge senior citizen development. The rest of the park and recreation land is owned by the Township. The largest municipal parcels are the Manalapan Recreation Center, located on Freehold Road, and Thompson Park, located on Thompson Grove Road. The remainder of municipal park land is in smaller neighborhood parks, located in the northern part of the township.

Schools

Public school sites account for 1.25 percent of all land in Manalapan. The schools located within the township are: Milford Brook School, Clark Mills School and Taylors Mills Schools, all on Gordons Corner Road; Pine Brook School on Pease Road; Lafayette Mills School on Maxwell Lane; and Manalapan High School on Church Lane. School land also includes a parcel on Route 33, used for administrative purposes, and on Millhurst Road currently under construction for use as a middle school.

Utilities and Streets & Roadways

The majority of public utility land in Manalapan is comprised of the Jersey Central Power and Light Company easements that run through the western portion of Manalapan. Also within the Township is the Western Monmouth Utilities Authority (WMUA) Pine Brook Treatment Facility, located off of Utility Road near the border of Old Bridge Township. Utility land comprises 1.5 percent of total land area.

Public roads account for approximately 1381.69 acres or 7% of the Township.

Other Public Buildings and Land

This category takes in all other public land not previously mentioned. Examples of these land uses are park and ride facilities, fire houses, the first aid squad, the municipal building, the Monmouth County library, the Manalapan Road Department, the Manalapan Green Field & Senior Citizen Center, and drainageways. These areas constitute 1.5 percent of the Township land area.

QUASI-PUBLIC

Quasi-public lands include houses of worship, cemeteries, private schools, quasi-public open areas, fraternal organizations and institutions. Such lands occupy 3.81 percent of the Township.

Houses of Worship and Cemeteries

Houses of worship are mostly in the northern part of Manalapan and account for less than 1 percent of all land. The cemetery of Old Tennent Church lies between Craig Road and Freehold Road.

Private Schools

Private schools comprise less than 1 percent of all land. These schools include KinderCare on Gordons Corner Road, ABC Spectrum Preschool on Millhurst Road, Ranney School on Woodward Road and the Yellow Duck Nursery School on Pinebrook Road.

Quasi-Public Open Areas

Quasi-public open areas account for 78.74 percent of all quasi-public land. The largest of these parcels include the Monmouth Council Boy Scouts of America, and the Knob Hill and Battleground Golf Courses.

AGRICULTURE

Agriculture in Manalapan includes field crops, orchards, equestrian uses, nurseries, horticulture. These uses cover more than a quarter of Manalapan Township. The balance of agricultural use is south of the railroad right-of-way. Since 1974, agricultural land use has declined from over 11,000 acres to under 6,000 areas.

INDUSTRIAL & RAILROAD RIGHT-OF-WAY

Industrial uses are found in three (3) locations within Manalapan. The largest is Lectro Products, Inc. on Woodward Road. The next largest is North American Reiss Corp. and is located off of Mount Vernon Road. The last is property owned by Sanyar Realty at the corner of Route 33 and Park Avenue. Industrial use comprise 0.15 percent of the township's area.

Bisecting Manalapan is the rail right-of-way for the Freehold & Jamesburg Branch. This right-of-way runs east-west from Freehold Township to Monroe Township along the southern border of the Borough of Englishtown.

UNDEVELOPED LAND

Undeveloped, privately owned land totals over 3,000 acres and accounts for 15 percent of all property in Manalapan. Most of this land is south of the rail right-of-way, although several large parcels can be found in the northern Township.

Land in the undeveloped category has increased somewhat since 1974. This reflects, in part, farmlands reverting to fields and woodlands.

CONCLUSIONS

Manalapan's land use pattern is characterized by suburban features to the north and rural features in the south. In 1989, over forty percent of the Township remained in farms, fields, woodland, or other undeveloped lands. However, residential development pressures will alter the character of southern portion of Manalapan by the turn of the century. Farm acreage will continue to decline. Most of Manalapan's developed acreage is residential. Public lands are a significant component of land use largely because of the size of Battleground State Park. Commercial land use consists mainly of retail, service, and professional uses that developed to meet the needs of a growing residential population. Nearly all development has occurred in low rise buildings of one to two stories at suburban densities and intensities.

TABLE 6-1

MANALAPAN TOWNSHIP
EXISTING LAND USE - 1989

Category	Acres	Percentage of Total Area
Residential:		
Single Family	5188.80	26.28
Under Construction	515.70	2.61
Two Family	19.50	0.10
Multi-Family/Attached	251.57	1.27
Under Construction	65.45	0.33
Home Occupation/Home Professional	11.57	0.06
SUBTOTAL	6052.59	30.65
Commercial:		
Retail	506.50	2.56
Office	74.38	0.38
Under Construction	25.45	0.13
SUBTOTAL	606.33	3.01
Public:		
State Park	1291.90	6.54
County Park	60.17	0.30
Municipal Parks	224.46	1.14
Schools	246.28	1.25
Utilities	300.17	1.52
Streets & Roadways	1381.69	7.00
Other Public Buildings & Land	297.19	1.50
SUBTOTAL	3801.86	19.25
Quasi-Public:		
Houses of Worship	64.79	0.33
Cemeteries	25.79	0.13
Private Schools	45.29	0.23
Quasi-Public Open Areas	593.06	3.00
Other Quasi-Public	24.13	0.12
SUBTOTAL	753.06	3.81
Agriculture	5433.63	27.52
Industrial	29.75	0.15
Railroad Right-of-Way	35.37	0.18
SUBTOTAL	65.12	0.33
Undeveloped Land	3006.62	15.23
Millhurst Pond	24.79	0.13
TOTAL	19744.00	100.00

30.85 square miles

Compiled by: Townplan Associates - 1989

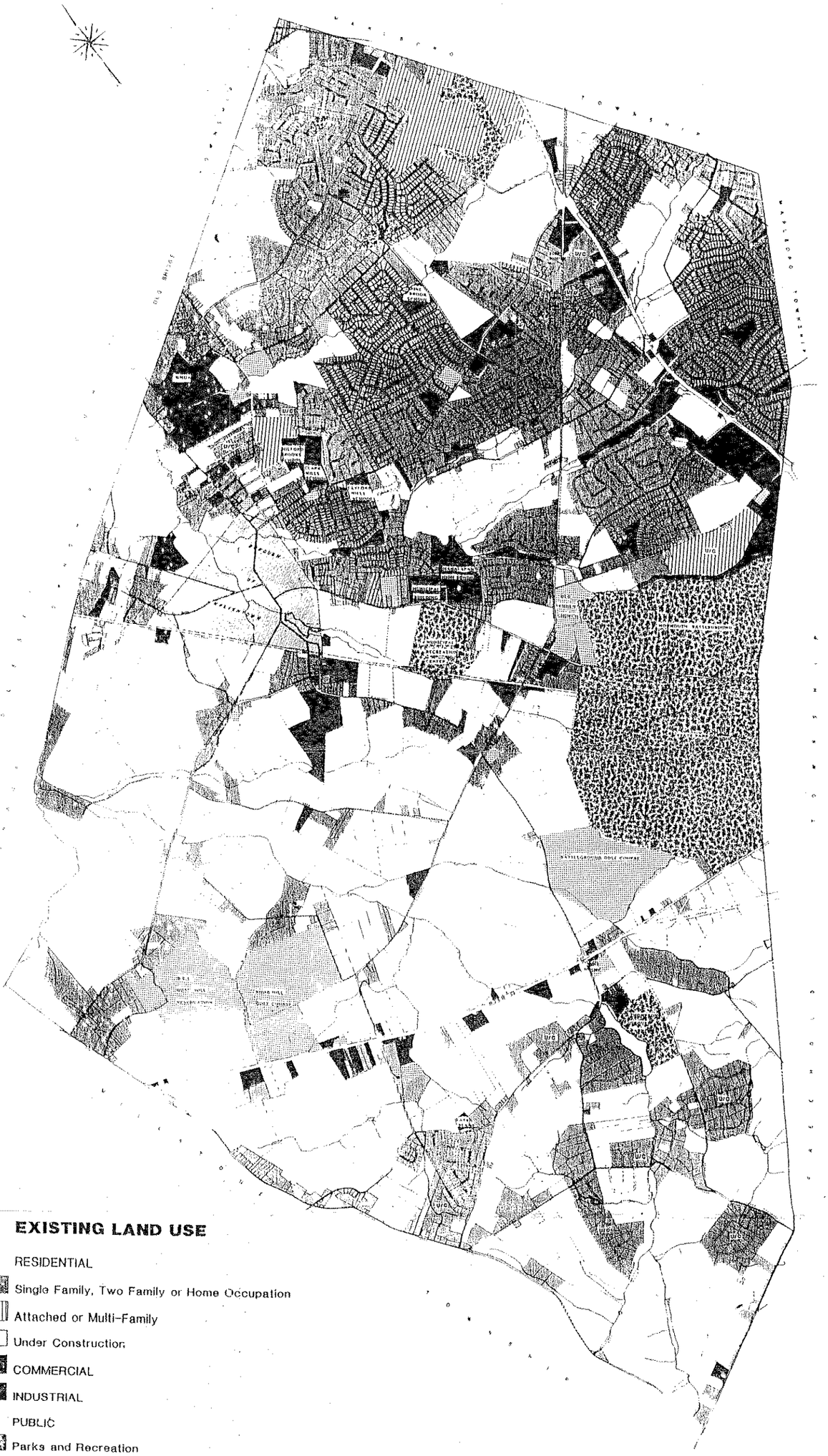
TABLE 6-2

MANALAPAN TOWNSHIP
LAND USE - 1974

CATEGORY	ACRES	PERCENTAGE
Residential:		
Single-Family	2496.0	12.6
Multi-Family	31.2	0.2
Subtotal	2527.2	12.8
Commercial	308.9	1.6
Public:		
Public Lands & Buildings	240.7	1.2
Public Open Space	1290.0	6.5
Streets and Roadways	654.1	3.3
Subtotal	2184.8	11.0
Quasi-Public	683.5	3.5
Agriculture	11,055.4	56.0
Industrial	132.3	0.7
Undeveloped	2,851.4	14.4
TOTAL	19,744.0	100

SOURCE: Monmouth County Planning Board
Compiled by: Townplan Associates

FIGURE 5



EXISTING LAND USE

RESIDENTIAL

- Single Family, Two Family or Home Occupation
- Attached or Multi-Family
- U/C — Under Construction
- COMMERCIAL
- INDUSTRIAL

PUBLIC

- Parks and Recreation
- Other Public or Utilities
- QUASI-PUBLIC
- AGRICULTURE or UNDEVELOPED

SOURCE
Manalapan Township Tax Maps - 1988
Tax Assessment Data
Field Survey - August 1989

BASE MAP
Prepared By: John Allgair
Manalapan Township Engineer
Updated By: TOWNPLAN Associates
November 1988

MANALAPAN TOWNSHIP
MONMOUTH COUNTY, N. J.

SCALE 1"=1000'

TOWNPLAN Associates

EXISTING ZONING

Manalapan Township is organized into twenty-seven zoning districts. These districts provide for a range of residential, commercial, and industrial uses at suburban intensities. They also provide for low density single family residential development and agricultural uses in rural areas where sewer and water is unavailable. The existing zone map is reproduced as Figure 6.

Of the Township area which is undeveloped or in agricultural use, approximately one thousand acres has received preliminary approval for residential or commercial development. This includes the two CD, Consent Districts along Route 33 which were created as part of a Court approved settlement of Mount Laurel litigation. These two districts alone will yield 3,574 dwelling units.

Of the agricultural or undeveloped acreage which has not been the subject of a major development approval, over 84 percent (approximately 6,300 acres), is located in one of five zone districts (R-AG) Rural Agricultural; R-R, Rural Residential; R 40/20, Single Family; GCRC, Golf Course Residential Community; or SED-20, Special Economic District. Development on this acreage will be constrained either by freshwater wetlands or the absence of sewer and water service. The Monmouth County Soils Survey indicates that approximately 41 percent of the acreage may be within a hydric soil series. Such soils are associated with the presence of wetlands, however, the extent of wetlands can only be determined by on-site surveys.

A second development constraint is the lack of sewer and water infrastructure. Approximately eleven hundred (1,100) undeveloped and uncommitted acres are within an existing or planned sewer service area which lies outside a hydric soil series. Another four hundred (400) such acres are within the GCRC Golf Course Residential District. This district, although outside the areas planned for water and sewer service, requires that residential development be served by water and sewer.

Of the approximately fifteen hundred acres where sewer is planned or required, over half (790 acres) is zoned for office or office park development; approximately one quarter is zoned as golf course residential (GCRC), and one quarter is zoned as single family residential (R-40/20 or R-20). The distribution of undeveloped acreage by zone district is shown in Table 7-1.

The uncommitted land supply in Manalapan Township, would allow, if fully developed, an additional two thousand dwelling units and seven million square feet of office and related commercial space. These estimates are rough approximations. Actual yield will vary based upon the delineation of wetlands, infrastructure availability, and market conditions.

TABLE 7-1

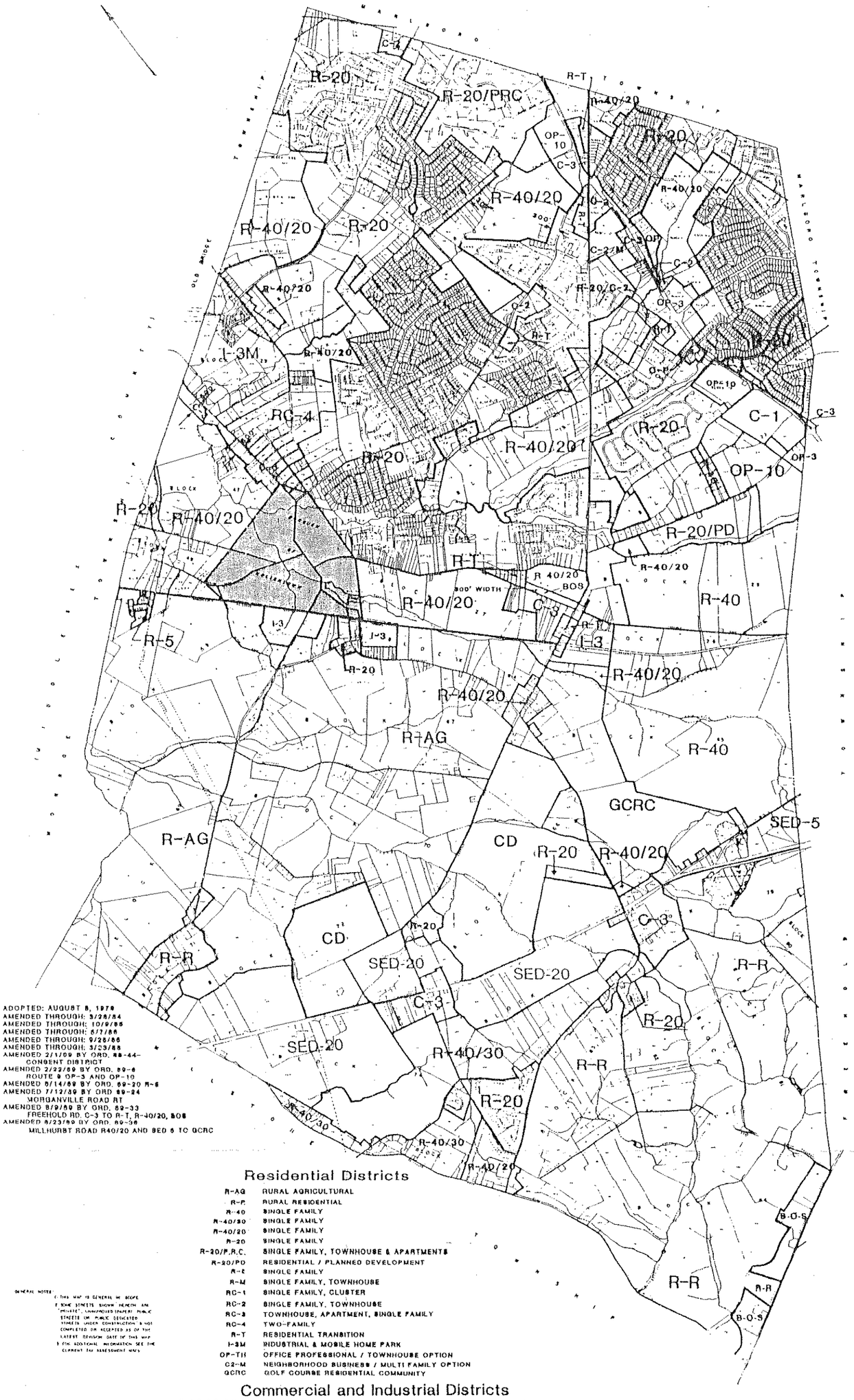
MANALAPAN TOWNSHIP
UNDEVELOPED AND UNCOMMITTED ACREAGE
BY ZONE DISTRICT

ZONE	TOTAL UNDEVELOPED	PERCENT IN HYDRIC SOIL SERIES
R-AG	2,887	60
R-R	1,124	14
R-40/20	949	68
SED-20	836	23
GCRC	480	15
R-40/30	184	26
OP-10	179	28
R-20	111	47
BOS	90	16
SED-5	66	--
I-3	65	41
C-3	45	48
OP	23	70
OP-3	19	21

Compiled by: Townplan Associates

FIGURE 6

Zoning Map



ADOPTED: AUGUST 8, 1978
AMENDED THROUGH: 3/28/84
AMENDED THROUGH: 10/9/85
AMENDED THROUGH: 6/1/86
AMENDED THROUGH: 9/25/86
AMENDED THROUGH: 3/23/88
AMENDED 2/1/89 BY ORD. 88-44- CONSENT DISTRICT
AMENDED 2/22/89 BY ORD. 89-6 ROUTE 9 OP-3 AND OP-10
AMENDED 5/14/89 BY ORD. 89-20 R-5
AMENDED 7/12/89 BY ORD. 89-24 MORGANVILLE ROAD RT
AMENDED 8/9/89 BY ORD. 89-33 FREEHOLD RD. C-3 TO R-T, R-40/20, BOS
AMENDED 8/23/89 BY ORD. 89-36 MILLHURST ROAD R40/20 AND SED 6 TO GCRC

GENERAL NOTES:
1. THIS MAP IS GENERAL IN SCOPE.
2. SOME STREETS SHOWN HEREON ARE "PRIVATE", UNIMPROVED (PAPER) PUBLIC STREETS OR PUBLIC DEDICATED STREETS UNDER CONSTRUCTION & NOT COMPLETED OR ACCEPTED AS OF THE LATEST REVISION DATE OF THIS MAP.
3. FOR ADDITIONAL INFORMATION SEE THE CURRENT TAX ASSESSMENT MAPS.

Residential Districts

R-AG	RURAL AGRICULTURAL
R-R	RURAL RESIDENTIAL
R-40	SINGLE FAMILY
R-40/30	SINGLE FAMILY
R-40/20	SINGLE FAMILY
R-20	SINGLE FAMILY
R-20/P,R,C.	SINGLE FAMILY, TOWNHOUSE & APARTMENTS
R-20/PD	RESIDENTIAL / PLANNED DEVELOPMENT
R-E	SINGLE FAMILY
R-M	SINGLE FAMILY, TOWNHOUSE
RC-1	SINGLE FAMILY, CLUSTER
RC-2	SINGLE FAMILY, TOWNHOUSE
RC-3	TOWNHOUSE, APARTMENT, SINGLE FAMILY
RC-4	TWO-FAMILY
R-T	RESIDENTIAL TRANSITION
I-3M	INDUSTRIAL & MOBILE HOME PARK
OP-TH	OFFICE PROFESSIONAL / TOWNHOUSE OPTION
C2-M	NEIGHBORHOOD BUSINESS / MULTI FAMILY OPTION
GCRC	GOLF COURSE RESIDENTIAL COMMUNITY

Commercial and Industrial Districts

C-1,C-2,C-3,C-H	COMMERCIAL
I-3	INDUSTRIAL
O-P	OFFICE - PROFESSIONAL
OP-3	OFFICE PARK
OP-10	OFFICE PARK
B-O-S	BUSINESS, OFFICE, SERVICE
SED-6	SPECIAL ECONOMIC DEVELOPMENT
SED-20	SPECIAL ECONOMIC DEVELOPMENT

Zone Map Revised by:

TOWNELAW Associates

P.O.Box 828
Red Bank, NJ
07701

Original Zone Map Prepared by E. Eugene Oross Associates

GENERAL PARCEL MAP

MANALAPAN TOWNSHIP

MONMOUTH COUNTY, N. J.

ENGINEERING SURVEYING PLANNING ASSOCIATES
BOX 259 RT. 9 HOWELL, NEW JERSEY

JOHN ALLGAIR - TOWNSHIP ENGINEER

SEWERAGE INFRASTRUCTURE

The Western Monmouth Utilities Authority (WMUA) provides sewerage service to Manalapan Township and Marlboro Township as member communities. It also serves the Borough of Englishtown and a portion of the Township of Freehold as customer communities. The limits of the WMUA existing and proposed service area within Manalapan are shown on Figure 7. Areas within the Township outside the existing or proposed sewerage service area rely upon septic systems or on-site treatment facilities.

Treatment Facilities

The WMUA Pine Brook Treatment Plant on Utility Road provides tertiary treatment and discharges into the Matchaponix Brook. The Pine Brook Plant has an independent collection system and pump station. The permit capacity of Pine Brook is currently 5.5 MGD, but the plant has been expanded to 6.6 MGD and is waiting for the revised permit from the New Jersey Department of Environmental Protection. Issuance of the revised permit will end a moratorium on sewer hook-ups, which is now in effect. In addition, a stream modeling study has been completed to allow the plant to expand to 8.0 MGD. The WMUA is also considering the use of reed beds to treat sludge.

The WMUA Wastewater Management Plan projects that the population of Manalapan Township will increase to 40,000 by the year 2000. Expansion of the Pine Brook Plant is intended to accommodate development of the Mount Laurel Consent Districts in Manalapan and Marlboro and projected growth within the WMUA service area. The WMUA anticipates an additional flow of 1.59 MGD to the Pine Brook Plant from the Mount Laurel Developments and from the proposed service area in Manalapan Township. The flow from areas in Manalapan that will be served by on-site wastewater treatment is projected at 0.45 MGD.

There are two other treatment plants within Manalapan. The Viviani Corporation Treatment Plant is a privately owned secondary treatment plant with a design capacity of 0.011 MGD. It is not in use and considered abandoned. The Battleground Park Plant is independent of the WMUA. It provides secondary treatment with subsurface discharge for Battleground State Park.

Water Quality and On-Site Waste Disposal

The areas of Manalapan which rely upon on-site wells for water supply also rely upon on-site septic systems for waste disposal. Because percolation tests for septic fields do not evaluate the ability of the environment to dilute and transport contaminants out of a watershed, groundwater degradation may occur in areas having a density of properly functioning septic tank systems.

Guidelines for housing densities to prevent groundwater degradation in non-sewered areas have been proposed by the Preliminary State Development and Redevelopment Plan for New Jersey. The plan utilizes a nitrate dilution model to arrive at suitable densities for unsewered areas. Nitrate concentrations are used as an indicator of overall groundwater quality. Excessive concentrations of nitrate can cause eutrophication of surface water and be toxic to infants.

The state guidelines recommend limits of 3mg/l of nitrate in areas designated by the State plan as Tier 5 (Exurban Reserve) or Tier 6A (Agricultural Areas). In Tier 6B (Environmentally Sensitive Agricultural Areas and Tier 7 (Environmentally Sensitive Areas), the guideline is 3 mg/l of nitrate.

The state nitrate dilution model estimates a recommended average housing density for an area of up to several square miles based upon aquifer type and watershed areas. The model estimates a density based upon normal parameters (normal rainfall) and upon conservative parameters that assume drought condition. The state recommends using the conservative parameters. The supportable housing densities based upon the dilution model for the aquifer types in Manalapan are shown on Table 8-1. The location of the aquifer outcrop areas is shown on the surficial geology map in Natural Resource Inventory, included in the appendix.

TABLE 8-1

NITRATE DILUTION MODEL - SUPPORTABLE HOUSING DENSITIES
MANALAPAN TOWNSHIP

AQUIFER TYPE	HOUSING DENSITY RANGE (ACRES/UNIT)			
	5 mg/l		3 mg/l	
	Normal	Conservative	Normal	Conservative
REGULAR COASTAL Vincentown Sand(Tvt) Mt.Laurel/Wenonah(Kmw) Englishtown (Ket) Red Bank (Krb) Wenonah Sand (Kw)	2.0	2.9	3.5	5.2
BEST COASTAL Kirkwood (Tkw) Cohansey (Tch)	1.0	2.4	3.1	4.1
ARGILLITE/COASTAL Aquitards/Conglomerate Hornerstown Marl(Tht) Navesink Marl (kns) Woodbury Clay (kwb) Marshalltown (kmt)	7.1	11.8	12.4	20.7

Source: New Jersey Office of State Planning
Nitrate Dilution Model Run December 6, 1988

FIGURE 7

SEWER SERVICE AREA

EXISTING SERVICE AREA

PLANNED SERVICE AREA

PLANNED FOR ON-SITE TREATMENT

AREA SERVED BY SEPTIC SYSTEMS

SOURCE: WMUA Wastewater Management Plan June 1987

GENERAL PARCEL MAP

MANALAPAN TOWNSHIP

MONMOUTH COUNTY, N. J.

TOWNPLAN Associates

ENGINEERING, SURVEYING, PLANNING ASSOCIATES

JOHN ALLGAIR — TOWNSHIP ENGINEER

WATER SUPPLY

Franchise Areas

Manalapan Township is divided into two franchise areas for water service. Generally, north of the railroad right-of-way of the Freehold and Jamesburg Branch, the Township is within the Gordons Corner Water Company franchise area. South of the rail right-of-way is the Manalapan Township franchise area. Within the Township franchise, a limited area is presently served by the municipal water utility. The franchise areas and locations of existing and proposed water service are shown on Figure 7.

WATER SUPPLY SOURCES

Because of the Critical Area I designation applied by the New Jersey Department of Environmental Protection to the upper strata of the Raritan-Magothy formation as an aquifer, Township withdrawals are limited to a 1983 consumption level of 0.0635 MGD at its Lamb Lane water treatment plant. Nonetheless, two major residential developments within the Township franchise area requiring water service have been approved in order to satisfy the Township obligation to provide for low and moderate income housing. These two developments, Knob Hill and The Villages, are within the consent districts created by Court Order to resolve Mount Laurel litigation. The Matchaponix Water Supply Company will serve as the sole source of supply for these developments. The company is constructing a treatment plant off of Wilson Avenue adjacent to Matchaponix Brook. The company proposes diverting water (5 MGD) from the Matchaponix Brook south of the intersection of Route 527 and Union Hill Road. In addition to supplying the Consent Districts, water will be supplied to Freehold Township and to the Gordons Corner Water Company as a conjunctive source of supply by the Matchaponix Water Supply Company.

Southern Franchise Area

In 1988, the Manalapan Planning Board adopted a water supply and distribution Master Plan for the Township southern water franchise area. The plan, prepared by CME Associates, recommends improvements in two phases to serve the Consent Districts and the Route 33 Corridor. The phased improvements as described in the Water Supply and Distribution Master Plan are included below.

Phase I

The first phase of the recommended water supply and distribution system improvements for the Township franchise area are those which will be needed in the immediate future to meet the needs of the proposed Mount Laurel developments as well as initiate commercial/industrial development along the N.J. Route 33 corridor, starting in the general vicinity of Woodward Road.

The first phase of improvements should consist of the water transmission and distribution mains and 2.0 million gallon storage tank proposed by the Mount Laurel developers under the terms of the Court Order and Consent Order currently negotiated before Judge Serpentelli, AJSC. In addition, a 12" water main should be extended from Lamb Lane along Woodward Road, across N.J. Route 33 and interconnect with the Mount Laurel development water distribution system at Daum Road. Twelve inch parallel water mains should also be extended in an east-west direction along the north and south shoulders of N.J. Route 33 to the Park Center complex and commercial/industrial properties of the Mount Laurel developers.

Acquisition of alternate sources of water supply should also be initiated under this phase of the Township water supply system. Initially, emphasis should be placed on the purchase of diversion rights for the Englishtown aquifer from the NJDEP. Obtaining these diversion rights will permit the full utilization of the Lamb Lane water treatment plant capacity (0.72 MGD). When these diversion rights are obtained, the plant should be expanded accordingly.

Regardless of the success of diversion right acquisition by the Township and possible expansion of the Lamb Lane water treatment plant, the existing water treatment plant should be provided with an emergency, standby generator. The generator is being provided by the developer of the Sweetmans Estates III subdivision on Woodward Road.

Phase II

The second phase of the recommended water supply and distribution system expansion is primarily intended to expand water service for consumption and fire protection along the N.J. Route 33 corridor to continue to encourage commercial/industrial development.

