

**Radnor Township, Delaware County, Pennsylvania**

# RADNOR TOWNSHIP COMPREHENSIVE PLAN



2003



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LANDSCAPE ARCHITECTURE

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## SECTION 1 INTRODUCTION

The planning theme, *Making a Great Community Even Better*, at first blush almost sounds Pollyanna-like. In some ways, Radnor is like that, almost too good to be true. The strengths of the Radnor community can be easily seen in its successful residential neighborhoods, some of which span many years. Strengths are there in its wonderful public and private educational institutions, nationally acclaimed and its systems of community parks, recreational areas, and open spaces. Radnor's commerce serves the community, the region, even the world. People move through the community using the region's most sophisticated systems of roads and rails.

At the same time, there are issues that need to be addressed, issues that relate to existing needs as well as to emerging needs resulting from the reality of ever-changing demographic and natural resource and economic forces that refuse to be cast in stone. People grow older. Developing watersheds build out and water quality changes. Highways grow clogged and congested. Radnor is replete with these potent dynamics. Keeping it simply "the way it is" is no easy matter.

Better also means room for improvement. With all of its good fortune, Radnor is not without problems and certainly not without planning challenges. There have been impacts, costs associated with the considerable development that has occurred, including traffic congestion, loss of open space and diminished aesthetic values that go with it, impacts to the community's water resources and related natural systems, and an overall erosion of the quality of life for some residents.

♦ In some places too much has been paved over and developed in ways that create adverse effects which could be avoided. In some very sensitive places perhaps development should have been avoided altogether--should be avoided in the future?

♦ Radnor's extensive roadway network affords excellent vehicular access within the Township and to the region, but often at the cost of poor opportunities for pedestrian and bicycle connections. The lack of non-automobile transportation opportunities often forces residents to rely on the auto for short trips that otherwise might be accomplished via bike or foot, adding to roadway tie-ups. How can pedestrian and bicycle opportunities be enhanced in the Township?

♦ Radnor's excellent roadway network and regional rail connections point to even greater opportunities for the redevelopment of areas in the future as land values increase and these zones become too valuable to support current land uses. How will the Township approach redevelopment of these opportunities *and* enhance the quality of life in the Township?

♦ Although Radnor has made great strides in enhancing the visual environment of the Township through such efforts as the Route 30 "Gateway Initiative," there remains more work to be accomplished. The Township has set high standards for design--how can these standards be reinforced in the new comprehensive plan and in what ways?

♦ Issues of off-campus student housing associated with the Township's many educational institutions is an on-going issue. Additionally, can we ensure that there will be an adequate

supply of moderately priced housing so that new, younger, and diverse residents can make Radnor their home?



◆ There also remain a significant number of multi-acre, old estate properties that have yet to be subdivided. Many of these properties will eventually be developed, although some may be able to be conserved as open space in toto or at least creatively approached with limited development conservation design options. The comprehensive plan should address these remaining multi-acre sites and identify how, if subdivided and developed, they can enhance the environment of the Township. Perhaps strategies like transfer of development rights can even be used to preserve and protect the most outstanding of values and redirect development to sites most suitable and with best access.

◆ The many streams and waterways in the Township, such as Meadowbrook Run, Valley Run, Gulph Creek, and Darby Creek and its many tributaries should be re-examined for the greenway linkages that they can provide and for the environmental benefits they afford the Township. Exciting opportunities are already emerging through the evolving Darby Creek Rivers Conservation Plan (Cahill consultant). These stream valleys often transcend municipal



boundaries, as do the land use concerns of the Township. The comprehensive plan process is an opportunity for Radnor Township to reconnect with its neighbors, now encouraged by the Pennsylvania Municipalities Planning Code.

