

# **Environmental Resource Inventory of Haddon Township, New Jersey<sup>1</sup>**

Prepared for  
The Haddon Township Environmental Commission

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# 1. Geography

Figure 1.1 shows the location of Haddon Township within northwestern Camden County.

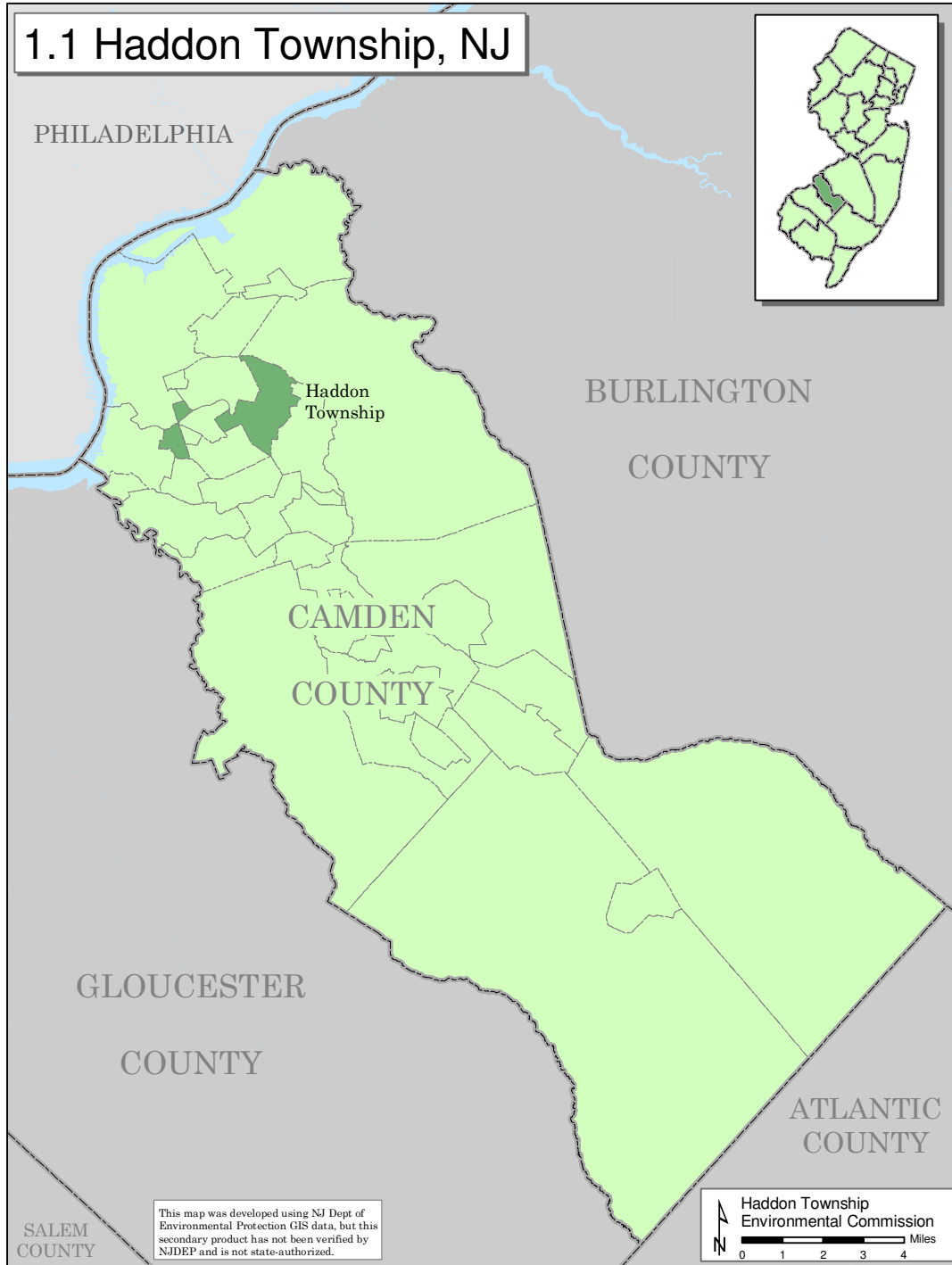


Figure 1.1 Location of Haddon Township within northwestern Camden County, NJ.

## 2. Demographics

### 1.1. *Population Trends*

The population of Haddon Township has declined in recent years, unlike Camden County and the State of New Jersey as a whole (Table 2.1.1). The 2000 census reports 14,651 Haddon Township residents, down from 14,837 in 1990 (a change of -1.2%). Since 1980 there has been a 7.7% decline in the number of residents. However, this is not an unusual case as 26 other Camden municipalities recorded losses in population from 1980 to 2000. Of these, Bellmawr (17.9%), Hi-Nella (-17.7), Audubon Park (-13.5), and Clementon (-13.5) had the greatest rates of decrease.

There are some notable differences in population trends within the three divisions of Haddon Township. The number of residents decreased at the same rate within all three divisions during the 1990s. However, during the 1980s the West Collingswood Extension and West Collingswood Heights both increased in population (15.7% and 22.2% respectively), while the population of Westmont declined at a rate of approximately 10%. Many factors may be at work here, including emigration, trends toward smaller families, and families choosing to postpone children.

The population of Camden County increased at a rate of 6.6% from 1980 to 1990 with growth slowing to a more moderate rate of increase at 1.2% from 1990 to 2000. This growth is most likely explained by rapid suburban expansion in outlying eastern suburbs such as Gloucester Township (42.5%), Voorhees (117.7%) and Winslow (72%). Figure 2.1 provides a comparison of growth rates among all Camden County municipalities. At the state level, growth has steadily increased at a rate of 5% from 1980 to 1990 and a robust 8.8% from 1990 to 2000.

	1980 Pop.	1990 Pop.(Change)	2000 Pop.(Change)
<b>Haddon Township (total)</b>	15,875	14,837 (-6.5%)	14,651 (-1.2%)
-- Westmont	14,006	12,611 (-10%)	12,453 (-1.2%)
-- West Collingswood Ext.	898	1,039 (15.7%)	1,026 (-1.2%)
-- West Collingswood Heights	971	1,187 (22.2%)	1,172 (-1.2%)
<b>Camden County</b>	471,650	502,824 (6.6%)	508,932 (1.2%)
<b>New Jersey</b>	7,364,131	7,730,198 (5%)	8,409,795 (8.8%)

Table 2.1.1 Population change in the region 1980-2000.

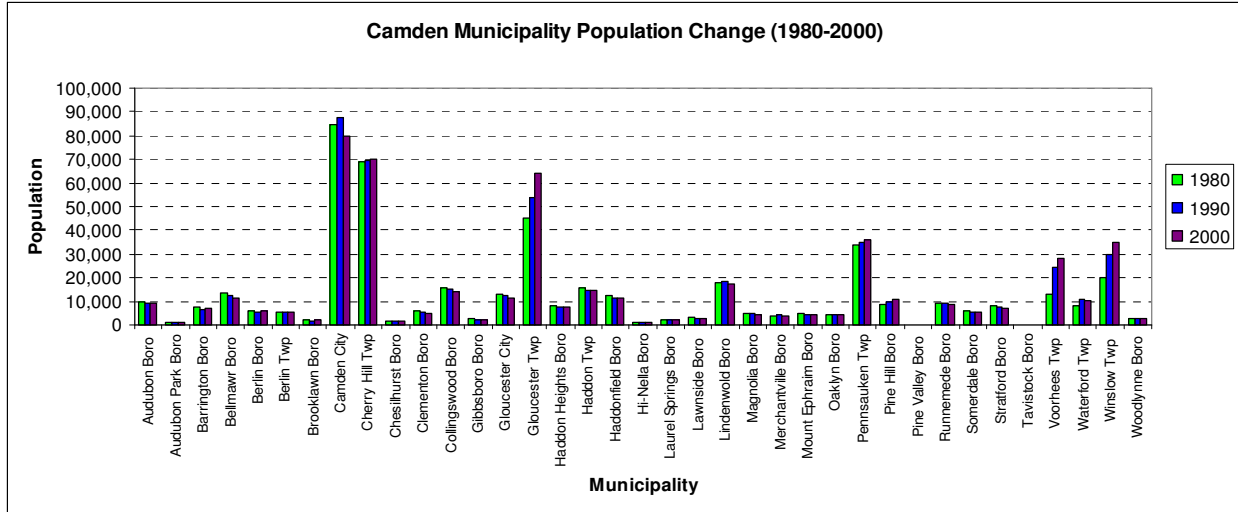


Figure 2.1.2 Relative population growth of all Camden County municipalities

## 1.2. Population Density

Figure 2.2.1 shows a choropleth map of Camden County population density based on 2000 census data at the block group level. Haddon Township (yellow outline) is situated in the area of highest population density, in the northern portion of Camden County between the Delaware River and the New Jersey Turnpike. It ranks as the eighth most densely populated Camden County municipality, and ranks in the top fifth statewide. Table 2.2.1 compares the densities of Haddon Township's communities with those of Camden County and New Jersey as a whole. Of the three sections of Haddon Township, the West Collingswood Extension is the most densely populated (7,174 persons per square mile), followed by Westmont (5,419) and West Collingswood Heights (3,100). West Collingswood Heights contains large wetland tracts, accounting for this disparity.

Countywide density (2,237) is less than half the level of Haddon Township (5,195) due to lower housing densities and greater proportions of farmland, forested land, and protected wetlands in the southeastern portion of the county. Finally, Haddon Township's is approximately five times that of the state as a whole, and New Jersey ranks as the most densely populated state.

	Population (2000)	Area (sq. mi.)	Population Density
<b>Haddon Twp</b>	14,651	2.82	5,195
-- Westmont	12,453	2.3	5,419
-- West Collingswood Ext.	1,026	0.14	7,174
-- West Collingswood Hts.	1,172	0.38	3,100
<b>Camden County</b>	508,932	227.47	2,237
<b>New Jersey</b>	8,409,795	7,788	1,080

Table 2.2.1 Population density in the region.



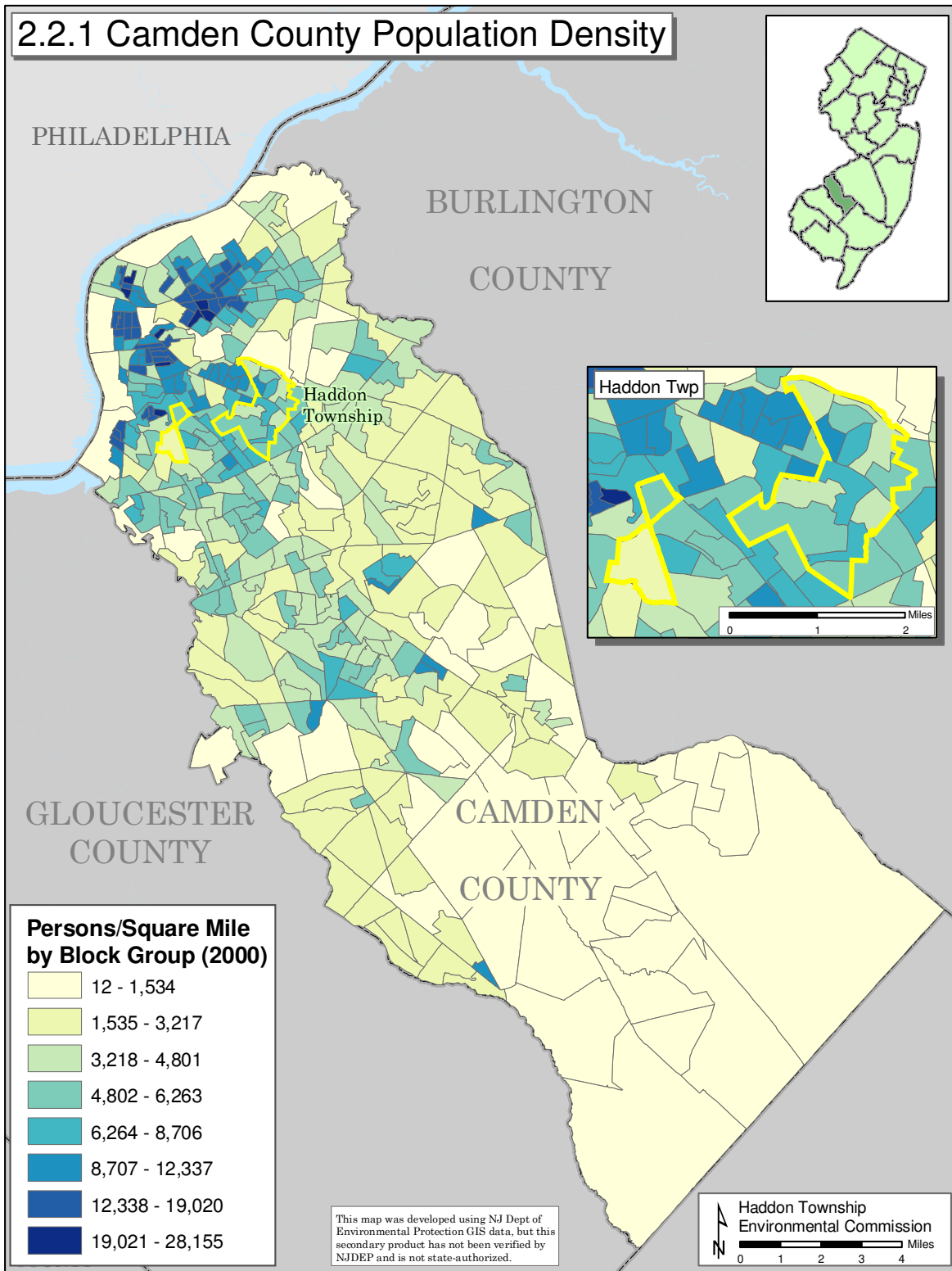


Figure 2.2.1 Camden County population density.

### 3. Topography

#### 1.3. Elevation

Like much of Southern New Jersey, the terrain in and around Haddon Township is characterized by low elevations and gentle slopes. Figure 3.1 shows an elevation map of Haddon Township and the immediate vicinity. The area slopes generally downward toward the west and northwest, eventually draining into the Delaware River at sea level. The highest elevations (approximately 95 feet above mean sea level) in Haddon Township are located in the southernmost portion of the Westmont section, near the intersection of Crystal Lake Ave and Hopkins Road.

#### 1.4. Slope

Steep slopes are something of a rarity within Haddon Township except those areas near Cooper River, Newton and Peter Creeks. The transitions from the permanent stream channels to the floodplains are marked by most of the steeper slopes in the Township. These patterns are illustrated in figure 3.2. Readers should note that slope calculations are derived from a 10-meter digital elevation model, which tends to "smooth" much of the terrain's actual variation. Sheer drop-offs might be represented as much more gently sloped areas in the map.

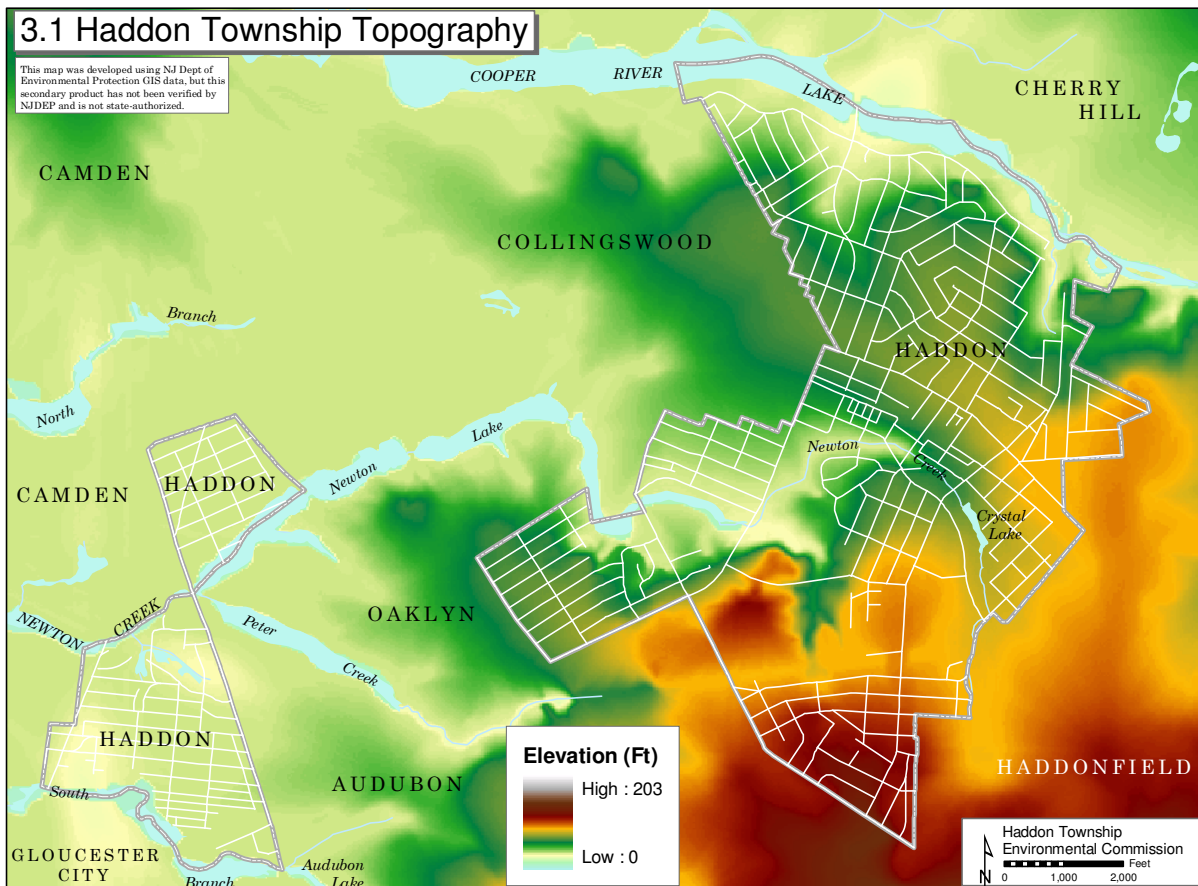


Figure 3.1 Haddon Township topography.