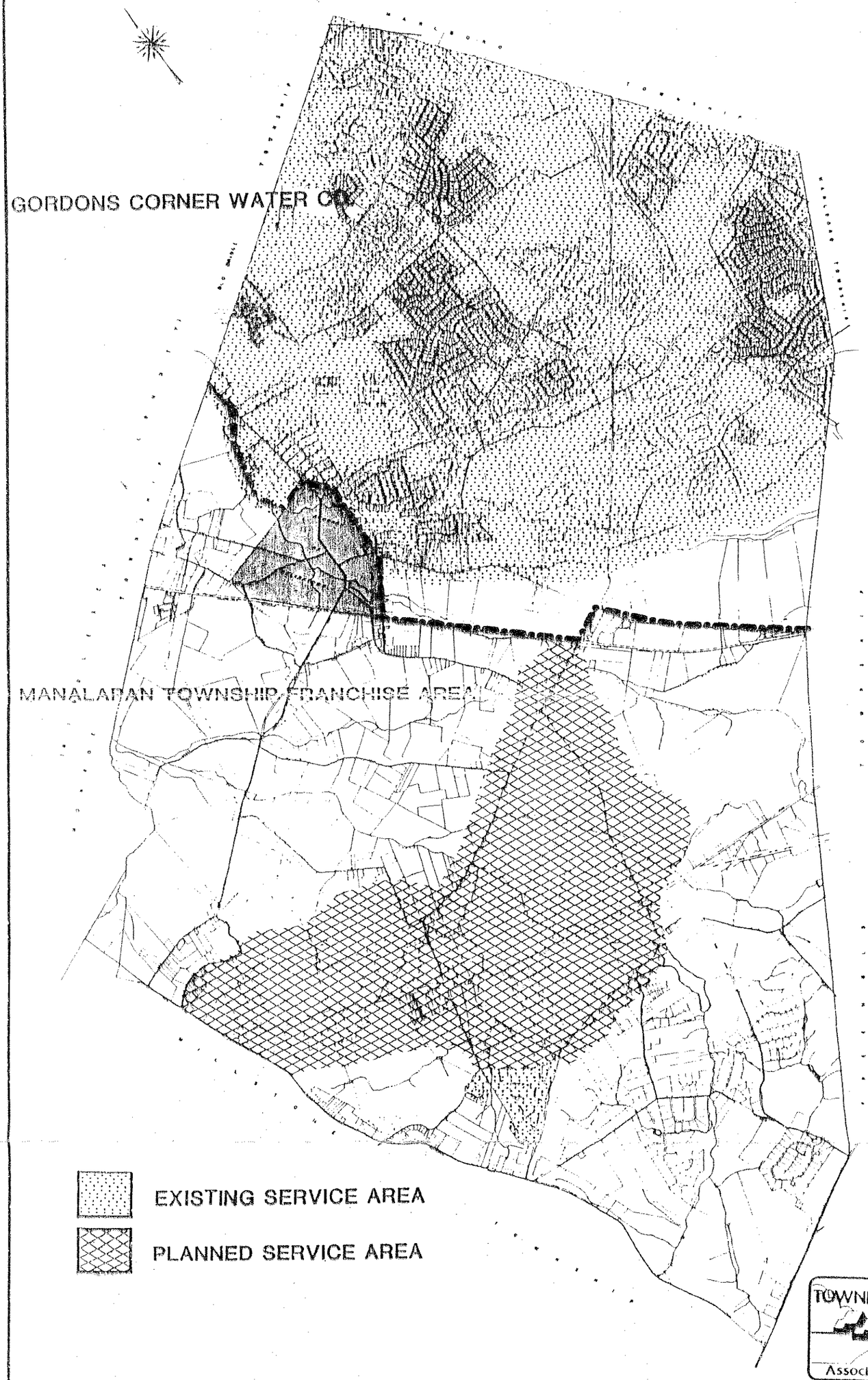
In general, the parallel 12" water mains along the N.J. Route 33 Right-of-Way should be extended from the Millstone/Manalapan Township boundary to Millhurst Road. The mains should be reinforced by looping of 12" mains in Millhurst Road and Sweetmans Lane with the N.J. Route 33 mains. In addition, a reinforcing main from the 2.0 MG storage tank at the Quail Hill Scout Reservation along LaValley Drive and Iron Ore Road to N.J. Route 33 will be required. The Lamb Lane treatment facility would be expanded to include a 1.50 MG standpipe.

Potential sources for water for the Township franchise area are shown on Table 9-1. Improvements beyond Phase II would require significant capital expenditures to provide water service to the remainder of the Township franchise area, which is being developed with low intensity residential uses. Development will rely on on-site wells for water supply. Historically wells which draw from

depths of one hundred feet (100 feet) or greater yield adequate quantities of potable water. Shallow wells are susceptible to fluctuations in the sufficial water table during drought. Water quality is satisfactory and there is no reported chemical contamination. High iron content is treatable with household conditioning systems.

FIGURE 8

WATER SUPPLY SERVICE AREA



TOWNPLAN Associates

GENERAL PARCEL MAP

MANALAPAN TOWNSHIP

MONMOUTH COUNTY, N. J.

ENGINEERING SURVEYING PLANNING ASSOCIATES
BOX 388 RT. 9 HOWELL, NEW JERSEY
JOHN ALLGAIR — TOWNSHIP ENGINEER

TABLE 9-1

Summary of Alternate Water Sources

ALTERNATIVE SOURCE	AVAILABLE WATER FOR PURCHASE	BULK WATER COST	1987 PRELIMINARY CONSTRUCTION	ESTIMATED COST OF DELIVERED WATER	COMMENTS
Englishtown Aquifer:	0.72 MGD+	N/A	$250/MG+	$250/MG+	Cost would increase as water plant expansion required.
Middlesex Water Company:					
Marlboro MUA	10 MGD	$1,059.33+/MG	?	$1,059.33+/MG ($1,200-1,400/MG)	Exact cost of infrastructure construction costs to be determined based on quantity of water to be purchased.
Gordons Corner Water Co.	1 MGD (2)	$1,115.00+/MG	?	$1,059.33+/MG ($1,200-1,400/MG)(1)	Exact cost of infrastructure construction costs to be determined based on quantity of water to be purchased.
Other Surface Supplies:					
Matchaponix Water Supply Company	1.25-5.0 MGD	$1,750/MG	N/A	$1,750/MG	Project presently under construction to serve Mt. Laurel developers and others.
Manalapan Brook	1.60 MGD+	N/A	$1,420-1,820/MG	$1,420-1,820/MG	Preliminary estimate subject to NJDEP diversion permit.
Manasquan Reservoir	14.765 MGD	$909/MG	?	?	Exact cost of infrastruction construction costs to be determined based on quantity of water to be purchased.

(1) Future cost estimates after completion of regional transmission system.

(2) 1 MGD reportedly available now but may be expandable upon negotiations with the subject parties.

SOURCE: MANALAPAN TOWNSHIP WATER SUPPLY AND DISTRIBUTION MASTER PLAN

MASTER PLAN ELEMENTS

STATEMENT OF PRINCIPLES, OBJECTIVES, ASSUMPTIONS, POLICIES AND STANDARDS

Principles

In order to balance the need for the continued development of Manalapan with the need for environmental protection and the conservation of desirable community features, this master plan is based upon the following principles:

1. The township is a community of diverse land use. Locations suitable for suburban, rural, commercial, industrial and large scale planned development have been identified. Growth through the year 2010 will be largely absorbed within the suburban and planned development locations of the northern township and the Route 33 corridor.

2. Future development should be coordinated with the capacity of existing and planned infrastructure and the need to maintain satisfactory levels of service.

3. Certain natural features represent environmentally critical areas whose essential natural character cannot be altered without causing injury to the community and the region. These features should be identified as conservation areas and regulated accordingly.

4. The long term community interest is best served by identifying and reserving appropriate locations for the development of an economic base.

5. To the extent permitted by law, the cost of provision of the public facilities and capital improvements needed to support future growth should be borne by the private sector.

Objectives

The Manalapan Township Master Plan establishes the following as the objectives of its municipal planning process:

1. Secure public safety from fire, flood, panic and other natural and man-made disasters.

2. Develop and maintain a satisfactory level of public facilities and services.

3. Encourage the most appropriate use of land consistent with its suitability for development.

4. Establish appropriate population densities and control the intensity of development to ensure neighborhood community, and regional well being and preserve the natural environment and resources.

5. Ensure that township development does not conflict with development and the general welfare of neighboring muncipalities, the County, and the State as a whole.

6. Coordinate public development with land use policies to encourage the appropriate and efficient expenditure of public funds.

7. Provide sufficient space and appropriate locations for residential, commercial, recreational, agricultural and light industrial use.

8. Locate and design transportation routes and commuter parking lots to promote the free flow of traffic while discouraging congestion or blight.

9. Promote a desirable visual environment.

10. Conserve landmarks and historic sites.

11. Protect areas with scenic, cultural, and recreational values.

12. Promote the recycling of materials from solid waste, and encourage the conservation of energy.

13. Maintain and attract beneficial commercial uses.

14. Encourage planned developments that incorporate the best features of design and relate the type, design, and layout of residential, commercial, industrial, and recreational development of a particular site.

15. Encourage senior citizen community housing construction.

16. Maintain a continuous planning process that will coordinate capital expenditures with the master plan and provide development reviews to assure that the policies and standards promoted by the master plan are implemented.

Assumptions, Policies and Standards

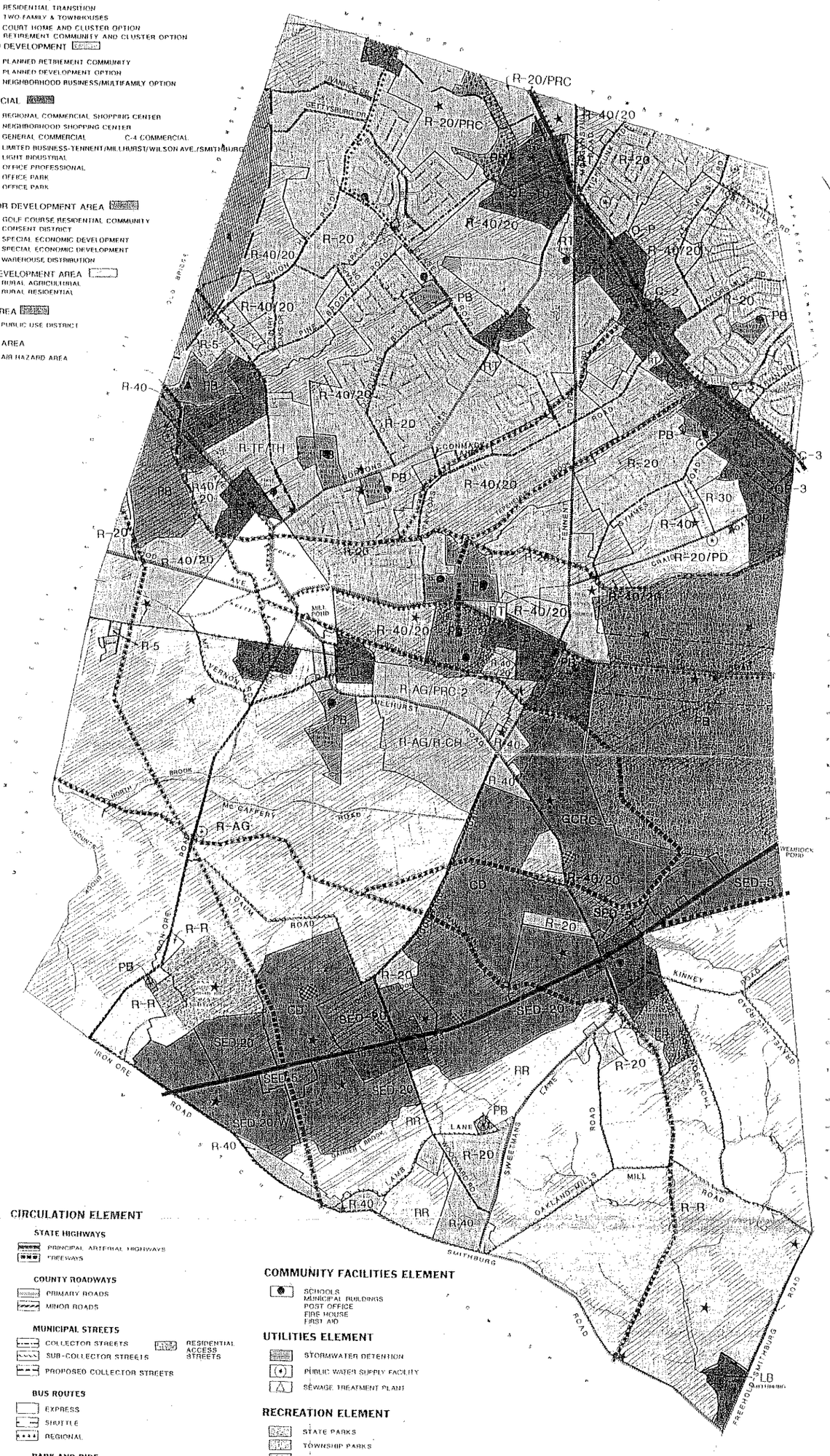
The Manalapan Master Plan assumes that there will continue to be economic expansion within the region which will express itself through the continued development and growth of Manalapan Township. Each plan element is presented with a summary of the background information utilized in its preparation. This is followed by a presentation of the policies, standards and other recommendations proposed for the physical, economic and social development of the township. The graphic representation of the master plan is presented as Figure 9.

Recommendation for a Capital Improvement Program

Notwithstanding variations in the rate of growth resulting from regional economic fluctuations, the master plan projects that the township population will increase from 26,000 in 1988 to 43,000 by 2010. To address the capital needs generated by this development, it would be prudent for the Township Planning Board to prepare a capital improvement program which, in accordance with NJSA 40:55D-29, identifies the scheduling and estimated costs of property acquisition and construction projects needed to support the future population.

The capital improvement program may be used in conjunction with requirements for developer contributions for off-tract improvements for circulation, drainage and water facilities.

MASTER PLAN



LAND USE ELEMENT

SUBURBAN DEVELOPMENT AREA

RESIDENTIAL

- R-40 SINGLE FAMILY
- R-30 SINGLE FAMILY
- R-40/20 SINGLE FAMILY
- R-20 SINGLE FAMILY
- R-5 SINGLE FAMILY
- R-1 RESIDENTIAL TRANSITION
- R-TF/TH TWO FAMILY & TOWNHOUSES
- R-AG/R-CH COURT HOME AND CLUSTER OPTION
- R-AG/PRC-2 RETIREMENT COMMUNITY AND CLUSTER OPTION

PLANNED DEVELOPMENT

- R-20/PRC PLANNED RETIREMENT COMMUNITY
- R-20/PD PLANNED DEVELOPMENT OPTION
- C2-M NEIGHBORHOOD BUSINESS/MULTIFAMILY OPTION

COMMERCIAL

- C-1 REGIONAL COMMERCIAL SHOPPING CENTER
- C-2 NEIGHBORHOOD SHOPPING CENTER
- C-3 GENERAL COMMERCIAL
- C-4 COMMERCIAL
- LB LIMITED BUSINESS-TENNENT/MILLHURST/WILSON AVE./SMITHBURG
- LI LIGHT INDUSTRIAL
- OP OFFICE PROFESSIONAL
- OP-3 OFFICE PARK
- OP-10 OFFICE PARK

CORRIDOR DEVELOPMENT AREA

- GCRC GOLF COURSE RESIDENTIAL COMMUNITY
- CD CONSENT DISTRICT
- SED-5 SPECIAL ECONOMIC DEVELOPMENT
- SED-20 SPECIAL ECONOMIC DEVELOPMENT
- SED-20/W WAREHOUSE DISTRIBUTION

RURAL DEVELOPMENT AREA

- R-AG RURAL AGRICULTURAL
- R-R RURAL RESIDENTIAL

PUBLIC AREA

- PB PUBLIC USE DISTRICT

OVERLAY AREA

- AIR HAZARD AREA

CIRCULATION ELEMENT

STATE HIGHWAYS

- PRINCIPAL ARTERIAL HIGHWAYS
- FREEWAYS

COUNTY ROADWAYS

- PRIMARY ROADS
- MINOR ROADS

MUNICIPAL STREETS

- COLLECTOR STREETS
- SUB-COLLECTOR STREETS
- PROPOSED COLLECTOR STREETS
- RESIDENTIAL ACCESS STREETS

BUS ROUTES

- EXPRESS
- SHUTTLE
- REGIONAL

PARK AND RIDE

- EXISTING
- PROPOSED

LANDMARK ELEMENT

- HISTORIC SITES
- LANDMARK CORRIDOR

CONSERVATION ELEMENT

- CRITICAL AREAS

COMMUNITY FACILITIES ELEMENT

- SCHOOLS
- MUNICIPAL BUILDINGS
- POST OFFICE
- FIRE HOUSE
- FIRST AID

UTILITIES ELEMENT

- STORMWATER DETENTION
- PUBLIC WATER SUPPLY FACILITY
- SEWAGE TREATMENT PLANT

RECREATION ELEMENT

- STATE PARKS
- TOWNSHIP PARKS
- COUNTY PARKS
- TRAIL SYSTEM
- QUASI-PUBLIC OPEN SPACE

ADOPTED: MAY 23, 1991

BASE MAP

Prepared By: John Allgair P.E., L.S.
Manalapan Township Engineer

Updated By: TOWNPLAN Associates
November 1989

RICHARD S. CRAMER, JR., P.P., A.I.C.P. Township Planning Consultant

MANALAPAN TOWNSHIP

MONMOUTH COUNTY, N. J.

TOWNPLAN Associates

LAND USE PLAN ELEMENT

The land use plan element guides the extent and intensity of future development within Manalapan Township. The recommendations are coordinated with the other master plan elements, the basic planning studies, and the statement of principals, objectives and assumptions.

Background

Manalapan is characterized by a suburban pattern of development in the northern portion of the township. This pattern has been strongly influenced by accessibility to New Jersey State Highway 9 and the availability of sewer and water infrastructure. The southern portion of the township is less developed and rural in character. However, development pressures along the Route 33 corridor and south of that highway will alter land use patterns in that portion of the township over the next 20 years. A doubling of the township population from the 1980 level is projected by the year 2010. This has resulted in plans to provide sewer and water infrastructure along the Route 33 corridor to support the projected development. It has also resulted in plans to evaluate the use of Manalapan Brook, Matchaponix Brook, non-threatened aquifers, and other alternative sources of potable water.

Statement of Recommended Standards of Population Density and Development Intensity

Although 40 percent of Manalapan Township remained undeveloped in 1989, continued development will bring pressures to diminish farm acreage and open space, as well as woodlands, fields, and habitats for native flora and fauna. However, infrastructure and environmental constraints dictate that certain portions of Manalapan should be limited to a rural development pattern. Moreover, it is not necessary to open up all rural areas to development in order to accommodate the growth projected for the community to the year 2010. Accordingly, the land use plan element organizes the township into an area of suburban development, an area of rural development, and an area of planned development along the Route 33 corridor (Figure 1). The standards for population density and development intensity as well as specific land use classifications are derived from these categories (see Table 11-1 and Figure 9). It is the intent of the plan that intensity standards should be responsive to the development constraints and potential of land within the Township. This approach is presented in the following section on land use policies.

Land Use Policies

Suburban Development

Northern Manalapan Township has developed largely as a suburban residential area of single family homes with nodes of office, retail, and services. Commercial nodes are located at Union Hill Road on the Marlboro border and at Yorktown at the intersection of

Pease Road and Gordons Corner Road. A civic complex is developing west of Tennent at the intersection of Taylors Mills Road and Freehold-Englishtown Road. Land use along Route 9 has developed largely as a commercial corridor. Within the suburban development area, future land use will be based upon existing land use patterns, density, and intensity of development. Sewerage and water infrastructure will be expanded south to Millhurst Road and allow for the extension of the suburban pattern. Development districts have been delineated on the basis of existing land use, approved development applications, and appropriate locations for expansion of the suburban pattern. Retail service nodes have been identified on the basis of existing land use and suitable location and access. The Route 9 corridor has been planned for development of an economic base that will generate substantial employment opportunities for the community.

Corridor Development Area

The Route 33 corridor area is planned as a location which will absorb a substantial portion of the township's future growth by the year 2010. The availability of large tracts of land within the corridor make it suitable for major planned development which will provide a balance of housing. Land use policy in the corridor will encourage planned development districts including locations which will provide for the township obligation for the regional low and moderate income housing need. Appropriate locations will be reserved for non-residential development to meet the retail service needs of the new residential population. Locations will also be reserved to expand the economic base of the community through the development of employment and warehouse/distribution centers. Sewer and water infrastructure will be extended to the corridor area. It is recommended that public transportation services be provided, commuter parking lots be established, and that the township and the county undertake a study of Route 33 to determine the desirability of designating it as a transportation development district.

Rural Development Areas

Two locations within the township should be restricted to development at rural intensities. Land use is recommended to be restricted to low density single family residential, agriculture, open space, and limited areas for retail/service development to meet the needs of the residential population. Two areas are shown for rural development. The first is north of the corridor development area and west of Millhurst Road. This location, which includes areas accessible by Iron Ore Road, Daum Road and McCaffery Road, consists largely of undeveloped lands or lands in agricultural use. South of Route 33, tract development, typically in the form of large lot subdivisions, has occurred and resulted in a mix of residential and agricultural use. Within rural development areas, efforts should be made to take advantage of farmland preservation programs.

Except for two older residential developments abutting Lamb Lane (the Knolls and Manalapan Woods), where public water service is available, sewerage and infrastructure is neither existing nor planned for the rural development areas. Development relies on on-site wells and septic systems. Because of the reliance on on-site systems for wastewater and water supply, and because this area, along with the corridor area, drains into the Manalapan Brook, a potential source of public water supply, development should be coordinated with State water quality standards. A nitrate dilution model, as recommended by the Office of State Planning, may be utilized as a guideline for evaluating rural density. Development in these areas would be subject to the following:

1. Clustering development on tracts containing at least fifty (50) developable acres such that, in the R-R areas, at least twenty (20) percent of the developable area is maintained in open space, farmland or woodland and, in the R-AG areas, at least fifty (50) percent of the developable area is so maintained. The minimum cluster lot size shall be 60,000 square feet, exclusive of wetlands and transition areas.

2. Buffers should be established between residential and agricultural uses.

3. Development design should maintain rural features including hedgerows, woodland, wetlands, stream corridors, habitats of threatened or endangered species and, to the extent possible, agricultural uses.

4. Clusters would be permitted as a conditional use based upon the Planning Board's determination that the cluster design would be the most appropriate means of maintaining rural features.

Special Considerations

In addition to the classification for future land use according to its location within a suburban, corridor, or rural area, categories have been established for areas, uses or features which merit special consideration and treatment. These areas, addressing environmental concerns, public uses, landmarks, and special design districts, are described below.

Critical Protection Area

The conservation and stormwater elements of the master plan identify critical natural features which have limited suitability for development or tolerance for disturbance. These features, which include wetlands, flood hazard areas, stream corridors and aquifer recharge areas are found in suburban, rural, and corridor areas of the township. The sensitive features may overlay any delineated zone district and should be protected by development regulations. Within the critical areas overlay, permitted activity should be limited, subject to the preemption of the state

freshwater wetlands protection act, to prevent harm to the community by preserving the essential natural character of the land.

Air Hazard Overlay District

The location of Old Bridge Airport adjacent to Manalapan Township requires that Manalapan recognize and delineate an airport hazard area (NJSA 40:55D-28b.(2)(c)). The air hazard area will be established as an overlay to underlying land use classifications. Within the air hazard overlay, runway subzones, runway end zones, and clear zones must be established as required by NJAC 16:62-3.2. In the air hazard area, the following uses would be permitted if allowed by the underlying zone district:

1. Residential single family dwellings situated on a lot at least three acres in size and not located in clear zone.

2. Open space

3. Agriculture

4. Commercial Uses

5. Industrial Uses

Limited Business

Four limited business districts are suggested for Manalapan Township:

- Limited Business - Tennent
- Limited Business - Millhurst
- Limited Business - Smithburg
- Limited Business - Wilson Avenue

Permitted uses in these districts include: Professional and business offices, veterinary clinics, banks, antique shops, places of worship, schools, day care facilities, nursing homes, farms, garden supply and nursery centers, post offices and municipal facilities.

Limited Business District - Tennent

As a place of early settlement, Tennent has historic association with Monmouth Battleground State Park and the National Historic Landmark of Tennent Church. Its location at the intersection of Freehold-Englishtown Road and Tennent Road provides an approach to the historic core of the community. For that reason, special treatment is proposed to control design, and maintain and enhance the dignity of the approaches to this historic area. Design control should be established to ensure that architecture, signage, and streetscape improvements within this area maintain historic continuity.

In addition to the uses permitted in all Limited Business districts described above, the following uses will be permitted in the Limited Business - Tennent district: residential uses and home occupations on Main Street; office/retail and restaurant uses, provided they are located no closer than 300 feet to a single-family residential district.

Within the Limited Business District - Wilson Avenue, retail uses would be permitted in clusters of architecturally coordinated buildings that maintain a compact arrangement and emphasize a pedestrian scale and orientation, as well as traditional architectural forms. The number of stores within each building and building and building size would be limited. Display windows and building entrances would be located on more than one building face and parking would not be permitted within a front yard area.

Limited Business - Millhurst

Millhurst, south of Route 33 on Sweetmans Lane, is associated as a place of early settlement in Manalapan. It contains some landmark buildings and lies between the rural and corridor areas of the township. The intent of the Limited Business designation is to control development by assuring that architecture, signage, and streetscapes maintain a continuity of design and spatial arrangement appropriate to this area.

Limited Business - Smithburg

The Smithburg Limited Business district is located along Freehold-Smithburg Road in the southeastern portion of the Township. The intent of the Limited Business designation is to maintain the character of a village situated around Elton Pointe. Development should be controlled by assuring that architecture, signage and streetscape improvements maintain a continuity of design and spatial arrangement appropriate to this area.

Limited Business - Wilson Avenue

The Wilson Avenue Limited Business District is located on Wilson Avenue north of Englishtown. The limited business designation is intended to provide an alternative to the highway commercial designation formerly assigned to Wilson Avenue. Commercial development will continue but design will be controlled to discourage a "highway strip" appearance.

Public Facilities and Open Space

The major locations of public open space and buildings, including schools, parks, and recreation areas, have been designated as a public facilities and open space district. The policy is to retain these areas in public use and, where appropriate, require that the design of adjoining development provide for buffer or suitable access.

Landmarks

Within Manalapan Township, landmarks have been identified by the historic conservation element. Landmarks and adjoining property should be subject to special design considerations that control future subdivision and site plan approval. Demolition or inappropriate alteration of these landmarks should be discouraged. Township policy is to encourage their preservation as part of the common heritage of the residents of Manalapan Township.

In addition to the identification of individual historic sites and structures, a landmark corridor has been designated in Manalapan Township. The landmark corridor runs along Freehold Road and Main Street through the Monmouth Battlefield State Park. The corridor encompasses landmark sites, including the Old Tennent Church. It is recommended that all development proposals within 1,000 feet of the corridor boundary be designed to respect the historic integrity of the landmark corridor. Building and site design should be compatible with the pre-1900 vernacular styles present in Manalapan.

Planned Development Options

Where planned development is proposed for commercial and residential uses, and such development is to be phased, the policy of the township will be to require an overall plan of the development showing its conceptual arrangement, its phasing, and demonstrating the feasibility of providing the necessary infrastructure to service it.

Maximum Site Improvement Ratio

Maximum site improvement ratios should be established to control the intensity of development. This ratio will compare the usable floor area of a building to the improvable area of a lot where buildings and structures can be placed without encroaching on a critical protection area of sensitive environmental features or violating yard requirements.

Minimum Improvable Area Requirement

The building envelope on a lot as defined by the minimum yard requirement of a zone district should be required to enclose a minimum contiguous improvable area which is not encroached upon by a critical protection area of sensitive environmental features.

Relationship to Existing and Proposed Zone Plan

The land use element map (Figure 9) in conjunction with Table 11-1 (Standards of Development Intensity) establishes the location and type of zone districts intended. The districts and intensity standards have been derived from the existing zone plan. The major innovations being recommended to the zone plan are listed below:

1. Air hazard overlay district;
2. Critical area overlay district;
3. Limited Business district for Millhurst, Tennent and Smithburg and Wilson Avenue;
4. Public Use district;
5. Expansion of the OP-10 district west along Pine Brook Road;
6. That portion of the R-AG district north and south of Millhurst Road which overlaps the planned sewer service area will be designated to conditionally permit R-40/20 single-family development and planned developments provided the developer extends sewer and water service to support the higher densities;
7. R-5 district applied to Bucks Head/Forest Hills and Pergolaville;
8. Replace I-3 and I-3M districts with an LI-Light Industrial designation that deletes residential options;
9. Expand R-40/20 designation to Millhurst Road in anticipation of sewer service;
10. Deletion of BOS designation;
11. Deletion of redundant zone district categories (RC-1, RC-2, RC-3, OP-TH, and C-H);
12. Redesignation of RC-4 district as R-TF/TH, two-family and townhouses;
13. Expand R-R to north of Lamb Lane;
14. Require overall concept plan for all phased developments, office park developments, and office industrial park developments;
15. Cluster option for R-R and R-AG;
16. Establish standards and guidelines to improve the design, layout, building relationships and visual appearance of development;
17. Establish standards and guidelines to require that building and development design be arranged in conjunction with existing site physiography to minimize regrading and soil import or export;
18. Landmark Corridor Overlay district;
19. Creation of a new SED-5 district along Route 33 south of the Knob Hill Golf Course. The SED-5 district will, in the future, provide for limited recreational uses including golf training centers, bowling and tennis.
20. Revise office park provisions to allow for a mix of ancillary uses for employee convenience and to help reduce automobile trips. Such uses would include day care, child recovery, restaurants, and retail banks. Hotel/conference centers would be permitted as a conditional use within major office parks.
21. Permit Helistops as an accessory use to major development within the SED-20 and SED-20/W zone districts with standards to control setback from residential areas.
22. The creation of a C-4 district north of Symmes Drive. This is a highway commercial district limited to uses characterized by low peak hour traffic generation such as hotels and theatres.