As good as it is, public and private action in the past has resulted in impacts to the natural resources of the Township. Radnor can do better. There are housing needs. There are transportation problems. Again, Radnor can do better. Businesses in Wayne are on the upswing, and the Town is aglow with rebirth excitement. Still, there is opportunity to build on and improve and make it work even better. Open space and recreation facilities are impressive and exceed standards, but demands on facilities and programs continue to grow. Radnor can do better. Radnor's remarkable array of institutions, both public and private, is literally unsurpassed. But how to keep them resonating positively and productively with the Township and Township neighbors? A wealth of historical and archaeological values abounds everywhere you look, but many of these wonderful old places of such significance are totally unprotected and subject solely to economic decision making. Radnor can do better. That's what this Comprehensive Plan is all about.

Finally, a note is in order regarding sustainability and "...making it even better." Radnor is a community of over 30,000 persons with even more jobs. That's remarkable. Much of this development in this mature, not very large community of about 14 square miles has already occurred. Relatively little new development will occur on undeveloped land (little undeveloped land remains), although re-development will occur, possibly at an accelerating rate. As this process continues, the goal of the comprehensive plan is to amend past practices where they have been ill-conceived and make this highly developed community of residents and businesses as balanced—as sustainable—as possible. Sustainability here is meant to be defined in terms of natural resource systems, as well as human and economic systems. It means keeping the air and water as clean as possible, remediating problems at every opportunity. It means making sure that housing is available for all types of people, for folks with special physical needs and for those with income constraints. It means providing jobs for all types of workers. Radnor, with its many advantages, has the opportunity to achieve a sustainable balance, which escapes so many other communities. Radnor in 2001 is already a great community. The preparation of a new comprehensive plan for Radnor Township is an opportunity to re-establish and strengthen the essential elements of community that have helped Radnor evolve into the sophisticated place that it is today. Through building on its rich history, its abundant natural resources, and the wealth of human capital and social institutions that define Radnor today, a vibrant vision for Radnor's future can be forged. Radnor is a great community that can grow even better!

The comprehensive planning process is Radnor's opportunity to define change--however large and however small--in the next 10, 20, or 30 years. This process, we believe, will be most successful if strategies for the future build on the rich legacy, which has come to define the Radnor community. The founding fathers (and mothers) of the Township recalled their Welch heritage when they ventured into Penn's Woods to boldly plan their new community more than three hundred years ago. In 2001, the Township celebrates its one hundred years as an incorporated Township with the centennial motto "Looking back, moving forward." This is an appropriate theme for the new comprehensive plan--building on the best from the existing community and boldly planning for a new Radnor community.

## SECTION 2 ENVIRONMENTAL & NATURAL RESOURCES

### A. Introduction and Statement of Goals

Radnor Township is blessed with an abundance of natural resources: the geology, soils, vegetation, surface water, and biota provide the foundation for the growth and management of all the Township's assets. Agriculture, recreation, business and commerce, residential land – every use of the land is built upon the distinctive environmental conditions contained in Radnor Township. The Township is almost "built-out;" vacant land is nearly obsolete. The extensive development that has proliferated throughout the Township is testament to its general developability, enjoying the good rock foundations and the good soils that exist. With a few exceptions, even the lesser desirable soils and topographic situations tolerate building from a builder's perspective, provided that certain accommodations are made.

#### 1. Goals and Objectives

As remaining natural resources are threatened by encroaching development and redevelopment situations, the Township is taking a proactive approach. Listed below is the overriding goal that has developed out of the comprehensive planning process, followed by the Objectives necessary to fulfill the goal:

##### Goal

*Protect the Township's vital environmental values, including water resources, wetlands, floodplains and riparian areas, woodlands and important habitat areas, balancing the needs of development with environmental values.*

##### Objectives

- 1. Direct development to areas of minimum environmental sensitivity; prohibit development in areas of heightened sensitivity and value, such as wetlands, floodplains, riparian zones, and steep slopes.*
- 2. Manage water resources, both water quality and water quantity, especially through a program of improved stormwater management.*
- 3. Implement watershed-wide planning principles as developed by the Darby Creek River Conservation Plan and other appropriate watershed planning processes.*
- 4. Work to preserve remaining natural woodlands in the Township through minimum disturbance/minimum maintenance land development techniques, site conservation, and other practices; reinforce tree protection requirements and promote re-vegetation and re-forestation strategies with native species, compatible with sound landscape ecology principles.*