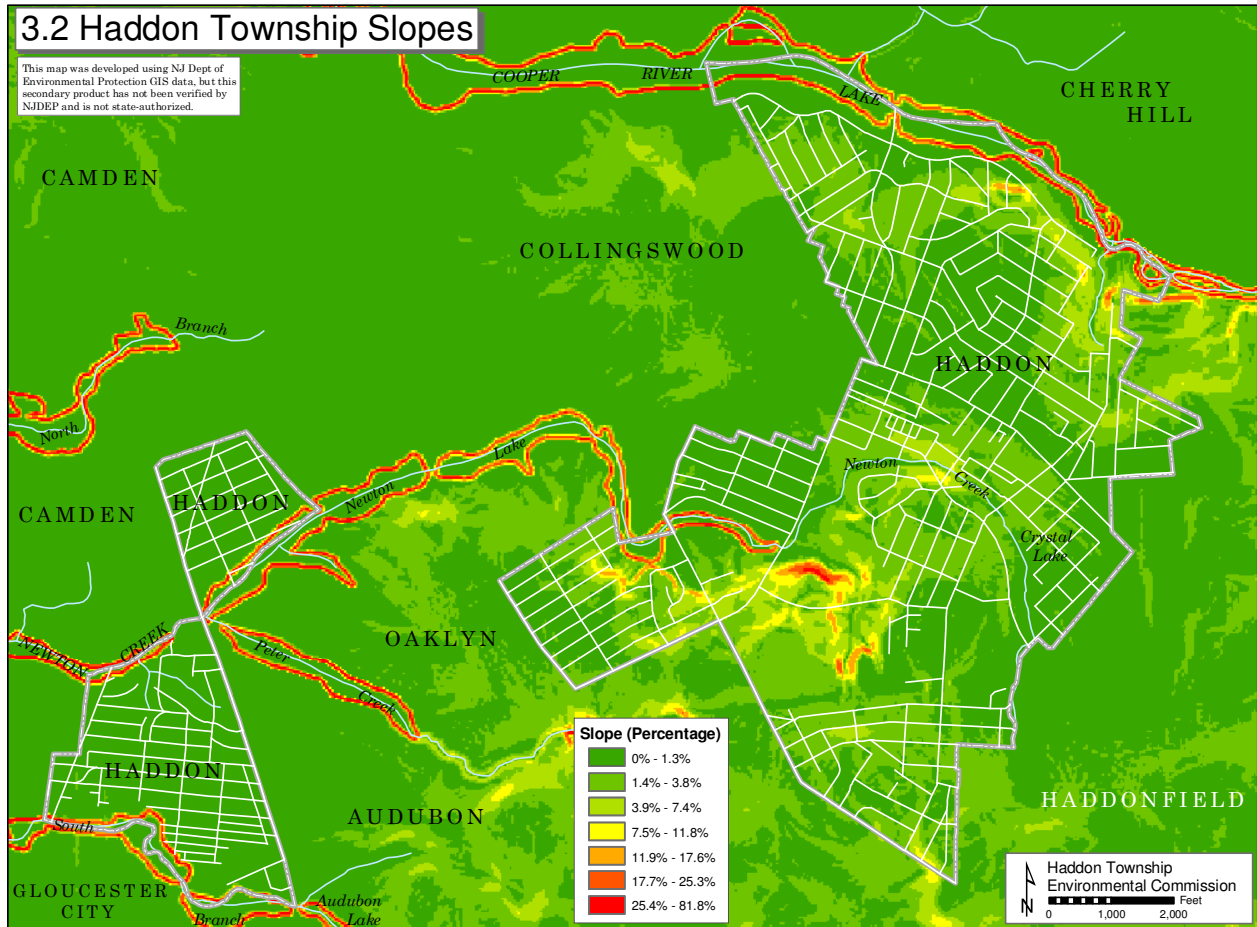


Figure 3.2 Haddon Township slopes.

## 4. Climate

New Jersey's climate is influenced by a number of factors. Due to its location in the middle latitudes, New Jersey lies in the boundary zone between cold, dry arctic and polar continental air masses to the north and warmer, humid maritime tropical air masses to the south. This boundary zone is known as the polar front. Weather systems known as midlatitude cyclones or wave cyclones continually develop and migrate along the polar front. These atmospheric disturbances are about 1,000 miles in diameter and are driven along by westerly wind flow. They develop and break up in a cycle lasting approximately six to twelve days and are responsible for the majority of precipitation in our region. However, convectional thunderstorms also contribute significant rainfall during warmer months as well as infrequent tropical storms and hurricanes.

Continental land masses heat up and cool off more quickly than do large bodies of water. Prevailing winds at New Jersey's latitude are predominately from the west. Therefore, even though New Jersey lies on the coast, temperatures here tend to be quite a bit cooler in winter and are hotter in the summer compared to a corresponding location in Northern California at the same latitude. Temperatures there are significantly moderated by maritime air masses originating over the Pacific.

The Natural Resources Conservation Service publishes climate tables covering the entire United States. These tables summarize data collected over many years and contain information such as monthly temperature and precipitation averages, minimums/maximums, growing season lengths, etc. The nearest station for which tables are available is located near Hammonton. Three of these tables (4.1.1, 4.1.2, and 4.1.3) are reproduced below. Readers should note that Haddon Township is situated in an area of greater urban development and higher impervious coverage (e.g., buildings, asphalt, concrete, etc.) than Hammonton. Because there is less potential evaporation and transpiration from vegetation, urban areas tend not to cool off as much as more heavily vegetated areas. These characteristics make Haddon Township more prone to urban heat island effects (and corresponding warmer temperatures) than Hammonton.

Month	Temperature (Degrees F.)						Precipitation (Inches)				
	Avg. daily max	Avg. daily min	Avg.	2 years in 10 will have		Avg. num. of growing degree days	Avg.	2 years in 10 will have		Avg. num. of days w/ 0.1 or more	Avg. total snowfall
				Max temp. > than	Min temp. > than			Less than	More than		
Jan	40.4	20.5	30.5	67	-4	27	3.78	2.07	5.48	7	5.4
Feb	43.5	23.2	33.4	72	3	47	3.15	1.60	4.72	6	4.5
Mar	53.3	31.3	42.3	80	12	152	3.47	2.01	4.63	6	1.0
Apr	63.2	39.8	51.5	88	23	349	4.14	2.32	5.91	7	0.2
May	73.5	50.0	61.8	93	34	672	4.06	2.28	5.87	7	0.0
Jun	81.6	58.2	69.9	97	43	892	4.01	2.35	5.56	7	0.0
Jul	87.2	64.0	75.6	100	49	1101	3.71	2.10	5.38	6	0.0
Aug	85.9	62.6	74.2	98	46	1060	4.28	1.85	6.29	6	0.0
Sep	78.9	54.4	66.7	96	37	796	3.66	1.92	5.24	5	0.0
Oct	67.0	42.0	54.5	85	24	452	3.62	2.18	4.93	6	0.0
Nov	57.4	35.3	46.3	79	18	222	4.05	1.76	6.20	5	0.2
Dec	46.7	26.8	36.8	70	5	71	3.86	1.97	5.52	6	1.1
Yearly											

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Avg.	64.9	42.3	53.6								
Extreme	103	-9		101	-4						
Total						5841	45.80	26.71	50.57	74	12.5

\*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold : 40.0 deg. F)

Table 4.1.1 Temperature and precipitation summary based on data collected in Hammonton, NJ from 1961 to 1990. Source: Natural Resources Conservation Service.

	Daily Minimum Temperature		
Last freezing temperature in spring	24°F or lower	28°F or lower	32°F or lower
1 year in 10 later than	April 10th	April 17 <sup>th</sup>	April 25th
2 years in 10 later than	April 5th	April 13 <sup>th</sup>	April 21st
5 years in 10 later than	March 26th	April 6 <sup>th</sup>	April 15th
First freezing temperature in fall			
1 year in 10 earlier than	October 27th	October 14 <sup>th</sup>	October 3rd
2 years in 10 earlier than	November 4th	October 21 <sup>st</sup>	October 8th
5 years in 10 earlier than	November 18th	November 3 <sup>rd</sup>	October 19th

Table 4.1.2 Frost-free period based on data collected in Hammonton, NJ from 1961 to 1990. Source: Natural Resources Conservation Service

	Daily Minimum Temperature		
Probability	Number of days > 24°F	Number of days > 28°F	Number of days > 32°F
9 years in 10	205	185	166
8 years in 10	216	194	173
5 years in 10	237	211	186
2 years in 10	258	229	199
1 year in 10	269	238	206

Table 4.1.3 Growing season length based on data collected in Hammonton, NJ from 1961 to 1990. Source: Natural Resources Conservation Service.

## **5. Hydrology**

### **1.5. Surface Waters**

The principal streams in and around Haddon Township (see Figure 5.1) are the Cooper River, the North, South and Main branches of Newton Creek, and Peter Creek, a tributary of Newton Creek. All of the streams flow through highly developed areas which significantly modifies their water quality and flow regimes. Urban streams are more prone to both point and non-point source pollution, and are more subject to flash flooding due to higher percentages of surrounding impervious coverage.

The Cooper River is approximately 16 miles in length and drains approximately 40 square miles. Cooper River Lake forms approximately 1.6 miles of the northern boundary of the Westmont section of Haddon Township, and provides recreation for its residents. The U.S. Geological Survey (USGS) maintains a gauging station (#01467150) approximately 1.5 miles upstream near the Kings Highway bridge in Haddonfield. Water quality data have been monitored at this location since 7/22/1925, and flow data have been recorded since 10/1/1963. In addition, this gage is a USGS real-time site where gage height and stream discharge (flow measured in cubic feet per second) are uploaded to a website within a few hours of the actual measurement. All of these records can be accessed online at:

[http://nwis.waterdata.usgs.gov/nj/nwis/nwisman/?site\\_no=01467150&agency\\_cd=USGS](http://nwis.waterdata.usgs.gov/nj/nwis/nwisman/?site_no=01467150&agency_cd=USGS)

The main branch of Newton Creek is approximately four miles long and it drains an area of approximately 3.5 square miles. It is impounded at Crystal Lake and Newton Lake, and becomes tidal west of Black Horse Pike. USGS does not currently maintain a gauging station on the stream.

### **1.6. Wells**

NJ DEP maintains digital maps of two main types of wells; a Public Community Water Supply Well (PCWSW), and a Public Non-Community Water Supply Well (PNCWSW). There are 7 public water supply wells, all in or near Saddler's Woods. These are all owned and operated by Haddon Township Water Department and are illustrated in Figure 5.2

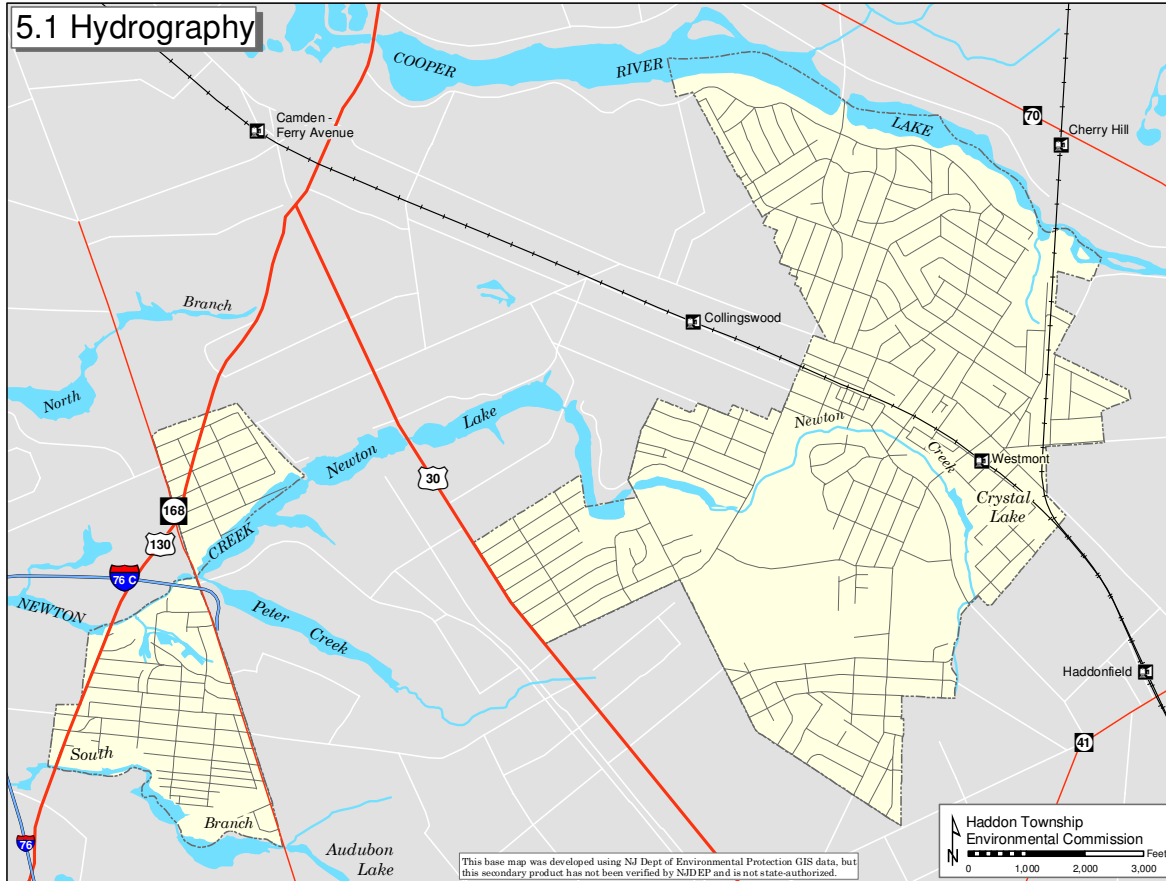


Figure 5.1 Surface waters of Haddon Township and surrounding area.

There is only one Public Non-Community Water Supply well within Haddon Township and it is owned by Jiffy Lube of Pennsauken. It is located just west of Saddler's Woods and also appears in Figure 5.2. The DEP defines a PNCWS as follows:

*A Public Non-Community Water Supply well (PNCWS) is a public water supply well used by individuals other than year-round residents for at least sixty days of the year. A non-community water supply well can be either transient or nontransient. A nontransient non-community water supply well serves at least twenty-five of the same people over a period of six months during the year, such as schools, factories, and office buildings. A transient non-community water supply well is a well that serves year-round for at least sixty days of the year, but does not serve the same individuals during that time period. Transient non-community water supply wells include rest stop areas, restaurants, and motels. There are 3481 Public Non-Community Water Supply wells in this database.*

*The Public Non-Community Water Supply wells locations download includes an ESRI shapefile with associated database file and metadata. The NJDEP Bureau of Safe Drinking Water has cataloged and field located the PNCWS wells using the Global Positioning System (GPS) as part of the Source Water Area delineation process (SWAP). Associated ARC/INFO coverages of Well Head Protection Areas for Public Non-Community Water Supply wells in New Jersey, N.J. Geological Survey Digital Geodata Series DGS04-5 is available as a download at: (<http://www.state.nj.us/dep/njgs/geodata/dgs04-5.htm> )*



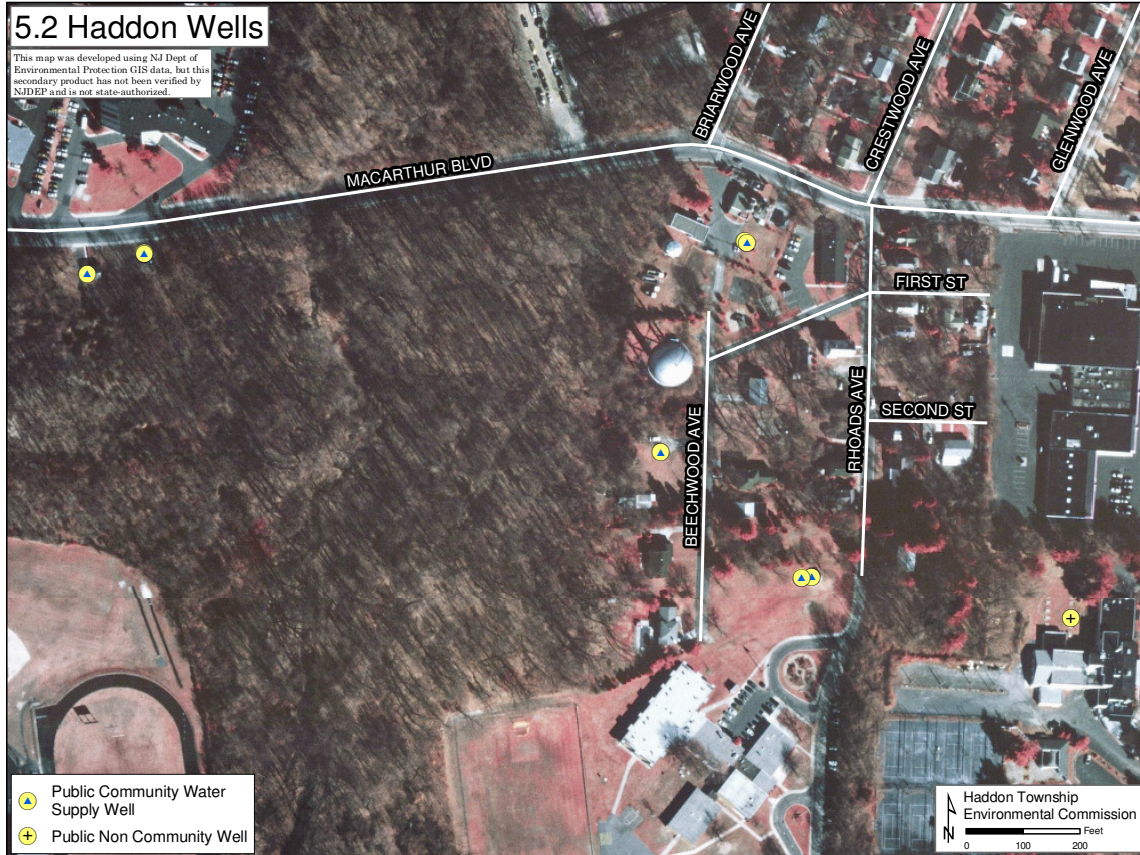


Figure 5.2 Public community and non community water supply wells in Haddon Township. All wells are located near Saddlers Woods shown at center-left in the image.