23. Establish a maximum site improvement ratio by zone district.
24. Establish a minimum improvable area requirement by zone district.

TABLE 11-1
RECOMMENDED STANDARDS OF POPULATION DENSITY
AND DEVELOPMENT INTENSITY

DISTRICT	DESCRIPTION	STANDARD
R-40	Single-family detached dwellings along Washington's Advance.	40,000 s.f./d.u. minimum lot area.
R-40/20	Single-family detached dwellings with cluster lot option. Located mainly in the northern township on undeveloped lands adjoining R-20 neighborhoods.	40,000 s.f./d.u. minimum which may be clustered on 20,000 s.f. lots on tracts of 30 acres or more.
R-30	Single-family detached dwellings north of Craig Road.	30,000 s.f./d.u. minimum lot area.
R-20	Developed single-family detached dwellings in northern township and limited locations of existing housing in rural areas.	20,000 s.f./d.u. minimum, variable lot size/cluster option.
R-5	Subdivisions of single-family detached dwellings west of Pension Road adjacent to Old Bridge Township, and at Pergolaville.	5,000 s.f./d/u. minimum lot area.
R-T	Single-family locations in suburban areas fronting on major roads and providing a transition to commercial or office districts. Conversion of dwelling and infill office use permitted provided a residential scale is maintained.	20,000 s.f./d.u. minimum; for non-residential, 40,000 s.f. lot area minimum; .18 maximum site improvement ratio.
R-TF/TH	Two-family and townhouse dwellings located in areas of existing or approved development along Pension Road and Wilson Avenue.	Two-family dwelling - 10,000 s.f. minimum lot area.
R-20-PRC	Planned retirement community. Covered Bridge, along Route 9 South. Townhouses and clusters of patio homes are permissible.	6 d.u./gross acre maximum

DISTRICT	DESCRIPTION	STANDARD
R-20/PD	Planned residential development option for designated area south of Craig Road. Townhouse and patio homes permitted under the planned development option.	R-20 standards for conventional or clustered detached dwellings. 5 d.u./gross acre for planned development.
C2-M	Neighborhood business area with multi-family option. Limited to an existing area of approved development between Route 9 and Tennent Road.	C-2 standards apply to non-residential. For attached housing, 8 d.u./gross residential acre
C-1	Regional commercial shopping center district located northwest of the intersection of Craig Road and Route 9. Presently developed as the Manalapan Mall with expansion area available for mixed commercial uses.	.20 maximum site improvement ratio; 15 acres minimum lot size
C-2	Neighborhood shopping center districts included as a convenience to suburban residential areas. Locations are designated along Route 9, at the intersection of Gordons Corner Road and Pease Road (Yorktowne), at Union Hill Road adjacent to Marlboro Township.	.18 maximum site improvement ratio. 4 acres minimum lot size
C-3	General commercial districts confined to locations along Route 9, Route 33 and Wilson Avenue. Allows for a range of retail, service and office uses.	.18 maximum site improvement ratio. 40,000 s.f. minimum lot area
C-4	Highway commercial district northwest of Symmes Drive and Route 9, limited to uses characterized by low peak hour traffic generation. The commercial use mix is intended to complement the C-1 district to the south. Uses will include hotels of at least 100 rooms, threaters, indoor commercial recreation such as health clubs and racquet clubs. Commuter parking facilities would also be permitted.	.18 maximum site improvement ratio. 20 acres minimum lot size
LB-Tennent LB-Millhurst LB-Smithburg LB-Wilson Avenue	Limited business districts confined to Tennent, Millhurst, Wilson Avenue and Smithburg. See Land Use Element text for Limited Business description and use recommendations.	.15 maximum site improvement ratio except .18 will be permitted in the Wilson Avenue District

DISTRICT	DESCRIPTION	STANDARD
LI	Light industrial districts planned for offices, research facilities, warehousing, wholesaling, and light manufacturing. Locations are along the Conrail Line southwest of Englishtown and Tennent.	3 acres minimum lot area .20 maximum site improvement ratio
OP	Office professional district limited to professional and business offices. Locations along Franklin Lane and at the Route 9/Briarhill drive intersection.	20,000 s.f. minimum lot area .18 maximum site improvement ratio
OP-3	Office district allowing professional and business offices. Located along Taylors Mills Road/Route 9 and Craig Road.	3 acre lot minimum area .20 maximum site improvement ratio
OP-10	Office district providing for major office park development. Located on larger tracts along Route 9 and Craig Road east of Washington's Advance.	10 acre lot minimum area .20 maximum site improvement ratio
GCRC	Golf Course Residential Community located within the Route 33 corridor. Provides for major planned residential development on the site of Battleground Country Club and preservation of the golf course.	1.1 d.u./gross acre maximum Minimum of 60% of tract must be reserved as open area.
CD	Consent districts created by settlement of Mt. Laurel litigation. Provides two locations for major planned residential development along the Route 33 corridor and for the set-aside of affordable dwelling units.	As provided in Court Order
SED-5	Special economic development district for smaller parcels within the Route 33 corridor. Uses restricted to non-retail commercial, office, research facilities, lodging and limited recreation uses related to golf, tennis and bowling	5 acres minimum lot area .20 maximum site improvement ratio
SED-20	Special economic district to permit major campus development of offices, office parks, office industrial parks, and office-warehouse distribution facilities. Limited to locations within the Route 33 corridor.	20 acre minimum lot area .15 maximum site improvement ratio

DISTRICT	DESCRIPTION	STANDARD
SED-20/W	SED-20 with warehouse distribution centers permitted.	20 acre minimum lot area .25 maximum site improvement ratio for warehouse distribution centers .15 maximum site improvement ratio other uses
R-AG	Rural agricultural district intended for open space/ conservation uses and agriculture/horticulture operations. Non-farm dwellings permitted at low density. Located north of Route 33 corridor and west of Millhurst Road.	120,000 s.f./d.u. minimum Clustering for larger tracts on 60,000 S.F. lots
R-AG/R-CH	Planned sewer service area south of Millhurst Road. R-AG standards apply until sewer and water are provided.	R-AG development permitted as of right. If the developer provides sewer and water, development may proceed based upon R-40/20 standards or as court homes. Court homes are attached single-family dwellings developed at a maximum of 1.3 units per gross acre on tracts with sufficient non-critical area. Homes are clustered around private courts that provide vehicle access. If the court home option is followed, a contribution toward future Mount Laurel obligation will be required in accordance with COAH regulations.
R-AG/PRC-2	Planned sewer service area north of Millhurst Road. R-AG standards apply until sewer and water are provided.	R-AG development permitted as of right. If sewer and water are provided, development may proceed based upon R-40/20 standards or as a planned retirement community. Planned retirement communities will only be permitted at a maximum of three dwelling units per gross acre where the total non-critical area is fifty acres or more. Contributions toward future Mount Laurel obligation, no access to Main Street/Tennent Road unless needed for efficient circulation, and a green belt of continuous open space are required.

DISTRICT	DESCRIPTION	STANDARD
R-R	Rural residential development districts intended for low density residential development and agricultural uses. Located principally south of Route 33.	80.000 s.f./d.u. minimum Clustering for larger tracts on 60,000 S.F. lots
PB	Public use district intended for major public facilities including schools, parks, government offices and public utilities.	To be based upon facility type.
Air Hazard Overlay	Overlay adjacent to Old Bridge Airport. District delineation required by N.J.S.A. 40:55D-28B.	To be based upon N.J.A.C. 16:62-1 and underlying land use designation.
Critical Area Overlay	Overlay consisting of wetlands, wetlands transition areas, floodways, flood hazard areas, steep slopes and stream corridors. Uses limited to open space, conservation, agriculture or recreation associated with the underlying zone designation.	Each lot shall have a minimum contiguous improvable area for the location of structures including buildings, parking lots, and loading areas which is not encroached upon by one or more features that define the critical area overlay.
Landmark Corridor Overlay	Overlay along Freehold Road and Main Street, through Monmouth Battleground State Park. Contains many sites of historical significance.	Development within 1,000 feet of corridor to be scrutinized for compatibility with historic values. Standards based on underlying land use classifications. Architecture to be compatible with local vernacular styles of the 18th and 19th centuries.

HOUSING PLAN ELEMENT AND FAIR SHARE PLAN

The housing plan element and fair share housing plan for Manalapan Township is based upon the requirements of the Fair Housing Act and the amended Municipal Land Use Law which became effective on July 3, 1985 (C.222 Public Laws of 1985). The housing element must be designed to achieve a goal of access to affordable housing to meet required housing needs with particular attention to low and moderate income housing.

The Council on Affordable Housing (COAH) is the state agency responsible for identifying housing regions and estimating low and moderate income housing need. COAH has identified Monmouth and Ocean Counties as the East Central Housing Region.

Housing need is comprised of three major components: indigenous need, reallocated present need, and prospective need. Indigenous need consists of deficient housing units occupied by low and moderate income households within a municipality. Reallocated present need is the portion of the housing region total number of deficient housing units occupied by low and moderate income households that have been redistributed to designated areas. Prospective need is a projection of low and moderate income housing needs based on development and growth which is likely to occur in the housing region.

Based on the requirements for the preparation of a housing plan element, the rules and regulations of the New Jersey Council on Affordable Housing, and the township consent order for final judgement of Mount Laurel II, Manalapan has planned to exceed its fair share housing obligation for the period 1987 - 1993.

HOUSING STOCK CHARACTERISTICS

The housing stock characteristics in Manalapan Township include the total number, types, age, ownership, value and condition of housing units.

Number and Type

According to the 1980 Census, Manalapan Township had a total of 5,871 year-round housing units and 3 seasonal housing units for a total of 5,874 units. Of the 5,871 year-round housing units, 4,303 or 73.3 percent, were detached, single family units and 1,451, or 24.7 percent were multi-family housing units. The balance of the housing stock consisted of 112 attached single-family units and 5 mobile homes or trailers.

Between 1980 and 1988, 2,854 housing units were authorized by building permits. There were 87 demolitions for a net gain of 2,767 units. As of December 31, 1988, it is estimated that the total number of dwelling units in the Township was 8,641.

Age of Housing

The Township housing stock is relatively new. Only 4.9 percent of the current housing stock was built prior to 1939. This accounts for 427 of the 8,641 housing units in existence in 1988. Between 1940 and 1949, a total of 171 units were constructed which accounts for 2.0 percent of the current housing stock. Between 1950 and 1959, 313 housing units or 3.6 percent of the total housing stock was constructed. Between 1960 and 1969, 2,289 or 26.5 percent of the housing stock was constructed. Between 1970 and March 1980, 2,671 housing units or 30.9 percent of the total housing stock was constructed.

Table 12-1, "Age of Housing Units: 1980 and 1988 - Manalapan Township", indicates the dates of construction based upon Census data and issuance of building permits since 1980.

Rate of Construction

A comparison of building and demolition permits from 1970 through 1988 indicates that between 1970 and 1988, a total of 5,199 building permits were authorized and 124 demolition permits were authorized for a net gain of 5,075 units. The peak construction year was 1971 when 508 building permits were authorized. In the same year, no demolition permits were authorized resulting in a net gain of 508 units. Other peak years included 1978 when there was a net gain of 475 units, 1979 when there was a net gain of 422 units, and 1980 when there was an additional gain of 422 units. Between 1980 and 1988, a net gain of 2,767 units occurred within the Township for an annual average increase of 346 units per year. This data is presented in Table 12-2, "Building And Demolition Permits: 1970 - 1988, Manalapan Township."

Ownership and Value

According to the 1980 Census of Housing, 94.8 percent of the occupied housing units in Manalapan Township were owner occupied compared to 69.3 percent in Monmouth County. With respect to rental housing, 5.2 percent of the Township housing units were renter occupied compared to 30.7 percent of the County housing units. The 1980 median value of owner occupied housing units in Manalapan Township was $84,497 compared to $65,500 for the County. The 1980 median gross monthly rent was $244 for Monmouth County and $306 for Manalapan Township housing units.

Housing which was affordable to low and moderate income households in 1980 can be extrapolated from the 1980 Census data. Based upon the 1980 Census, none of the renter occupied units in Manalapan Township were affordable to low income households in the East Central Housing Region. These are households which earned 50 percent or less of the median household income level in the region. Fifteen (0.02 percent) of the rental housing units in Manalapan Township were affordable to moderate income households in the East Central Housing Region. These are households earning between 50 percent and 80 percent of the median household income in the housing region. In addition, of the owner occupied units, 22 units (0.39 percent) were affordable to low income households and 87 units (1.2 percent) were affordable to moderate income households in the housing region. Household income limits that define low and moderate income in Monmouth County are shown on Table 12-9.

The housing stock in Manalapan Township had a significant number of substandard units according to the 1980 Census. The 1980 Census indicates that Manalapan Township had 544 units lacking complete kitchen facilities, 182 units lacking central heating, and 40 units lacking complete plumbing facilities. In accordance with the Council on Affordable Housing methodology, there is an indigenous housing need of 33 substandard permanent housing units occupied by low and moderate income households within the Township.

PROJECTIONS OF HOUSING STOCK 1989-2000

The total number of year-round housing units in Manalapan Township increased 54.5 percent between 1970 and 1980, from 3,200 units in 1970 to 5,871 units in 1980. Projections based upon historical growth trends using 5, 10, and 15 year data indicate continued growth in the Township housing stock. The projected yearly increase in the Manalapan Township housing stock ranges from 302 to 326 new units per year.

Township officials have indicated that there are 44 projects which have been approved for development within the Township totaling 2,746 new units. In addition, presently before the planning board there are 15 projects which have received preliminary approval totaling 798 units and another 19 active applications for development totalling 3,755 units. Thus, the total pending is 7,299 dwelling units.

Actual housing construction is dependent on a variety of factors over which the Township has little control including financing, marketing and builder timing.

Based upon the available land supply, approved construction and past building trends, and current zoning, it is projected that an average of 300 to 330 units per year could be constructed over the next 3 year period. In the event all approved projects are developed this number could increase to approximately 600 units per year.

DEMOGRAPHIC CHARACTERISTICS

A detailed population report is included in the basic planning studies and provides population data, age and income characteristics, and population projections.

The Township had a total of 5,638 households in 1980 with an average of 3.36 persons per household. Only 740 (13.1 percent) of the heads of households were classified as female. This data is presented in Table 12-5, "Household Profile: 1980 - Manalapan Township.

EXISTING AND FUTURE EMPLOYMENT CHARACTERISTICS

Characteristics of the Manalapan Township labor force are presented in Table 4-9, "Occupational Distribution: 1980 - Manalapan Township & Monmouth County." In 1980, the Census recorded that 23.7 percent of the 7,338 jobs held by residents of Manalapan Township were classified as managerial, 18.2 percent as administrative support/clerical, 16.2 percent as professional, 14.4 percent as sales, 8.1 percent as production/craft/repair, and the remaining as technical, private household service, protective service, other service, farm/forest/fish, machine operators, transportation and material moving, handlers and laborers. The occupational distribution in Manalapan is generally similar to Monmouth County with a somewhat lesser emphasis on services.

Private sector covered employment refers to employed persons who are covered by New Jersey unemployment compensation as reported to the New Jersey Department of Labor. A comparison of Manalapan, Monmouth County and New Jersey covered employment from 1978 to 1988 shows that the Township gained a total of 2,128 (127.9 percent) covered jobs compared with increases of 44.3 percent and 25.6 percent for the County and State respectively during the same period. The overall increase in the township was not evenly distributed during the eleven year period. Major increases occurred in 1979, 1984, 1985, and 1988. During the same eleven year period, the Monmouth County employment total increased from 121,710 to 175,567 a 44.3 percent increase. The New Jersey private sector covered employment increased a total of 25.6 percent from 2,468,644 to 3,100,604.

Employment projections done by the Monmouth County Planning Board show an increase of 3,032 jobs in Manalapan Township between 1988 and 2010 (Table 12-7).

DETERMINATION OF PRE-CREDITED PRESENT AND PROSPECTIVE FAIR SHARE FOR LOW AND MODERATE INCOME HOUSING

Manalapan Township has a fair share housing need of 445 low and moderate income housing units as calculated by the New Jersey Council on Affordable Housing and presented in the report entitled "Municipal Present, Prospective, and Pre-Credited Need" dated May 21, 1986. The methodology established by the New Jersey Council on Affordable Housing allocates present and prospective housing needs for all municipalities within New Jersey.

The Council calculates a pre-credited fair share need of 586 low and moderate income housing units for Manalapan. This includes 33 units of existing housing in need of rehabilitation which are occupied by low and moderate income families. Of this total, 7 units are estimated to have been spontaneously rehabilitated through private efforts. This leaves 26 existing units which should be rehabilitated according to the Council methodology. The Council methodology credits the township with 132 units of low and moderate income housing "filtered down" from higher income families to moderate and low income families between 1980 and 1987. The Council also estimates that 2 units of low and moderate income units have been converted from non-residential development.

The Council methodology results in a pre-credited fair share need of 445 units. The total fair share need is calculated as 586 units minus 132 filtered down units, minus 2 conversion units, minus 7 spontaneous rehabilitation units, to yield a pre-credited of 445 units (Table 12-8).

CONSENT DISTRICTS

In 1984, to resolve litigation and prior to the issuance of the COAH calculations, Manalapan entered into a consent order for partial judgement of its low and moderate income housing obligation (Mt. Laurel II). A consent order for Final judgement was entered in 1986. The order establishes the township fair share at 900 units of low and moderate income housing. To meet its obligation, the township agreed to the development of two consent districts (the Villages at Manalapan Brook and Knob Hill) and to the rehabilitation of 150 dwelling units. The consent order provides for the following:

1. 436 lower income units to be produced within the Villages at Manalapan Brook Consent District

2. 100 lower income units to be produced within the Knob Hill Consent District

3. 100 lower income units to be rehabilitated by the Township, utilizing a $1,000,000.00 developer contribution.

4. 150 units to be produced through other township efforts

5. 114 units to be deferred until after 1992.

Under the consent order, Manalapan Township enjoys a period of repose from further litigation over its Mount Laurel obligation for a six year period ending in 1992.

The township settlement of its housing obligation prior to 1985 is deemed to constitute a substantively certified housing plan and ordinance pursuant to the Fair Housing Act.

HOUSING POLICY

The township encourages development of a variety of housing types, suitable to the needs of existing and prospective residents. Housing development shall be compatible with existing residential neighborhoods, with environmental constraints, with the availability of infrastructure, and with the need to maintain adequate levels of service for public facilities. The township will satisfy its constitutional obligation to create realistic opportunities for the provision of its fair share of the region's low and moderate income housing need.

Housing development will be directed to the suburban and corridor areas of the township as presented in the land use plan element. Housing development within rural areas will be restricted to single family residential uses at rural densities.

RECOMMENDATIONS

The following recommendations are made in order to advance the housing plan element:

1. The township should seek a modification of the terms of its consent order to reduce the township low and moderate income housing obligation to 445 dwelling units based upon the criteria, guidelines, and decisions of the Council on Affordable Housing.

2. Any provisions within the consent order which result in the production of more than 445 dwelling units should be recognized as a surplus which will be a credit against any future obligation incurred by the Township.

3. Since the township will incur additional lower income housing obligations for the period 1994-2000, future increases in the permissible intensity or density of land use should be linked to a contribution toward or to the on site production of low and moderate income housing.

TABLE 12 - 1

AGE OF HOUSING UNITS: 1988
MANALAPAN TOWNSHIP

DATES OF CONSTRUCTION (1)	STRUCTURES	PERCENT OF TOTAL/1980	PERCENT OF TOTAL/1987
1939 OR Earlier	427	7.3	4.9
1940 to 1949	171	2.9	2.0
1950 to 1959	313	5.3	3.6
1960 to 1969	2289	39.0	26.5
1970 to March 1980	2671	45.5	30.9
1980 TOTAL YEAR ROUND HOUSING UNITS	5871	99.9	67.9
1980 TOTAL SEASONAL UNITS (2)	3	0.1	0.0
	5874	100	68.0
1980 -1988	2767		32.0
1988 TOTAL HOUSING UNITS	8641		100

SOURCE: 1) 1980 Census of Population, STF IX
2) New Jersey Department of Labor, Division of Planning and Research, "Residential Building Permits Historical Summary 1980-1988"

NOTE: (1) Unless otherwise noted dates of construction ranges are January 1 to December 31.
(2) Includes only those units built prior to April 1, 1980.

COMPILED BY: Townplan Associates

TABLE 12 - 2

BUILDING AND DEMOLITION PERMITS: 1970 - 1988
MANALAPAN TOWNSHIP

YEAR	AUTHORIZED BUILDING PERMITS	AUTHORIZE DEMOLITION	NET CHANGE
1970	146	0	146
1971	508	0	508
1972	113	0	113
1973	206	0	206
1974	152	0	152
1975	59	2	57
1976	227	7	220
1977	28	19	9
1978	483	8	475
1979	423	1	422
1980	429	7	422
1981	169	8	161
1982	97	11	86
1983	419	4	415
1984	341	5	336
1985	497	2	495
1986	388	8	380
1987	213	30	183
1988	301	12	289
1970-1987 TOTALS	5199	124	5075

SOURCES: 1) New Jersey Department Of Labor, Division Of Planning And Research, "Residential Building Permits Historical Summary 1970-1979" & "Residential Building Permits: Yearly Summaries 1980-1988".

COMPILED BY; Townplan Associates

TABLE 12 - 3

CONDITION OF HOUSING
MANALAPAN TOWNSHIP

TOTAL HOUSING UNITS	TOTAL OCCUPIED UNITS	VACANT UNITS	UNITS LACKING COMPLETE PLUMBING	UNITS LACKING COMPLETE KITCHENS	UNITS LACKING CENTRAL HEATING
5874	5578	293	40	544	182

SOURCE: 1980 U.S. Census (Profiles IX & X)

COMPILED BY: Townplan Associates

TABLE 12 - 4

HOUSING STOCK PROJECTIONS
MANALAPAN TOWNSHIP

	TRENDS		
YEAR	1974-88	1979-88	1984-88
1986	8169	8169	8169
1987	8352	8352	8495
1988	8641	8641	8820
1989	8943	8956	9146
1990	9244	9270	9472
1991	9546	9585	9798
1992	9848	9900	10123
1993	10149	10215	10449
1994	10451	10529	10775
1995	10753	10844	11100
1996	11054	11159	11426
1997	11356	11473	11752
1998	11658	11788	12077
1999	11959	12103	12403
2000	12261	12418	12729

REGRESSION TRENDS	PROJECTED MEAN YEARLY CHANGE
1979-88	315
1984-88	326
1974-88	302

SOURCES: Trends based upon New Jersey Department of Labor, Division of Planning & Research, "Residential Building Permits Historical Summary 1970-1979" & "Residential Building Permits: Yearly Summaries 1980-1988."
Compiled by: Townplan Associates

TABLE 12 - 5

HOUSEHOLD PROFILE - 1980

MANALAPAN TOWNSHIP

	TOTAL NUMBER
HOUSEHOLDS	5638
POPULATION OF HOUSEHOLDS	18914
PERSONS PER HOUSEHOLD	3.37
FEMALE HEADED HOUSEHOLDS	740
% OF TOTAL	13.1

SOURCE: U.S. Census of Population 1980
Compiled by: Townplan Associates

TABLE 12 - 6

PRIVATE SECTOR COVERED EMPLOYMENT
MANALAPAN TOWNSHIP, MONMOUTH COUNTY & NEW JERSEY

YEAR	MANALAPAN TOWNSHIP	PERCENT CHANGE	MONMOUTH COUNTY	PERCENT CHANGE	NEW JERSEY	PERCENT CHANGE
1978	1663		121710		2468644	
1979	2062	23.99%	124155	2.01%	2529140	2.45%
1980	1967	-4.61%	126165	1.62%	2530556	0.06%
1981	1644	-16.42%	129165	2.38%	2589641	2.33%
1982	1822	10.83%	131074	1.48%	2566143	-0.91%
1983	1905	4.56%	137728	5.08%	2680826	4.47%
1984	2356	23.67%	150140	9.01%	2813014	4.93%
1985	3341	41.81%	154127	2.66%	2869833	2.02%
1986	3055	-8.56%	161675	4.90%	2949495	2.78%
1987	3086	1.01%	171793	6.26%	3047993	3.34%
1988	3791	22.85%	175567	2.20%	3100604	1.73%

SOURCES: New Jersey Department of Labor, Division of Planning and Research, Office of Demographic & Economic Analysis; "New Jersey Covered Employment Trends" (1978-1988 Issues)

COMPILED BY: Townplan Associates

TABLE 12 - 7

EMPLOYMENT PROJECTIONS: 1988-2010
MANALAPAN TOWNSHIP

YEAR	NO. OF JOBS IN MANALAPAN TOWNSHIP
1988	5,771
2010	8,803 (Projected)

SOURCE: Monmouth County Planning Board
Compiled by: Townplan Associates

TABLE 12 - 8

MANALAPAN TOWNSHIP - LOW & MODERATE INCOME
HOUSING NEED 1987 - 1993

Indigenous Need	33	Units
Reallocated Present Need	19	Units
Present Need (Subtotal)	52	Units
Prospective Need	523	Units
Total Need	575	Units
Demolitions	11	Units
Filtering	-132	Units
Conversions	-2	Units
Rehab	-7	Units
Precredited Need	445	Units

SOURCE: New Jersey Council on Affordable Housing
Compiled by: Townplan Associates 1990

TABLE 12 – 9

LOW AND MODERATE INCOME LIMITS – 1989

COUNTY		1 PERSON	2 PERSON	3 PERSON	4 PERSON	5 PERSON	6 PERSON	7 PERSON	8 PERSON
MONMOUTH	MEDIAN	26,680	30,720	34,560	36,400	40,800	43,200	43,600	48,000
	MODERATE	21,504	24,576	27,448	30,720	32,840	34,340	36,400	38,400
	LOW	13,440	15,360	17,280	19,200	20,400	21,600	22,800	24,000

SOURCE: Council on Affordable Housing

Compiled by: Townplan Associates

CONSERVATION PLAN ELEMENT

The conservation element provides for the preservation, conservation, and utilization of natural resources within Manalapan Township. Because these features occur throughout the township, the master plan proposes regulating major natural features as environmentally critical areas. As provided for in the land use plan element, these features will be treated as an overlay to other land use categories. Uses within the critical area should be limited to those which are compatible with the natural character of the land.

Background

The natural resources within Manalapan Township have been identified in the background studies of the master plan and in the Natural Resources Inventory. The Inventory is reproduced as a technical appendix to the plan. The resources which have been identified include the following:

1. Freshwater wetlands and wetlands transition areas
2. Floodways and flood hazard areas
3. Hydric soils
4. Stream corridors
5. Watersheds of public water supply (Manalapan Brook and Matchaponix Brook).
6. Category One watersheds (Weamaconk Creek and McGellairds Brook are so designated by the NJDEP as pristine waters.)
7. Habitats of threatened and endangered species and wildlife corridors
8. Steep slopes
9. Mature woodlands
10. Major aquifer outcrop areas (Englishtown formation, Mount Laurel and Wenonah formations).

Conservation Policy

Where development occurs, the township will protect major natural features from degradation and unreasonable disturbance. Development will be directed to suitable portions of a site and design shall be arranged to eliminate unreasonable environmental impact.

Recommendations

In order to implement the conservation policy of the master plan, the following recommendations should be incorporated into the development regulations and environmental impact statement requirements of the township:

1. Cluster developments should be encouraged on larger tracts in all areas of the township with emphasis on the protection of critical areas from disturbance. Density in cluster development shall not exceed the density of a conventional plotting conforming to the zone district standards.

2. The permissible level of development and density and intensity should be based upon the net tract area which excludes critical areas. This will minimize pressure to disturb critical features by assuring that development can be satisfactorily located outside a critical area.

3. Development shall be required through the environmental impact statement to demonstrate no reduction in recharge in aquifer outcrop areas.

4. Where on-site septic systems are proposed, the environmental impact statement shall be required to address the suitability of the site for the proposed density of development by addressing soil conditions and the nitrate dilution model guidelines.

5. The municipal agency responsible for plan approval may, on the basis of environmental impact, require revisions to the design or layout of the site or require that alternative approaches be utilized in order to eliminate or minimize adverse or undesirable impacts.

HISTORIC PRESERVATION PLAN ELEMENT

The historic preservation element identifies landmarks of historical, archaeological, cultural, scenic, or architectural significance within the township. It further provides for their utilization and means of preservation. Finally, it includes standards to assess the worthiness of a site for landmark designation. A landmark may be any real property, man-made structure, or natural object which meets those standards.