5. *Work to preserve remaining open spaces in the Township, using all direct means such as acquisition, as well as less direct regulatory programs; prioritize those open spaces, taking into account factors such as proximity to wildlife habitat and forage areas, aesthetic values, water resource values, and other factors relating to landscape ecology management.*
6. *Integrate management of noise, artificial light, and odor into the Township's planning and management program.*
7. *Work to protect air quality through mobile source emission strategies developed in the transportation planning element of the comprehensive plan and through integrating transit oriented development and other auto trip reduction strategies into overall planning.*

## **B. Earth Resources**

### **1. Geology**

Radnor Township is comprised primarily of older rock from the Precambrian era (older than 570 million years) and Lower Paleozoic era (430 to 570 million years ago). Weathering and erosion of these rock types has created the surficial land features including the relatively gently rolling topography of Radnor Township. During much of the Paleozoic era (570 to 245 million years ago), the earth's plate tectonic movements forced the ancient landmasses together several times. One of the most significant of these "collisions" occurred 300 million years ago as the eastern margin of North America collided with South America and Africa. The impact uplifted the North American land area – called Pangaea – and produced the Appalachia mountain range, whose 15,000-foot peaks rival the Alps and Himalayan mountains. After the collision, Pangaea began to break up and rift during the Triassic period (245 to 208 million years ago) to create the modern day Atlantic Ocean. Through the subsequent millions of years of intense geologic activity, the Appalachian range underwent vigorous erosion by wind and water, as well as cycles of uplifting and rifting, to create the present geology and landforms within the Township.

#### **Geologic Formations in the Township**

Radnor Township is comprised primarily of ancient crystalline bedrock, along with metamorphic and igneous rocks from the Precambrian period (430 to 570 million years ago). Figure 2-1 depicts the surficial geologic units of the Township and surrounding municipalities. Each rock formation has important properties that influence the local hydrology, topography, soil composition, vegetative association, and landforms found within the Township. Felsic gneiss and Mafic gneiss are metamorphic rock types that cover most of the Township. These formations yield small quantities of water due to the smallness of the cracks, joints, and other openings within the rock. The Wissahickon Formation is a mica schist derived from sandstones and mudstones, and is found in the extreme northern and southern portions of the Township. The Wissahickon Formation is a consolidated rock aquifer and is the highest yielding crystalline aquifer in Delaware County (Balmer and Davis, 1996). Small areas of serpentine rock underlie a small portion of the township. Early in the 19<sup>th</sup> century, the

surrounding region was famous for its serpentine rock quarries. Serpentine stone was easily extracted from the earth and provided building material for many local structures and homes in earlier periods. Serpentine and the minerals associated with this formation produce a sterile and toxic growing environment for crops and plants, hence the name “serpentine barrens.” Serpentine barrens are rare on the east coast and provide habitat for many rare, threatened, and endangered species. Mining and quarrying over the years destroyed much of the serpentine barrens in Radnor and beyond, with continuing sprawling development leading to the consumption of much of the remaining serpentine barrens habitat.

## **2. Physiography**

A *physiographic province* is the expression of bedrock at the surface of the land. As shown in Figure 2-2, Radnor Township lies within the Piedmont Uplands Physiographic Province. The Piedmont is characterized by generally very old and hard upland rocks, which have been deposited from the erosion of the Appalachian Mountains. The Piedmont, meaning “foot of the mountains,” is a region of gently rolling hills, fertile valleys, and well-drained soils. Weathering and erosion of the colossal Appalachian range has produced the rolling topography with deeply incised stream valleys traversing the landscape.

As explained above, tectonic forces and shifting crustal plates followed by millions of years of erosion by wind and water, shaped Radnor Township’s present day topography. In the rolling valleys of Radnor, elevations range from 150 feet above sea level in the northern and central portion of the Township, to 60 feet above sea level in the southern portion of the Township near the confluence of Ithan Creek and Darby Creek. Although elevations are not great in the Township, change in elevation, and therefore steeply sloped areas, can occur, especially in the deeply incised stream valleys which have been cut over the years. The geological history and variability is often revealed in the attractive rock outcroppings which are exposed in these stream valleys.