### 1.7. Flood Prone Areas

The Federal Emergency Management Agency (FEMA) publishes a paper series of Flood Insurance Rate Maps (FIRMs) to aid in disaster response, floodplain management and risk assessment, as well as flood insurance marketing. A digital version of the FIRMs is available by county. Known as Q3 Digital Flood Data, these maps contain selected data from the FIRMs and have been digitized and rectified with horizontal control consistent with USGS maps compiled at 1:24,000 scale. The accuracy of 1:24,000 maps is generally +/- 50 feet. Therefore the Q3 data may not be detailed nor accurate as the paper FIRMs for some uses.

Figure 5.3 shows the areas in and around Haddon Township that lie within FEMA's "Special Flood Hazard Area" (SFHA) on a FIRM. The land within this boundary has an estimated 1% chance of being flooded in any given year (previously referred to as the base flood or 100-year flood). Approximately 210 acres (including lakes and streams) or 11.6% of Haddon Township's 1803 acres falls within the SFHA. Fortunately, only a small number of dwellings are located within this zone. However, residents living outside designated flood hazard areas should not assume that they are completely safe from the effects of flooding and should treat these maps as a best guess of potentially vulnerable areas.



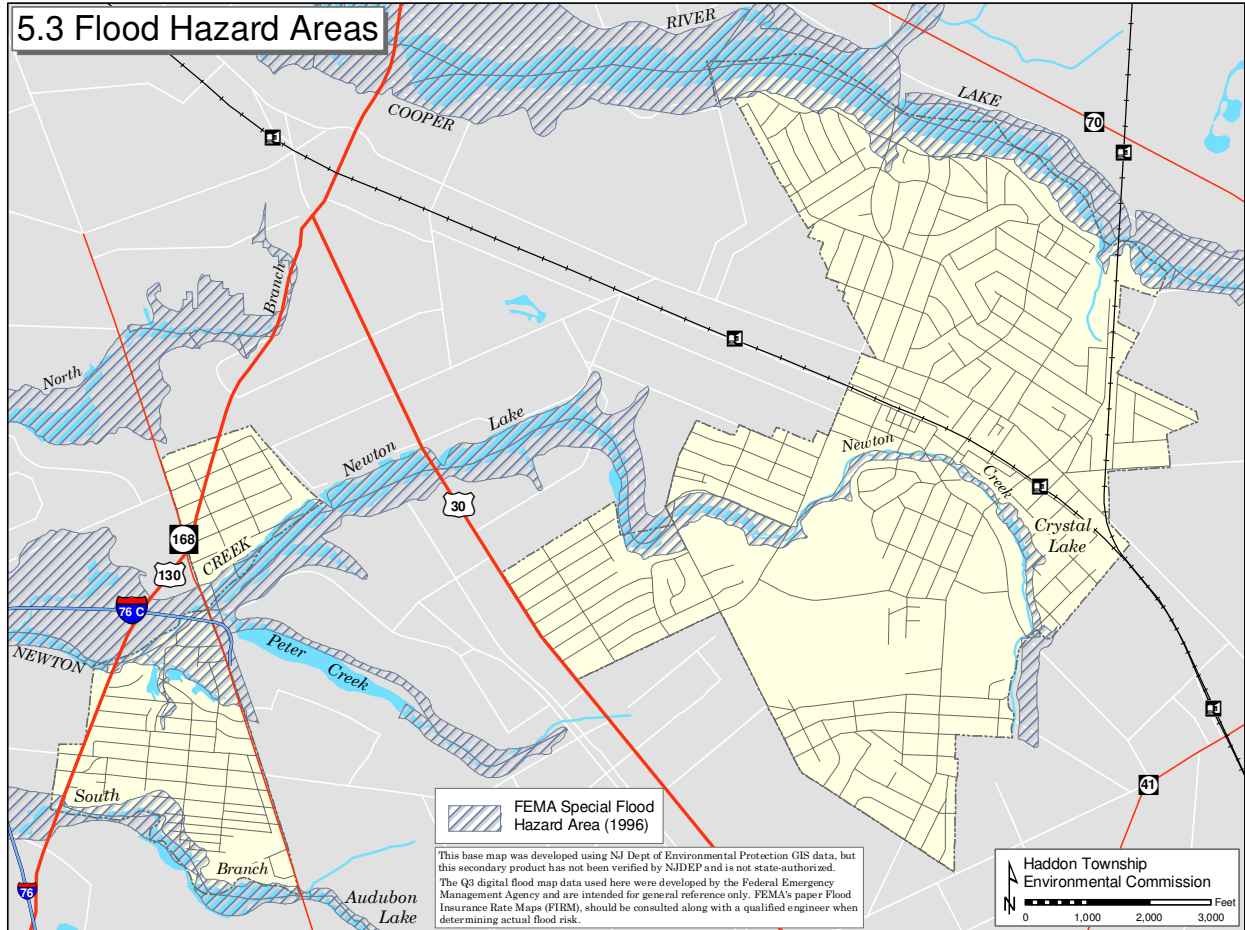


Figure 5.3 Special Flood Hazard Areas as designated by the Federal Emergency Management Agency (FEMA).

## 6. Land Use and Zoning

### 1.8. Land Use/Land Cover

NJ DEP published a land use classification based on the interpretation of aerial photographs acquired in 1995 and 1997. The scheme is a modified version of the Anderson *et al.* classification that is widely used in land use planning and scientific research. There are seven general Level 1 *land cover* categories (i.e., urban, agriculture, forest, wetlands, water, barren land and perennial ice/snow) that are further classified into more specific Level II – IV *land use* categories (e.g., Level 1 = wetlands, Level II = forested wetlands, Level III = deciduous wooded wetlands). For more information on land use classes and classification, refer to the metadata included with the digital copy of this report or online at:

<http://www.state.nj.us/dep/gis/supfiles.html>

Figure 6.1.1 and Table 6.1.1 illustrate the distribution of land use within Haddon Township. Like many NJ municipalities in the inner suburban ring around Camden, Haddon Township is

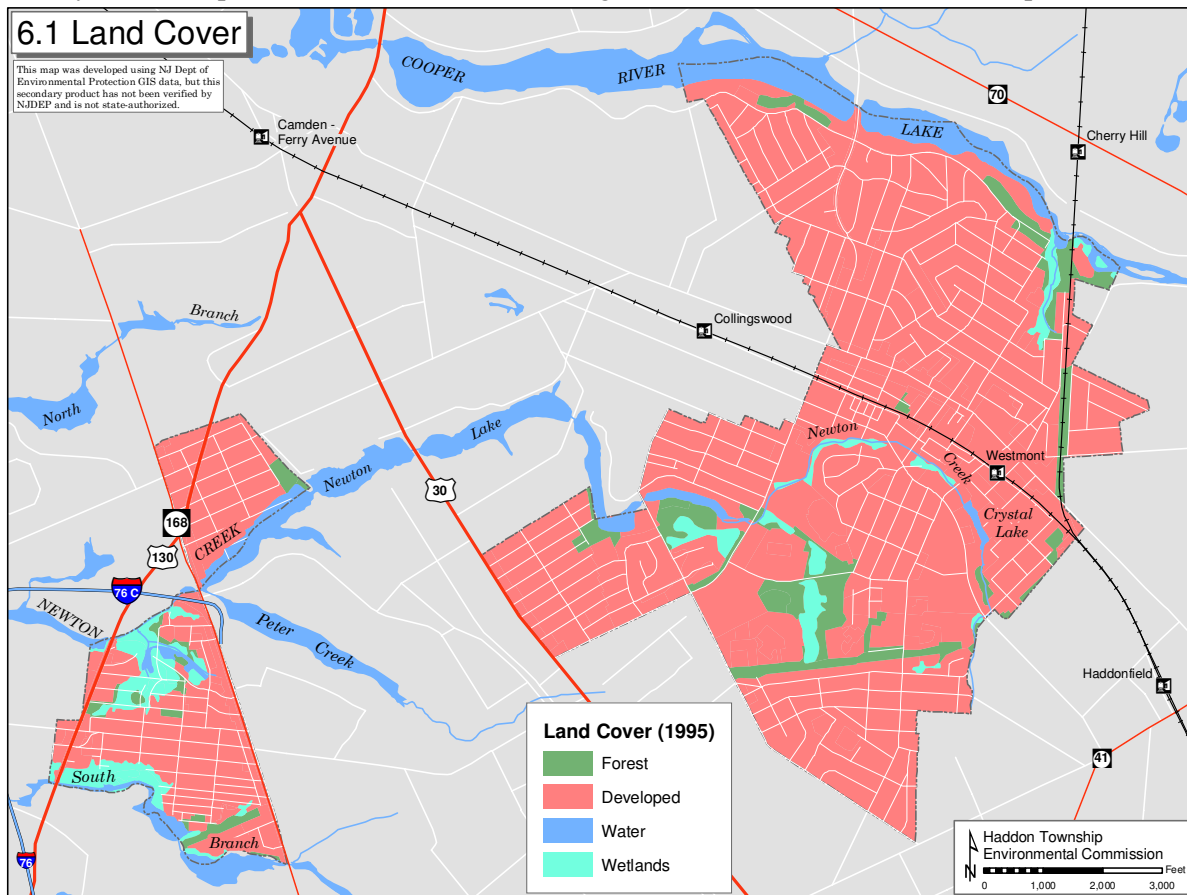


Figure 6.1 NJ DEP land cover in Haddon Township, based on 1995-1997 aerial photography.

predominately developed and nearly built-out. Just over 78% of the Township's land cover is classified as urban/built up – approximately 84% if recreational land and athletic fields (considered

Land Use Category	Acreage	Percentage of Total
<b>Urban/Developed Land</b>		
Industrial	29.86	1.66
Commercial/Services	175.80	9.75
Transportation/Communications/Utilities	39.53	2.19
Residential, High Density, Multiple Dwelling	174.06	9.65
Residential, Rural, Single Unit	2.48	0.14
Residential, Single Unit, Low Density	25.04	1.39
Residential, Single Unit, Medium Density	930.57	51.58
Mixed Urban Or Built-Up Land	3.05	0.17
Other Urban Or Built-Up Land	31.76	1.76
Recreational Land	79.16	4.39
Athletic Fields (Schools)	32.29	1.79
<b>Subtotal</b>	1523.6	84.6
<b>Forest</b>		
Deciduous Brush/Shrub Land	11.94	0.66
Deciduous Forest (10-50% Crown Closure)	31.00	1.72
Deciduous Forest (>50% Crown Closure)	72.12	4.00
Mixed Forest (>50% Deciduous w/ >50% Crown Closure)	2.08	0.12
Old Field (< 25% Brush Covered)	1.19	0.07
<b>Subtotal</b>	118.33	6.6
<b>Wetlands</b>		
Deciduous Scrub/Shrub Wetlands	7.49	0.42
Deciduous Wooded Wetlands	65.50	3.63
Disturbed Wetlands (Modified)	6.51	0.36
Freshwater Tidal Marshes	4.07	0.23
<b>Subtotal</b>	83.57	4.6
<b>Water</b>		
Streams And Canals	3.84	0.21
Tidal Rivers, Inland Bays, And Other Tidal Waters	4.57	0.25
Artificial Lakes	70.06	3.88
<b>Subtotal</b>	78.47	4.3
<b>Total</b>	1803.98	100.00

urban land use in the Anderson classification) are included. Forest, wetlands and water make up the remaining categories. Open space is addressed in Section 8 of this report.

Table 6.1.1 Land use in Haddon Township according to a modified Anderson classification.

## 1.9. Zoning

Figures 6.2.1 through 6.2.5 show the current zoning for Haddon Township (received in digital form from the Camden County Improvement Authority in November 2004). There are six residential classes, four commercial classes, and one industrial class in the current scheme.

Parcels zoned for residential use make up the overwhelming majority of Haddon Township, accounting for 72.2% of the total. Residential classes R-1 (single family, 10,000 sq. ft. lots) and R2 (single family, 6,000 sq. ft. lots) alone account for 66.4% of all land in Haddon Township. Residential land is followed by Public/Conservation/Recreation zoning at 16% of the total. These

parcels are primarily made up of lakes, floodplains and/or parks and schools. Commercial parcels make up 9.2% of Haddon Township and light industrial parcels account for the remaining 2.6% of all land.

<b>Code</b>	<b>Description</b>	<b>Group</b>	<b>Area (acres)</b>	<b>Percentage</b>
C-1	Downtown Commercial	Commercial	33.3	1.8
C-2	Shopping Center Commercial	Commercial	69.1	3.8
C-3	Highway Commercial	Commercial	24.5	1.4
C-4	Office & Business	Business	39.1	2.2
<b>Subtotal</b>			<b>166.0</b>	<b>9.2</b>
I-1	Light Industrial	Industrial	47.9	2.6
<b>Subtotal</b>			<b>47.9</b>	<b>2.6</b>
PCR	Public / Conservation / Recreation	Public	289.3	16.0
<b>Subtotal</b>			<b>289.3</b>	<b>16.0</b>
R-1	Single Family Residential: 10,000 Sq ft	Residential	627.0	34.6
R-1AH	Single Family Residential Detached Dwelling 20% Set Aside	Residential	16.6	0.9
R-2	Single Family Residential; 6,000 Sq ft	Residential	575.2	31.8
R-D	Downtown Residential	Commercial	21.9	1.2
R-G	Garden Apartments	Residential	39.9	2.2
R-H	High - Rise Apartments	Residential	26.4	1.5
<b>Subtotal</b>			<b>1307</b>	<b>72.2</b>
<b>Total</b>			<b>1,810.2</b>	<b>100.0</b>

Table 6.2.1 Permitted uses within Haddon Township (Camden County Improvement Authority 2004).

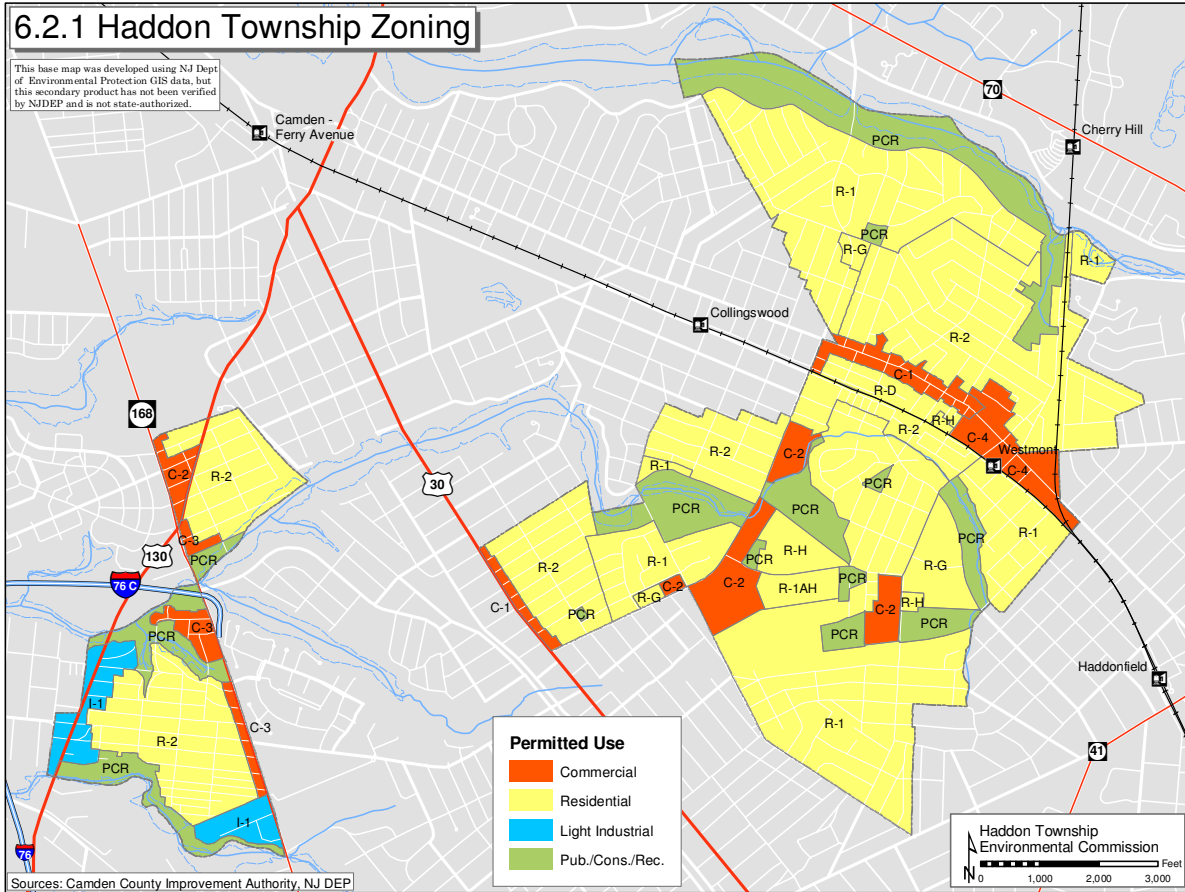


Figure 6.2.1 Haddon Township zoning overview.