Background

The township legacy includes sites that are architecturally, culturally, and archaeologically significant. Among them are: the site of a major battle from the American Revolution, and farmsteads and homesteads from the eighteenth and nineteenth centuries. The battlefield is a designated national historic landmark. Old Tennent Church, which adjoins the Battlefield State Park, is one of the most important historic buildings in Monmouth County.

The landmarks identified in this element have been derived from the Monmouth County Historic Sites Inventory 1980 - 1984. The complete survey forms, photographs, maps of Manalapan Township upon which the county inventory is based are on file in the office of New Jersey Heritage in Trenton and in the Monmouth County Historical Association, Freehold. The locations of township landmarks and a summary of their significance are provided in the basic studies section of the master plan. In addition to sites identified in the Monmouth County Inventory, sites of local significance have been included.

The landmark sites and locations listed by the township master plan are based on immediately available research. Further information on sites of landmark value in Manalapan may result in additional designations. To guide the identification and designation process, the next section provides standards to be followed in making landmark designations.

Landmark Designation Standards

The following standards are to be used in evaluating the significance of properties and their eligibility for landmark designation in Manalapan Township:

1. The landmark is associated with events that have made a significant contribution to the broad patterns of local, state, or national history; or

2. The landmark is associated with lives of persons significant in the past; or

3. The landmark embodies the distinctive characteristics of a type or method of construction, or it represents the work of a master, or it possesses high artistic values, or it represents a significant and distinguishable entity whose components may lack individual distinction; or

4. The landmark has yielded, or may be likely to yield, information important in prehistory or history; or

5. The landmark exhibits scenic, historic, architectural, archeological or cultural features which make a unique contribution to the townscape of Manalapan.

Landmark Preservation Policy

The township encourages the preservation of landmark buildings and sites and discourages their destruction or inappropriate alteration. Utilization of landmark sites in accordance with the land use plan element and other elements of this master plan is encouraged. Where rehabilitation, renovation, or adaptive re-use of a landmark is needed, the guidelines developed by the U.S. Department of the Interior and published as The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings should be used.

Recommendations

The following means should be pursued by the township to achieve the preservation of historic sites:

1. Development Review - The impact of public or private projects on landmarks should be a factor in evaluating the design and layout of development proposals. Appropriate language should be included within the township development regulation to require that applications for development provide for the appropriate utilization and preservation of designated landmarks. Where removal, demolition, or inappropriate alteration of the landmark is proposed, the environmental impact statement shall be required to review the alternatives which were considered to preserve the landmark. The municipal development agency may require alternative approaches to site development which would enable the landmark to be preserved and maintained on site.

2. Zoning Designation - The zoning ordinance may designate a landmark and provide design criteria to be used to regulate the development or alteration of landmark property.

3. Historic Preservation Commission - The township may create an "historic preservation commission." Such a commission would have responsibility under the municipal land use law (NJSA 40:55D-107) to compile a survey of historic sites, advise on the preservation plan element of the master plan, and on applications for development, and also carry out educational programs. If the zoning ordinance of the township also designates and regulates landmark sites on districts, then the commission would have powers to grant or deny permits for the development or alteration of the designated sites.

4. Community Education - The township should sponsor program of community education which would include recognition of landmarks through the award of landmark certificates to the owners of such properties and recognition of individual landmark preservation efforts.

TABLE 14-1

Historic PRESERVATION ELEMENT MANALAPAN TOWNSHIP LANDMARKS

1. Monmouth Battlefield
2. John Conover House
3. Farmstead - North side, Freehold Englishtown Road
4. Rev. A.P. Cobb House
5. Sutfin - Solomon House
6. Presbyterian Church of Freehold
7. Joseph Forman House
8. James English House
9. Daniel Dubois Farm
10. Farmstead - North side, County Route 537
11. Robert Craig House
12. Farmstead - South side, Craig Road
13. Bowne House
14. Chicken House - Gordons Corner Road
15. James English House
16. Reid House
17. Georgian Residence - Quail Hill Boy Scout Camp
18. Italianate Residence - Northeast corner, Main Street and Conrail Railroad Tracks
19. Railroad Siding Complex - Southwest corner, Main Street and Conrail Railroad Tracks
20. Georgian Residence - West side of Main Street north of Millhurst Road
21. Ely House
22. Quackenbush House
23. Millhouse - Northeast side, Smithburg Road, northwest of County Road 537
24. Woodville A.M.E. Church
25. Federal Residence - North side, Route 33, west of Woodward Road
26. Farmstead - Northwest corner State Route 33 and Millhurst Road
27. Farmstead - South side, State Route 33, east of Smithburg Road
28. Hunt House
29. Perrine House
30. Snyder Grist Mill
31. Thompson Grove School
32. Victorian House - Southwest corner, Tracy Station Road and Pergolaville Road
33. Stillwell Farm
34. Bear Tavern - Northeast corner, Wickatunk Road and Morganville Road
35. Dreyer House
36. Millhurst School
37. Landmark Corridor - Tennent

UTILITY SERVICE PLAN ELEMENT

The utility service plan element analyzes the need for and describes the provisions for water supply and distribution facilities, drainage and flood control facilities, sewerage and waste treatment facilities, solid waste disposal, and storm water management.

Background

The location of existing and future infrastructure facilities for water supply, sewerage, and regional storm water management are shown on the master plan map (Figure 9) and are discussed in the basic studies section of the master plan. Sewerage and water infrastructure is planned for the suburban and corridor areas discussed in the land use plan element. Although moratoriums are in place which restrict the extension of water and sewer service by the Western Monmouth Utilities Authority and the Gordons Corner Water Company, these moratoriums are expected to be lifted in 1990. The plans for the township water supply franchise area, which will support development of the Route 33 corridor, is provided for in the Manalapan Township Water Supply and Distribution System Master Plan, Phase 1 and Phase 2. That plan, as adopted, is reaffirmed and incorporated by reference as an element of the Manalapan Township Master Plan.

Historically, the township has locations which flood and are characterized by poor drainage. Poor drainage is characteristic of wetlands and hydric soil locations. Areas subject to flood hazard have been delineated on flood insurance rate maps prepared by the Federal Emergency Management Agency and NJDEP Flood Hazard Reports No. 8 and No. 17 for the Manalapan Brook and Matchaponix Brook, respectively. In 1984, the township enacted a flood damage control ordinance to regulate flood plain development. Historically, severe flood damage has occurred in the Pine Brook area because of development which encroached upon the floodway. Other major flood plains within the township are found along the Milford Brook, Tepehemus Brook, McGellairds Brook, Matchaponix Brook, Weamaconk Creek, Wemrock Brook, Manalapan Brook, Stillhouse Brook and Gander Brook. Since Manalapan is downstream of the drainage basin of these streams, the township recognizes that stormwater management can only be effectively dealt with on a regional basis. For that reason, the utilities element reflects regional detention facilities including those recommended in the Stormwater Management Plan of Manalapan Brook and Dubois Creek Water Shed prepared by the Monmouth County Planning Board. In addition to these measures, the Township adopted a municipal stormwater management ordinance in 1990.

Solid waste collection in the township is provided through contractual arrangement between the municipality and a private hauler.

Policy

The utilities plan element proposes the following policies:

1. Locations designated as areas for suburban and corridor development by the land use element will be the areas for provision or extension of sewerage and water service infrastructure.

2. Development applications within sewer and water service areas should demonstrate that adequate sewer and water facilities are or will be available to support the proposed development.

3. Drainage systems, areas of poor drainage, and flood hazard areas should be protected from unsuitable development.

4. The development contributes or constructs its fair share of off-tract improvements.

Recommendations

1. The development regulations of Manalapan Township should incorporate appropriate provisions for implementing the policies of the utilities element.

2. The Wastewater Management Plan of the Western Monmouth Utilities Authority should be amended to recognize the suburban and development areas delineated by the Manalapan Township Master Plan as the location of existing and planned sewer service.

3. Development of floodways and flood hazard areas should be discouraged. To that end, they should not be credited as meeting the minimum improvable area requirement for the purpose of calculating lot area or the permissible intensity of development.

4. Wetlands and hydric soils are locations of poor drainage. Development should be restricted to those portions of a site which, under natural conditions, can be suitably drained. For that reason, wetlands should not be credited as meeting the minimum requirements for improvable lot area or for calculating the permissible intensity of development.

5. Unless a regional plan for stormwater management has been implemented and is in operation, development should provide for on-site stormwater management such that the rate of post development run-off from a site does not exceed the rate of run-off which would occur from a site in its natural condition. Water quality must also be maintained at predevelopment levels.

RECREATION PLAN ELEMENT

The Manalapan recreation element provides for a comprehensive system of recreation sites. It includes an inventory of all Township owned land dedicated to recreation and open space. These areas are described by name, size, location, the facilities they offer and improvements the township has proposed.

The 1984 Outdoor Recreation Plan of the State of New Jersey was used as a guideline for identifying municipal open space needs. These guidelines show the amount of public recreation and open space land which should be township owned when Manalapan becomes fully developed.

In addition, the inventory of municipal recreation and open space facilities has been compared to minimum standards used by the National Recreation and Park Association (NRPA). These standards provide a benchmark for assessing the need for active recreation facilities.

Finally, the Manalapan Department of Parks and Recreation has made recommendations which are included in this element.

Background

Existing Facilities & Proposed Improvements

Existing parks, the recreational facilities they offer and improvements proposed are described in this section.

Locust Grove Playground

This 2.4 acre park is located in the northeastern section of Manalapan between Holiday Road and Locust Grove Lane. Improvements are proposed for the existing basketball court and playground equipment.

Holiday Park

This 11.2 acre site is located in northern Manalapan between Pease Road and Blenheim Road with parking off of Pease Road and Arthur Court. The site contains a pond, used for winter ice skating, a softball field and playground. Potential improvements to this park consist of dredging the pond, constructing an outlet structure to utilize the park as a detention area, and improving playground apparatus and increasing Pease Road parking. Other additions to the park would include a footbridge, a bike trail and interpretive signs with the landscaping.

Colonial Court

This 11.5 acre site is located east of Route 9 near Chamber Lane and Colonial Court. This undeveloped area shall be kept in its natural state.

Manor Park

This 3.8 acre site is located off of Gordons Corner Road on Manor Drive. Currently the site only has playground equipment.

Tennent Road

This 0.8 acre site is located on Tennent Road south of Kensington Drive. This park shall be kept in its natural state.

Kelso

This 3.0 acre site is located west of Tennent Road on Kelso Place. Improvements are proposed for the existing basketball court.

Scenery Hill and Extension

This 4.0 acre site is located on Hearthstone Drive in the center of the Township. This undeveloped area shall be kept in its natural state.

Thompson Grove Park

This 65.0 acre site is located south of Route 33 on Thompson Grove Road. This park is adjacent to the Millhurst Pond, which the Township plans to acquire. A large portion of the site is designated as a bird sanctuary. Improvements to this park include developing campsites, an environmental/conservation area, constructing a comfort building, boat dock and a boat house, improving parking, dredging the pond, paving the roadway and creating athletic fields.

Pinewood Park

This 1.9 acre site is located in the northern portion of Manalapan between Pinewood Drive and Union Hill Road. Improvements to this park consist of upgrading the playground equipment and constructing a split rail fence.

Village Green

This 5.1 acre site is located on Freehold-Englishtown Road (Route 522) adjacent to the Public Works Department and the Senior Citizens Center. Facilities include a gazebo, a helicopter landing pad an open field and soccer fields.

Gettysburg Park

This 5.6 acre site is located in northern Manalapan along Gettysburg Drive and Shiloh Road. The Township plans to convert this open area into a park containing a fitness trail, tennis courts, playground equipment and landscaping.

Ogden Lane

This 3.0 acre site is located east of Route 9 near Ogden Lane. This undeveloped area is bi-sected by a 30' wide drainage easement, and shall be kept in its natural state.

Ryan Road

This 7.0 acre site is located east of Route 9 off of Ryan Road. This undeveloped area contains a drainage stream and shall be kept in its natural state.

McGellairds

This 19.7 acre site is located near Englishtown Borough on McGellairds Crossing Road. This undeveloped site shall be kept in its natural state.

Route 33

This 1.9 acre site is located on Route 33 West between Woodward Road and Knob Hill Golf Course. This undeveloped site shall be kept in its natural state.

Wynn Coop/Greenleaf

This 20.0 acre site is located near Belaire Lane near the junction of Tennent Road and Taylors Mill Road. This area is a bird sanctuary and shall be kept in its natural state.

Grant Road Woods Preserve

This 3.0 acre site is located in northern Manalapan off of Grant Road. This undeveloped site contains a 40' wide drainage easement and shall be kept in its natural state.

Old Town Hall

This 1.6 acre site is located on Freehold-Englishtown Road near the junction of Tennent Road. Facilities include an open area, picnic area and meeting area, as well as the Manalapan Senior Center Building.

Community Building

This 5.0 acre site is located along Route 33 near the junction of Millhurst Road and is rented to Monmouth County as a juvenile rehabilitation center.

Pension Hill

This 1.0 acre site is located north of Englishtown Borough on Pension Hill Road. Improvements to the site include upgrading playground apparatus, constructing a retention wall with seeding, landscaping and drainage, acquiring 0.75 acres of land, and fencing the northern side of the basketball court.

Manalapan Recreation Center

This 93.5 acre site is located on Freehold-Englishtown Road across from the Municipal Complex. The Manalapan Recreation Center is the largest township owned and operated facility in New Jersey and contains the following facilities:

1. Six multi-purpose fields used for soccer and football, two of which are lighted.
2. A 1.5 mile fitness trail.
3. Three baseball/softball fields, two of which are lighted.
4. Six basketball courts.
5. Six lighted tennis courts.
6. One lighted street hockey rink.
7. Two boccie courts.
8. Two shuffleboard courts.
9. Three tot lots.
10. One volleyball court.

Potential improvements include constructing a swimming pool, an ice rink, baseball dugouts and a field press box, lighting baseball Field 3 and E, installing a sound system, and creating a bikeway.

Bucks Head Playground

This 2.5 acre site is located in northern Manalapan near Pension Road. This park contains playground equipment, a gazebo, an open field and two tennis courts.

Knolls Playground

This 4.0 acre site is located on Lamb Lane south of Route 33. The park has a basketball court. Potential improvements include a multi-purpose field the Township intends to grade. Other improvements include adding a split rail fence and a bike rack and pad.

Short Oaks

This 0.5 acre tot-lot is located off of Union Hill Road near the Old Bridge Township border.

Forest Hills

This 2.0 acre site has not yet been dedicated but is currently under construction. It is located off of Union Hill Road near the Old Bridge border. It will include playground equipment and be adjacent to the Bucks Head site.

Balmar

This 6.1 acre site is located on Pease Road near the intersection of Pinebrook Road. The park contains a tot lot, tennis court and open field. The park also serves as a stormwater detention area.

Briarheath

This 2.5 acre site has not yet been dedicated nor is it under construction. It is located on Dortmunder Drive between Pension Road and Wilson Avenue. A basketball court is planned.

Tennent Manor

This 2.6 acre undeveloped site is located on Thomas Drive off of Tennent Road.

Southfield Estates

This site has been vacated and reverted to private development. It will serve as a recreation area for development and as a stormwater detention area.

Conmack

This 0.9 acre undeveloped site is located at the corner of Conmack Lane and Taylors Mill Road.

Longstreet Road

This 2.7 acre undeveloped site is located on Longstreet Road east of Lafayette Mills Road. It serves as a detention basin area.

Jared Lane

This 3.1 acre undeveloped site is located in northern Manalapan near Sandpiper Drive.

Pease Road

This 1.5 acre undeveloped site is located on Pease Road near the intersection of Taylors Mill Road.

Forman Lane

This 0.2 acre site can be accessed by Forman Lane and Maxwell Lane near the intersection of Route 9 and Ryan Road and contains a walkway leading to a drainage easement.

Tracey Drive

This 0.2 acre site is located on Tracey Drive off of Lafayette Mills Road and contains a walkway leading to a drainage easement.

Totals

Developed Park and Recreation Land	-	212.6 acres
Undeveloped Park and Recreation Land	-	81.7 acres
Land to be Dedicated	-	4.5 acres
Total	-	298.8 acres

1978 PARK * RECREATION * OPEN SPACE MASTER PLAN

In 1978 a recreation study was prepared for Manalapan Township. The following is a list of facilities and programs the Recreation Commission recommended:

Lighted Tennis Courts and Softball Field - These needs have been met by the Manalapan Recreation Center.

Year Round Teen Programs - In 1989 the Manalapan Parks and Recreation Department offered 66 programs and special events for youths and adults.

Basketball Programs - Youth and adult programs are offered by the Manalapan Parks and Recreation Department.

Hiking Trails - There are no rugged hiking trails but the Manalapan Recreation Center offers a 1.5 mile fitness trail.

Bikeways - Two bikeways are proposed: one at Holiday Park and the other at the Manalapan Recreation Center.

Swimming Programs - The Manalapan Parks and Recreation Department offers swimming programs through the Freehold YMCA and trips to the beach. A pool is proposed for the Manalapan Recreation Center.

Senior Citizen Park and Bus Transportation - The Senior Center is located on Freehold-Englishtown Road by the police station. Transportation is provided three times a week by the Monmouth County Special Citizen Area Transportation (SCAT). The Senior Center is also serviced by the Hills Taxi Share Ride Program which runs three days a week with a round trip fare of $1.00. These services are limited and transportation is still a problem at the Senior Center.

Ice Skating Rink - The Manalapan Recreation Center has proposed to build an ice rink.

Canoeing - No canoeing facilities exist or are proposed at this time.

Active Recreation Facility Standards

The National Recreation and Park Association (NRPA) provides suggested facility development standards. For the projected 1995 population of Manalapan Township (34,547), the NRPA recommends the following active recreation facilities:

One lighted football field.
Three soccer fields.
One 1/4 mile running track.
Seven official baseball fields.
One lighted baseball field.
Seven little league fields.
One lighted little league field.
Seven basketball courts.
17 tennis courts.
One handball court.
Seven volleyball courts.
One trail system.
One swimming pool.
Seven softball fields.

Manalapan Township currently has:

Six multi-purpose fields, two of which are lighted.
Three soccer fields.
One 1.5 mile fitness trail and another proposed trail.
Four baseball/softball fields, two of which are lighted with a proposal to light another field.
11 basketball courts.
11 tennis courts, six of which are lighted.
One handball court.
One softball field.
One ice skating pond.
One lighted street hockey rink.
Two shuffleboard courts.
Two boccie courts.
One proposed swimming pool.
Two proposed bike trails.
One proposed ice rink.

Based upon the active recreation standards of the NRPA, Manalapan should have a swimming pool, a trail system, an ice rink, six additional tennis courts and six volleyball courts.

Recreation and Open Space Needs

The New Jersey State Outdoor Recreation Plan was issued in November 1984 by the New Jersey Department of Environmental Protection. The NJDEP land use guideline for preserving open space at the municipal level is 3% of the developed and developable area of the municipality.

Manalapan Township has 11,324.2 acres of developed land and 3,610.6 acres of developable land, totalling 14,934.8 acres. Three percent (3%) of this total, 448.0 acres, should be municipally owned and dedicated to public recreation and open space.

As stated in the Existing Facilities and Proposed Improvements section of this element, the Township of Manalapan currently has 298.8 acres of Public Recreation and Open Space land. This leaves a deficit of 149 acres.

Recreation Policy

The diverse recreation needs of Township residents will be met through existing municipal programs, though a program of municipal acquisition and development of new or expanded park sites, and by requiring that major planned developments provide adequate recreation facilities.

Recommendations

The following recommendations have been made by the Manalapan Department of Parks and Recreation:

A fifty acre facility, for both passive and active recreation, is needed in the southern portion of the Township. A feasibility study should be conducted to locate a site south of Route 33.

New municipal recreation sites should be a minimum of five acres in size and include meaningful recreation facilities.

Multi-family housing developments should have priority for development of neighborhood recreation facilities.

A feasibility study should be conducted to locate a site for a community swimming pool and ice rink.

Open space currently owned by the township should continue to be developed based on community input.

Recreational facilities should be included in developments at the onset of the project.

The Township Committee and the Board of Recreation Commissioners should collaborate with the Manalapan-Englishtown Board of Education on the creation of a facility suitable for teen activities at the proposed junior high school.

The Recreation Element advances the following additional recommendations to meet the recreation and open space needs of the Township of Manalapan:

1. Implementation of the proposed improvements to existing park facilities.

2. Acquisition and dedication of 149 additional acres as township owned park and recreation space. This acreage should be developable for active recreation uses.

3. Preservation of the Quail Hill Boy Scout Reservation as permanent open space.

4. Consideration of expansion of Thompson Grove Park to include active recreation areas.

5. Implementation of a trail system in coordination with the Open Space Plan for Monmouth County.

6. A capital improvement program should be established to address the scheduling and location of recreation improvement needed to support population growth.

CIRCULATION PLAN ELEMENT

The circulation plan element describes the existing and proposed transportation system within the township and establishes objectives for adequate levels of service. Public transportation is described in terms of bus routes, park and ride facilities, and proposals for the Route 33 Corridor. A proposed trail system is also described. The Manalapan circulation element recognizes the airport hazard district which surrounds the Old Bridge Airport at the Manalapan - Old Bridge border. Access management techniques are also reviewed in this element.

Background

Existing Roadways & Functional Classification

Manalapan roadways are classified by jurisdiction and by function. The functions and requirements of state highways, county roads and municipal roads are described below:

State Highways

1. Freeways or Expressways

   Freeways or expressways are high-speed, high capacity, limited access highways devoted entirely to the movement of motor vehicles. They provide no direct access to abutting properties. Design features include the separation of opposing traffic lanes by a continuous center barrier or median strip and full access control and grade separation at intersections or interchanges which are generally widely spaced.

   There is one freeway located within Manalapan Township, the Route 33 Bypass, which links Route 33 to Freehold Township.

2. Principal Arterial Highways

   Principal arterial roads serve as major feeder roads to and from freeway systems and carry major movements of traffic between the principal traffic generators in the region. Principal arterial roads usually have four or more traffic lanes and may provide direct access to the abutting properties, a secondary function which should be minimized because it interferes with the traffic flow. Principal arterials are usually intersected at grade and utilize time traffic signals, jug-handle intersections, center barrier and lane markings to control traffic flow.

The roadway system in Manalapan contains two principal arterial roadways, Route 33, which runs east-west, and Route 9, which runs north-south.

County Roadways

1. Primary Roads

Primary roads are county roads. They generally connect municipal collector streets with arterial highways and freeways and often serve as alternate routes for arterial roads. They carry less traffic than principal arterial highways and often have only one lane in each direction. Their function is to convey traffic between municipalities and other centers quickly and efficiently. Therefore, access to these roads should be minimized to avoid disruption of traffic flow.

The primary roads in Manalapan Township are classified as existing primary, existing minor, and proposed primary. Minor roads are located in the rural areas of the Township.

Existing Primary Roads

		Proposed R.O.W.
Freehold-Smithburg Road	(Route 537)	80'
Smithburg Road	(Route 527) (Partial)	66'
Sweetmans Lane	(Route 527)	66'
Millhurst Road	(Route 527)	66'
Wilson Avenue	(Route 527)	66'
Wood Avenue	(Route 522)	66'
Gordons Corner Road	(Partial)	80'
Freehold-Englishtown Road	(Partial)	80'
Main Street		80'
Tennent Road		80'
Morganville Road		80'

Existing Minor Roads

		Proposed R.O.W.
Iron Ore Road		60'
Railroad Avenue		60'
Smithburg Road	(Partial)	60'

Proposed Primary Roads

Monmouth County proposes to take over the following existing municipal roads:

		Proposed R.O.W.
Gordons Corner Road	(Partial)	80'
Church Lane		66'
Craig Road		80'

The Township proposes that Woodward Road be made a county road.

Municipal Roadways

1. Collector Streets

Collector streets carry traffic from residential neighborhoods to arterial roads, provide access to abutting properties and promote free traffic flow. Disturbance of traffic flow should be minimized on these streets by not permitting parking, deliveries, trash pickup or access frontage to residential lots.

The collector streets in Manalapan Township are divided into two categories, collector streets and sub-collector streets.

Collector Streets

Collector street in Manalapan should have a minimum 60' right-of-way with a 40' cartway. The planned collector streets are:

Union Hill Road
Pension Road
Pine Brook Road
Pease Road
Wickatunk Road
Conmack Lane
Taylors Mill Road
Lafayette Mills Road
Symmes Drive
Ryan Road

Sub-Collector Streets

Sub-collector streets in Manalapan have a 60' right-of-way and a 36' cartway and include:

Old Queens Boulevard

Daum Road
Winthrop Drive
Lamb Lane
Oakland Mills Road
Kinney Road
Gravel Hill Road
Thompson Grove Road
Mill Road
Ivanhoe Drive
Gettysburg Drive
County Oaks Drive
Blenheim Road
Apache Drive
High Bridge Road
Mount Vernon Road (Partial)
Robertsville Road

2. Local Streets

Local streets provide access to residential lots and are used as corridors for utility installations. They are designed to carry only the traffic generated on the street itself and to provide access to adjoining property. The local streets in Manalapan Township are organized into two categories, residential access (suburban) and residential access (rural).

Residential Access Streets (Suburban)

Residential access streets in the suburban areas of Manalapan should have a 50' right-of-way and a 30' cartway.

Residential Access Streets (Rural)

Residential access streets in the rural areas of Manalapan should have a 50' right-of-way and a 22'-24' cartway.

Annual Average Daily Traffic (AADT)

The 1989 Annual Average Daily Traffic (AADT) for eleven roads in Manalapan are listed below in order of use:

Route 9	48,400
Route 33	14,400
Gordons Corner Road	12,027
Tennent Road	10,117
Freehold-Englishtown Road	9,795
Wood Avenue	6,206
Pease Road	5,779
Taylors Mill Road	5,768
Pension Road	5,330
Craig Road	5,001
Union Hill Road	1,091

Intersections with Route 9 are subject to peak hour congestion and deteriorated service levels.

Accident Locations

The township police reports the following as problem locations having a high incident of vehicular accidents:

Main Street and Millhurst Road
Gordons Corner Road and Pease Road
Gordons Corner Road and Route 9
Entire length of Route 9 - North and South Bound

Public Transportation

Bus Routes

There are four public transportation routes within the Township of Manalapan. These are serviced by express, shuttle and regional buses. The first three are regional routes connecting to Manhattan and North Jersey. The second is a local shuttle route.

The first route is along Wilson Avenue and Freehold Road, which runs through Manalapan Township and Englishtown Borough connecting Freehold and Monroe Townships.

The second route runs from Pease Road to Union Hill Road and into Marlboro Township. These two regional routes are serviced by New Jersey Transit.

The third route runs through Manalapan on Route 9 from Freehold to Marlboro Townships. This is an express and regional route serviced by New Jersey Transit, Suburban Transit Corp. and Academy Lines Inc. The regional route continues south providing service to South Jersey, Atlantic City and Philadelphia.

The fourth route is serviced by the Monmouth County Office of Transportation Shuttle Bus. This line runs along Route 9 from Freehold Township to the Pine Brook Golf Course and connects with Union Hill Road.

Park & Rides

Along Route 9 there are four Park & Ride facilities which are integrated with the existing public transportation routes. The first is located on the corner of Route 9 South and Symmes Road. The second is on Route 9 South, at Towne Pointe. The remaining two are along Franklin Lane, which is parallel to Route 9 North. One of these is on the east side of Franklin Lane and the other is between Route 9 North and Franklin Lane. Another Park and Ride is proposed in the area of Route 9 and Symmes Drive.

Two additional Park & Rides are proposed in anticipation of development along Route 33. The general locations for these are in the existing Knob Hill Golf Course and along Route 33 West between Woodward Road and Millhurst Road.

Alternates to these locations would be at the Battleground Golf Course on Millhurst Road and at the corner of Route 33 West and Millhurst Road.

Rail

Rail transportation within Manalapan is limited to the Secondary Branch of Conrail. The line is used exclusively for freight. There is no passenger rail service existing or planned. However, New Jersey Transit has proposed rail service through Western Monmouth County to Lakewood. The route preferred by the Monmouth County Planning Board would follow an alignment through Freehold Township and Marlboro Township. This proposal is not expected to be implemented until the year 2,000 or after.

Route 33 Corridor

The Senate and General Assembly of the State of New Jersey passed a bill in 1989 regarding transportation improvements caused by rapid growth. The bill authorizes regional partnerships to plan and finance these improvements and enables counties to establish transportation development districts (TDD).

Route 33 has prime growth potential for the developing southern portion of Manalapan Township and should be established as a TDD. Monmouth County would then be empowered to assess, by ordinance, development fees to be used to finance transportation improvements.

Transportation improvements that should be considered for the Route 33 Corridor includes expanded bus service and park and ride facilities. As the corridor develops, service to North Jersey and New York will be extended.

Pedestrian Circulation and County Trail System

Except along rural residential access streets, sidewalks will be planned to accommodate pedestrian circulation. All circulation will be interconnected with a system of trails coordinated with Monmouth County as described below:

Manalapan R.O.W. Greenway

This 8.9 mile existing Jersey Central Power & Light (JCP&L) right-of-way has the potential for development as an inter-county trail linkage of Turkey Swamp and the Metedeconk River Greenway with Jamesburg Park in Middlesex County.