### **Hydrogeology and Watersheds**

Groundwater is present in and moves in different degrees through cracks, fractures, and voids within the bedrock material in virtually all rock formations in the Township (see discussion in the Water Resources Section). These cracks, fissures, and voids have been caused by weathering over the millennia and are most common closer to the surface; therefore most of this groundwater can be found relatively close to the earth’s surface as well, typically less than 500 feet in depth. As depth increases, rock tends to get “tighter” and weathering and water “opportunities” generally decrease. Although small wells have been developed over the years in Radnor and still exist, none of the geologic formations in the Township yields enough water consistently for large industrial or public supplies because of the inherently low storage capacity of these consolidated rocks (Balmer and Davis, 1996). Streams in the Township generally act as “drains” for the groundwater aquifers, as they are called, with the groundwater continuously discharging by gravity to the surface streams through systems of springs, seeps, wetlands, and other points of discharge (i.e., groundwater creates the stream system).

Figure 2-3 shows the Township in relation to the local and regional Watershed system. About 80 percent of Radnor Township is located in the Darby Creek Watershed, which flows into the Delaware River and includes Little Darby Creek, Ithan Creek, and Meadowbrook Run. The

Little Darby has been residentially developed in lower densities, whereas the Ithan originates in high density Wayne and is buried and channeled in storm sewers down to the vicinity of Meadowbrook and Pembroke Avenues. Meadowbrook Run drains Rosemont/Garrett Hill and a blend of residential, institutional, and other developed uses. To the north, Gulph Creek (about 20 percent of the Township) flows easterly for about three miles through the northern portion of Township and into the Schuylkill River. The watershed divide between the Darby and Gulph/Schuylkill systems roughly follows the alignment of the AMTRAK/Paoli Local between Strafford and Bryn Mawr. These creeks all have cut through the hard rock to form deep Piedmont stream valleys which have considerable planning significance for the Township.