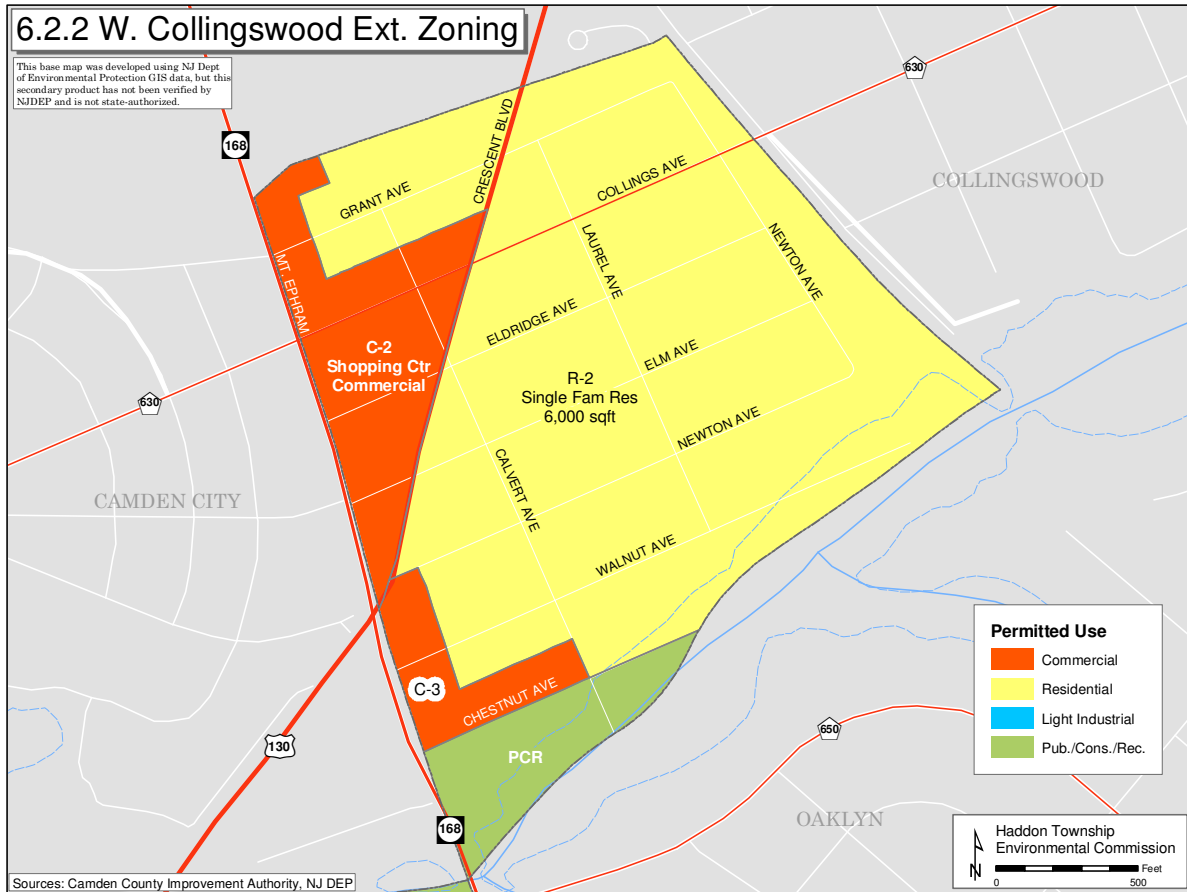


Figure 6.2.2. Zoning in the West Collingswood Extension section of Haddon Township.

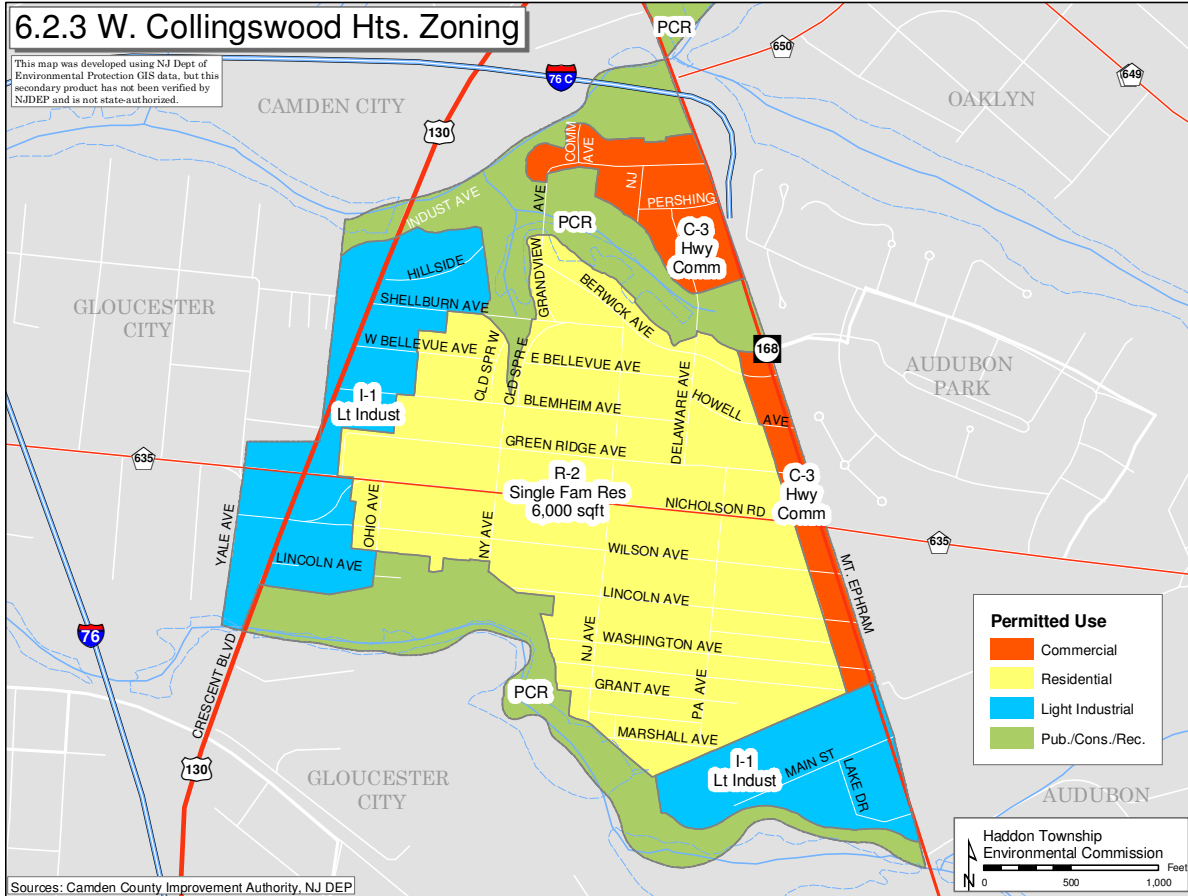


Figure 6.2.2. Zoning in the West Collingswood Heights section of Haddon Township



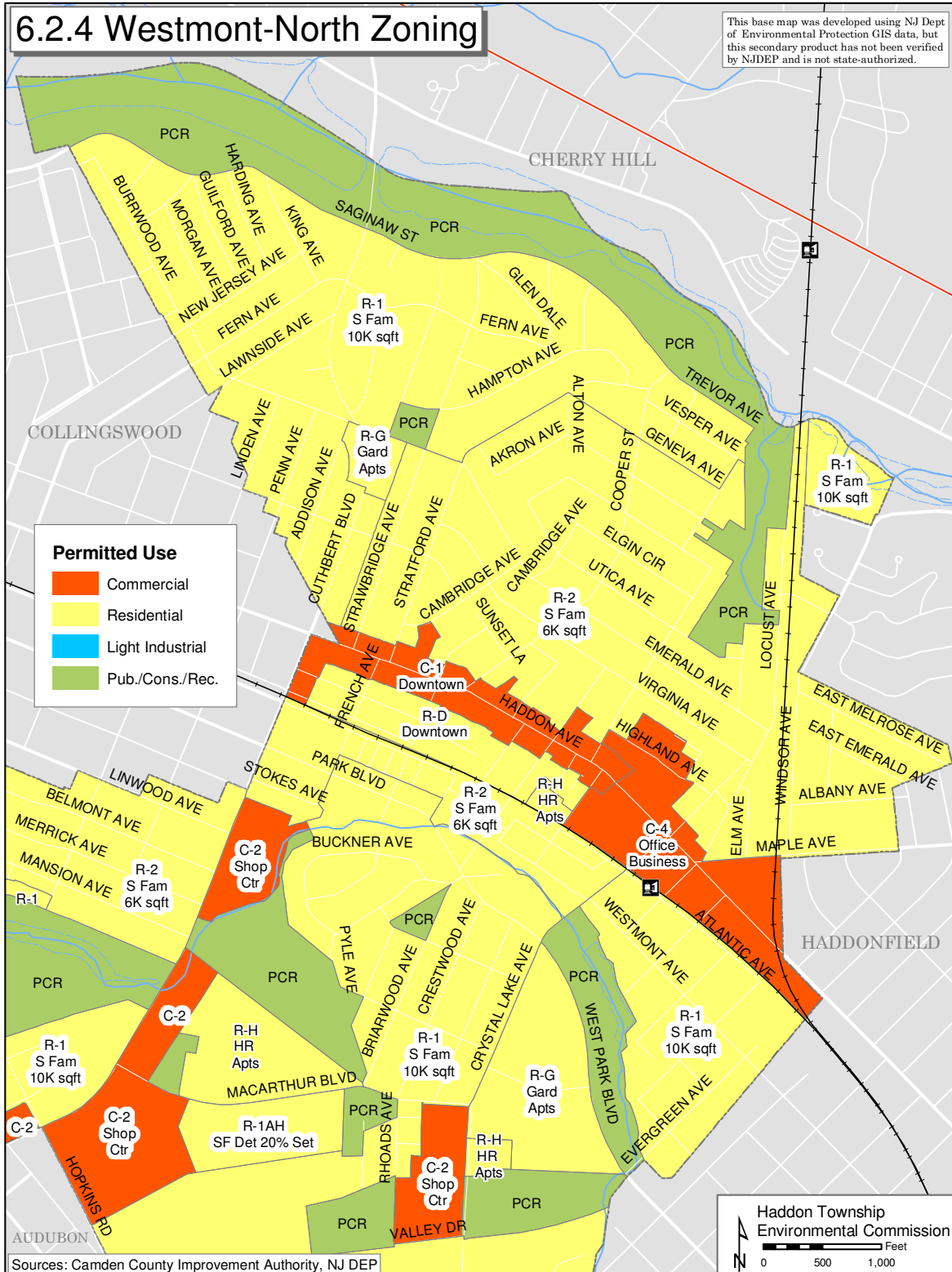


Figure 6.2.4 Haddon Township zoning in the northern portion of the Westmont section.



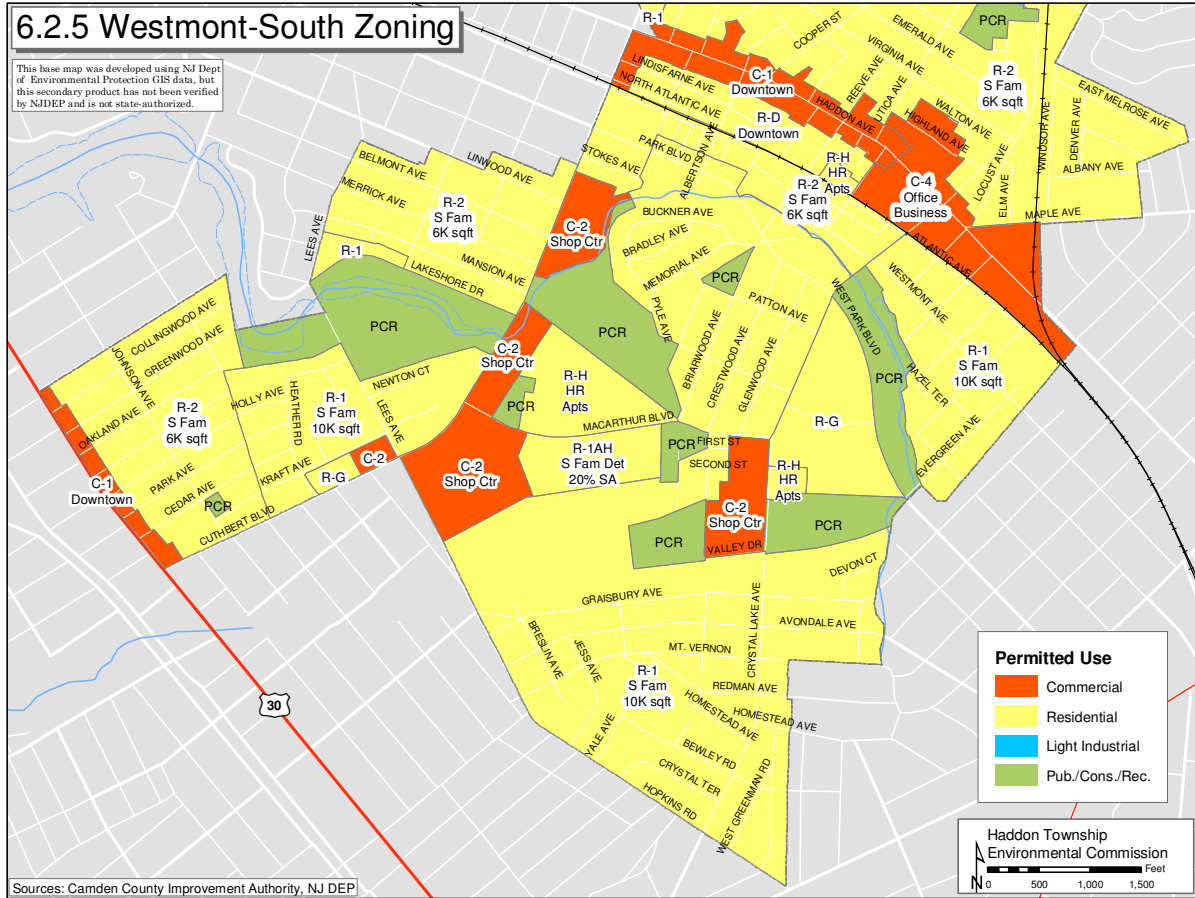


Figure 6.2.4 Haddon Township zoning in the southern portion of the Westmont section.

## **7. Infrastructure**

### **1.10. Roads**

There are approximately 57 miles of road within Haddon Township affording residents quick access to many nearby interstate highways (see Figure 7.1). While access for motorists is convenient, dense road networks are often associated with watershed impairment, due to higher runoff, associated non-point source pollution, and reduced groundwater recharge rates.

### **1.11. Public Transportation**

Haddon Township residents have excellent access to public transportation. The PATCO High Speed Line makes a stop at Westmont station (and neighboring Collingswood and Haddonfield stations) and runs from Lindenwold to Philadelphia. PATCO allows riders to make connections with Amtrak via SEPTA trains in Philadelphia and also connects with NJ Transit trains in Lindenwold (to Atlantic City) and Camden (to Trenton, with connections to northern New Jersey's NJ Transit system). Haddon Township is also well-served by NJ Transit buses. The 400, 403, 450, 451, and 457 bus routes all run through Haddon Township or adjacent to one of its boundaries.