Manalapan Brook Greenway

This 7.4 mile greenway runs along the Manalapan Brook linking the proposed Charleston Springs County Park to the existing Thompson Grove Park. This trail also has the potential of inter-county linkage with Middlesex County open space areas and is consistent with Middlesex County plans. This proposal also enhances stream valley protection.

McGellairds Brook Greenway

This 7.9 mile greenway has potential linkage with Middlesex County open space areas via the Matchaponix Brook. This trail links population centers with municipal, county and state parks, and enhances stream valley protection.

Weamaconk Creek Greenway

This greenway will link population centers at Tennent and Englishtown with Monmouth Battlefield State Park, the Manalapan Recreation Center, and Manalapan High School.

Tepehemus Brook and Milford Brook Greenways

These local greenways will provide trail linkage to McGellairds Greenway and to the Weamaconk Greenway.

Airport Hazard District

The location of Old Bridge Airport adjacent to Manalapan requires that the Township regulate adjoining land use in accordance with the New Jersey Air Safety and Hazardous Zoning Act of 1983. Accordingly, the land use element of this plan identifies an air hazard district in accordance with regulations of the New Jersey Department of Transportation (NJDOT).

Access Management

In 1989, the New Jersey Municipal Land Use Law was amended by the State Highway Access Management Act. The act authorizes the NJDOT, county, and municipalities, to adopt access management codes. Where such codes have been adopted, no permits for construction of a building or structure can be issued unless the proposed access conforms to the adopted codes of the entity with jurisdiction over the road. NJDOT is presently preparing an access code for state highways. Municipal zoning ordinances will be required to regulate land adjacent to state and county roads in conformity with the access management code. Access management techniques include the following requirements:

1. Minimum spacing of driveways.

2. Minimum corner clearance.

3. Minimum property clearance.

4. Regulation of the number of driveways per property frontage.

5. Consolidation of access for adjoining properties.

6. Consolidation of access for parcels assembled for one purpose, plan, entity, or usage.

7. Designation of the number of driveways permitted to each existing property and denial of additional driveways regardless of future subdivision.

8. Minimum sight distance.

9. Encouraging connections between adjacent property.

10. Adequate internal design and circulation.

Circulation Policy

Manalapan Township will work in conjunction with the state, the county, and the private sector to create a balanced circulation system which provides safe and convenient circulation and satisfactory levels of service within the community.

Recommendations

The following recommendations are made to advance the Township circulation policy:

1. Access management techniques should be applied throughout the township.

2. Major developments should be required to submit traffic studies that identify the improvements needed to maintain adequate service levels and to create a safe, convenient, and balanced circulation system.

3. The present level-of-service for intersections and roadway segments within suburban and corridor development areas should be maintained and not allowed to deteriorate, provided that the minimum acceptable level is "C" as defined in the 1985 Highway Capacity Manual of the Transportation Research Board. Where existing levels-of-service are below the minimum acceptable level, the existing level-of-service should not be allowed to further deteriorate and consideration shall be given to cost-effective improvements and traffic management techniques which would improve the level of service.

4. The present level of service for intersections and roadway segments within rural development areas should be maintained provided the minimum acceptable level of service is "B". Where existing levels-of-service are below the minimum, the level should not be allowed to further deteriorate and consideration shall be given to cost effective improvements and traffic management techniques to improve the level of service.

5. Development should provide for its fair share of the off-tract circulation improvements needed to maintain adequate facilities and adequate levels-of-service. An ordinance establishing standards for determining the fair share of costs.

6. Development should fully provide the on-site and off-site circulation improvements needed to create a safe, efficient, and balanced circulation system.

7. Monmouth County should be requested to consider the feasibility of establishing a Transportation Development District for the Route 33 Corridor.

8. The Monmouth County Highway Plan should be amended to recognize that the right-of-way for Craig Road is 80 feet.

9. Consideration should be given by Monmouth County to upgrading the right-of-way for Millhurst Road to 80 feet.

10. Church Lane should be deleted from the list of proposed primary county roads and be classified as a suburban residential access street.

11. County proposals for widening and improvements within the landmark corridor of Tennent Road, Main Street, and Freehold-Englishtown Road should be tempered by the association of the area with historic landmarks and by the need to maintain and provide a desirable and attractive streetscape which respects the dignity of historic events associated with this area.

12. A long-term capital improvement program should be maintained to identify the location and scheduling of necessary improvements to the circulation system.

COMMUNITY FACILITIES PLAN ELEMENT

The community facilities element of the master plan considers the municipal services and related facilities necessary to meet the safety, health, education and general welfare needs to present and future township residents. Included in this are the provisions for schools, library, police, fire, rescue squad and municipal administration.

Background

The township administrative offices are located on Route 522 and Taylors Mill Road, adjacent to the Manalapan High School and opposite the Manalapan Recreation Center. The U.S. Post Office is constructing a facility next to the township offices. A branch post office is located in Tennent. Library services in Manalapan are provided by the Monmouth County Library Headquarters at Symmes Drive. The township maintains a senior center next to the public works facility on Freehold-Englishtown Road. Provisions for education, fire, police, and first aid services in Manalapan are described below.

Education Facilities

The public school system in Manalapan is administered by the Manalapan-Englishtown Regional School System, for kindergarten through Grade 8, and the Manalapan Regional High School of the Freehold Regional High School District, for Grades 9-12. Manalapan has six public schools. This includes four elementary schools, one middle school and one high school.

Clarks Mills School and Taylors Mills School are both located on the southern end of Gordons Corner Road. These schools serve Kindergarten through Grade 3.

Lafayette Mills School, located on Maxwell Lane, serves Grades 3-6.

Milford Brook School, located on Globar Terrace, serves Grades 4-6.

Pine Brook School, located on Pease Road, serves Grades 7-8. Another middle school for 1300+ students is proposed to be built by the 1991-92 school year on Millhurst Road.

Manalapan Regional High School, located on Church Lane, serves Grades 9-12.

Police

The Manalapan Police Department is located in the municipal building on Route 522 and Taylors Mills Road. It had 43 sworn officers at the end of 1989. Additional staff includes two secretaries, seven dispatchers and two part-time police clerks acting as firearm permit personnel.

The Department has 18 police vehicles: 10 marked units, fully equipped; 6 un-marked units; and 2 trucks.

Although facilities and equipment are reported as adequate at present, the Department reports that manpower, equipment and building space will be problematic by 1995. Renovations to the current police building or a new facility should be studied in order for the police department to function at its highest efficiency levels. Storage space is minimal and the implementation of a computer system should be explored to aid in storing records.

The most common problems the Police Department addresses relate to drugs, alcohol, burglaries, malicious damages, juvenile delinquencies and traffic accidents. Crime prevention programs are offered in business and residential areas as well as to area schools. Various school programs deal with drugs, alcohol, driving while intoxicated (DWI), bike safety, Halloween safety, juvenile crime, street law, constitutional law, careers and related topics. The Department also offers an Explorer Post for youths 14-21, to expose them to the police profession.

Fire Protection

Manalapan is organized into two fire districts. In the north, the township is serviced by Fire District 1, Gordons Corner fire Company. District Headquarters is located on Tennent Road. This district maintains a satellite station on Pease Road.

In the south, the township is served by Fire District 2 which operates from the Manalapan Township No. 1 Fire Company on Sweetmans Lane south of Route 33.

Both fire districts are fire commission forms of government. The fire commissioners are elected to office by the people.

Fire Districts 1 & 2 provide a range of rescue services including air and underwater capabililities. They are also part of the mutual aid system in western Monmouth County.

With the exception of two full-time fire prevention officers in the Bureau of Fire Prevention, the township relies upon volunteers for its fire fighting and rescue capability. Manalapan Fire Company presently reports twenty-eight (28) active members; the Gordons Corner Company has fifty-three (53) active members. The major

problem faced by the fire companies is maintaining adequate day-time coverage. The increase in township population has not been accompanied by a corresponding increase in the pool of volunteers. Future township growth will continue to stress the all volunteer system resulting in need to consider alternatives, such as additional full-time fire employees, to maintain adequate daytime coverage.

While both companies report that their equipment needs are satisfied, they have suggested the creation of satellite stations may be necessary to keep abreast of growth. Fire District 1 indicates that a satellite station should be considered in the vicinity of the township administration building. Fire District 2 indicates that satellite would be desirable in the Iron Ore Road area.

Fire District 2 indicates that flag lot configurations in the southern township pose access and indentification problems in combatting fires.

The fire officials in the township expressed concern over the current and proposed development in both sections of the township without proper water supply. While District 1 is currently almost 100% equipped with fire hydrants, often during the summer months water pressure for fire fighting is poor.

In District 2, the lack of a public water system for the majority of the fire district poses strategical and operational problems which force the use of water tankers and outside agencies to assist in fire fighting.

As the district grows, the lack of adequate water increases the burden on the fire services.

First Aid

The Manalapan First-Aid Emergency Squad, located on Sanford Street, is an all volunteer company which relies heavily on donations for its equipment needs. It currently has thirty-two active members who respond to approximately two thousand calls annually. Maintaining membership to provide adequate coverage, particularly in the day-time, and equipment needs are major problems facing the squad. The squad foresees a need for paid personnel in the future. It also suggests that a satellite first aid station be located along Route 33 to serve growth in the southern township.

Public Works

The Public Works Department operates from a facility and yard area on Freehold-Englishtown Road. The needs reported by the Department are for additional or replacement vehicles, equipment, and manpower to keep abreast of growth, road maintenance needs, storm drainage, public buildings and grounds, and the potable water system. The Department also cites needs related to leaf composting that would include an approved composting site.

Community Facility Policy

The township will maintain and expand community facilities to assure that adequate services are provided to meet the needs of the growing population.

Recommendations

1. A capital improvements program should be established to recommend the scheduling and location of additional township facilities needed to support future growth.

2. A township task force should be established to consider alternatives to enhancing or increasing membership in the volunteer system.

3. A uniform street numbering system should be created to identify property location for emergency crews.

RECYCLING PLAN ELEMENT

The State of New Jersey adopted a statewide mandatory Source Separation and Recycling Act in 1987. This act requires that the municipal master plan include a recycling element which incorporates the State's recycling goals for solid waste. The law also requires that the township develop regulations which specify standards for site plans and subdivisions to ensure conformity with the Municipal Recycling Ordinance.

The Manalapan Township Recycling Program

The Township of Manalapan has been established the following recycling activities to comply with State and County requirements:

1. All mandatory recyclable are collected twice monthly. This is achieved through a private trash collector. All recyclable must be separated in accordance with a recycling ordinance (Ordinance No. 225 adopted March 25, 1987). This ordinance establishes a recycling coordinator who enforces the rules and regulations as set forth under the ordinance.

2. A regulation applying to future development that is the subject of site plan or subdivision approval will be enacted to ensure that residential development, multi-family housing and non-residential establishments are designed to accommodate the recycling program. The regulations shall establish mandatory standards for the separation, storage, and collection of recyclable from solid waste.

3. The township issues a community newsletter describing requirements of the law, schedules of collection, collection districts and other information to ensure the success of the municipal recycling program.

Township Recycling Policy

The township will continue to provide for the recycling of waste materials and maintain a program which meets State and County recycling requirements. New development shall be required to design and plan for the separation, storage and collection of recyclable.

STATEMENT OF PLAN RELATIONSHIPS

Municipal master plans must include a policy statement which indicates the relationship of the municipal plan to the plans of contiguous municipalities, the Monmouth County Plan, the County Solid Waste Management Plan and the State Development and Redevelopment Plan.

The policy of the Township of Manalapan is to ensure that the township's development does not conflict with the development and welfare of neighborhood municipalities, the County and the State as a whole. An analysis of the township Plan shows that it is compatible with the plans of adjoining municipalities.

Contiguous Municipalities

The Township of Manalapan adjoins Englishtown, Marlboro, Freehold and Millstone in Monmouth County as well as Monroe and Old Bridge Township in Middlesex County. The adjoining township zone districts that border Manalapan are generally compatible with the Manalapan plan. Buffers should be maintained between the light-impact industrial and neighborhood commercial zones in Monroe and the residential zones in Manalapan. The plan is also compatible with Englishtown Borough.

Monmouth County Growth Management Guide

The Middlesex County Proposed Land Use Plan - 2000 and the Monmouth County Growth Management Guide both recognize suburban development as the predominant land use along the northern portion of the Manalapan township border. South of Englishtown, the Middlesex Plan proposes areas of undeveloped land with scattered conservation and agricultural zones. Such land uses are compatible with the rural development areas of Manalapan. There are incompatibilities between the Monmouth County plan and the township plan. A portion of the rural development area designated by Manalapan west of Millhurst Road appears as suburban settlement on the county plan. The Route 33 corridor, which the township has designated and committed to major planned development, appears as agriculture, conservation in the County plan. The township position is that the county plan, prepared in 1982, should be updated to reflect recent development and infrastructure planning in Manalapan.

Monmouth County District solid Waste Management Plan

The Monmouth County Reclamation Center in Tinton Falls serves as the landfill for solid waste generated by Monmouth County municipalities. It is also the site of the County recycling transfer station. The County Solid Waste Management Plan was amended in 1987 to mandate certified municipal recycling programs as a condition for municipal solid waste dumping privileges at the

the County in September 1987 for having a recycling ordinance consistent with the County plan. Annual recertification is contingent on meeting the goals set forth by the recycling law of the state. These goals include a Recycling Plan Element adopted to the Master Plan and an ordinance to amend development regulations. Manalapan has submitted a recycling plan element for review by the county. Once this plan is accepted and the development regulations are amended, the township will receive its recycling program certification.

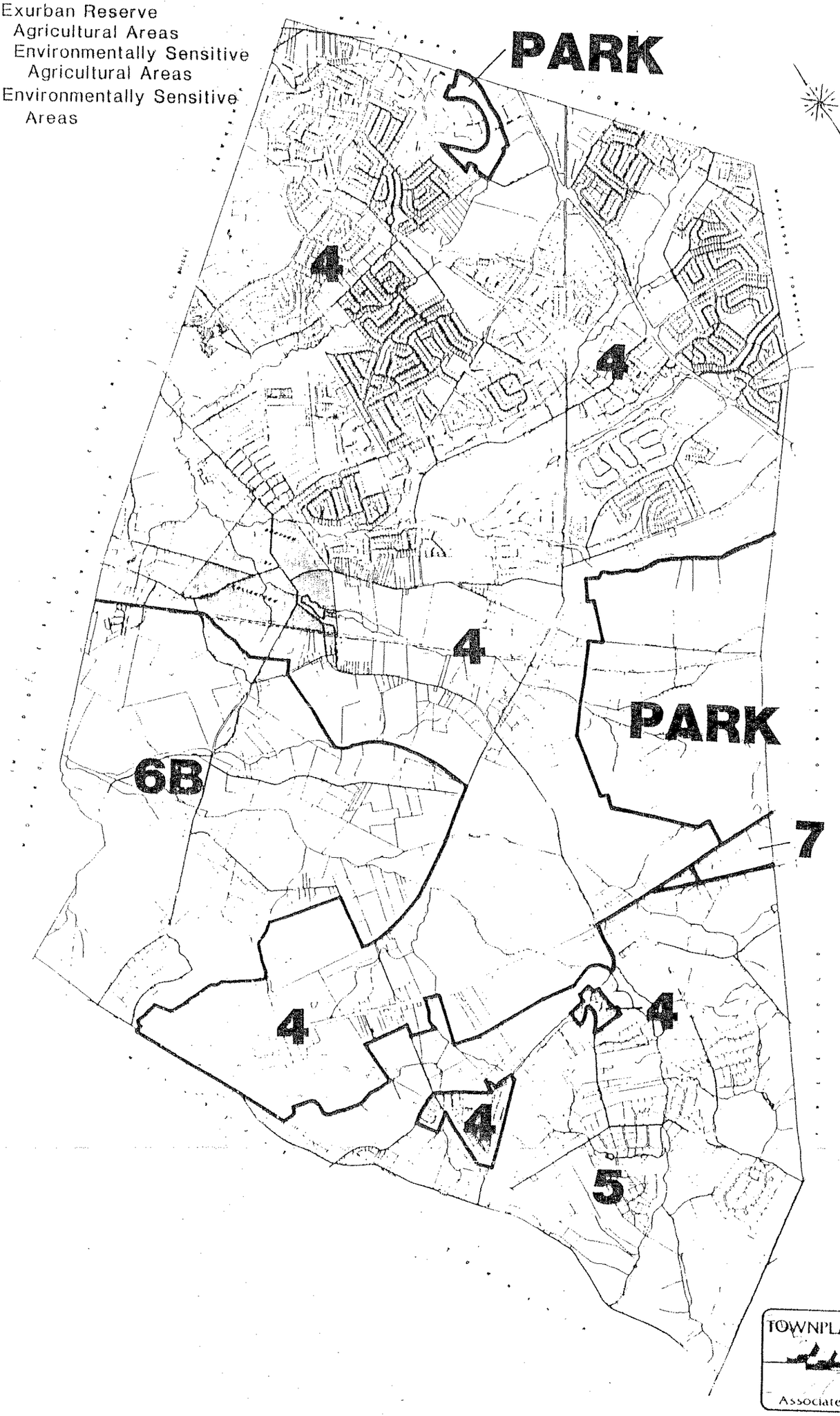
State Development and Redevelopment Plan

The township has actively participated in the cross acceptance process of the Preliminary State Development and Redevelopment Plan. In response to the proposed state plan issued in 1989, the township met with county officials and has recommended a delineation system. The proposed tier map for Manalapan is shown on Figure 10. During the negotiation phase of cross-acceptance in 1990, the township position is that this is the appropriate delineation which should be incorporated into the final state plan. The township has used this delineation in preparing the master plan. Its suburban and corridor development areas correspond to the Tier 4, suburbanizing, category of the state plan. The township rural development areas correspond to either Tier 5, exurban reserve, or Tier 6B, environmentally sensitive agricultural area. The township has also submitted to the county comments on the policies of the state plan.

PROPOSED TIER DELINEATION FOR MANALAPAN TOWNSHIP

1 Redeveloping Cities and Suburbs
2 Stable Cities and Suburbs
3 Suburban and Rural Towns
4 Suburbanizing Areas
5 Exurban Reserve
6A Agricultural Areas
6B Environmentally Sensitive Agricultural Areas
7 Environmentally Sensitive Areas

FIGURE 10



TOWNPLAN Associates

GENERAL PARCEL MAP

MANALAPAN TOWNSHIP

MONMOUTH COUNTY, N. J.

ENGINEERING, SURVEYING, PLANNING ASSOCIATES

JOHN ALLGAIR - TOWNSHIP ENGINEER

May 18, 1989
Revised October 23, 1989
Revised January 31, 1990

APPENDIX

NATURAL RESOURCE INVENTORY

COMPILED OCTOBER 1976 BY THE MANALAPAN TOWNSHIP ENVIRONMENTAL COMMISSION - DAMES & MOORE, CONSULTANTS.

TABLE OF CONTENTS

INTRODUCTION

This Natural Resource Inventory is a report of the Township's Environmental Commission. The Environmental Commission has been long aware of pressures for growth within the Township and their impact on the environment. The Commission realized that accurate environmental information about the Township is needed to provide a sound basis for the work of planning and directing future growth. However, a systematic inventory of the Township's natural resources did not exist. Accordingly, the Environmental Commission and the Township Committee has given high priority to the task of gathering and displaying this data into a Natural Resource Inventory.

This report represents the conclusion of a significant planning effort. It does not, however, represent the total planning effort. In addition to the text, the following graphic material has been prepared and is a part of the inventory, and is available in the Environmental Commission's library.

a) A set of eleven map overlays and base maps at a scale of 1"=800' with dimensions of approximately 3' x 7'.

b) A Development Suitability Model at a scale of 1"=800'. This model shows the environmental suitability for development of each 10-acre parcel in the Township.

c) One set of 9" x 9" stereoscopic, aerial photographs at a scale of 1"=1500'.

REPORT ORGANIZATION

This Natural Resource Inventory is divided into two basic sections reflecting the two classes of maps presented, (i) data maps and (ii) development suitability model.

The data maps consist of 11 maps, as follows:

SOURCE MAPS	INTERPRETIVE MAPS
Geology-Aquifer	Flood Plains
Topography	Depth to Water Table
Slope	Septic Suitability
Soils	Foundation Limitations
Historical and Aesthetic	Erosion Potential
Open Space	

The first six maps are "source" maps. They are based on available, mostly published, information. The latter five maps are "interpretive" maps; i.e., they are derived from combinations of the source maps.

Information presented on the source maps is classified as to development suitability according to slight, moderate, and severe. The maps that are classified by development suitability are Surficial Geology, Slope, Depth to Water Table, Flood Plains, Foundation Limitations, Erosion Potential and Septic Suitability.

Following the data maps is the Development Suitability Model. This model is a map which divides the Township's 32 square miles into 2,090 ten-acre squares. Each square has a development value derived from the development suitability ratings of each data map, and the relative importance or "weight" of each data map as determined by the Environmental Commission, resulting in a five-class breakdown of development suitability: (1) most suitable for development; (2) suitable for development; (3) adequate for development; (4) unsuitable for development; and (5) most unsuitable for development.

REGIONAL LOCATION

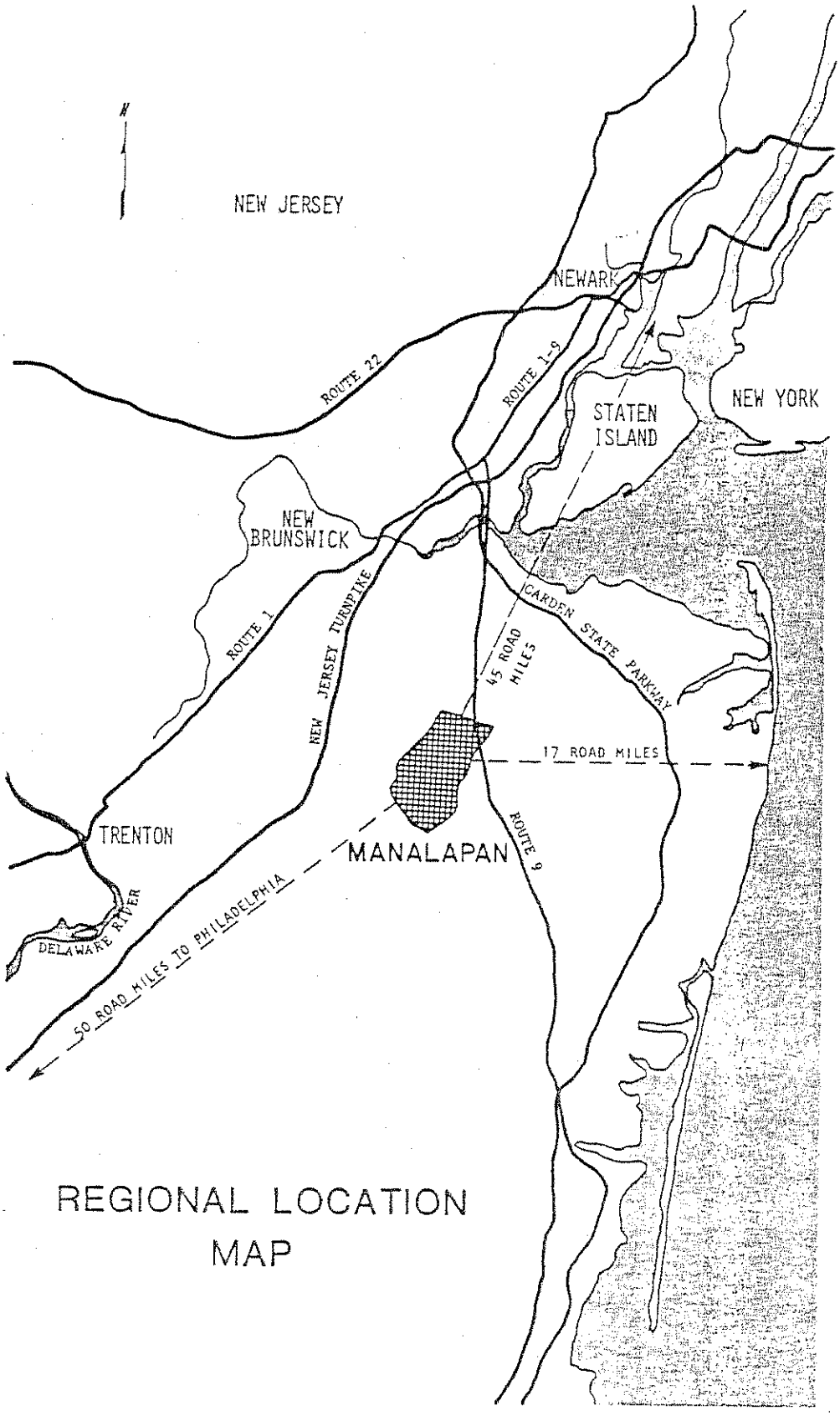
Manalapan Township is located on the northwestern boundary line of Monmouth County. It is bounded:

- on the north by Old Bridge and Marlboro Townships
- on the east by Freehold Township
- on the south by Freehold and Millstone Townships
- on the west by Monroe Township

Although located in the outer ring of the New York metropolitan area, the Township over the past decade has experienced remarkable growth. In 1950 its population was 3,137. In 1960 its population was only 3,990. By 1970 this figure zoomed to 14,049, or an increase of three and one half fold. The 1976 population is 18,070.

The Township's growth resulted from a combination of several factors:

- a location midway between the Jersey Shore and the New York-Newark metropolitan area, as well as about 50 miles from Philadelphia
- substantial tracts of relatively vacant and cleared land
- access to a variety of major transportation facilities, most notable the Garden State Parkway, the New Jersey Turnpike, and Routes 18, 33 and the recent dualization of Route 9



REGIONAL LOCATION MAP

SURFICIAL GEOLOGY

Manalapan Township is located in the Atlantic Coastal Plain Province which is a few miles southeast of the dividing line between this province and the Piedmont Province.

Geologically the Township is underlain by Precambrian Age metamorphic rock. The surface of these rocks dips gently (about 50 to 60 feet per mile) toward the southeast. Generally, the Precambrian rock surface is found at depths of 200-300 feet below ground level in Manalapan.

Overlying the Precambrian basement rock are alternating strata of unconsolidated sediments of Cretaceous and Tertiary Age. These formations consist mostly of sand, silt and clay which tend to thicken to the southeast.

The major source of private well water in the Township is the Raritan Formation at depths of 500 to 700 feet. The major geologic formations that outcrop (appear on the surface of the earth) in Manalapan Township, in order of increasing age, are: the Kirkwood, Vincentown, Hornerstown, Red Bank, Navesink, Mount Laurel and Wenonah, Marshalltown and Englishtown Formations. These formations, in general, become younger to the southeast.

Those formations in the Township that are considered major sources of ground water are the Englishtown, Mount Laurel and Wenonah regional aquifers* followed by the Red Bank and Vincentown Formations.

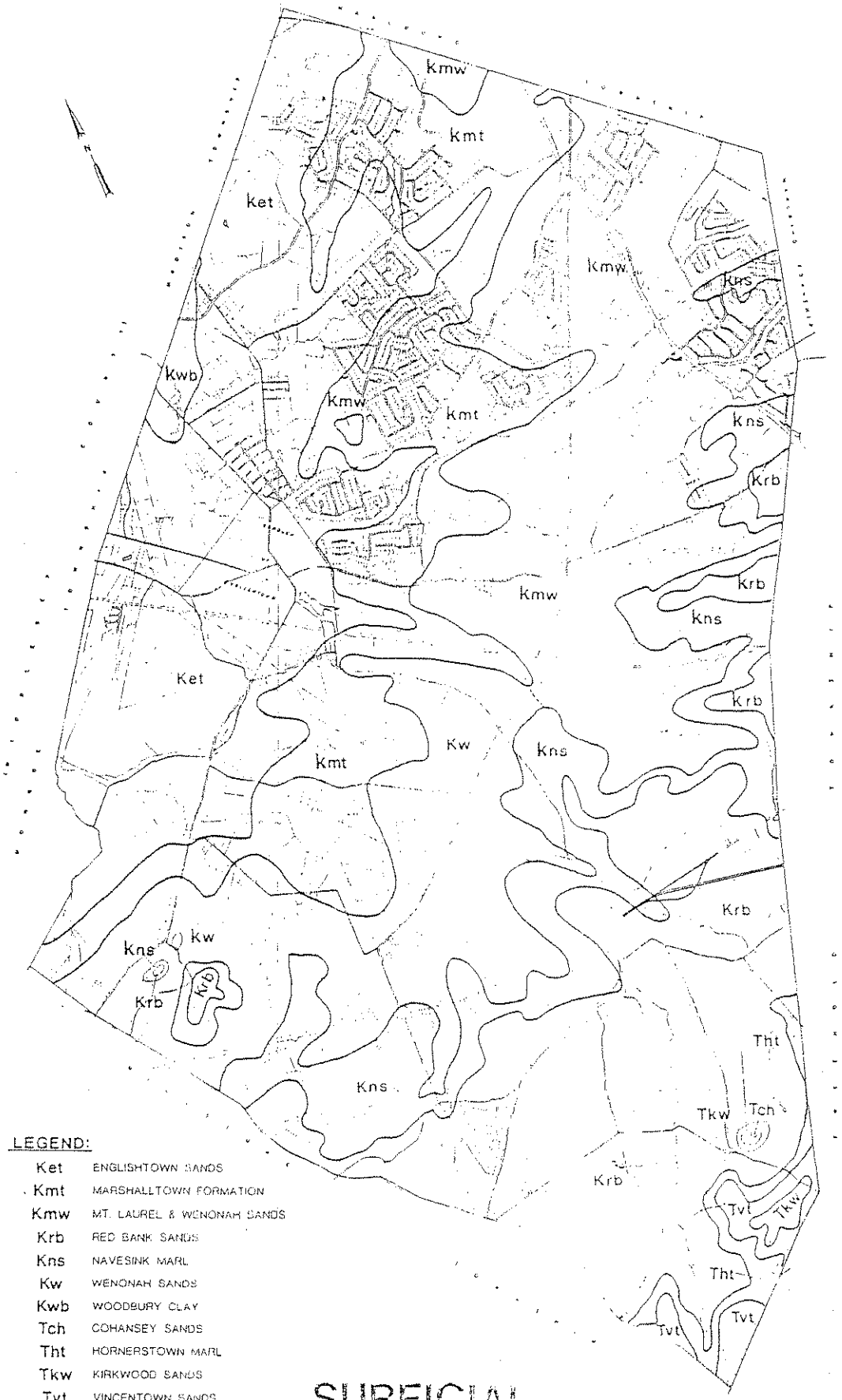
The Englishtown Formation is partly continental and partly marine in origin. The Englishtown aquifer is an important local aquifer yielding a limited quantity of water of excellent quality, except for a generally high iron content. The sands are generally quartzose, white or yellow, medium grained and well sorted with various concentrations of mica, lignite and glauconite.