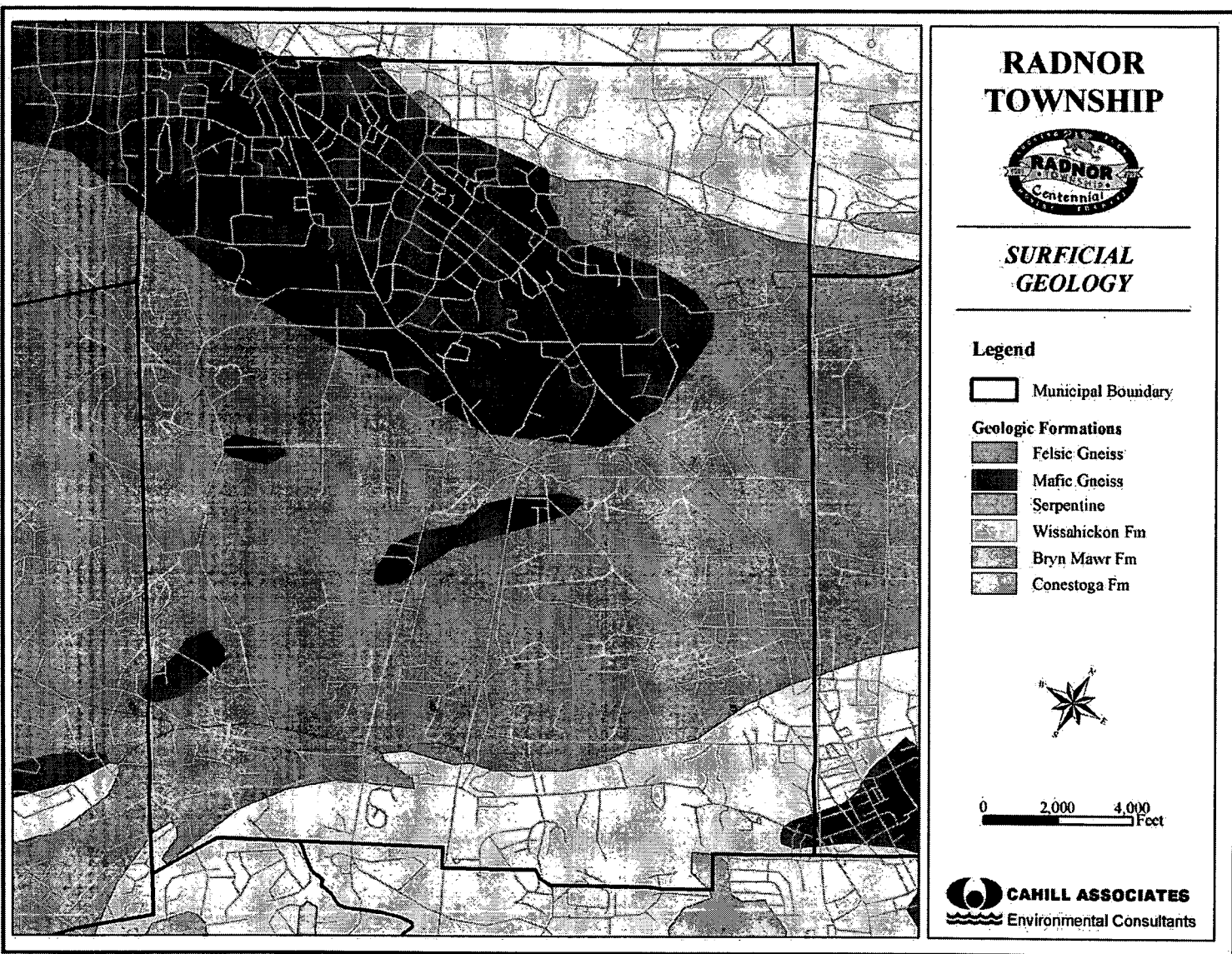


Figure 2-1. USGS Geologic Composition in Radnor Township

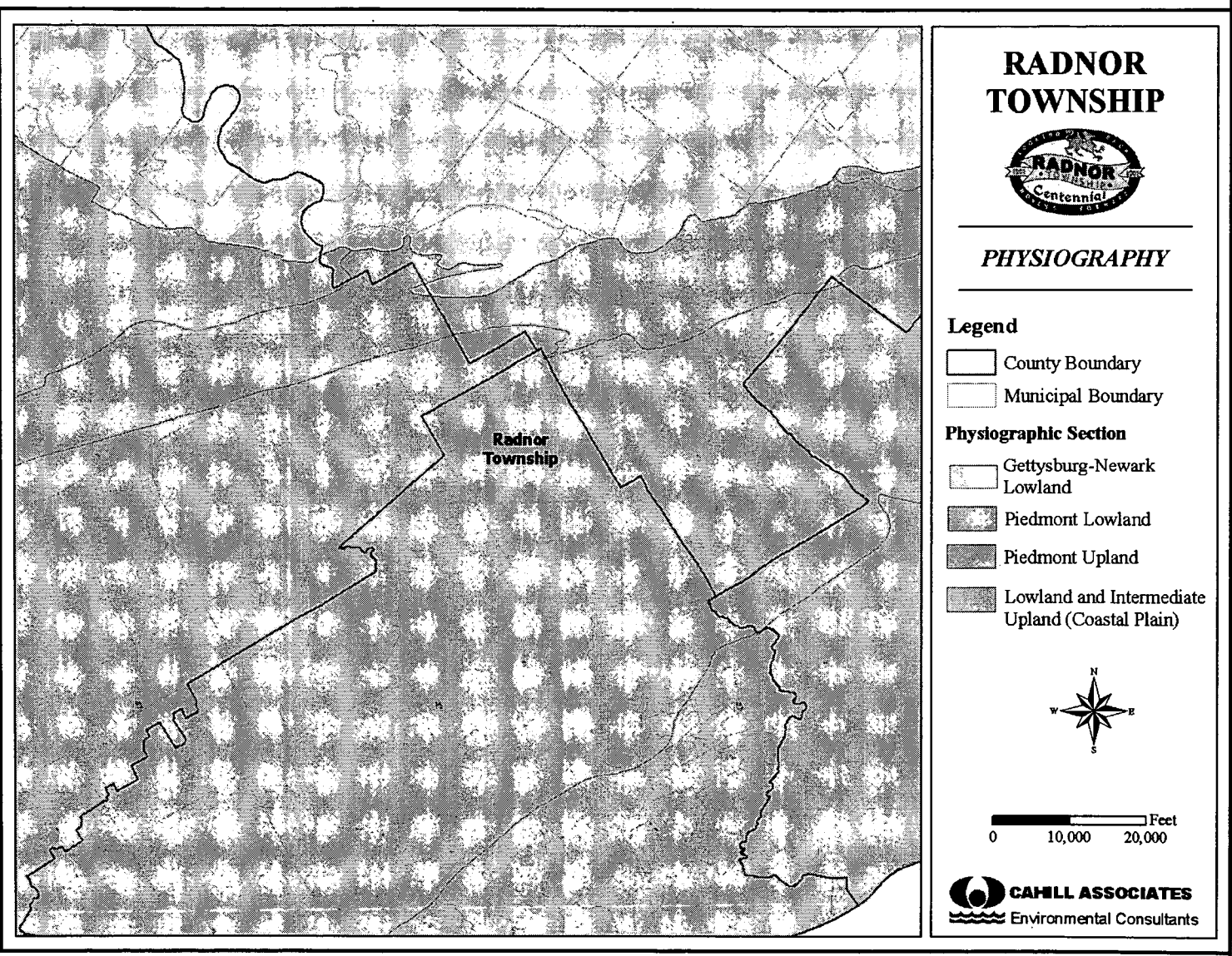


Figure 2-2. Physiographic Provinces for Radnor Township

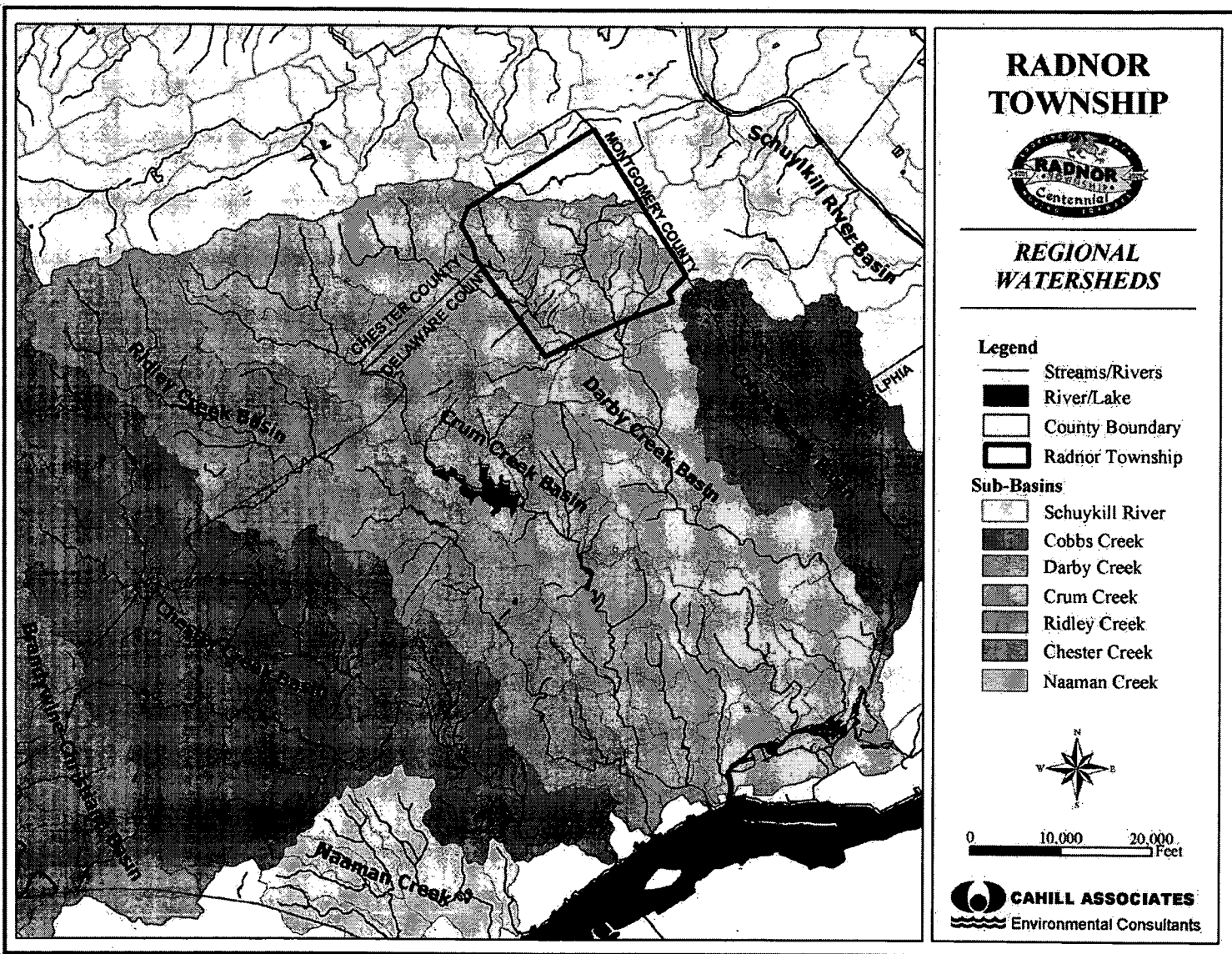


Figure 2-3. Watersheds of Radnor Township and Surrounding Region

### 3. Soil

The soils in the Township, shown in Figure 2-4, reflect the weathering process of the parent bedrock geology. In this Piedmont region, schist, gneiss, and crystalline rock are the predominant bedrock material. The eroded and weathered underlying bedrock gives way to the well-drained silt loam soils that are the majority of the township, including Glenelg and Manor. Both Glenelg and Manor formed in materials weathered from micaceous schist and support native oak and red maple vegetation. Minor series found in the township include Wehadkee, Worsham, Chewacla, and Congaree soil series are “wet” soils that are moderately to poorly drained, occurring in low-lying areas around floodplains and headwaters of streams. They may be either alluvial soils and/or