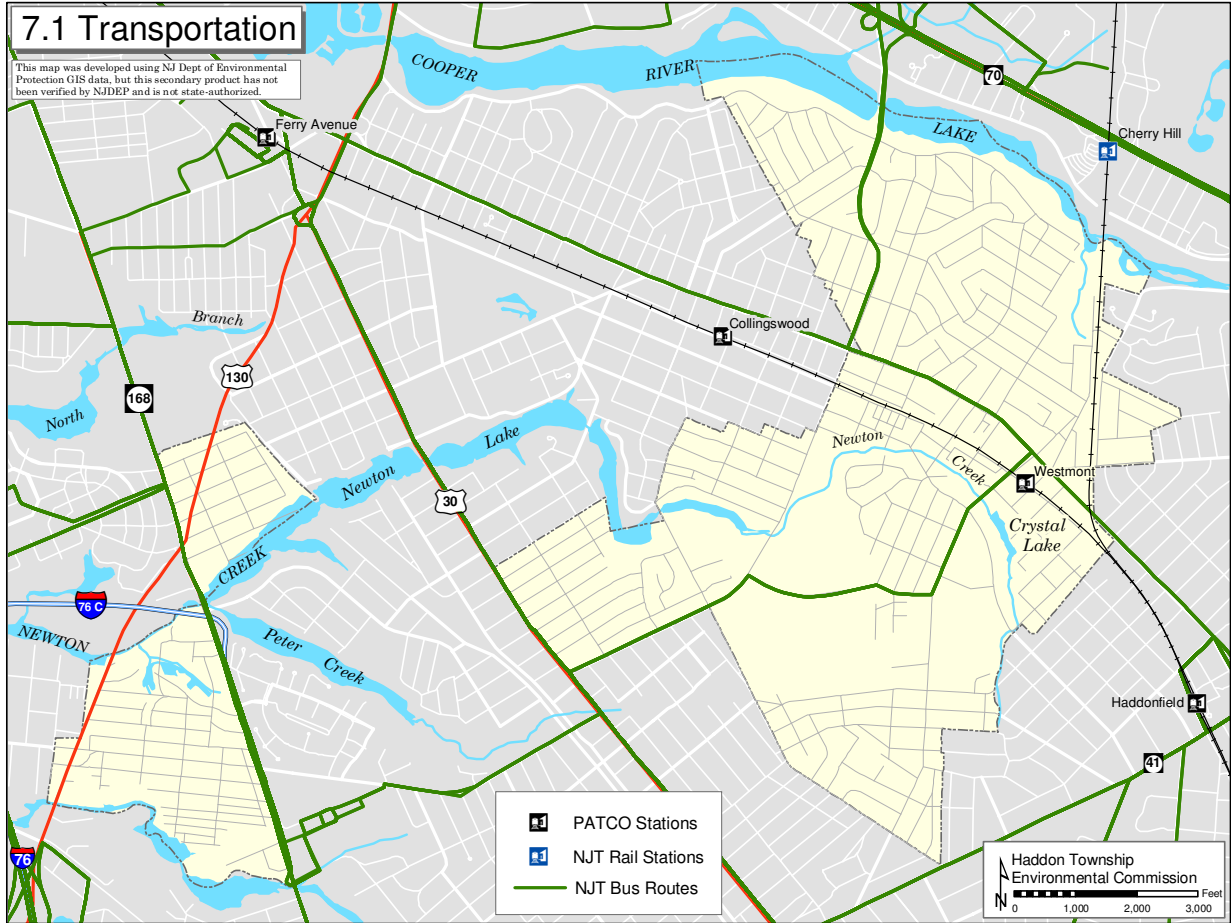


Figure 7.1 Transportation infrastructure within Haddon Township.

## 8. Open Space

Mapping open space can present problems to those attempting to compile an inventory. Tracts like state parks, state forests, and game reserves tend to have well-defined boundaries and are frequently available in digital form. NJ DEP posts a GIS map of state and federally-owned open space on their website. However, none of the parcels in this layer fall within Haddon Township.

The photointerpreters responsible for NJ DEP's 1995/1997 land use / land cover classification used a category for recreational land which can aid in an open space inventory. In many cases the decision whether or not to classify a tract as recreational land is made easier by the presence of athletic fields and playground equipment, but in Haddon Township, this layer omits heavily forested tracts like Saddler's Woods and a large parcel between Newton Creek Lake and Newton Court. Open space classification is also problematic whenever there is a mix of land uses such as commercial campuses featuring large lawns, parking lots, recharge ponds and big buildings. There are also classification issues with features such as cemeteries and tracts with water features.

Finally, the NJ DEP LU/LC layers make little or no reference to ownership, and the implications of ownership are quite significant. Privately held tracts of open space in New Jersey are rapidly dwindling as the demand for housing, "big box stores" and other residential and commercial space increases. Even publicly held open space controlled by a local Board of Education might be developed if the demand for classroom space increases.

The NJ DEP Recreation and Open Space Inventory (ROSI) table for Haddon Township lists 34 parcels (one of these parcels, block 29.14, lot 19, does not exist in the current Haddon Township parcel map). Table 8.2 lists the ROSI parcels along with the acreages calculated from the Camden County Improvement Authority digital parcel layer. The table also lists the parcel owner, the name of the facility or tract, and whether or not NJ Green Acres funds were used to purchase the tract in question.

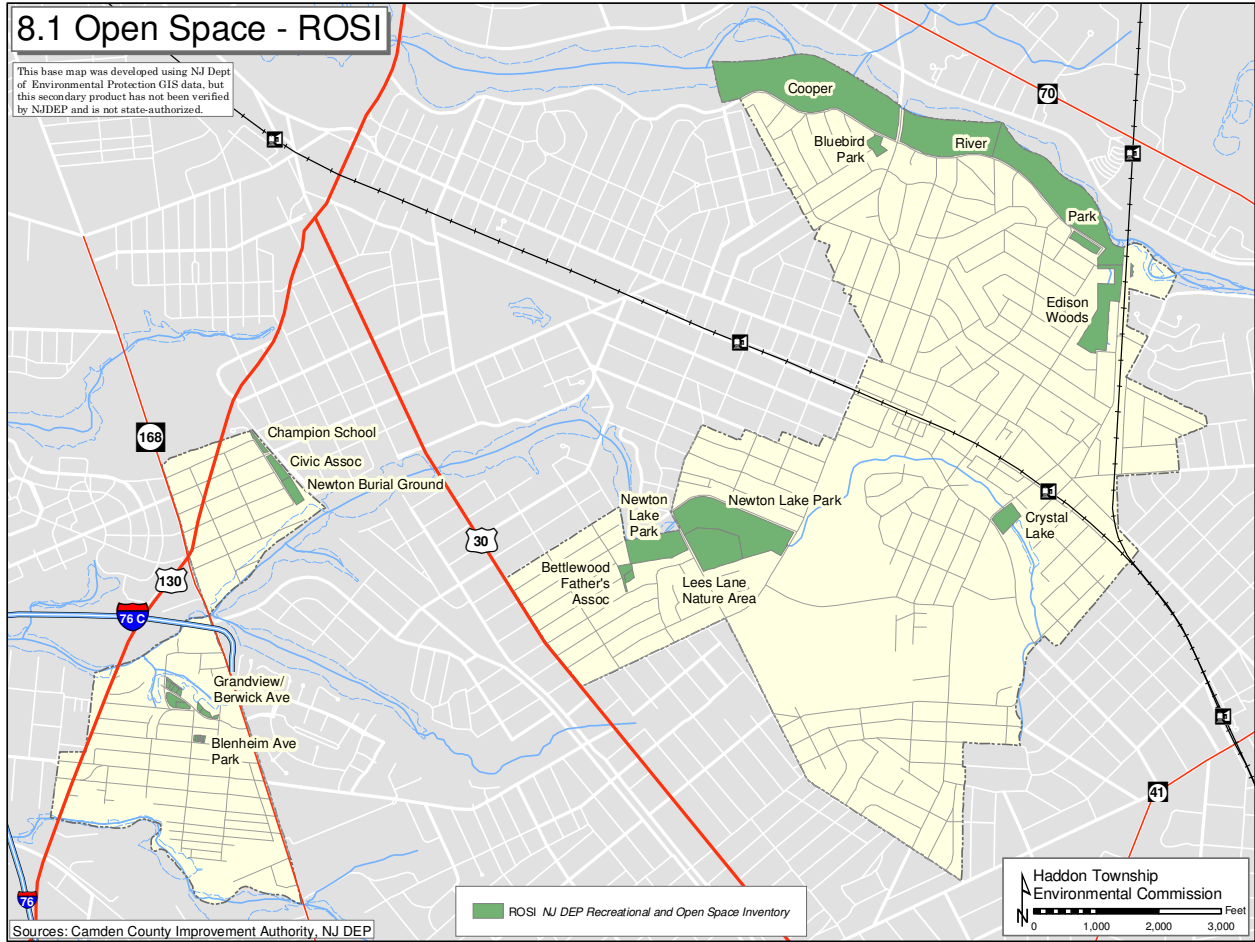


Figure 8.1 NJ DEP Recreational and Open Space Inventory (ROSI) parcels within Haddon Township.

Haddon Township Environmental Resource Inventory/February 2007

Block	Lot	Acres	Owner	Facility Name	Green Acres Funding?
1.01	10	0.43	Twp of Haddon/Champion School	W Collingswood	No
2.04	1	1.24	Twp of Haddon/Civic Assoc Bldg	Extension Center	No
2.04	2	1.48	Newton Burial Ground, Twp of Haddon	Extension Center	No
3.02	19	0.39	Twp of Haddon	Berwick Avenue	No
3.02	20	0.18	Twp of Haddon	Berwick Avenue	No
3.02	27	0.15	Twp of Haddon	Grandview And Berwick Ave	No
3.02	28	0.08	Twp of Haddon	Grandview And Berwick Ave	No
3.02	29	0.18	Twp of Haddon	Grandview And Berwick Ave	No
3.02	30	0.14	Twp of Haddon	Grandview And Berwick Ave	No
3.02	31	0.17	Twp of Haddon	Grandview Ave	No
3.02	32	0.09	Twp of Haddon	Grandview And Berwick Ave	No
3.05	1	0.76	Twp of Haddon	Grandview Ave	No
3.05	2	0.46	Twp of Haddon	Grandview & Shelburne	No
4.07	1	0.06	Twp of Haddon	Blenheim Avenue Park	No
4.07	2	0.06	Twp of Haddon	Blenheim Avenue Park	No
4.07	3	0.06	Twp of Haddon	Blenheim Avenue Park	No
4.07	4	0.06	Twp of Haddon	Blenheim Avenue Park	No
4.07	5	0.06	Twp of Haddon	Blenheim Avenue Park	No
4.07	6	0.06	Twp of Haddon	Blenheim Avenue Park	No
4.07	7	0.06	Twp of Haddon	Blenheim Avenue Park	No
7.02	9.02	8.18	Camden Co Park Comm.	Newton Lake Park	No
7.10	18	0.84	Twp of Haddon	Bettlewood Father's Assoc	No
7.10	19	0.44	Twp of Haddon	Bettlewood Father's Assoc	No
9.03	1	10.07	Twp of Haddon	Lees Lane Nature Area	Yes
9.03	1.01	20.68	Camden Co Park Comm.	Newton Lake Park	No
19.13	1	2.72	Twp of Haddon	Crystal Lake	Yes
23.02	2	0.17	Camden Co Park Comm.	Cooper River Park	Yes
24.07	31	9.26	Twp of Haddon	Edison Woods	No
25.02	9	1.43	Camden Co Park Comm.	Cooper River Park	Yes
25.03	1	26.48	Camden Co Park Comm.	Cooper River Park	Yes
29.09	13	1.39	Twp of Haddon	Bluebird Park	No
30.01	1	45.02	Camden Co Park Comm.	Cooper River Park	Yes
31.01	1	19.22	Camden Co Park Comm.	Cooper River Park	Yes
<b>Total acreage</b>		<b>152.07</b>			

Table 8.2 NJ DEP Recreational and Open Space Inventory for Haddon Township. Readers should note that in some cases these acreages differ from the calculations in the original paper versions of the Township tax maps. Both calculations can be found in the ROSI GIS shapefile on the accompanying data disk.

## 9. Geology and Soils

Haddon Township lies within the Inner Coastal Plain physiographic province. The area is characterized by relatively flat topography and is made up of sands, silts and clays deposited during the Cretaceous Period, approximately 100 million years ago. The Soil Survey of Camden County published by the USDA Natural Resources Conservation Service (NRCS - formerly the Soil Conservation Service) published in 1966, was based on field work conducted in 1961. It is now available in Adobe PDF format on CD from the NRCS office in Somerset, NJ. The manual contains an excellent discussion of Camden County soils along with their suitability for farming, construction, septic system development, etc.

NRCS has also compiled a digital version of its soil survey maps known as the Soil Survey Geographic (SSURGO). NJ DEP has converted these maps to ESRI shapefiles and makes them available for Internet download. Figure 9.1 shows the Camden County SSURGO shapefile clipped to the borders of Haddon Township (the Camden County shapefile is included in its entirety with the data CD accompanying this report).

The soil survey mapping unit (used in both paper and digital soil surveys) is normally a more specific description of soils belonging to a more general soil series classification. Three soil series, Freehold, Downer, and Howell, account for the majority of the land within Haddon Township. However, most of the land within inner-ring Philadelphia suburbs like Haddon Township was already developed by 1961. In these areas, accurate soil mapping unit classification by field test and aerial photo interpretation was not feasible. Consequently, soil series with different characteristics were aggregated/lumped within the same mapping units/polygons. For example, the Freehold and Downer Urban Land Complex mapping unit, is made up of soils belonging to the Freehold soil series or the Downer series. This mapping unit makes up the bulk of Westmont.

In addition to the Downer, Freehold and Howell series, there are a few other classifications on the soil survey maps. The loamy alluvial land class is not a soil series, but refers to areas adjacent to streams where sediments have been recently deposited by flooding. Several areas within Westmont are classified as "Made Land". In these tracts, excavation and construction at the time of the original mapping had so disturbed the natural soil profile, that soil scientists could not reliably determine soil type. Finally, in the original soil survey, soil scientists ceased mapping east of a roughly drawn north-south line that clips the western edge of the Westmont section near Johnson Avenue. East of this boundary, all dry land including West Collingswood Heights and the West Collingswood Extension, is designated by the "Urban Land" classification in the SSURGO digital map.

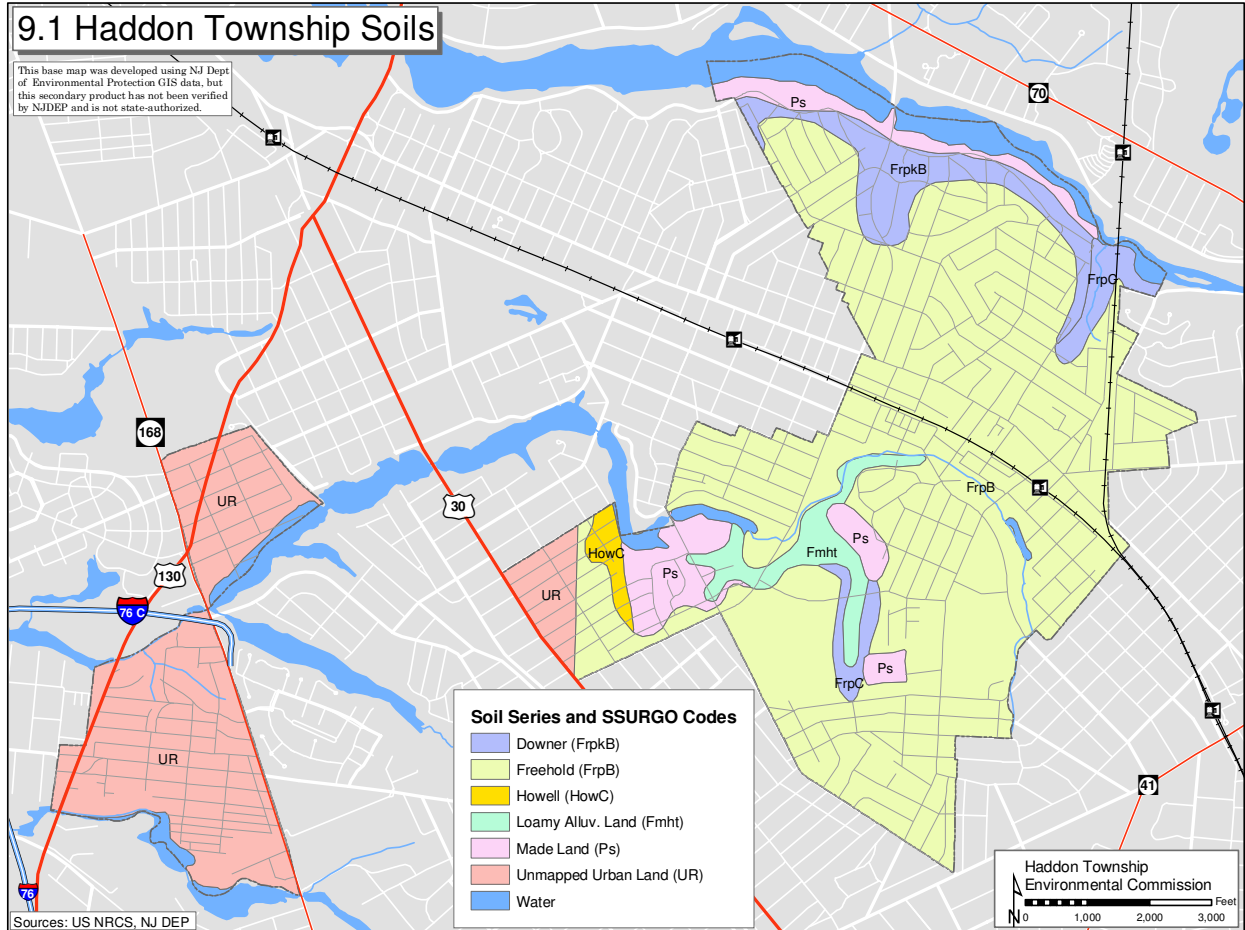


Figure 9.1 Haddon Township soils taken from the Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) digital map.

Soil Survey Code	SSURGO Code	Mapping Unit Name
FxB	FrpB	Freehold and Downer-Urban land complex, gently sloping
FxC	FrpC	Freehold and Downer-Urban land complex, sloping
Fy	FrpkB	Freehold and Downer-clayey substrata, -Urban land
HoC	HoWC	Howell-Urban land complex, sloping
Lv	Fmht	Loamy alluvial land
Ma	Ps	Made land
n/a	UR	Urban land

Table 9.1 NRCS/SCS soil survey mapping unit codes along with their updated SSURGO classifications and their descriptions.

For further reference:

New Jersey Geological Survey. <http://www.state.nj.us/dep/njgs/>

US Natural Resources Conservation Service. <http://www.nrcs.usda.gov/>

Tedrow, John C. F. (1986). *Soils of New Jersey*. Malabar, FL. Krieger Publishing Co.