The Mount Laurel and Wenonah Sands are two separate geologic formations but are connected hydraulically and are thus referred to as a single unit. The Wenonah Formation consists of dark gray micaceous quartz silt and fine grained sand interbedded with clay lenses. The overlying Mount Laurel Sand is a greenish-gray glauconitic, clayey, quartz sand. This formation has a relatively low capacity for transmitting water, but its uniform thickness and lithology, and good quality of water make it an important aquifer.

The Red Bank Sands outcrop area contains an upper sand that is slightly clayey, medium to coarse grained sand colored reddish-brown to gray, and a lower sand that is clayey and glauconitic medium to fine grained sand colored dark gray. Since the areal extent of the aquifer is limited and the quality of water yielded is high in iron and is acidic, the potential development of it is limited.

The Vincentown Formation also contains two members. The upper member is a fine to medium grained sand containing numerous fossils. The lowest member is a greenish to gray fine to medium sand. The formation is quite thin and not continuous, and generally produces low yields of water although of excellent quality.

*Aquifers are water bearing formations (usually sand and gravel) which will yield water readily to wells.



LEGEND:

Ket	ENGLISHTOWN SANDS
Kmt	MARSHALLTOWN FORMATION
Kmw	MT. LAUREL & WENONAH SANDS
Krb	RED BANK SANDS
Kns	NAVESINK MARL
Kw	WENONAH SANDS
Kwb	WOODBURY CLAY
Tch	COHANSEY SANDS
Tht	HORNERSTOWN MARL
Tkw	KIRKWOOD SANDS
Tvt	VINCENTOWN SANDS

AQUIFER RECHARGE AREAS

SURFICIAL GEOLOGY

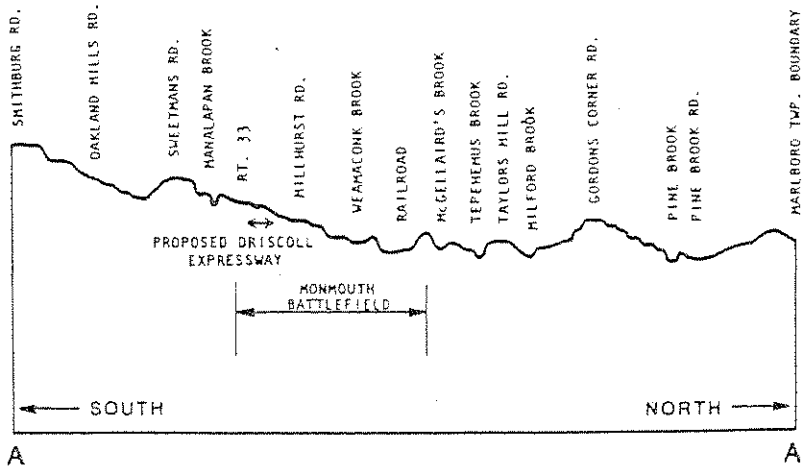
SLOPE AND TOPOGRAPHY

The topography of Manalapan Township consists of moderate to gently rolling hills. The southern half of the Township has more noticeable hills than does the northern half. In the south, Locust Hill, elevation 258', and Oakland Mills Hill, elevation 208', are the two highest points. The northern border with Middlesex County is the area of minimum height ranging from 60 to 100 feet. The Topography Map is derived from the U.S. Geologic Survey Maps of the area with interpolation of missing contours. However, this map is not reproduced in this report because the details would be lost, but is available in the Environmental Commission Library.

Slope is defined as the inclination of the ground with respect to a horizontal plane. It is usually expressed as a percentage and is read as the number of feet of vertical height for each 100 feet of horizontal distance. The Slope Map is derived from the SCS Soils Map and is classified into three categories. These categories are:

SLOPE CLASSIFICATION	LIMITATION
0% - 5%	Slight
6% - 15%	Moderate
16% and greater	Severe

Slope is one of the factors used in generating the Development Suitability Map. Slope is an initial input; the Slope Map affects such items as homesite, playgrounds, farming, parking lots, woods and campsites. As a secondary input, slope as a soil factor affects septic disposal, erosion and excavation.



SLOPE	LIMITATIONS TO DEVELOPMENT	
0 - 5%	SL	(SLIGHT)
6 - 15%	M	(MODERATE)
MORE THAN 15%	S	(SEVERE)

SLOPE

FLOOD PLAINS

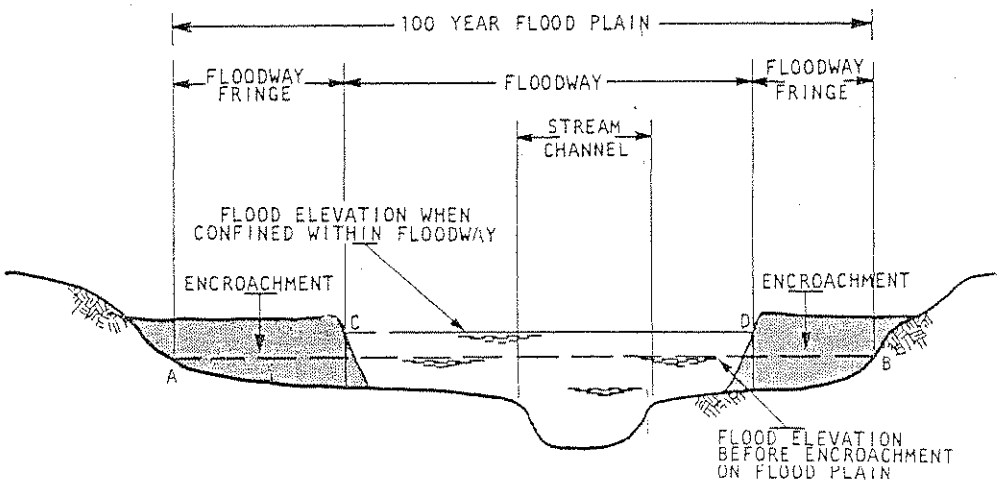
Surface water drainage of Manalapan Township is predominantly to the northwest. The major water courses in the Township, north to south, are: Pine Brook; Matchaponix Brook, McGellaird's Brook and its tributaries, the Milford Creek and Tepehemus Brook; Weamaconk Creek; Manalapan Brook and its tributaries, the Still House Brook and Gander Branch Brook. Located on the Manalapan Brook in the most southern portion of the Township are two large lakes and numerous smaller impoundments on its tributaries.

In recent years, Federal, State and local governments have increasingly recognized that flood plains are a valuable natural resource, serving both to minimize the extent of flooding and to maximize the amount of ground water recharge. As with any natural resource, a prudent step in planning for its protection and utilization is to identify it, and the best identification format, as with any land form, is a map.

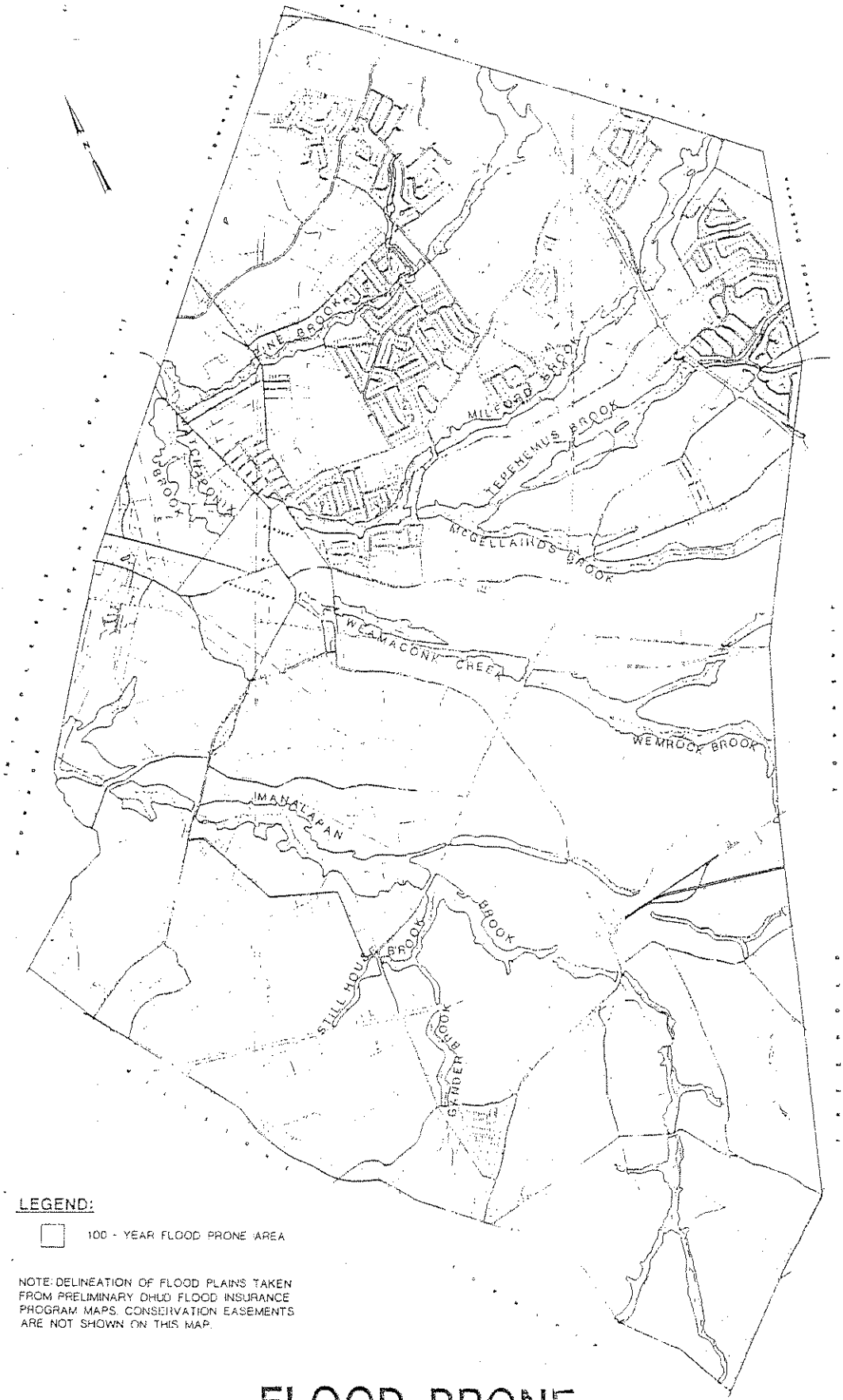
A discussion of land use applications of the National Flood Insurance Program is included in the Appendix.

The recently completed draft of the DHUD Flood Insurance Study analyzes the flood prone areas of the Manalapan Brook and Matchaponix Brook Basins. Five streams in the Manalapan Brook Basin and nine streams in the Matchaponix Brook Basin were studied. The Flood Plains map on the following page shows the 100-year flood plain limits. Flood hazard determinations are based on hydrologic and hydraulic conditions.

State, county and local governments recognize the value of flood plains as a valuable natural resource, serving both to minimize the extent of flooding as well as to protect the health, safety and general welfare of the public. To this end there are strict regulations dealing with encroachments and construction within the flood plains.



LINE A-B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C-D IS THE FLOOD ELEVATION AFTER ENCROACHMENT



LEGEND:

☐ 100 - YEAR FLOOD PRONE AREA

NOTE: DELINEATION OF FLOOD PLAINS TAKEN FROM PRELIMINARY DHUD FLOOD INSURANCE PROGRAM MAPS. CONSERVATION EASEMENTS ARE NOT SHOWN ON THIS MAP.

FLOOD PRONE AREAS

DEPTH TO WATER TABLE

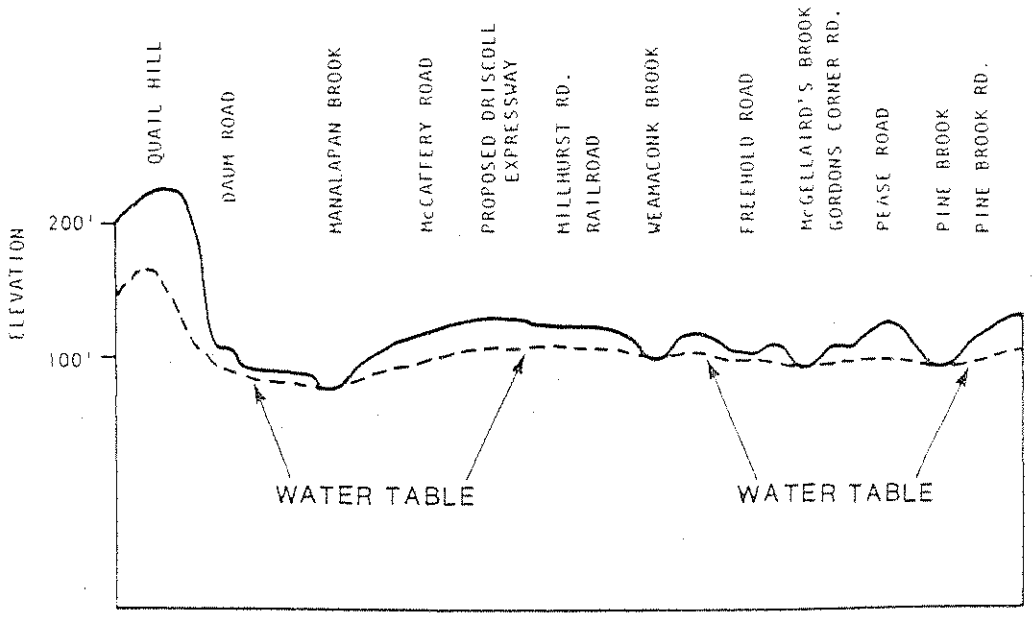
The depth of the water table in Manalapan Township is closely related to topography and soil types. In general, the upland areas act as ground water recharge areas and the stream rivers and swamps are ground water discharge areas. In the topographically low areas near these discharge areas the water table is usually near to or at the surface of the ground. In the upland recharge areas, especially where permeable soils are found, the water table is generally more than 5 feet below ground and may be much deeper.

Sections of the Township where large volumes of the ground water are being pumped from the water table aquifer may have a lower water table than if left untapped. Usually pumpage from artesian aquifers which are overlain by confining formations will create zones of lowered hydrostatic pressure within these aquifers in the vicinity of the well field. Pumping from these aquifers, however, will generally not have a noticeable effect on the depth to water table.

In areas adjacent to streams and rivers, these depths are affected by seasonal water levels of adjacent water bodies. Heavily vegetated areas tend to stabilize the water table, and conversely, removal of such vegetation may promote rapid fluctuations.

The three categories and their respective depth to the water table are:

DEPTH TO WATER TABLE	LIMITATION
Greater than 4'	Slight
1' to 4'	Moderate
Less than 1'	Severe



LIMITATIONS TO DEVELOPMENT	DEPTH TO WATER TABLE
GREATER THAN 4'	SL (SLIGHT)
1' TO 4'	M (MODERATE)
LESS THAN 1'	S (SEVERE)

DEPTH TO WATER TABLE

SOILS

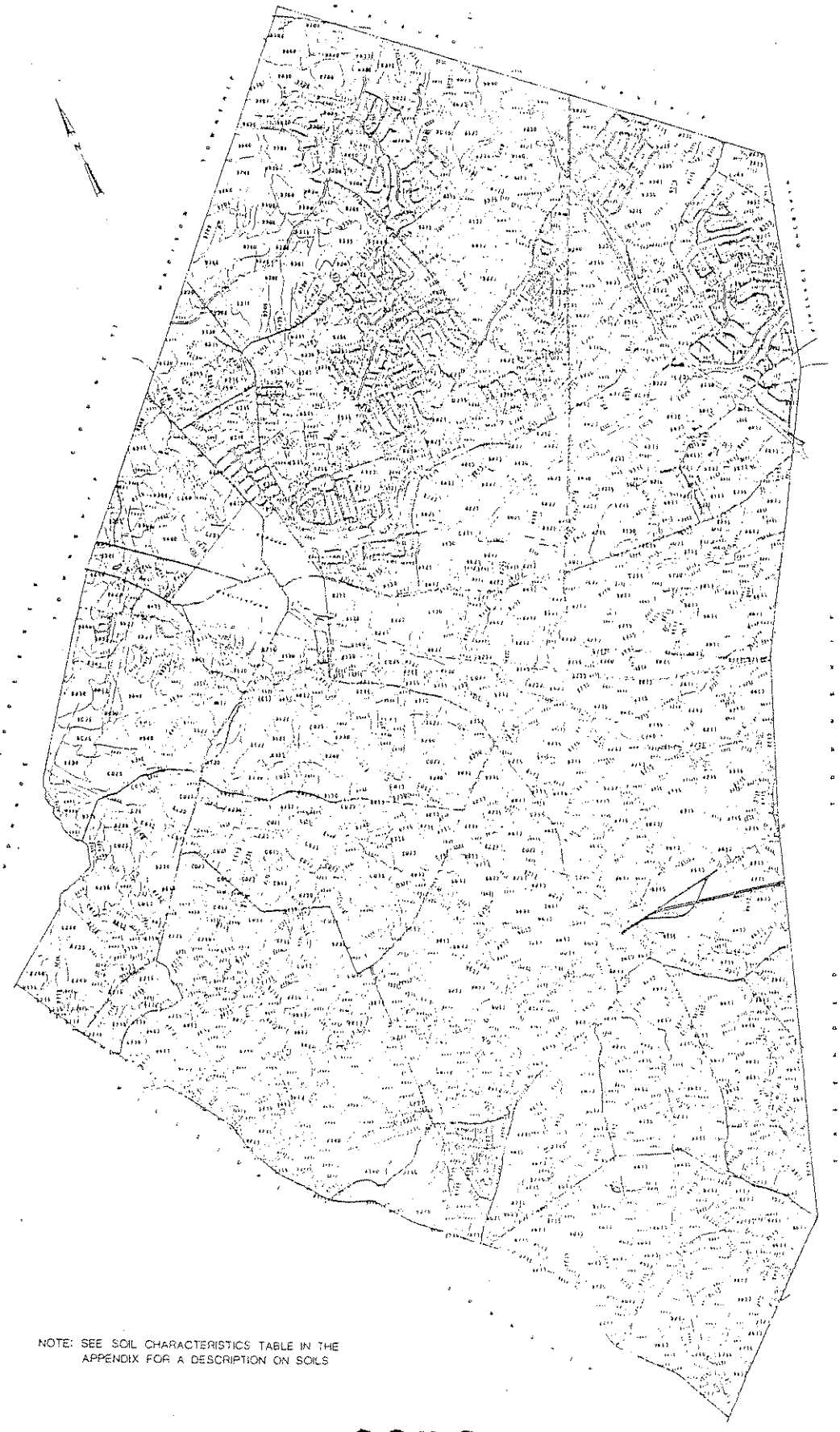
The development of soils and their profiles are determined by the interrelationship and interaction of climate, plant and animal life, parent material, topography and time. Climate is important because temperature and rainfall are responsible for variations in plant and animal life and govern the rates of rock weathering and mineral decomposition. Plant and animal life found in the area are responsible for the total amount of organic matter, the amount of available nutrients found in the soil and the color of the soil. In general, color is an indicator of soil productivity. A brown, yellow, and yellow-brown color are favorable for productivity. An olive green color shows the soil contains large amounts of greensand (the mineral glauconite which is a silicate of iron and potassium yielding potash), and is also favorable for productivity if the soil has good texture and is easy to work. A gray or black is often unfavorable, but black soils artificially drained may be highly productive.

The parent material, unconsolidated masses from which the soils are formed, is responsible for determining the mineralogical and chemical composition of the soil. Also, it acts in conjunction with climate to determine the rate that soil forming processes take place. Parent material of Township soils consists of beds of sand, gravel and clay, and in certain places, shell deposits from which the soils are derived. All parent materials are the sources of the nutrients naturally existing in the soil. The mineral greensand often has associated with it some phosphate of lime and occasionally carbonate of lime. If a soil containing greensand has a suitable texture, the potash adds to its fertility.

The parent materials of most Township soils vary from acid to very acid in the natural state. The local Soil Conservation Service office has found several soils that when exposed to air are highly acidic, with a pH that may go as low as 3. These soils, most notably Donlonton and Howell,* may require extraordinary measures to mitigate potential harmful effects of such acidity.

Topography through drainage patterns, slope and position with respect to the water table greatly influence the formation of soils and their profiles. Soils found in the relatively flat valleys tend to be heavier and with a greater organic content than soils found on slopes. These lowland soils, such as Elkton and Pocomoke,* also tend to be under a greater water influence due both to depth to water table and streams. Soils that are located on relatively higher land than the lowland soils are usually well drained with a loamy or sandy loam texture. These soils are useful for agricultural production and are represented by the Sassafras and Woodstown series. The upland soils are mostly light textured with good drainage characteristics and moderate fertility as represented by the Evesboro and Lakewood series.

*See Appendix for description of soils.



NOTE: SEE SOIL CHARACTERISTICS TABLE IN THE APPENDIX FOR A DESCRIPTION ON SOILS

SOILS

FOUNDATION LIMITATIONS

The Foundation Limitations Map is derived from the Soil Conservation Service Soil maps of Manalapan Township. The three categories of slight, moderate and severe are based on the properties listed on the accompanying table for low buildings with cellars of low loads and minimum vibration. These properties affect bearing capacity, bearing strength, settlement, cost of excavation and cost of construction.

The slight category is given to soils that have favorable overall foundation characteristics. The moderate category is given those soils that have properties which are not as suitable as slight but may be overcome by simple design or special planning. The final category, severe, is given to those soils that have one or more properties that are so unfavorable as to require extensive site preparation.

FOUNDATION LIMITATIONS

CHARACTERISTICS	SLIGHT	MODERATE	SEVERE
Drainage Class	Well Drained	Moderately drained	Poorly drained
Seasonal water table	>60"	30"-60"	<30"
Flooding	None	None	Occasional
Slope	0-8%	9-15%	>15%
Shrink swell potential	Low	Moderate	High
Potential frost action	Low	Moderate	High
Depth to bedrock	>60"	40-60"	>40"
Typical Soils	Collington Evesboro Freehold Monmouth Sassafras Tinton	Adelphia Colts Neck Delanco Holmdel Howell Keyport Klej Lincroft Woodstown	Alloway Colemanton Donlonton Elkton Fallsington Freneau Marlton Pocomoke St. Johns Shrewsbury

LIMITATIONS TO DEVELOPMENT

SL (SLIGHT)

M (MODERATE)

S (SEVERE)

NOTE: SEE PAGE 14 FOR DESCRIPTION OF LIMITATIONS

FOUNDATION LIMITATIONS

EROSION POTENTIAL

Erosion is the removal of soil and land from its present location by the agents of wind, water and man. The most important long term agent acting on soil removal is water. Normal soil erosion operates very slowly, yet inexorably. Over many thousands of years, normal soil erosion levels entire mountains to form plains, plateaus and river flats. When erosion exceeds this normal rate, as will sometimes occur through man's activities, it becomes destructive and is referred to as accelerated erosion. The effects of this type of erosion can be seen at a large construction site where there is no adequate erosion and sedimentation control plan being utilized, or on a large cleared and sloping field after a rainfall.

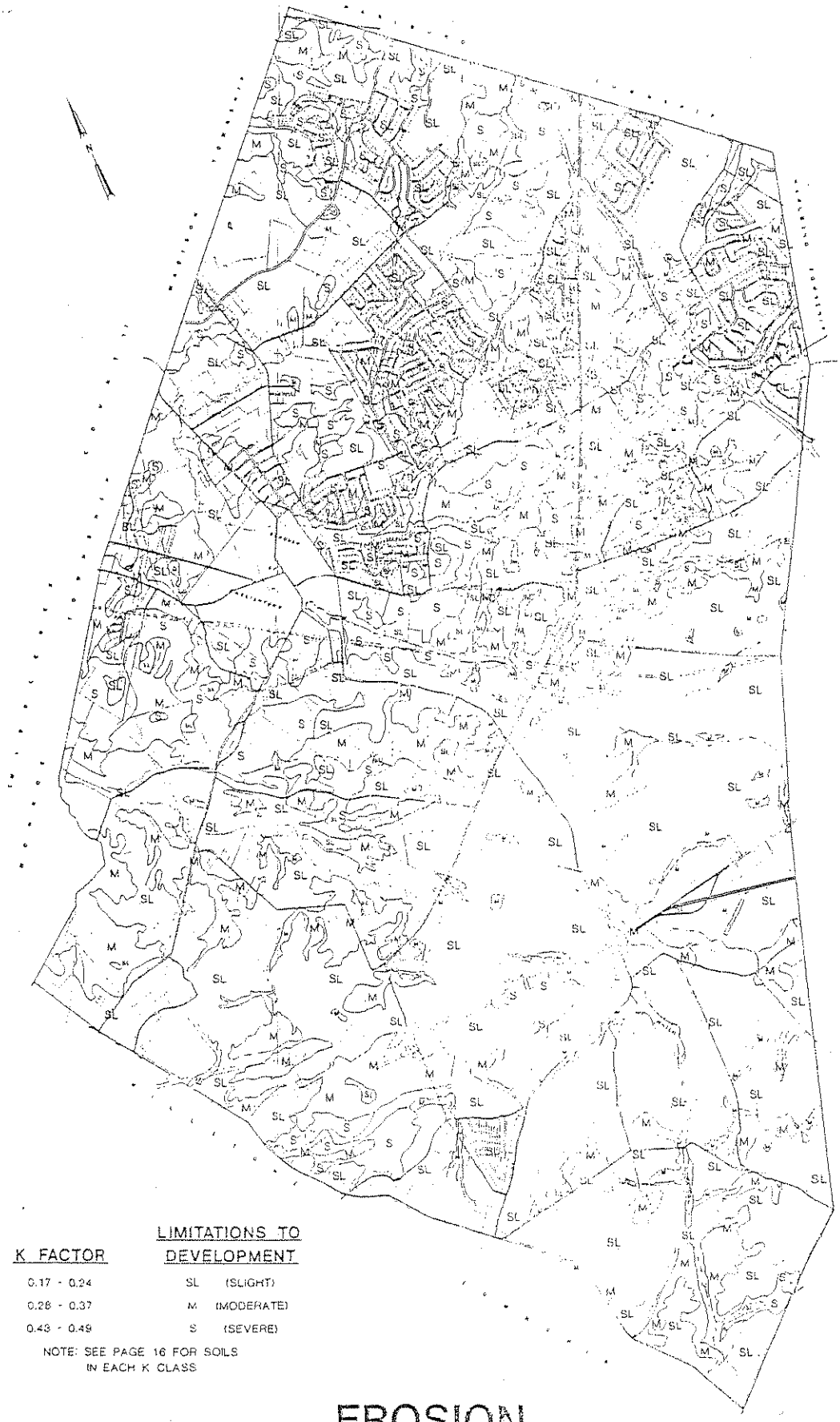
An additional consideration is the exposure of acid soils such as Donlonton and Howell soils. These soils, exposed to the surface, maintain extremely low pH levels, a condition hostile to the growth of vegetation. This vegetation would normally help stabilize the soil and reduce erosion potential.

Erosion is an important contributor to regional flooding. Sediment accumulations in the bottom of a stream tend to raise high water levels during heavy storms, with a corresponding overflow of stream banks and flooding of adjacent lowlands. Sediments carried downstream tend to accumulate in larger bodies of water such as lakes, ponds, etc. This reduces their capacity and any potential for smoothing out water-flow surges and attendant downstream effects.