Widmer, Kemble. (1964). *Geology and Geography of New Jersey*. Princeton, N.J. D. Van Nostrand Co.



## 10. Vegetation

### 10.1. Common Species of the Inner Coastal Plain

While most of the native plant communities of New Jersey's Inner Coastal Plain have been drastically modified for agriculture, industrial, and residential use, there are a few remnants that contain species representative of conditions prior to European settlement. While there is no comprehensive list of all tree, shrub, vine and herbaceous plant species found within the boundaries of Haddon Township, this portion of the Inner Coastal Plain is populated by species belonging to two plant communities; Mixed Oak Forest (Table 10.1.1) and Beech-Oak Forest (Table 10.1.2). Species documented within Saddle's Woods are found within the lists of both plant communities.

Common name	Genus and species
<b>Dominant trees</b>	
White oak	<i>Quercus alba</i>
Chestnut oak	<i>Quercus prinus</i>
Black oak	<i>Quercus velutina</i>
Scarlet oak	<i>Quercus coccinea</i>
American holly	<i>Ilex opaca</i>
Sassafras	<i>Sassafras albidum</i>
<b>Other trees</b>	
Black cherry	<i>Prunus serotina</i>
Spanish oak	<i>Quercus falcate</i>
Sweet gum	<i>Liquidambar styraciflua</i>
Red maple	<i>Acer rubrum</i>
Virginia pine	<i>Pinus virginiana</i>
Persimmon	<i>Diospyros virginiana</i>
American beech	<i>Fagus grandifolia</i>
<b>Shrubs and vines</b>	
Early lowbush blueberry	<i>Vaccinium pallidum</i>
Black huckleberry	<i>Gaylussacia baccata</i>
Pinxter flower	<i>Rhododendron periclymenoides</i>
Mountain laurel	<i>Kalmia latifolia</i>
Downy junberry	<i>Amelanchier arborea</i>
Sweet pepperbush	<i>Clethra alnifolia</i>
Bayberry	<i>Myrica pensylvanica</i>
Glaucous greenbrier	<i>Smilax glauca</i>
Common greenbrier	<i>Smilax rotundifolia</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
<b>Herbs</b>	
Bracken fern	<i>Pteridium aquilinum</i>
Rattlesnake weed	<i>Hieracium venosum</i>
Pennsylvania sedge	<i>Carex pensylvanica</i>
Cow-wheat	<i>Melampyrum lineare</i>
Spotted wintergreen	<i>Chimaphila maculate</i>
Stemless lady's-slipper	<i>Cypripedium acaule</i>

Table 10.1.1. Typical Plant Species of the Mixed Oak Forest of South Jersey. Source: Collins, Beryl R., & Anderson, Karl H. (1994). *Plant Communities of New Jersey: A Study in Landscape Diversity*. New Brunswick, NJ. Rutgers University Press.

<b>Common name</b>	<b>Genus and species</b>
<b>Dominant trees</b>	
American beech	<i>Fagus grandifolia</i>
White oak	<i>Quercus alba</i>
Chestnut oak	<i>Quercus prinus</i>
Black oak	<i>Quercus velutina</i>
Tulip tree	<i>Liriodendron tulipifera</i>
American holly	<i>Ilex opaca</i>
<b>Other trees</b>	
Black cherry	<i>Prunus serotina</i>
Spanish oak	<i>Quercus falcate</i>
Sassafras	<i>Sassafras albidum</i>
Sweet gum	<i>Liquidambar styraciflua</i>
Red maple	<i>Acer rubrum</i>
Virginia pine	<i>Pinus virginiana</i>
Persimmon	<i>Diospyros virginiana</i>
Mockernut hickory	<i>Carya tomentosa</i>
Pignut hickory	<i>Carya glabra</i>
<b>Shrubs and vines</b>	
Maple-leaved viburnum	<i>Viburnum acerifolium</i>
Arrowwood	<i>Viburnum dentatum</i>
Black huckleberry	<i>Gaylussacia baccata</i>
Pinxter flower	<i>Rhododendron peridymenoides</i>
Mountain laurel	<i>Kalmia latifolia</i>
Early lowbush blueberry	<i>Vaccinium pallidum</i>
Sweet pepperbush	<i>Clethra alnifolia</i>
Bayberry	<i>Myrica pensylvanica</i>
Glaucous greenbrier	<i>Smilax glauca</i>
Common greenbrier	<i>Smilax rotundifolia</i>
Dewberry	<i>Ftubus flagellaris</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
Poison ivy	<i>Toxicodendron radicans</i>
<b>Herbs</b>	
Rattlesnake weed	<i>Hieracium venosum</i>
Spotted wintergreen	<i>Chimaphila maculate</i>
Solomon's-seal	<i>Polygonatum biflorum</i>
False Solomon's-seal	<i>Smilacina racemosa</i>
Canada mayflower	<i>Maianthemum canadense</i>
Beech drops	<i>Epifagus virginiana</i>
Stemless lady's-slipper	<i>Cypripedium acaule</i>
Pennsylvania sedge	<i>Carex pensylvanica</i>

Table 10.1.2. Typical Plant Species of the Beech-Oak Forest of South Jersey. Source: Collins, Beryl R., & Anderson, Karl H. (1994). *Plant Communities of New Jersey: A Study in Landscape Diversity*. New Brunswick, NJ. Rutgers University Press.

## **10.2. Vegetation of Saddler's Woods**

Saddler's Woods, formerly known as the MacArthur Tract or MacArthur Heritage Forest contains several large diameter trees, some of which may be as old as 300 years. Maggi Downham and Janet

Goehner – Jacobs of the Saddler's Woods Conservation Association have been compiling a species list and have catalogued the plants listed in tables 10.2.1 and 10.2.2 below.

<b>Common name</b>	<b>Genus and species</b>
<b><i>Trees (46 species)</i></b>	
Ash, White	Fraxinus Americana
Ash, Green	Fraxinus pensylvanica
Aspen, Big-toothed	Populus grandidentata
Beech, American	Fagus grandifolia
Birch, Gray	Betula populifolia
Blackgum	Nyssa sylvatica
Box Elder	Acer negundo
Catalpa	Catalpa speciosa
Cherry, Black	Prunus serotina
Cherry, Sweet	Prunus avium
Cherry, Choke	Prunus virginiana
Crabapple	Malus sp.
Dogwood	Cornus florida
Elm, American	Ulmus Americana
Hackberry	Celtis occidentalis
Hickory, Pignut	Carya glabra
Hickory, Mockernut	Carya tomentosa
Hickory, Shellbark	Carya laciniosa
Holly, American	Ilex opaca
Honeylocust	Gleditsia triacanthos
Ironwood	Carpinus caroliniana
Locust, Black	Robinia pseudoacacia
Magnolia, Cucumber	Magnolia acuminata
Maple, Red	Acer rubrum
Maple, Silver	Acer saccharinum
Mulberry, White	Morus alba
Mulberry, Red	Morus rubra
Mountain Laurel	Kalmia latifolia
Oak, Black	Quercus velutina
Oak, Chestnut	Quercus prinus
Oak, Northern Red	Quercus rubra
Oak, Pin	Quercus palustris
Oak, Scarlet	Quercus coccinea
Oak, Southern Red	Quercus falcate
Oak, Swamp White	Quercus bicolor
Oak, White	Quercus alba
Oak, Willow	Quercus phellos
Poplar, Yellow	Liriodendron tulipifera
Sassafras	Sassafras albidum
Sumac, Smooth	Rhus glabra
Sumac, Winged	Rhus copallinum
Sweetgum	Liquidambar styraciflua
Sycamore	Platanus occidentalis
Walnut, Black	Juglans nigra
Witch Hazel	Hamamelis virginiana
Viburnum, Arrowwood	Viburnum dentatum

Table 10.2.1. Tree species identified within Saddler's Woods.

<b><i>Shrubs (5 species)</i></b>	<b><i>Vines (5 species)</i></b>
Blackberry	Bittersweet nightshade
Forsythia	Catawba grape
Mountain laurel	Native honeysuckle
Pinkster - rhododendron	Poison ivy
Silky Dogwood	Sweet pea
<b><i>Grasses (3 species)</i></b>	<b><i>Mushrooms (17 species)</i></b>
Crab grass	Beefsteak Polypore
Hawk weed	Brick Tops
Sheep sorrel	Common Split Gill
<b><i>Wildflowers (31 species)</i></b>	Crown Tipped Coral
Beechnut drop	Destroying Angel
Blue Violet	Devil's Urn
Boneset	Fawn Mushroom
Canadian May flower	Half free Morel
Coltsfoot	Hen of the woods
Common Milkweed	Jack o' lantern
Common Sunflower	King Bolete
Daisy Fleabane	Old Man of the woods
Evening Primrose	Orange Mycena
Goldenrod	Stalked Scartlet Cup
Indian pipe	Tacky Green Russula
Indian strawberry ,Yellow	Thick Maze Oak Poly
Jack in the pulpit	Violet Toothed Polypore
Jewel weed	
Joe Pyeweed	
Ladies Thumb	
Marsh marigold	
Pennsylvania Smartweed	
Pipsissewa	
Queen Anne's Lace	
Ragweed	
Red clover	
Sessile Bellwort	
Skunk cabbage	
Solomon's seal – true	
Solomon's seal false	
Star of Bethlehem	
Sweet Pea	
White clover	
White Violet	
Wild Basil	

Table 10.2.2. Other plant species identified within Saddler's Woods. Invasive species are usually intentionally or accidentally exotics that spread quickly, out-compete native species and are frequently difficult to eradicate. Below is a list of 14 species identified within Saddlers Woods

<b><i>Invasive species (14)</i></b>	
Ailanthus (Tree of Heaven)	Japanese Knotweed
Devil's walking stick	Maple, Norway
Elm, Chinese	Mimosa
Empress Tree	Multiflora Rose
English Ivy	Periwinkle
Garlic Mustard	Phragmites
Japanese Honeysuckle	Wisteria

Table 10.2.3. Invasive plant species identified within Saddler's Woods.

### ***10.3. Municipal Tree Inventory***

In a pilot program funded in part with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services, an inventory of Township street trees was begun. Covered were all streets in the West Collingswood Extension and West Collingswood Heights sections of the Township, as well as Crystal Lake Avenue between Haddon Avenue and Graisbury Avenue and Park Boulevard between Briarwood Avenue and the Haddonfield border, as shown in Figure 10.1.

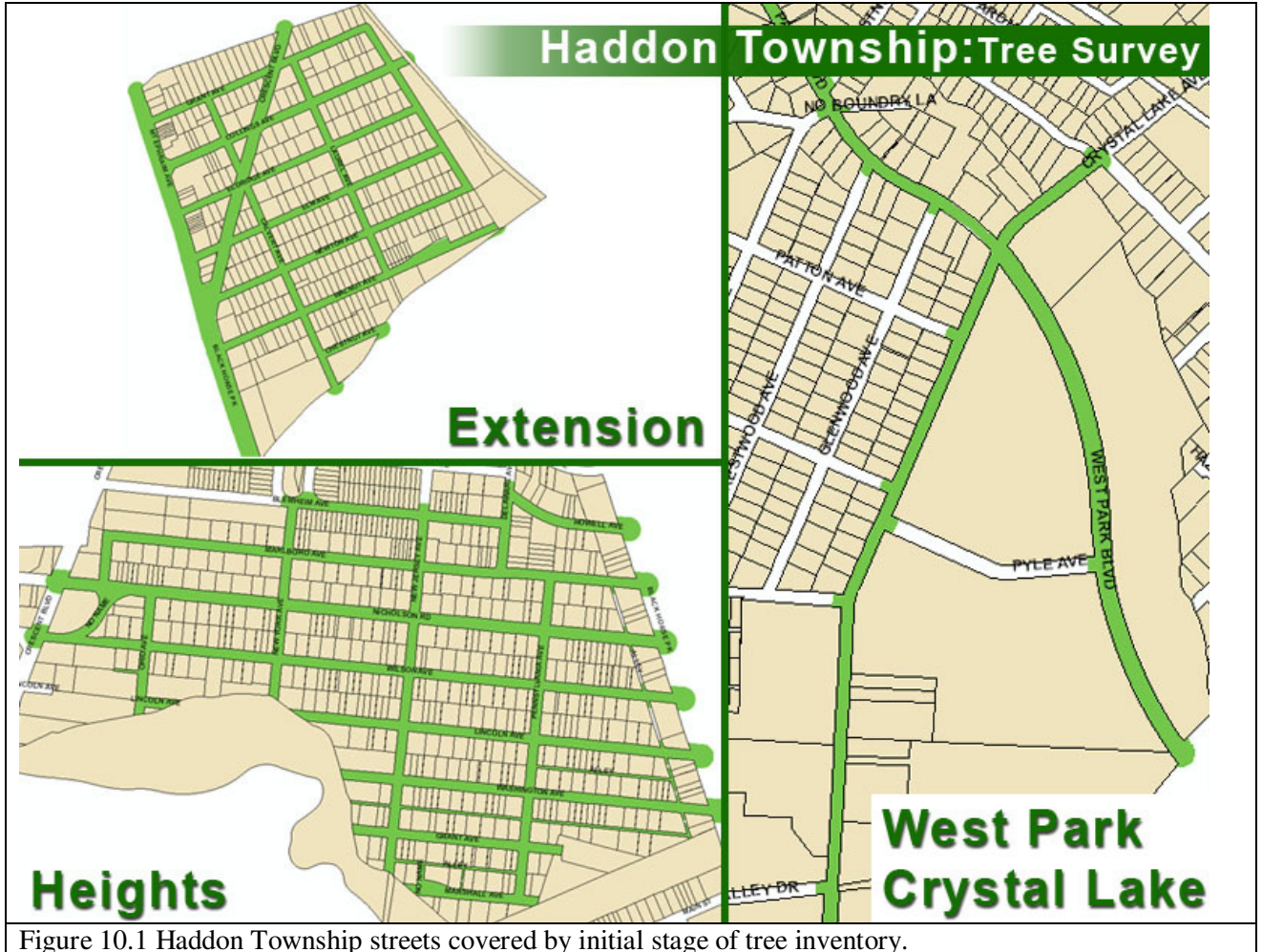


Figure 10.1 Haddon Township streets covered by initial stage of tree inventory.

The inventory was conducted by Hopeworks 'N Camden, a youth training organization. Hopeworks surveyed approximately 500 trees in the selected project areas, covering 19 miles of curbside within the Township (10 miles of street, eliminating the sides of streets in bordering municipalities). (Even streets containing no street trees were traversed in order to confirm the absence of trees.) Data observed and collected for each tree include species, health, height, growing condition, crown width, address, sidewalk damage, location, diameter at breast height, surveyed date, planting strip width, and presence of overhead wires (Table 10.3.1). The collected information was then transferred into the Environmental Commission's GIS system.

<b>Haddon Township Tree Inventory Data Collected</b>	
<b>Attribute</b>	<b>Descriptions</b>
<b>DIAMETER</b>	Also known as DBH (diameter at breast height), is the diameter of the tree observed at 4.5 feet from the ground in inches.
<b>COMMON</b>	Species of the tree
<b>DATE</b>	Date the tree was surveyed
<b>UNKNOWN</b>	Indicates if a tree's species was unknown to the surveyors. 1 = unknown, 2 = known
<b>HEALTH</b>	Overall condition of the tree based on condition of bark, growing conditions, and canopy.
<b>HT_CLSS</b>	Height measurement of the tree based on three classes: Class 1 (<25'); Class 2 (25'-45'); Class 3 (> 45')
<b>GROW_COND</b>	Growing conditions for the tree observed based on soil condition, size of planting strip, and location.
<b>TREE_GUARD</b>	Presence of a tree guard. 0 = no, 1 = yes.
<b>GRATE</b>	Presence of a grate. 0 = no, 1 = yes.
<b>CRWNWTH1</b>	Crown size for the tree observed at its widest point, measured in feet.
<b>STRIP</b>	Width of planting strip, measured in feet.
<b>WIRES</b>	Presence of overhead wires. 0 = no, 1 = yes.
<b>SIDEWALK</b>	Sidewalk damage present. 0 = no, 1 = yes.

Table 10.3.1 Collected attributes in Township tree inventory.

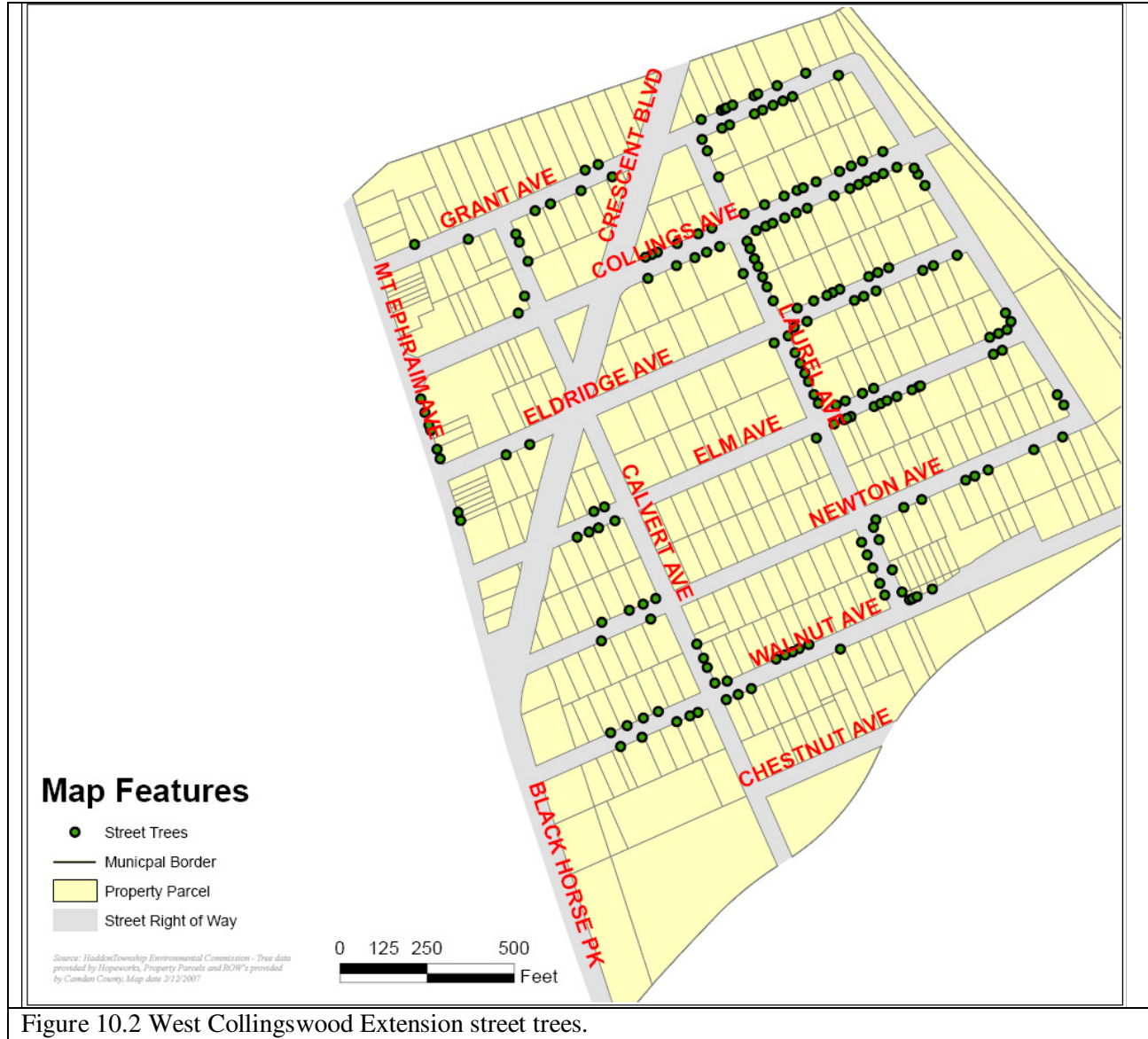


Figure 10.2 West Collingswood Extension street trees.



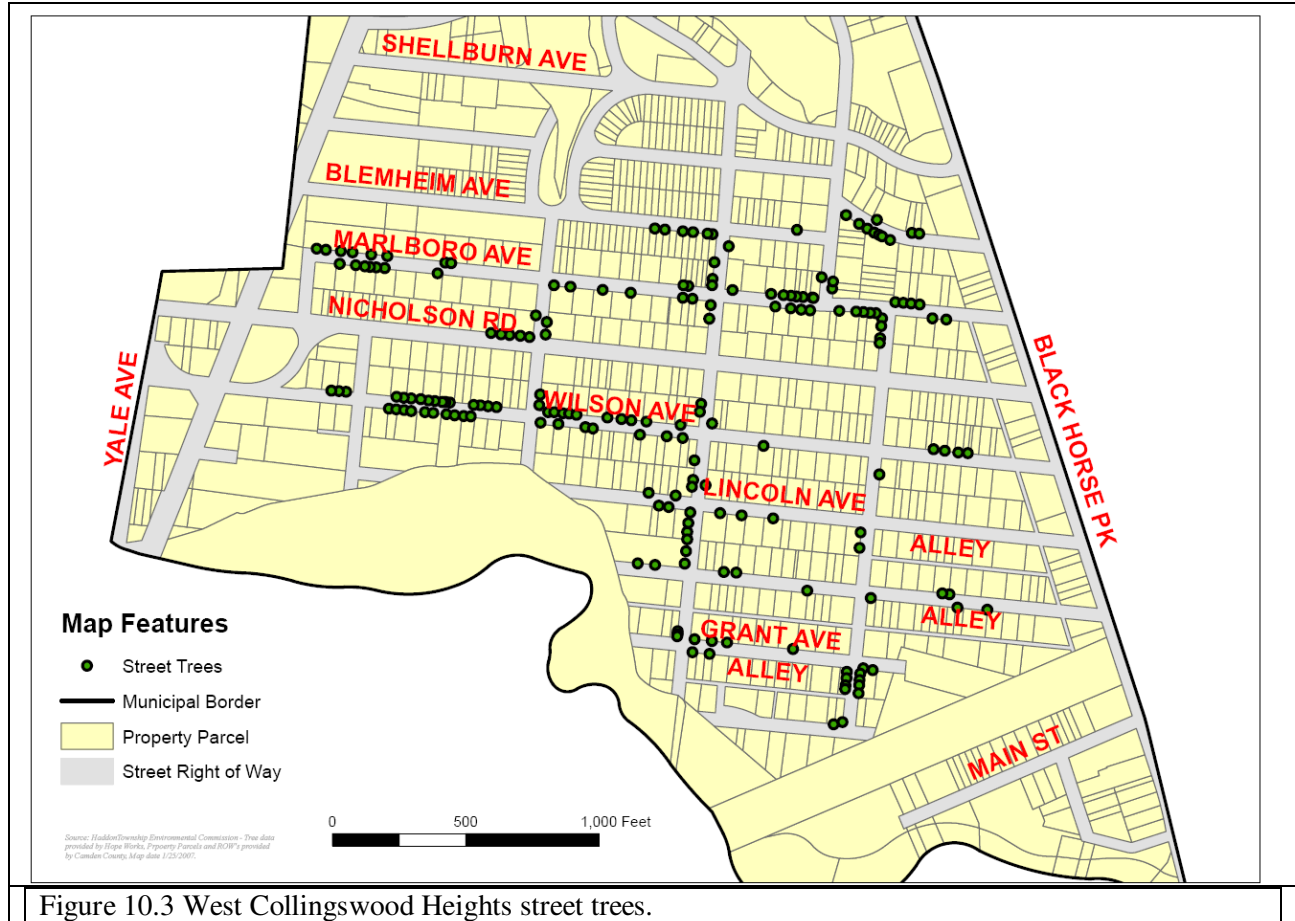


Figure 10.3 West Collingswood Heights street trees.

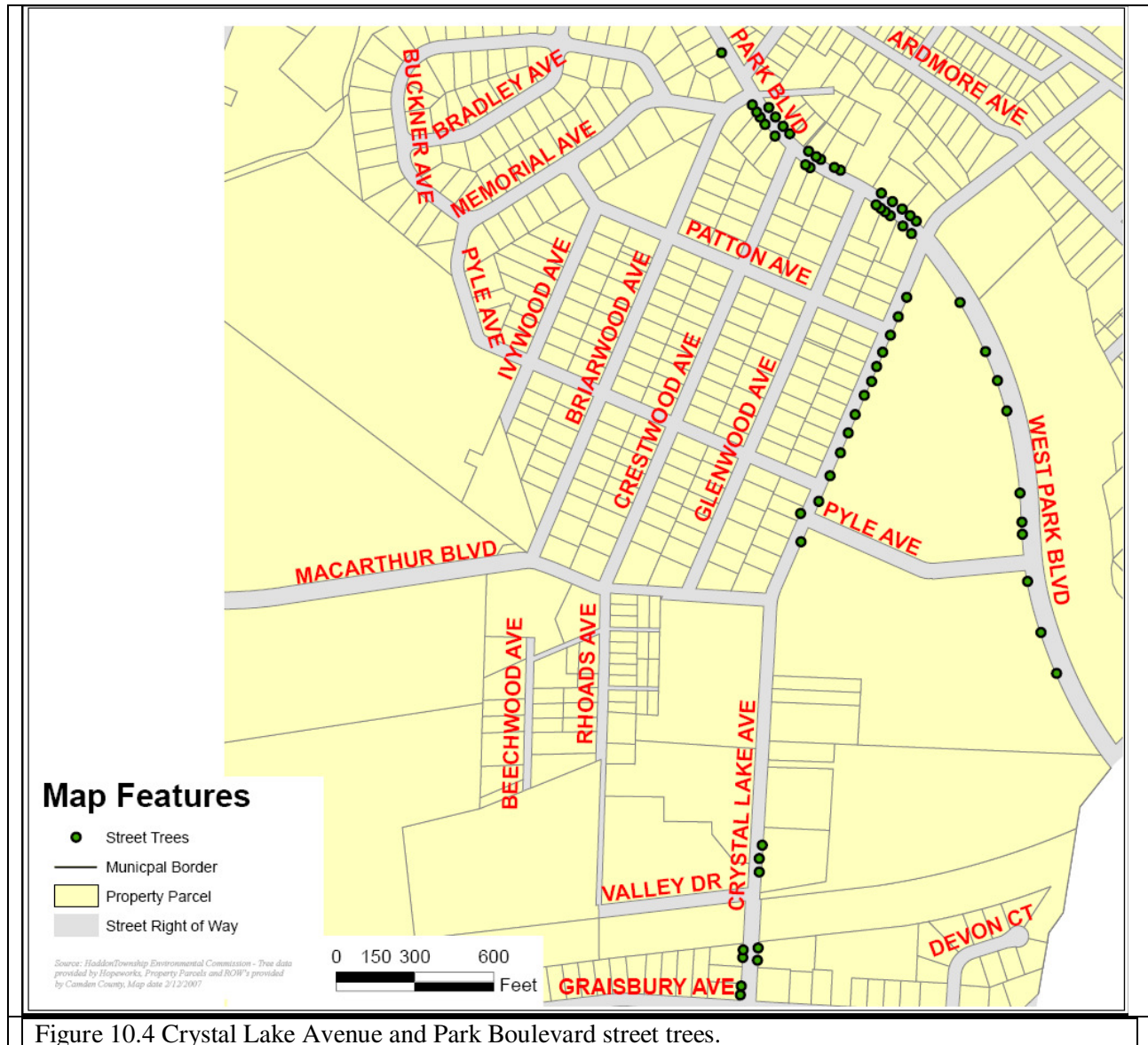


Figure 10.4 Crystal Lake Avenue and Park Boulevard street trees.

Summary Table 10.3.2 indicates that Bradford Pears, Pin Oaks, and Norway Maples predominate in those three Township survey areas, but in different ratios. In the Crystal Lake and Park Boulevard, fully half of the trees are Pin Oaks. In the Extension, Pin Oaks are the most prevalent, but represent about a quarter of the street trees. In the Heights, Bradford Pears predominate in a similar ratio. Note that the invasive species Norway Maple appears in significant numbers in all three areas. Street trees on the two major thoroughfares are in generally good health. However, the trees falling into the Poor-to-Fair categories total 43.6% of the Heights street trees and 53.9% of the Extension's.

Species	West Collingswood Heights		West Collingswood Extension		Crystal Lake/ Park Blvd:			
	Trees	%	Trees	%	Trees	%		
Bradford Pear	45	23.9%	Pin Oak	45	23.3%	Pin Oak	30	50.0%
Pin Oak	28	14.9%	Unknown	31	16.1%	Bradford	9	15.0%

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	Unknown	20	10.6%	Norway Maple	27	14.0%	Pear	Unknown	9	15.0%
	Norway Maple	17	9.0%	Bradford Pear	25	13.0%	Norway Maple	Norway Maple	7	11.7%
	Silver Maple	14	7.4%	American Sycamore	25	13.0%	Silver Maple	Silver Maple	3	5.0%
	Sugar Maple	12	6.4%	Silver Maple	16	8.3%	Red Maple	Red Maple	2	3.3%
	Red Maple	11	5.9%	Locust	5	2.6%				
	American Elm	8	4.3%	Zelkova	3	1.6%				
	Cherry	8	4.3%	Cherry	4	2.1%				
	Sweetgum	5	2.7%	Hickory	3	1.6%				
	American Sycamore	4	2.1%	Kentucky Coffeetree	2	1.0%				
	White Oak	3	1.6%	White Ash	2	1.0%				
	Maple	3	1.6%	Green Ash	2	1.0%				
	Zelkova	2	1.1%	Scarlet Oak	1	0.5%				
	Scarlet Oak	2	1.1%	Red Oak	1	0.5%				
	Green Ash	2	1.1%	Red Maple	1	0.5%				
	Weeping Willow	1	0.5%							
	Poplar	1	0.5%							
	Cleveland Pear	1	0.5%							
	Red Oak	1	0.5%							
<b>Health</b>	Poor Health	7	3.7%	Poor Health	7	3.6%	Poor Health	Poor Health	1	1.7%
	Fair Health	75	39.9%	Fair Health	97	50.3%	Fair Health	Fair Health	12	20.0%
	Good Health	98	52.1%	Good Health	83	43.0%	Good Health	Good Health	40	66.7%
	Excellent Health	8	4.3%	Excellent Health	6	3.1%	Excellent Health	Excellent Health	7	11.7%
<b>Height</b>	< 25' Tall	49	26.1%	< 25' Tall	44	22.8%	< 25' Tall	< 25' Tall	7	11.7%
	25' - 45' Tall	48	25.5%	25' - 45' Tall	55	28.5%	25' - 45' Tall	25' - 45' Tall	15	25.0%
	> 45' Tall	91	48.4%	> 45' Tall	94	48.7%	> 45' Tall	> 45' Tall	38	63.3%
<b>Total Trees</b>		<b>188</b>			<b>193</b>			<b>60</b>		

Table 10.3.2. Summary characteristics of trees in Township tree inventory.

The Environmental Commission plans to extend the tree inventory to the remaining areas of the Township as resources permit.

## 11. Animal Species

Forest fragmentation is a serious threat to many animal species in New Jersey and throughout the more densely populated areas of the Northeast. Fragmentation refers to the reduction of large patches of intact forest (by development) into many smaller patches with comparatively high amounts of edge. Saddler's Woods is approximately 27 acres in area and is a vital piece of habitat in the highly developed region surrounding Philadelphia. The tract boasts a remarkable 69 species of birds. This diversity is due to the relatively large core to edge ratio which favors interior-adapted species such as songbirds like vireos and warblers, making them less vulnerable to predators and brood parasitism by cowbirds. Following are tables of animal species identified within Saddler's Woods.

<b>Birds (non-warblers) 54 species</b>	
Acadian Flycatcher	Northern Flicker
American Crow	Northern Mockingbird
American Goldfinch	Northern Oriole
American Robin	PeeWee
Black Capped Chickadee	Piliated Woodpecker
Blue Jay	Purple Finch
Brown Creeper	Red Breasted Nutchatch
Brown Headed Cowbird	Red Bellied Woodpecker
Cardinal	Red Eyed Vireo
Carolina Wren	Red Shouldered Hawk
Cedar Waxwing	Red Tail Hawk
Chimney Swift	Red Wing Blackbird
Chipping Sparrow	Rock Dove
Common Grackle	Rose breasted Grosbeak
Cooper's Hawk	Rufous Sided Towhee
Downy Woodpecker	Ruby Crowned Kinglet
European Starling	Scarlet Tanager
Eastern Kingbird	Song Sparrow
Eastern Screech Owl	Tree Swallow
Gray Catbird	Tufted Titmouse
Great Horned Owl	Turkey vulture
Great Crested Flycatcher	Veery
Hairy Woodpecker	White Breasted nuthatch
House Finch	White throated sparrow
House Sparrow	Winter Wren
Junco	Wood Thrush
Mourning Dove	Yellow bellied sapsucker

Table 11.1 Bird species identified within Saddler's Woods. Source: Maggi Downham and Janet Goehner – Jacobs, Saddler's Woods Conservation Association.

<b>Warblers (15 species)</b>	
Bay Breasted Warbler	Myrtle Warbler
Black And White Warbler	Northern Parula Warbler
Blackpoll Warbler	Oven Bird
Black Throated blue Warbler	Palm Warbler
Canada Warbler	Wilson's Warbler
Chestnut Sided Warbler	Yellow Rumped Warbler

Common Yellowthroat Warbler	Yellow Warbler
Magnolia	

Table 11.2 Bird species (warblers) identified within Saddler's Woods. Source: Maggi Downham and Janet Goehner – Jacobs, Saddler's Woods Conservation Association.

<b><i>Insects (29 species)</i></b>	
American Tent Caterpillar	Forest Wolf Spider
Bark Beetle	Goldsmith Beetle
Black flies	Green Grasshopper
Carolina Praying Mantis	Ground bees
Chinese Praying Mantis	Honey bees
Cicada	Katydid
Cicada Killer	Lady bug
Centipede	Metaphid Jumping Spider
Crickets	Pennsylvania Firefly
Carrion beetle	Red flat bark beetle
Cylindrical Hardwood Borer	Red tailed bumble bee
Common black Ground beetle	Tiger Mosquito
Divergent Metallic Wood borer	Fungus gnats
Eastern Daddy-Long legs	Yellow Jackets
Eastsern Wood Tick	

Table 11.3 Insect species identified within Saddler's Woods. Source: Maggi Downham and Janet Goehner – Jacobs, Saddler's Woods Conservation Association.

<b><i>Butterflies and Moths (19 species)</i></b>	
Black swallowtail	Mourning cloak butterfly
Cabbage white	Polyphemus moth
Clouded sulpher	Red admiral
Eastern Comma	Silver spotted skipper
Gypsy Moth	Small Copper
Hackberry Butterfly	Spice bush swallowtail
Harvester	Spring Azure
Hickory Hairstreak	Tiger swallowtail
Isabella tiger moth	Virginian Tiger Moth
Monarch	

Table 11.4 Butterfly species identified within Saddler's Woods. Source: Maggi Downham and Janet Goehner – Jacobs, Saddler's Woods Conservation Association.