Erodibility (k) factors are relative erosion factors indicating the severity of sheet erosion that might be expected from bare (non-vegetated cover) soil. These ratings are discrete numbers; 0.17, 0.20, 0.24, 0.28, 0.32, 0.37, 0.43, and 0.49, with 0.17 being the lowest erosion hazard and 0.49 being the highest. The Erosion Potential map divides this soil property into three groups:

LIMITATION	K FACTOR	TYPICAL SOILS
Slight	0.17-0.24	Collington, Delanco, Evesboro, Freehold, Klej, Lincroft, St. Johns, Tinton
Moderate	0.28-0.37	Adelphia, Colts Neck, Fallsington, Holmdel, Pocomoke, Sassafras, Shrewsbury, Woodstown
Severe	0.43-0.49	Colemanton, Donlonton, Elkton, Howell, Keyport, Marlton

The erosion potential of each of the soils listed can be significantly modified by vegetative plantings.



K FACTOR	LIMITATIONS TO DEVELOPMENT
0.17 - 0.24	SL (SLIGHT)
0.28 - 0.37	M (MODERATE)
0.43 - 0.49	S (SEVERE)

NOTE: SEE PAGE 16 FOR SOILS IN EACH K CLASS

EROSION POTENTIAL

SEPTIC SUITABILITY

Manalapan Township is included in the service area of the Western Monmouth Utilities Authority (WMUA). Those major subdivisions located in the northern half of the Township are served by a sewage collecting system operated by the WMUA. The southern half of the Township is not presently serviced by a collection system and as such is serviced by individual septic tank systems.

Septic tanks require certain environmental characteristics to perform properly. The Soil Conservation Service has defined these characteristics and rated them slight, moderate and severe, depending on certain performance criteria. Slight is used for few or no significant limitation; moderate for one or more limitations that can normally be overcome at moderate costs by careful construction and design; severe is one or more limitations that cannot be overcome without considerable costs. A severe rating does not imply that the soil is unsuitable, but that development costs are high.

Important soil properties that are examined to determine septic suitability are percolation rate, depth to water table, slope, amount of stone, depth to bedrock and flood hazard.

It is not intended that the ratings substitute for on site percolation tests. The soil map and the ratings assigned to various community uses are for substantial areas and do not preclude differences between localized conditions and mapped conditions.

SEPTIC SUITABILITY

CHARACTERISTICS	SLIGHT	MODERATE	SEVERE
Permeability	>2"/hr	6-2"/hr	<2"/hr
Hydraulic conductivity	>1"/hr	1-0.6"/hr	<0.6"/hr
Percolation rate	<45 min/in	45-60 min/in	>60 min/in
Depth to water table	>72"	48-72"	<48"
Flooding	None	None	Occasional
Slope	0-5%	6-15%	>15%
Depth to bedrock	>72"	48-72"	<48"
Stoniness class	0-1	2	3, 4 & 5
Rockiness class	0	1	2, 3, 4 & 5
Typical soils	Collington Colts Neck Freehold Keyport Lincroft Monmouth Tinton	Adelphia Delanco Evesboro Holmdel Klej Sassafras Woodstown	Alloway Colemanton Doniontown Elkton Fallsington Freneau Howell Keansburg Marlton Pocomoke St. Johns Shrewsbury

PERCOLATION RATE	LIMITATIONS TO DEVELOPMENT
GREATER THAN 45 MIN./IN.	SL (SLIGHT)
45 - 60 MIN./IN.	M (MODERATE)
LESS THAN 60 MIN./IN.	S (SEVERE)

NOTE: ADDITIONAL LIMITATIONS ARE DESCRIBED ON PAGE 18

SEPTIC SUITABILITY

HISTORIC SITES

Monmouth Battleground:

The Battle of Monmouth, June 28, 1778, was designed to break up British General Henry Clinton's movement across New Jersey after the evacuation of Philadelphia. Although Washington failed to prevent Clinton's escape, he demonstrated his own qualities of leadership and the prowess of his army created in the misery of Valley Forge. The engagement was the longest sustained action in the War of Independence.

Tennent Church:

The present building was built in 1752 and named for its Presbyterian pastor. There were no services held the day of the Battle of Monmouth as most of the community was in hiding. Around noon on the day of the battle, General Washington with 6,000 troops hastily marched past the church to the fight. Soldiers wounded and killed during the battle were sent to the church for care and burial.

Washington and Lee Marker:

Marks the site where General Washington relieved General Lee at the Battle of Monmouth, turning the tide of the battle.

Molly Pitcher Well Marker:

Molly Pitcher, heroine of the Battle of Monmouth, was the wife of an artillery man. When her husband was shot, she stopped carrying buckets of water to the soldiers and took up her husband's position with the cannon. On recommendation of General Greene, she was commissioned by General Washington.

Cobb House:

This stately victorian house was built in 1870 by Archibald Cobb, pastor of the Old Tennent Church. The building is presently the information center for the Monmouth Battlefield Historical Society.

Millhurst Mill:

An old custom or merchant mill.

Taylors Mill:

Taylors Mill, located on the Tepehemus Brook, was rebuilt by Joseph R. Taylor in 1877.

Preston Mill:

Originally a woolen factory built around 1790 and destroyed by fire in 1846. It was rebuilt as a mill.

Lafayette Mill:

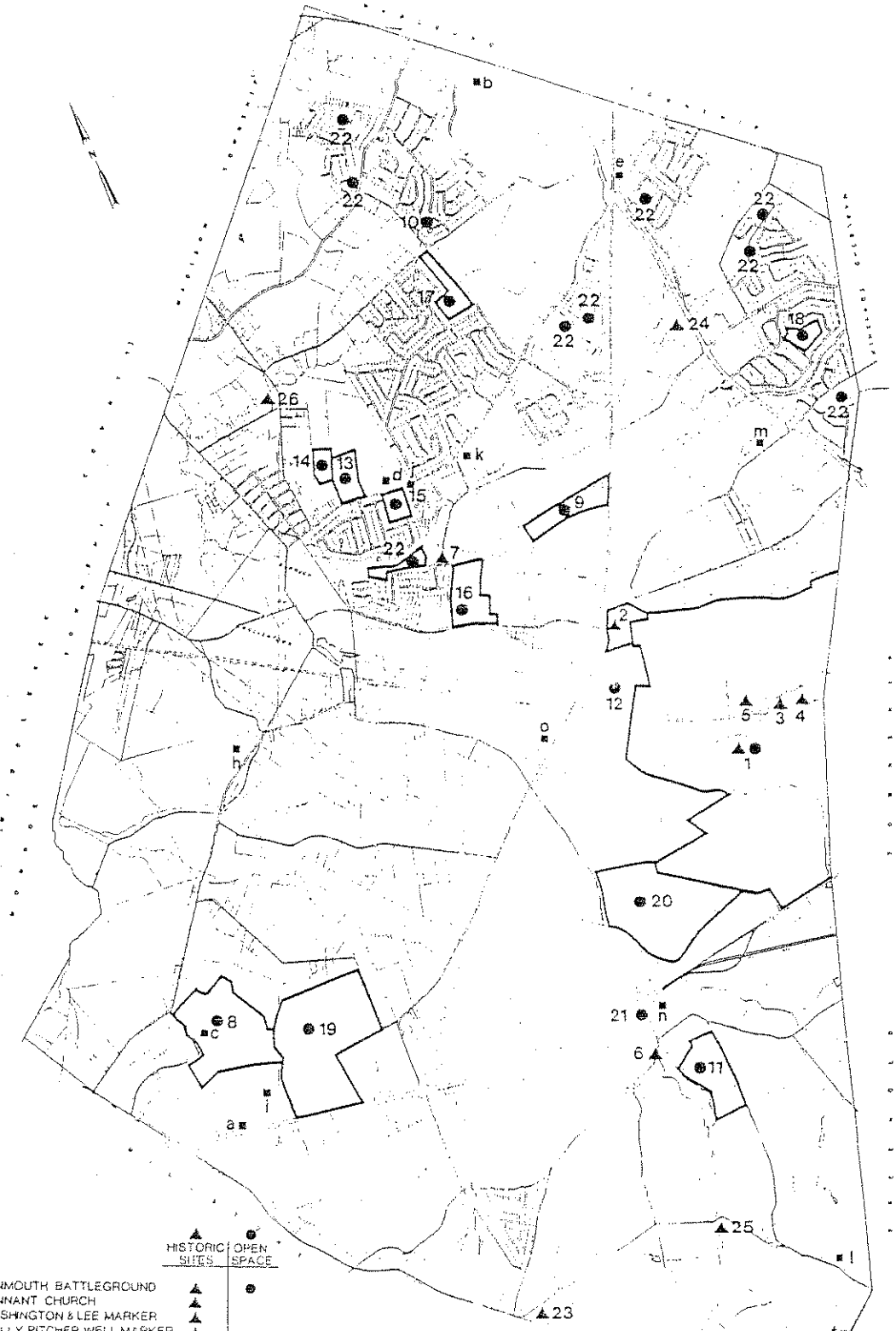
Originally built in 1744.

Parker Mill:

This grist mill was built about 1835 on the main branch of the Manalapan Brook. Prior to that it was a saw mill.

Clarks Mill:

This was a saw mill located along Pine Brook.



HISTORIC SITES | OPEN SPACE

1. MONMOUTH BATTLEGROUND
2. TENNANT CHURCH
3. WASHINGTON & LEE MARKER
4. MOLLY PITCHER WELL MARKER
5. COBB HOUSE
6. MILLHURST MILL
7. TAYLORS MILL
8. QUAIL HILL SCOUT RESERVATION
9. WYNKOOP BIRD SANCTUARY
10. HOLIDAY PARK
11. THOMPSON GROVE PARK
12. MANALAPAN TOWNSHIP VILLAGE GREEN
13. CLARK MILLS SCHOOL
14. MILFORD BROOK SCHOOL
15. TAYLORS MILL SCHOOL
16. MANALAPAN HIGH SCHOOL
17. PINE BROOK SCHOOL
18. LAFAYETTE MILLS SCHOOL
19. KNOB HILL GOLF COURSE
20. BATTLEGROUND GOLF COURSE
21. MILLHURST SCHOOL
22. POCKET PARKS AND OTHER TOWNSHIP OWNED LANDS

23. PRESTON MILL
24. LAFAYETTE MILL
25. PARKER MILL
26. CLARKS MILL

NOTE: ■ a-o ARE PRIVATELY OWNED HISTORIC HOMES DESCRIBED IN THE APPENDIX. COBB HOUSE ▲5 IS ALSO NOTED ON THIS LIST

HISTORIC SITES

OPEN SPACE

The Open Space map has four categories: (1) Agriculture; (2) Fields; (3) Woodlands; and (4) Other. This map is intended to show those areas within the Township that are not yet developed or presently used for commercial and residential use.

Included in the Other category are certain areas which are public and private lands that may be used for recreation, camping or nature walks. These sites are:

Monmouth Battleground

Quail Hill Scout Reservation

Wynkoop Bird Sanctuary

Holiday Park

Thompson Grove Park

Manalapan Township Village Green

Clark Mills School

Milford Brook School

Taylors Mill School

Manalapan High School

Pine Brook School

Lafayette Mills School

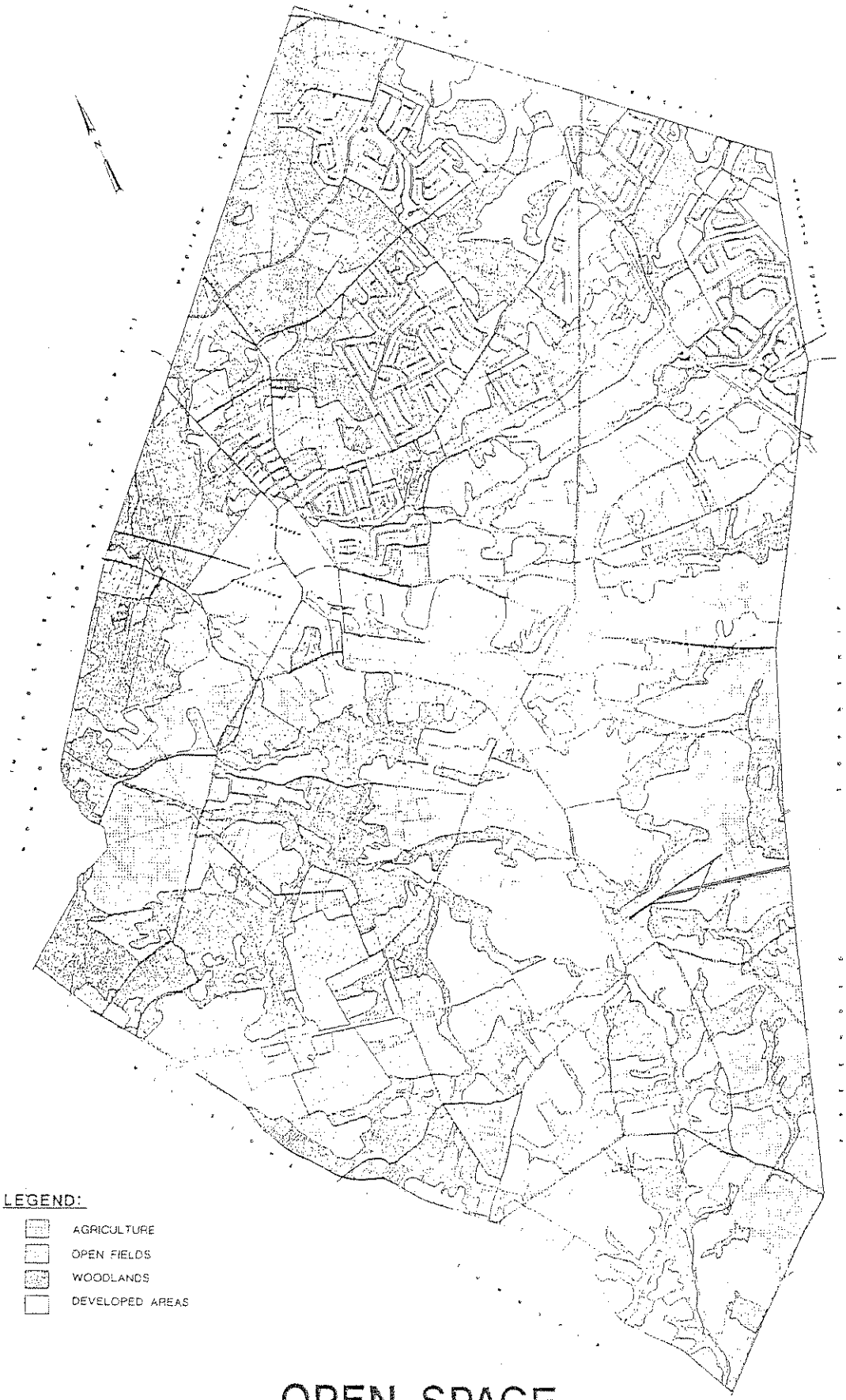
Knob Hill Golf Course

Battleground Golf Course

Millhurst School

Pocket parks and other Township-owned land

The above sites are shown on the Historic Sites map.


LEGEND:
AGRICULTURE
OPEN FIELDS
WOODLANDS
DEVELOPED AREAS

OPEN SPACE

DEVELOPMENT SUITABILITY MODEL

The preceding data maps set the basis for the design of an environmental development suitability model for Manalapan Township. The purpose of this model is to delineate, by ten-acre units, areas which, in terms of environmental criteria, are most/least suitable for development.

The development of the model involved the following steps:

1) division of the Township into uniform ten-acre units;

2) selection of data maps for inclusion into the development suitability model;

3) determination of development limitations for each parameter on the data maps;

4) weighting of each data map in terms of importance;

5) application of weighted numerical rating for each unit;

6) grouping of ranges of numerical ratings into classes ranging from least suitable for development to most suitable for development;

7) mapping of the various classes of the suitability for each unit.

Ten-Acre Units

Manalapan Township was divided by a lattice of north south lines defining a square cell, or unit. Each unit is ten acres square. The Township covers 2,090 units.

Selection of Data Maps

The following data maps were selected as input to the Development Suitability Model:

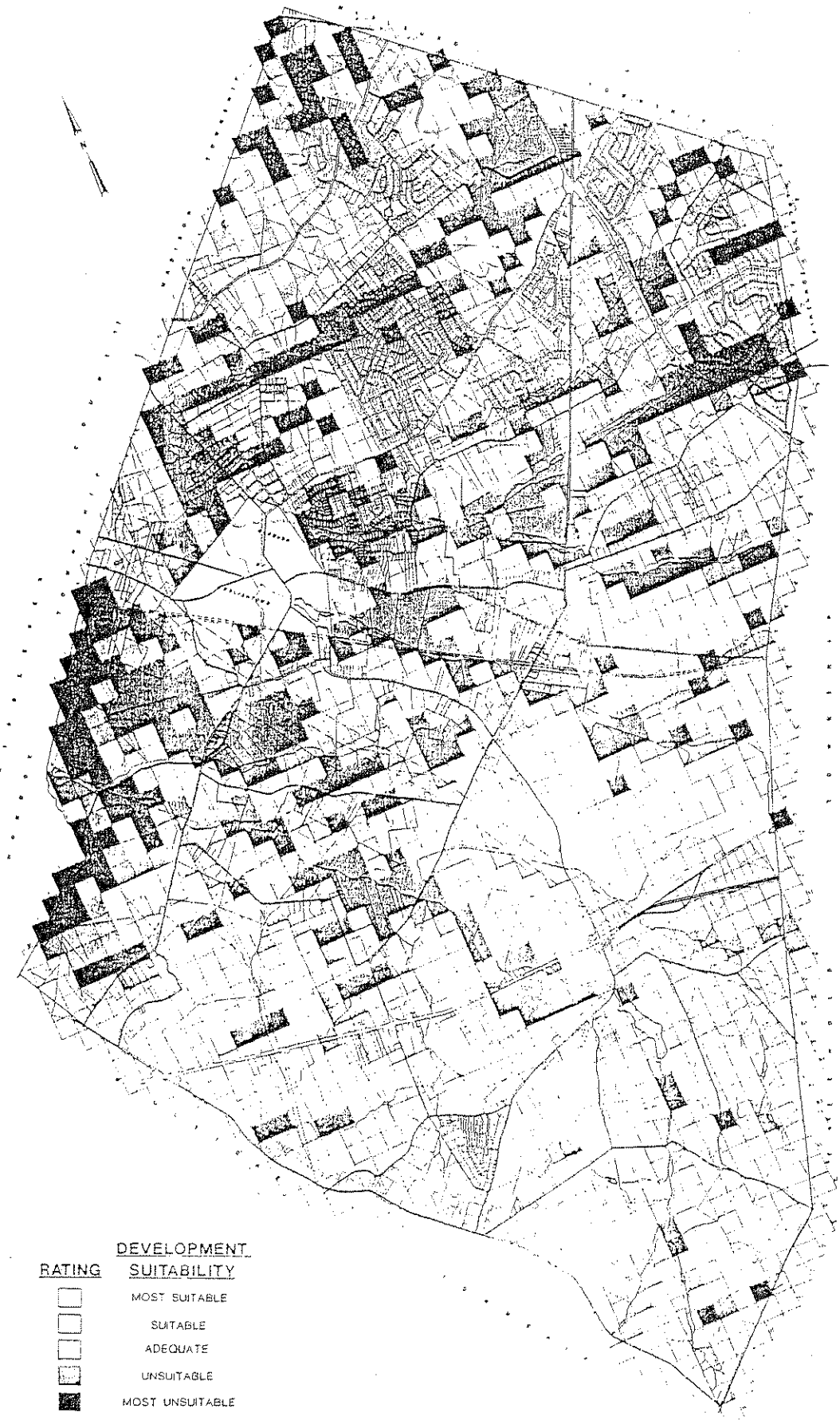
Surficial Geology
Slope
Flood Plains
Depth to Water Table
Foundation Limitations
Erosion Potential
Septic Suitability

Determination of Development Suitability Ratings

Each of the above data maps graphically illustrates certain characteristics. For each data map, the classes of data are assigned a rating in terms of limitation to development - slight, moderate or severe. These ratings are professional judgments based on generally accepted standards.

Weighting of Data Maps

Not all data maps are considered of equal importance; most people would consider flood plains as more significant to development suitability than slope. The determination of these weights is not necessarily a professional judgment but rather one that is related to local values. For that reason, the assignment of an importance value for each data map was determined by a consensus of the Environmental Commission. The results of the consensus are as follows:



DEVELOPMENT SUITABILITY MODEL

DATA MAP	WEIGHT	SLIGHT	MODERATE	SEVERE	VALUE	
		(1)	(2)	(3)	Max.	Min.
Flood Plains	7				21	7
Septic Suitability	6				18	6
Erosion Potential	5				15	5
Depth to Water Table	4				12	4
Foundation Limitations	3				9	3
Surficial Geology	2				6	2
Slope	1				3	1
					84	28

The minimum value can be less than 28 because several areas of the Township are noted on some data maps as "Other" or blank.

Application of Values to Data Maps

A transparent grid was placed over the data maps and the value of each map is coded in ten-acre units. All of the values (seven, one for each data map) are summed by unit, so that each unit now has a total value. The distribution of values by ten-acre unit is as follows:

SUMMATION AND DISTRIBUTION OF VALUES

Value	# of Cells	Cumulative	% of Total
0-5	0	0	0
6-10	0	0	0
11-15	0	0	0
16-20	0	0	0
21-25	0	0	0
26-30	201	201	9.6
31-35	704	905	33.8
36-40	186	1091	8.9
41-45	130	1221	6.2
46-50	122	1343	5.8
51-55	110	1453	5.2
56-60	195	1648	9.3
61-65	198	1846	9.5
66-70	114	1960	5.5
71-75	94	2054	4.5
76-80	36	2090	1.7
TOTAL	2,090		

Grouping of Numerical Ratings

In order to determine suitability groupings, five classes of development suitability were selected: (1) most suitable for development; (2) suitable for development; (3) adequate for development; (4) unsuitable for development; and (5) most unsuitable for development. The breakdown is as follows:

VALUE	SUITABILITY
Less than 33	Most suitable for development
33-34	Suitable for development
35-44	Adequate for development
45-61	Unsuitable for development
62-80	Most unsuitable for development

Mapping of the Various Classes

Each ten-acre unit was coded by suitability rating, thereby creating a Development Suitability Model overlay.

The Development Suitability Model is not a substitute for a Master Plan It does not consider, among others, the social and economic forces present in the Township which impose constraints and potential for development.

The Development Suitability Model does provide information relating to environmental impacts of public and private land planning decisions and activities. It is a basis for continuing land use planning and legislation to support such planning.

APPENDIX

1. Brief Description of Soil Series
2. Soils Characteristics Table
3. Climate
4. The Flood Insurance Program
5. Listing of Historic Homes
6. Bibliography

BRIEF DESCRIPTION OF SOIL SERIES

Adelphia:

Adelphia soils are deep moderately well or somewhat poorly drained loamy soils containing moderate amounts of glauconite. Slopes are nearly level to gently sloping.

They are high in natural fertility, moderate or high in available water capacity and moderate in permeability.

Alloway:

Alloway soils are very poorly drained with fine textured subsoil. The surface soil is very dark. Water is normally perched over the subsoil in late fall until late spring. The soils are generally in low positions where they receive much runoff from the slopes above.

Natural fertility is medium and available water capacity is moderate. Permeability is slow and frost heave is severe.

Collington:

Collington soils are deep well drained loamy soils containing moderate amounts of glauconite. They are underlain by stratified sandy sediments. Slopes range from nearly level to steep.

Natural fertility is high and available water capacity is moderate to high. Permeability is moderate or moderately slow.

Colemanton and Matlock:

These soils are deep, poorly drained glauconite soils of the uplands. They normally have a fine sandy loam, loam or sandy clay loam surface texture and a sandy clay, clay loam or clay gray mottled subsoil. The substratum is stratified loam and clay loam. Slopes range from 0 to 2%.

Natural fertility and available water capacity are high and permeability is slow.

Colts Neck:

Colts Neck soils are deep, well drained reddish-brown soils of the uplands. The subsoil is commonly sandy clay loam or sandy loam and a substratum of sandy loam. Iron concretions are common in the subsoil and substratum. Slopes are nearly level to very steep.

Natural fertility is moderate. Available water capacity is moderate and permeability is moderate to moderately rapid.

Delanco:

Delanco soils are deep, moderately well or somewhat poorly drained loamy soils with a thick sandy surface layer. The soils contain low amounts of glauconite and have a fluctuating water table that ranges in depth from 1½ to 4 feet. Slopes are nearly level or gently sloping.

Natural fertility is medium. Permeability is moderate. Available water capacity is moderate to 40 inches but is low in the surface layer.

Donlonton:

Donlonton are somewhat poorly drained soils having a moderately fine textured subsoil. They form in intermediate positions in the landscape. When exposed, the substratum turns extremely acid (pH 1-3). Slopes are nearly level.

Natural fertility is medium. Available water capacity is moderate. Permeability is slow.

Elkton:

Elkton soils are deep, poorly drained. They have a gray fine textured subsoil that is difficult to drain. The soils form in low positions in the landscape.

Slopes are nearly level. Natural fertility and available water capacity are moderate. Permeability is slow. Excess water is perched over the subsoil in winter and spring. Frost heaving is severe.

Evesboro:

Evesboro soils are excessively drained, deep sandy soils. Most soils are underlain below 40 inches by sand, loamy sand, sandy loam, or sandy clay loam. The clayey substratum soil is underlain by sandy clay or clay.

Fallsington:

Fallsington soils are deep poorly drained, moderately sand soils over stratified gravelly sand and sandy loam layers. They are dominantly gray colored. The water table drops to 3 to 5 feet in summer. Where outlets are available, water levels can normally be lowered by drainage.

Natural fertility is moderate. Available water capacity is moderate but may be increased by capillary action from water table.

Freehold:

Freehold soils are deep, well drained loamy soils containing low amounts of glauconite. They are underlain by stratified sandy sediments. Slopes range from nearly level to steep.

They are high in natural fertility, moderate or high in available water capacity, and moderate in permeability.

Freneau and Manalapan:

Freneau and Manalapan are flood plain soils in the glauconitic watershed of the Coastal Plain. They are characterized by red colors and iron-cemented material in the soil profile between 10 and 60 inches from the surface. Slopes are nearly level.

Natural fertility is medium. Permeability is moderate and available water capacity is high.

Holmdel:

Holmdel soils are deep, moderately well drained loamy soils containing low amounts of glauconite. Slopes are nearly level or gently sloping.

They are high in natural fertility, moderate or high in available water capacity when drained, and moderate in permeability.

Howell:

Howell soils are well drained or moderately well drained soils that have a moderately fine or fine textured subsoil. They form in high positions in the landscape. The substratum turns extremely acid (pH 1-3) when exposed to oxidation. Slopes range from nearly level to strongly sloping.

Natural fertility is medium. Available water capacity is moderate. Permeability is slow.

Keansburg:

Keansburg soils are very poorly drained loamy soils containing low or moderate amounts of glauconite. Slopes are nearly level.

They are high in natural fertility. Permeability is moderate. In winter the soils are saturated. If drained, available water capacity is high.

Keyport:

Keyport soils are deep, moderately well drained soils that have a moderately fine or fine textured subsoil. Water is perched over the subsoil in fall, winter, and spring when rainfall is normal and in summer when it is abnormally heavy. The soils form on intermediate positions in the landscape. Slopes range from nearly level to moderately steep.

Natural fertility and available water capacity are moderate. Permeability is slow.

Klej:

Klej soils are deep, moderately well and somewhat poorly drained sandy soils. Normally the water table reaches about 2 feet in late winter and early spring and drops below 5 feet in summer. Unless cover crops are planted, soils in fields are subject to wind erosion.

Natural fertility and available water capacity are low; permeability is rapid except in clayey substratum soils which have slow or moderately slow permeability.

Lincroft:

Lincroft soils consist of excessively drained soils on uplands. They formed in acid sandy coastal plain sediments containing some glauconite. These soils have a reddish brown and yellowish red loamy sand surface layer 16 inches thick. The subsoil layer between 16-38 inches is reddish brown and yellowish red loamy sand. The substratum from 38-60 inches is loose yellowish red loamy sand or sand. Slopes range from 0 to 35 percent.

Natural fertility and available water capacity are low. Permeability is rapid in the stratum and substratum.

Marlton:

Marlton soils are deep, well drained and moderately well drained soils of the uplands. These soils normally have a fine sandy loam, sandy loam or loam surface texture and sandy clay, clay loam or clay subsoil. The substratum is stratified sandy loam and sandy clay loam. Slopes range from nearly level to very steep.

Natural fertility and available water capacity is high and permeability slow.

Monmouth:

Monmouth are deep, well drained loamy soils, containing moderate amounts of glauconite. They are underlain by stratified sandy sediments. They form in high positions in the landscape. Slopes range from nearly level to moderately steep.

They are high in natural fertility, moderate or high in available water capacity, and moderately slow or slow in permeability.

Pocomoke:

Pocomoke soils are very poorly drained moderately sandy soils over stratified sand and sandy loam layers. The surface is very dark. The water table drops about 3 feet in summer. Where outlets are available, water levels can normally be dropped by drainage.