<b><i>Mammals (12 species)</i></b>	
Big Brown bat	Raccoon
Eastern chipmunk	Red fox
Eastern cottontail rabbit	Short tailed shrew
Eastern Spotted Skunk	Virginia opossum
Gray squirrel	White footed mouse
Muskrat	Woodland Vole

Table 11.5 Mammal species identified within Saddler's Woods. Source: Maggi Downham and Janet Goehner – Jacobs, Saddler's Woods Conservation Association.

<b>Reptiles and Amphibians (7 species)</b>	
Bullfrog	Eastern box turtle
Common garter snake	Rat snake
Green tree snake	Wood turtle
Eastern red backed salamander	

Table 11.6 Reptile and amphibian species identified within Saddler's Woods. Source: Maggi Downham and Janet Goehner – Jacobs, Saddler's Woods Conservation Association.

Janet Goehner – Jacobs also monitors animal species in and around Newton Lake has compiled the following list of sightings.

<b>Birds (21 species)</b>	
American coot	Green winged teal
Bald eagle	Hooded merganser
Belted kingfisher	Mallard duck
Black crowned night heron	Peregrine falcon
Brant	Red shouldered hawk
Canada goose	Red tail hawk
Common merganser	Ring necked duck
Cooper's hawk	Snow goose & snow goose blue phase
Great blue heron	Turkey vulture
Great white egret	Wood duck
Green heron	

Table 11.7 Bird species identified in and around Newton Lake. Source: Janet Goehner – Jacobs

<b>Reptiles and Amphibians (5 species)</b>	
Bullfrog	Snapping turtle
Crayfish	Wood urtle
Red-eared slider turtle	

Table 11.8 Reptile and amphibian species identified in and around Newton Lake. Source: Janet Goehner – Jacobs

## 12. Known Contaminated Sites

The New Jersey Department of Environmental Protection maintains a list of Known Contaminated Sites where contamination of soil, surface water or groundwater has either been identified or is suspected. Typical sites include gas stations with leaking underground fuel tanks, abandoned warehouses, manufacturing facilities, processing plants or landfills. Sites are ranked with a remedial level of increasing severity and complexity from B, C1, C2, C3, or D. Code D sites are usually designated as Superfund sites by the U.S. EPA (see Table 3.1.2).

Of the 587 Camden County sites listed on the 2001 NJ DEP Known Contaminated Sites List, 22 sites fall directly within Haddon Township. An additional six sites are located within 100 feet of the boundaries of Haddon Township (Figure 12.1 and Table 12.1). The 100-foot buffer was used in order not to exclude sites located on the boundary between Haddon Township and another municipality. A search of the EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) showed no National Priority List sites within Haddon Township, as of May 2004.

When viewing GIS maps of contaminated sites it is important to note that these sites are stored as points having no area. A particular point may represent a GPS position fix or a more approximate estimate of the location based on a GIS interpolation of the site's street address against an address range for a particular city block (i.e., an address match). Therefore GIS site locations may not represent the precise area of the actual contaminated soil, groundwater, etc., but rather the approximate location of the property where the contamination occurred. Additionally, many of these sites may have been remediated since the data were originally published. For more information, see the metadata files included with the digital data accompanying this report, or follow this link:

<http://www.state.nj.us/dep/gis/digidownload/metadata/statewide/kcsl2001.htm>

This reference also lists the agencies overseeing site remediation/cleanup and includes contact information for current site status.

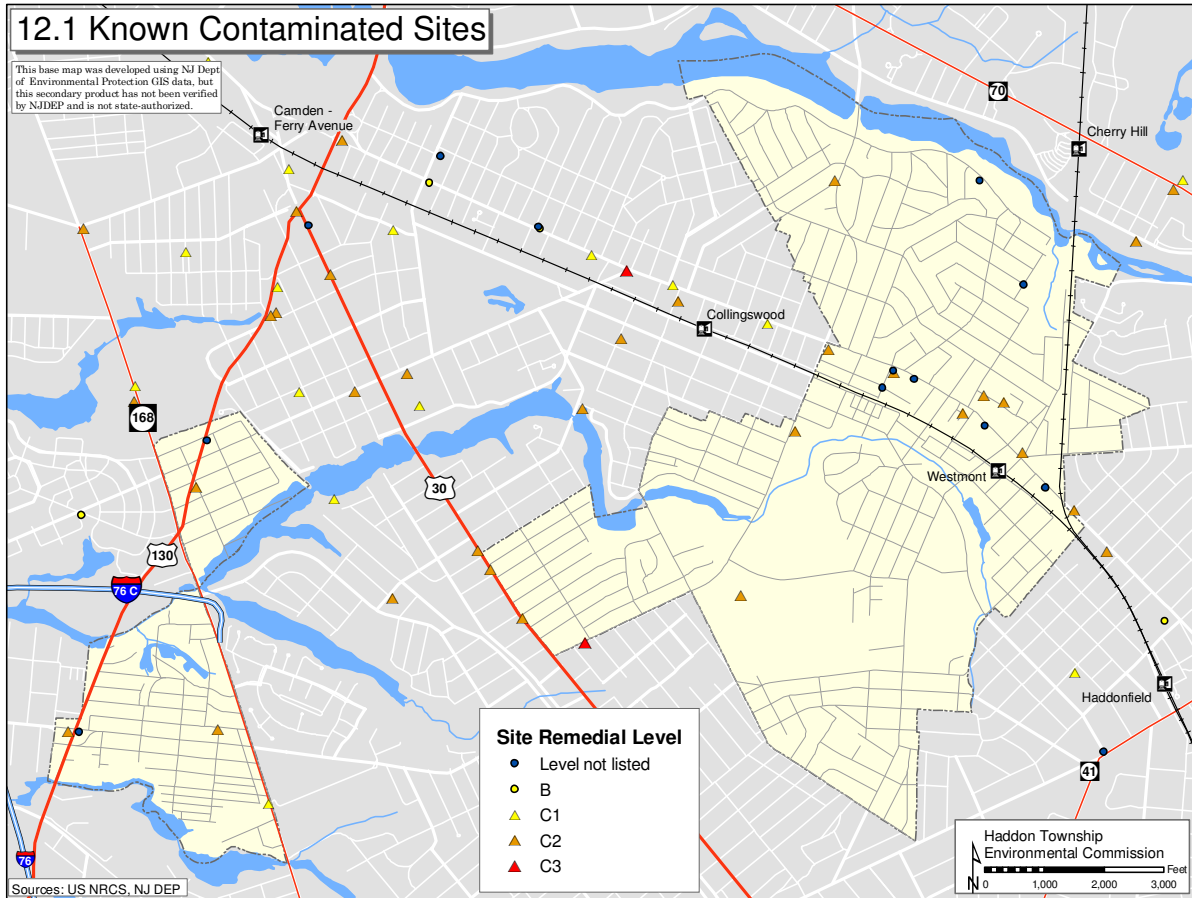


Figure 12.1 NJ DEP Known Contaminated Sites falling within or near Haddon Township.



Haddon Township Environmental Resource Inventory/February 2007

Site ID	Name	Address	City	Status	Lead Agency	Remedial Level
NJL800534018	816 Blackhorse Pike	816 Blackhorse Pk	Haddon Twp	Active	BFO-S	C1
NJL600038350	Dilisio Sons	Haddon & Albertson Aves	Haddon Twp	Active	BUST	C2
NJL600186928	A M Brown Fuel Company	310 Cuthbert Blvd	Haddon Twp	Pending	BFMCR	C2
NJL800136400	316 Cuthbert Boulevard	316 Cuthbert Blvd	Haddon Twp	NFA-A	BFO-S	C2
NJD982739500	Wing Corporation	215 Highland Ave	Haddon Twp	Pending	BFO-CA	C2
NJL600040372	Mobil Service Station Haddon Twp	2 Haddon Ave & Cuthbert Blvd	Haddon Twp	Active	BUST	C2
NJD986596047	Shell Service Station Haddon Twp	309 Haddon Ave	Haddon Twp	Active	BUST	C2
NJL600141865	Morgan Brothers	288 Highland Ave	Haddon Twp	Active	BUST	C2
NJL800012692	Westmont Plaza	404 Cuthbert Blvd W	Haddon Twp	Active	BFO-S	C2
NJL800563868	111 Marlboro Avenue	111 Marlboro Ave	Haddon Twp	Active	BFO-S	C2
NJL800060139	Service Station Haddon Twp	Rte 130 & Grant Ave	Haddon Twp	Active	BFO-IN	
NJL800242075	Poppa John Pizza	104 Haddon Ave	Haddon Twp	Pending	BFO-S	
NJL800413411	3 Albertson Avenue	3 Albertson Ave	Haddon Twp	Active	BFO-S	
NJL800464851	60 Albertson Avenue	60 Albertson Ave	Haddon Twp	Pending	BUST	
NJL800528176	700 Park Dr S	700 Park Dr S	Haddon Twp	Active	CEHA	
NJL800566614	Exxon Service Station	341 Haddon Ave	Haddon Twp	Active	BUST	
NJL800574857	Mobil Service Station Haddon Twp	Rte 130 & Nicholson Rd	Haddon Twp	Active	BUST	
NJL800607863	Amoco Service Station Haddon Twp	229 Haddon Ave	Haddon Twp	Active	BUST	
NJD982796211	Suburban Paving	100 Cuthbert Blvd	Audubon Boro	Active	BCM	C3
NJL600137756	Pauls Service Center	Haddon Rd & Center Ave	Berlin	Pending	BFMCR	C2
NJD982279499	Shell Service Station Gloucester City	Crescent Blvd & Nicholson Rd	Gloucester City	Active	BUST	C2
NJL800377541	Haddon Dpw Yard	504 Oneida Ave	Haddon Heights	Active	BUST	
NJD002495455	Hutchinson Plumbing	701 Haddon Ave	Haddonfield	Nfa-A	BUST	C2
NJL800567521	33 W Holly Ave	33 Holly Ave W	Oaklyn	Active	CEHA	C2
NJL600261846	Texaco Service Station Oaklyn	600 White Horse Pk	Oaklyn	Pending	BFO-S	C2
NJD986606366	Amoco Service Station Pennsauken	7955 Crescent Blvd	Pennsauken	Active	BUST	C2

Table 12.1 Known Contaminated Sites within Haddon Township and within 100' of the municipal boundaries.

Remedial Level	Description
B	Emergency response, simple removal activities of contaminants usually no impact to soil or GW
C1	Simple sites one or two contaminants localized to soil and the immediate spill or discharge area
C2	More complicated contaminant discharges, multiple site spills and discharges, more than one contaminant, with both soil and GW impacted or threatened
C3	High complexity and threatening sites. Multiple contaminants some at high concentrations with unknown sources continuing to impact soils, GW and possibly surface waters and potable water resources. Dangerous for direct contact with contaminated soils.
D	Same conditions as C3 except that D levels are also usually designated Federal "Superfund Sites"

Table 12.2 Remedial levels based on NJ DEP Site Remediation Program's 1989 Case Assignment Manual.

### 13. Noise

A frequent quality of life complaint of Haddon Township residents is the noise created by regular over flights of commercial air traffic on approach to Philadelphia International Airport. Figure 13.1 shows that Haddon Township is in near perfect alignment with the main landing runway. Though the airport is approximately a 12-mile/20-minute drive, the West Collingswood Heights section of the Township is only 6.4 air miles from the end of the nearest runway. A proposed airport lengthening of the airport's north south runway could possibly exacerbate this problem though FAA spokespersons deny that there will be a significant increase in noise levels.

Additionally, traffic noise as well as exhaust impacts residences near major thoroughfares such as the White Horse Pike, Johnson Avenue, Cuthbert Boulevard, MacArthur Boulevard and Haddon Avenue. Sources of noise and exhaust are school busses, 18 wheel trucks, NJ Transit busses as well as commuter traffic.

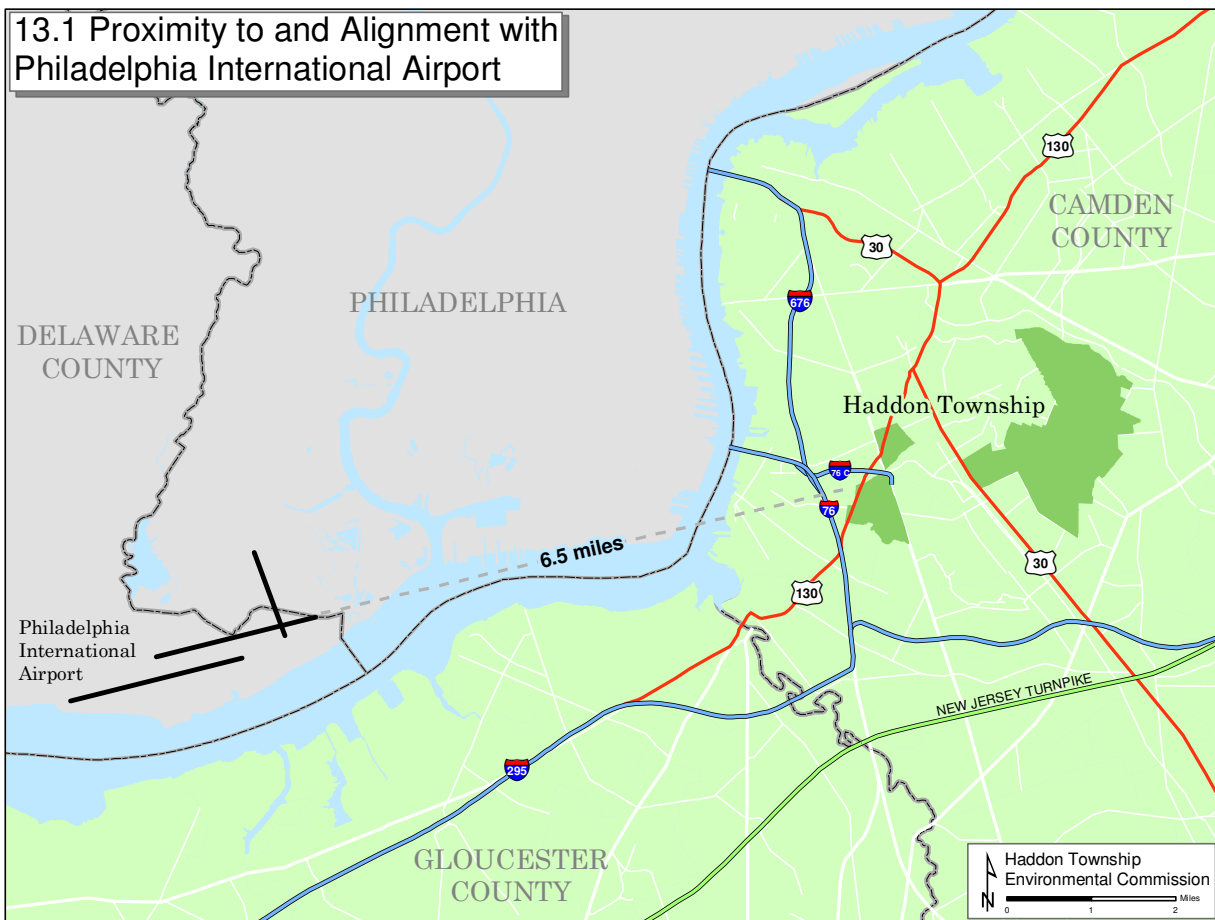


Figure 13.1 Haddon Township's proximity to and alignment with landing runways at Philadelphia International Airport.

## 14. Haddon Township ERI Phase II<sup>2</sup>

The cartographer's lament is that every map becomes obsolete the moment that it is printed. Due to this static nature of geographic data, an Environmental Resource Inventory should exist as a living document. It should be updated periodically as new data become available, and as conditions within the community and the needs of its residents change.

Land use/land cover is a prime example of a dynamic map feature, especially in New Jersey. The last available land use data (including that used in this report) were based on 1995-1997 aerial photography. NJ DEP now has 2002 aerial photography coverage of the entire state and updated land use land cover data based on this flight may be available in the future.

Water quality and flow is continually in flux, both due to natural influences (e.g., temperature/seasonal/evapotranspiration cycles) and human impacts (e.g., additional development/impervious coverage in a watershed) and should be monitored to identify changes from baseline data. Related to stream flow is the delineation of flood prone areas. If there are significant additions of impervious coverage (e.g., parking lots, strip malls, etc.) or forest loss within a watershed, areas downstream may become more susceptible to flooding. Therefore updated FEMA flood maps (in either paper or digital format) should be included as soon as they are available.

In addition to periodic updates of the existing data/material addressed in this document, there are a number of items that should be added in Phase II of Haddon Township's ERI. Following are some additional suggested topics of concern:

1. Items not covered in this document
  - a. History of Haddon Township
  - b. Air quality
  - c. Historic sites
  - d. Critical environmental areas
    - i. Some elements (wetlands, steep slopes, etc.) have been addressed separately within this document
  - e. Shade tree inventory
2. Items to be expanded
  - a. Geology
  - b. Soils
    - i. An discussion of the characteristics of the Freehold, Downer, and Howell soil series
  - c. Water quality indicators for major streams
    - i. Base levels
    - ii. Macroinvertebrate surveys (water bug counts)
  - d. Infrastructure
    - i. Water and sewer lines
3. Items for periodic update (as new data are published)
  - a. Land use
  - b. Flood prone areas
  - c. Known contaminated sites

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<sup>2</sup> Section written June 2005.