Natural fertility is moderate. Available moisture capacity is moderate but may be increased by capillarity from the water table. Permeability is moderate.

St. Johns and Rutledge:

St. Johns and Rutledge soils are very sandy throughout the profile and have a seasonally high water table. The surface horizon contains moderate to high amounts of organic matter and the subsoil contains enough organic matter to make the color dark. In places, the sand grains are cemented either weakly or strongly. The water table drops about 2 feet in summer.

Natural fertility and available water capacity are low. Permeability is moderately rapid.

Sassafras:

Sassafras soils are well drained, moderately sandy soils over stratified sand and loamy sand layers containing small amounts of hard quartzose gravel which is mostly fine in size. The subsoil is heavy sandy loam or sandy clay loam.

Natural fertility, available water capacity, and permeability are moderate for loam and sandy loam soils and moderately low for loamy soils.

Shrewsbury:

Shrewsbury soils are deep, poorly drained loamy soils containing glauconite. The depth to the seasonal high water table is 0 to 1 foot. Slopes are nearly level.

Natural fertility is high. Available water capacity is high. Permeability is moderate.

Tinton and Eatontown:

Tinton and Eatontown soils are deep, well drained, loamy soils with a thick sandy surface layer. The soils contain low amounts of glauconite. Slopes are nearly level or gently sloping.

Natural fertility is medium. Permeability is moderate. Available water capacity is moderate to a depth of 40 inches, but upper 20 to 30 inches is low. Soil is subject to wind erosion if left bare.

Woodstown:

Woodstown soils are moderately well drained, moderately sandy soils over stratified sand and loamy sandy layers containing small amounts of rounded quartzose gravel, extending 40 inches. In places, a clayey substratum is below 40 inches. The subsoil contains mottled colors indicating prolonged wetness.

Natural fertility, available water capacity and permeability are moderate. Normally the water table rises to 1½ to 2½ feet in late winter and spring and drops below 5 feet in summer.

SOILS CHARACTERISTICS

	NUMBER	STREAM OVERFLOW HAZARD	DEPTH TO BEDROCK	DEPTH TO SEASONALLY HIGH WATER TABLE	NATURAL FERTILITY	AVAILABLE WATER CAPACITY	SHRINK SWELL POTENTIAL	HYDROLOGIC GROUP
Adelphia	822	None	10'+	0.5'-4'	High	Moderate-High	Low	C
Alloway	984	None-Rare	10'+	At surface	High	Moderate	Low-Moderate	D
Collington	821	None	10'+	5'+	High	Moderate-High	Low	B
Colemanton and Matlock	814	Occasional	10'+	0-1'	High	High	Moderate	D
Colts Neck	890	None	4'-6.5'	>6'	Moderate	Moderate	Low	B
Delanco	C02	None	10'	1.5'-4'	Medium	Moderate	Low	A
Donlonton	812	None	10'+	0.5'-1.5'	Medium	Moderate	Low	C
Elkton	983	None-Slight	10'+	0-1'	Moderate	Moderate	Low	D
Evesboro	930	None	10'	3'+	Low	Low	Low	A
Fallsington	943	Seldom	10'+	0-1"	Moderate	Moderate	Low	D
Freehold	861	None	10'+	5'+	High	Moderate or High	Low	B
Freneau and Manalapan	C23 C24	Frequent	10'+	0-1'	Medium	High	Low	D
Holmdel	862	None	10'	1.5'-4'	High	Moderate or High	Low	C
Howell	BJ1	None	10'+	1.5'-5'	Medium	Moderate	Low	D
Keansburg	824	None to Common	10'	At surface	High	Saturated	Low	D
Keyport	982	None	10'+	1.5'-2.5'	Moderate	Moderate	Low	D
Klej	932	None	10'+	1.5'-4'	Low	Low	Low	B
Lincroft	841	None	10'+	5'+	Low	Low	Low	A
Marlton	801	None	10'+	2'-5'	High	High	Low	C
Monmouth	811	None	10'	5'+	High	Moderate or High	Low	B
Pocomoke	944	Seldom or Occasional	10'+	At surface	Moderate	Moderate	Low	D
St. Johns and Rutledge	974 934	Seldom or Occasional	10'	At surface	Low	Low	Low	D
Sassafrass	941	None	10'+	3'-5'	Moderate	Moderate	Low	B
Shrewsbury	823	Occasional	10'+	0-1'	High	High	Low	D
Tinton and Eatontown	C01 9K0	None	10'	5'+	Medium	Moderate	Low	A
Woodstown	942	None	10'+	1.5'-4'	Moderate	Moderate	Low	B

Note: The soil symbols shown on the Soils Map consist of four numbers or letters. The first three identify the soil series as noted on this table. The fourth shows the texture of surface soil, as follows: 0 - Silt loam; 1 - Loam; 2 - Fine sandy loam; 3 - Sandy loam; 5 - Loamy sand; 6 - Sand; C - Clay loam; E - Loamy fine sand; F - Fine sand; J - Sandy clay loam; W- Gravelly sandy loam.

CLIMATE

The climate of Manalapan is classified as continental. Summertime temperatures seldom exceed 100 degrees but there are frequent readings in the 90's from May until September. Wintertime temperatures below 0 are infrequent and usually of a short duration. The normal average temperature for the year is 53 degrees.

The vegetative growing season, the number of days between the last freezing temperature in the spring and first freezing temperature in the fall, averages 185 days in length. This growing season starts around April 18 and ends around October 19 each year. However, readings less than 32 degrees have been recorded as late as May 25 and as early as September 28.

Rainfall in Manalapan Township averages 45 inches a year. The heaviest amounts normally occur during the late summer when tropical storms pass along the coast.

CLIMATOLOGICAL SUMMARY

RECORDED AT FREEHOLD (N.J.) WEATHER STATION
1941-1970*

	TEMPERATURE (°F)							PRECIPITATION TOTALS (inches)			MEAN NUMBER OF DAYS					
	Means			Extremes							Temperatures					
												Max.		Min.		
Month	Daily Maximum	Daily Minimum	Monthly	Record Highest	Year	Record Lowest	Year	Mean	Greatest Daily	Year	Precip. .10 inch or more	90° and above	32° and below	32° and below	0° and below	Month
Jan.	39.7	23.0	31.4	73	1950	-14	1935	3.17	2.38	1936	6	0	8	27	1	Jan.
Feb.	41.5	23.8	32.7	76	1954	-20	1934	3.09	2.40	1966	6	0	5	23	*	Feb.
Mar.	50.0	30.3	40.2	87	1945	-2	1967	4.23	2.63	1953	7	0	1	19	*	Mar.
Apr.	62.3	39.7	51.0	92	1941	18	1944	3.45	2.05	1961	7	*	0	6	0	Apr.
May	73.1	49.1	61.1	96	1941	29	1952	3.93	4.54	1968	6	1	0	*	0	May
June	81.6	58.4	70.0	100	1934	35	1938	3.40	4.30	1938	6	5	0	0	0	June
July	85.6	63.5	74.6	106	1936	46	1945	4.69	5.15	1961	6	7	0	0	0	July
Aug.	83.6	61.9	72.8	101	1955	42	1940	4.39	4.04	1955	6	4	0	0	0	Aug.
Sept.	77.5	55.4	66.5	99	1953	32	1963	3.47	5.68	1938	5	2	0	*	0	Sept.
Oct.	67.3	46.3	56.3	94	1941	20	1969	3.14	2.95	1955	5	0	0	2	0	Oct.
Nov.	55.1	36.1	45.6	83	1950	7	1938	4.11	3.55	1963	7	0	*	12	0	Nov.
Dec.	42.5	25.9	34.2	72	1966	-5	1942	3.65	2.68	1946	7	0	5	24	*	Dec.
Year	63.3	42.7	53.0	106	July 1936	-20	Feb. 1934	44.72	5.68	Sept. 1938	73	19	19	113	1	Year

*Extremes for period 1931 - 1970
Means for period 1941 - 1970

*Minimum and maximum temperatures refer to daily low and high temperatures respectively. These minimum and maximum temperatures represent the occurrence of "hotter and colder than normal" days.

THE FLOOD INSURANCE PROGRAM

A prime purpose of the National Flood Insurance Program is to encourage State and local governments to adopt sound flood plain management programs.

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for the purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community.

For each Township stream studied in detail, the boundaries of the 100-year and 500-year flood were delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps. Maps used for Manalapan Brook and the Matchaponix Brook System are at a scale of 1" = 200' with a contour interval of 5 feet. Maps used for the Manalapan Brook tributaries and Tributary C of Pine Brook are at a scale of 1" = 500' with a contour interval of 10 feet. In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

Proposed Floodways

Encroachment on flood plains, such as artificial fill and/or structures, reduces the flood-carrying capacity and increases flood heights of the stream, thus increasing flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a proposed floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood be carried without substantial increases in flood heights. Criteria adopted by the State of New Jersey Department of Environmental Protection limit such increases in flood heights to 0.2 foot provided that hazardous velocities are not produced. (Velocities greater than 10 ft/sec within the channel, and 5 ft/sec on the flood plain are considered hazardous.) The floodways proposed to Manalapan are minimum standards that can be adopted or that can be used as a basis for additional studies.

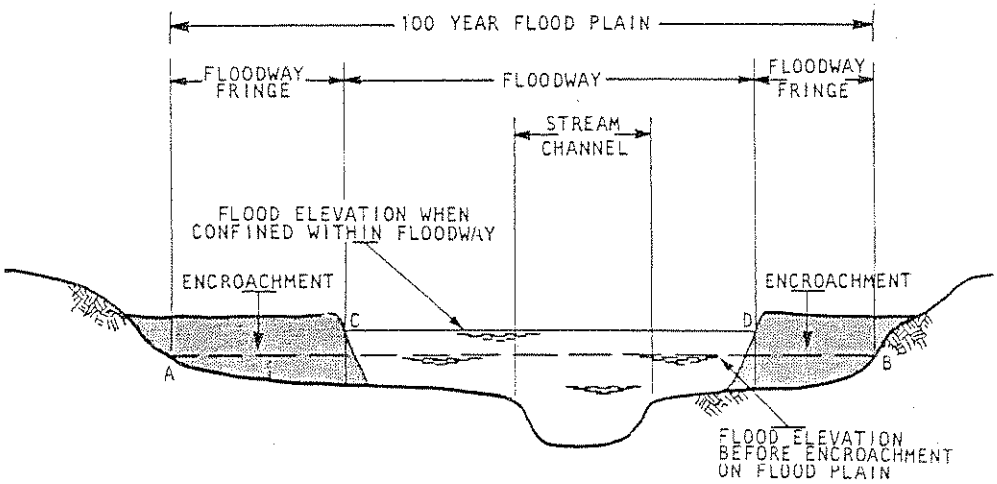
The floodways proposed for Manalapan were determined using Method 1 of the Corps of Engineers HEC-2 computer program. No encroachment was attempted for cross sections at bridges or having pre-floodway conditions velocities greater than the maximum permitted. Encroachment limits based on equal conveyance reduction which would produce a 0.2 foot water rise at each of the remaining sections were determined. Channel and overbank velocities were checked to ensure that they were within the maximums permitted. If they were not, the encroachment limits were adjusted until the velocities were reduced below these maximums, often resulting in a water surface increase of less than 0.2 foot.

Because of the effects of downstream encroachment on water surface elevations upstream, there may be numerous cross sections where minimal encroachment can be permitted wihtout upstream elevation increases of more than 0.2 foot. This "domino" effect, therefore, imposes an additional constraint on flood plan encroachment.

Under certain flow conditions, as the cross sectional flow area is reduced, the local effect is to lower the water surface elevation and increase velocity. The water surface elevation drops because potential energy is converted to kinetic energy to accelerate the flow through the restrictive section. Though the local effect of such an encroachment is a reduction

of water surface elevation, the increased velocity usually results in an increase in water surface elevation at some point upstream. If further encroachment were allowed at the restrictive section, the water surface would continue to drop and the velocity would continue to increase, causing a rise greater than 0.2 foot at upstream sections.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water surface elevation of the 100-year flood more than 0.2 foot at any point.



LINE A-B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C-D IS THE FLOOD ELEVATION AFTER ENCROACHMENT

LISTING OF HISTORIC HOMES

The following is a listing of privately-owned homes marked by the Bicentennial Commission of Monmouth County. They are opened from time to time for Historical Society tours.

	Constructed About		In Existence
a.	1700	Capt. John Anderson	No
b.	1737	Capt. David Forman	Yes
c.	1770	Quail Hill	Yes
d.	1740	Dr. James English	Yes
e.	1779	Gordon's Tavern	Yes
f.	1840	Sun Crest Farm (presently)	Yes
g.	1840	Former Thompson Property	Yes
h.	1776	John Reid Homestead	Yes
i.	1820	Floral Hall	Yes
j.	1851	James English, Aumack Homestead	Yes
k.	1836	Garret Conover	Yes
l.	1852	Thompson Grove School	Yes
m.	1870	Van Ness Thompson	Yes
n.	1833	Probasco Homestead	Yes
o.	1791	Cannon Hill	Yes

The Cobb House, an historic building, is listed and described in the Historic Sites section of this report.

BIBLIOGRAPHY

The following materials, which were used during the Natural Resource inventory project, are useful sources of information on matters contained in this Report.

1. "Environmental Assessment Wastewater Management Plan for Western Monmouth Utilities Authority," Schoor Engineering, Inc., Matawan, New Jersey, December, 1973.

2. "Environmental Guidelines for Planning, Designing and Constructing Interceptor Sewers," New Jersey Department of Environmental Protection, Trenton, New Jersey, September, 1972.

3. "Flood Hazard Report No. 8, South River Manalapan Brook," New Jersey Department of Environmental Protection, Trenton, New Jersey, October, 1972.

4. "Flood Hazard Report No. 17, Matchaponix Brook System," New Jersey Department of Environmental Protection, Trenton, New Jersey, March, 1973.

5. "Flood Insurance Study, Manalapan, New Jersey," United States Department of Housing Development, Washington, D.C., May, 1976.

6. "General Development Plan, 1969-1985 - Monmouth County," Monmouth County Planning Board, Freehold, New Jersey, October, 1969.

7. "Geology as a Guide to Regional Estimates of the Water Resources," Geologic Report, Series 8. New Jersey Geological Survey, Department of Conservation and Economic Development, Trenton, New Jersey, 1968.

8. "Geologic Quadrangle Maps of the United States," United States Geological Survey, Washington, D.C., 1964.

9. "Ground-Water Resources of Monmouth County, New Jersey," Special Report 23. New Jersey Department of Conservation and Economic Development, Division of Water Policy and Control, Trenton, New Jersey, 1968.

10. "Industrial Water Supply and Development Study for Manalapan Township," Engineering Surveying Planning Associates, Howell, New Jersey, 1975.

11. "Monmouth County Soil Survey," Monmouth County Soil Conservation Service, Freehold, New Jersey, Revised through 1975.

12. "Monmouth County Soils, Their Nature, Conservation, and Use," Bulletin 738. New Jersey Agricultural Experiment Station, College of Agriculture and Environmental Science, Rutgers University, New Brunswick, New Jersey, March, 1948.

13. "Natural Features Study for Monmouth County," Monmouth County Environmental Council, Freehold, New Jersey, April, 1975.

14. "Open Space Plan - Monmouth County - 1970-1985." Prepared by Monmouth County Park System and the Monmouth County Planning Board and adopted by the Monmouth County Planning Board on September 20, 1971 as an Amendment to the Monmouth County General Development Plan, adopted January 19, 1970, Freehold, New Jersey, 1970.

15. "Standards for Soil Erosion and Sediment Control in New Jersey," New Jersey State Soil Conservation Service, Trenton, New Jersey, 1972.

16. "Surface Water Supply of New Jersey - Stream Flow Records, October 1950 - September 1955." Department of Conservation and Economic Development, Division of Water Policy and Supply, Trenton, New Jersey, 1960.

17. "Wastewater Management Plan for Western Monmouth Utilities Company," Schoor Engineering, Inc., Matawan, New Jersey, December, 1973.

18. "Water Control Guide for Suburban and Rural-Residential New Jersey," Circular 605. New Jersey Agricultural Experiment Station, College of Agriculture and Environmental Science, Rutgers University, New Brunswick, New Jersey, 1971.

19. "History of Monmouth County," Franklin Ellis, originally published in 1885 and reprinted in July, 1973. Information on historic mills.

20. Jessie Lightfoot survey map, 1851. Approximate location of mills.

21. Historic house marking data supplied by Bicentennial Commission of Monmouth County. Manalapan members are Mrs. Wikoff and Mrs. Zdancewic.

THREATENED AND ENDANGERED SPECIES

5\21\87

NEW JERSEY NATURAL HERITAGE PROGRAM
POTENTIAL THREATENED AND ENDANGERED VERTEBRATE SPECIES
IN MONMOUTH COUNTY

AMERICAN BITTERN BOTAURUS LENTIGINOSUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Fresh water bogs, swamps, wet fields, cattail and bulrush marshes, brackish and saltwater marshes and meadows.

BALD EAGLE HALIAEETUS LEUCOCEPHALUS	FEDERAL STATUS: LELT STATE STATUS: LE	COUNTY OCCURRENCE: T*

HABITAT COMMENTS
Primarily near seacoasts, rivers, and large lakes.

BARRED OWL STRIX VARIA	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Dense woodland and forest (conif. or hardwood), swamps, wooded river valleys, cabbage palm-live oak hammocks, especially where bordering streams, marshes, and meadows.

BLACK RAIL LATERALLUS JAMAICENSIS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Salt, brackish, and freshwater marshes, wet meadows, and grassy swamps.

BLACK SKIMMER RYNCHOPS NIGER	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Primarily coastal waters, including bays, estuaries, lagoons and mudflats in migration and winter.

BOBOLINK DOLICHONYX ORYZIVORUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Tall grass areas, flooded meadows, prairie, deep cultivated grains, alfalfa and clover fields. In migration and winter also in rice fields, marshes, and open woody areas.

5\21\87

BOG TURTLE CLEMMYS MUHLENBERGII	FEDERAL STATUS: C2 STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Slow, shallow rivulets of sphagnum bogs, swamps, and marshy meadows; sea level to 1200 m in Appalachians. Commonly basks on tussocks in morning in spring and early summer. Hibernates in subterreanean rivulet or seepage area.

COOPER'S HAWK ACCIPITER COOPERII	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: W*

HABITAT COMMENTS
Primarily mature forest, either broadleaf or coniferous, mostly the former; also open woodland and forest edge.

GRASSHOPPER SPARROW AMMODRAMUS SAVANNARUM	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Prairie, old fields, open grasslands, cultivated fields, savanna.

GREAT BLUE HERON ARDEA HERODIAS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: N*

HABITAT COMMENTS
Freshwater and brackish marshes, along lakes, rivers, bays, lagoons, ocean beaches, mangroves, fields, and meadows.

LEAST TERN STERNA ANTILLARUM	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Seacoasts, beaches, bays, estuaries, lagoons, lakes, and rivers.

LOGGERHEAD SHRIKE LANIUS LUDOVICIANUS MIGRANS	FEDERAL STATUS: C2 STATE STATUS: LE	COUNTY OCCURRENCE: W

HABITAT COMMENTS
"Open country with scattered trees and shrubs, savanna, desert scrub and, occasionally; open woodland, often found on poles, wires or fenceposts (Tropical to Temperate zones)".

5\21\87

MERLIN FALCO COLUMBARIUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: W

HABITAT COMMENTS
During the breeding season inhabits coniferous or deciduous open woodlands, wooded prairies. At other times of the year found in a wide variety of habitats including: marshes and deserts, seacoasts, open woodlands, fields, etc.

MUD SALAMANDER PSEUDOTRITON MONTANUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: ?

HABITAT COMMENTS
Muddy springs, slow floodplain streams, and swamps along slow streams. Nonlarval forms usually found beneath logs and rocks, in decaying vegetation, and in muddy stream-bank burrows. Occasionally disperses from wet muddy areas.

NORTHERN HARRIER CIRCUS CYANEUS	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Marshes, meadows, grasslands, and cultivated fields. Perches on ground or on stumps or posts.

OSPREY PANDION HALIAETUS	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Primarily along rivers, lakes, and seacoasts, occurring widely in migration, often crossing land between bodies of water.

PIED-BILLED GREBE PODILYMBUS PODICEPS	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Lakes, ponds, sluggish streams, and marshes; in migration and in winter also in brackish bays and estuaries.

PINE BARRENS TREEFROG HYLA ANDERSONII	FEDERAL STATUS: C2 STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Swamps, ponds, cranberry bogs, and other wetland habitat. Post-breeding habitat the surrounding woodlands.

PINE SNAKE
PITUOPHIS MELANOLEUCUS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Lowlands to mountains; desert, prairie, brushland, woodland, open coniferous forest, farmland, marshes. Terrestrial, fossorial, and arboreal. Underground in cold weather.

PIPING PLOVER
CHARADRIUS MELODUS
FEDERAL STATUS: LELT
STATE STATUS: LE
COUNTY OCCURRENCE: B

HABITAT COMMENTS
Sandy beaches, especially where scattered grass tufts are present, sparsely vegetated shores and islands of shallow lakes, ponds, and impoundments. In migration and winter also mudflats, flooded fields.

RED-SHOULDERED HAWK
BUTEO LINEATUS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Moist and riverine forest, and in e. N. Am. in wooded swamps, foraging in forest edge and open woodland.

ROSEATE TERN
STERNA DOUGALLII
FEDERAL STATUS: PEPT
STATE STATUS: LE
COUNTY OCCURRENCE: B

HABITAT COMMENTS
Seacoasts, bays, estuaries.

SAVANNAH SPARROW
PASSERCULUS SANDWICHENSIS
FEDERAL STATUS:
STATE STATUS: LT
COUNTY OCCURRENCE: Y

HABITAT COMMENTS
"Open areas, especially grasslands, tundra, meadows, bogs, farmlands, grassy areas with scattered bushes, and marshes, including salt marshes in the BELDINGI and ROSTRATUS groups (Subtropical and Temperate zones)".

SHORT-EARED OWL
ASIO FLAMMEUS
FEDERAL STATUS:
STATE STATUS: LE/S
COUNTY OCCURRENCE: W*

HABITAT COMMENTS
Open country, including prairie, meadows, tundra, moorlands, marshes, savanna, dunes, fields, and open woodland. Roosts by day on ground or on low open perches.

5\21\87

TIMBER RATTLESNAKE CROTALUS HORRIDUS	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Wooded rocky hillsides in north; swampy areas, canebrake thickets, and floodplains in south. Near streams in late summer in some areas (B83DEG01NA). Often hibernates in burrows and crevices of rock outcroppings.

UPLAND SANDPIPER BARTRAMIA LONGICAUDA	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: B

HABITAT COMMENTS
Grasslands, especially prairies, dry meadows, pastures, and (in Alaska) scattered woodlands at timberline; very rarely in migration along shores and mudflats.

VESPER SPARROW POOECETES GRAMINEUS	FEDERAL STATUS: STATE STATUS: LE	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
"Plains, prairie, dry shrublands, savanna, weedy pastures, fields, sagebrush, arid scrub and woodland clearings".

WOOD TURTLE CLEMMYS INSCULPTA	FEDERAL STATUS: STATE STATUS: LT	COUNTY OCCURRENCE: Y

HABITAT COMMENTS
Vicinity of streams and rivers. In streams and in wooded areas and fields adjacent to streams in summer. In streams in spring and fall. Hibernates in banks or bottoms of streams in winter.

DEFINITION OF ACRONYMS

FEDERAL STATUS

LE=listed endangered.
LT=listed threatened.
PE=proposed endangered.
PT=proposed threatened.
C2=candidate for listing.

STATE STATUS

LE=listed as endangered. (short-eared owl winter pop. listed as stable:S)
LT=listed as threatened.

COUNTY OCCURRENCE

Y=present year-round, breeds.
N=present year-round, not recorded breeding.
B=present during the summer, breeds.
W=present during the winter.
T=present as a transient.
?=present status undetermined.
*=indicates that the county is within the species known breeding range.

EXPLANATION OF CODES ON NATURAL HERITAGE LIST

1. FEDERAL STATUS CODES

U.S.FISH AND WILDLIFE CATEGORIES OF ENDANGERED AND THREATENED PLANTS AND ANIMALS

The following definitions are extracted from the September 27, 1985 U.S. Fish and Wildlife Service notice in the Federal Register:

LE--Taxa formally listed as endangered.

LT--Taxa formally listed as threatened.

PE--Taxa proposed to be formally listed as endangered.

PT--Taxa proposed to be formally listed as threatened.

S --Synonyms.

C1--Taxa for which the Service currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species.

C2 --Taxa for which information now in possession of the Service indicates that proposing to list them as endangered or threatened species possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known or on file to support the immediate preparation of rules.

C3 --Taxa that are no longer being considered for listing as threatened or endangered species. Such taxa are further coded to indicate three subcategories, depending on the reason(s) for removal from consideration.

> 3A--Taxa for which the Service has persuasive evidence of extinction.
>
> 3B--Names that, on the basis of current taxonomic understanding, usually as represented in published revisions and monographs, do not represent taxa meeting the Act's definition of "species".
>
> 3C--Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

2. STATE STATUS CODES

These refer to State listed nongame animals and Pinelands listed plants:

D	= declining
EX	= extirpated
I	= introduced
IN	= increasing
LE	= state listed as endangered
LP	= plants listed by the N.J. Pinelands Commission
LT	= state listed as threatened
P	= peripheral
S	= stable
SC	= special concern
U	= undetermined
U:SC	= undetermined, of special concern

Status for animals separated by a slash(/) indicate a duel status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

3. EXPLANATION OF NATURAL HERITAGE PRIORITY ELEMENT RANKS

The Nature Conservancy has developed a rarity ranking system* for use in identifying elements (rare species and natural communities) of natural diversity most endangered with extinction. Each element is ranked according to it's rarity both in the state and globally. These ranks are used to prioritize conservation work so that the rarest most endangered elements receive attention first.

GLOBAL ELEMENT RANKS

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single western state, a physiographic region in the East) or because of other factors making it vulnerable to extinction throughout it's range; in terms of occurrences, in the range of 21 to 100.

G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

*This ranking system is adapted from that which appears in 'The Nature Conservancy, 1988. Model Heritage Operations Manual. The Nature Conservancy. Arlington VA'.

GH = Of historical occurrence throughout its range i.e., formerly part of the established biota, with the expectation that it may be rediscovered.

GU = Possibly in peril range-wide but status uncertain; need more information.

GX = Believed to be extinct throughout range (e.g., Passenger Pigeon) with virtually no likelihood that it will be rediscovered.

G? = Species has not yet been ranked.

STATE ELEMENT RANKS

S1 = Critically imperiled in state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres). Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but now through habitat destruction or some other critical factor of its biology have been demonstrably reduced in abundance. In essence, these are elements that even with intensive searching sizable additional occurrences are unlikely to be discovered.

S2 = Imperiled in state because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences. Habitat destruction being the primary cause of their rarity. Diligent searching may yield additional occurrences.

S3 = Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreages or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

S4 = Apparently secure in state, with many occurrences.

S5 = Demonstrably secure in state and essentially ineradicable under present conditions.

SA = Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include european strays or western birds on the East Coast and visa-versa.

SE = A species clearly exotic in New Jersey which includes those species not native to North America as well as any other species deliberately or accidentally introduced into the state and are therefore not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).

SH = Despite some searching of both historic occurrences and suitable habitat, no extant occurrences are known. Not all historic occurrences have been checked, and unsearched potential habitat remains. Until all leads are reasonably exhausted, elements ranked SH are considered possibly extant. While the last observed dates for most elements ranked SH are 50 or more years old, elements observed much more recently are also included when the only known occurrences have been destroyed.

SN = Regularly occurring, usually migratory and typically nonbreeding species for which no significant or effective habitat conservation measures can be taken in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in the winter (or, in a few cases, the summer); included also are certain lepidoptera which regularly migrate to a state where they reproduce, but then completely die out every year with no return migration. Species in this category are so widely and unreliably distributed during migration or in winter that no small set of sites could be set aside with the hope of significantly furthering their conservation. Other nonbreeding, high globally-ranked species (such as the bald eagle, whooping

crane or some seal species) which regularly spend some portion of the year at definite localities (and therefore have a valid conservation need in the state) are not ranked SN but rather S1, S2, etc.

SR = Reported from the state, but without persuasive documentation which would provide a basis for either accepting or rejecting (e.g., misidentified specimen) the report. Some of these are very recent discoveries for which NJNHP has not yet received first-hand information; others are old, obscure reports that are hard to dismiss because the habitat is now destroyed.

SRF = Reported falsely (in error) from New Jersey but this error persisting in the literature.

SU = Believed to be in peril but status uncertain. More information is needed to rank accurately.

SX = Apparently extirpated from state. All historic occurrences checked and a thorough search of potential habitat completed. The localities for many of these elements have been destroyed or greatly altered.

SXC = Species is presumed extirpated from the state but native populations collected from wild exist in cultivation.

Note: A 'T' appearing in either the G Rank or S Rank, indicates that the infraspecific taxa is being ranked differently than the species. A 'Q' in the rank indicates That there is taxonomic uncertainty about the taxa being ranked (i.e., taxa is being accepted as full species in this list but may be treated as a subspecies taxa by others). To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).