hydric soils. Alluvial soils are defined as those soils that have been deposited over the years by flooding events; alluvial soils can be used as a “proxy” for more detailed floodplain mapping where floodplain mapping has not been undertaken. Hydric soils are those “wet” soils which support hydrophytic or wetland vegetation and may be closely related to wetlands themselves through depth to water table (typically, not all hydric soils are wetlands, but all wetlands are hydric soils). There is a considerable amount of Made Land (also classified as “Urbana”) in the Township, reflecting the significant growth over the years and the substantial cutting and filling, grading, and overall land manipulation and alteration that occurs with traditional development. The areas of Made Land/Urban follow the Route 30 corridor in the northern area of the Township.

#### Hydrologic Soil Groups

The relationship between water resources and land development impacts is expressed by the Hydrologic Soil Group (HSG) classification of the soil series (USDA, 1979; Figure 2-5). HSGs are given a rating, A through D. These HSG ratings describe the physical drainage properties of each soil series, including texture and permeability, as well as certain physiographic properties, such as depth to bedrock and water table. HSG Group A is well drained and highly permeable, in contrast to HSG Group D which is poorly drained and produces much greater runoff. Sand would be an A; heavy clay would be a C or D. The HSG classification is of importance in determining the feasibility of using infiltration or recharge-oriented Best Management Practices for stormwater management, as well as for determining feasibility of land-based wastewater treatment technologies that recycle wastewater effluent (a permeability of 0.5 inches per hour is often considered adequate for infiltration of stormwater or wastewater).

Radnor Township contains mostly B soils. Lowlands along stream valleys typically consist of HSG Groups C and D soils, reflecting an almost constant saturation and poor drainage condition. The Made Land also tends to have relatively poor permeability, though as with C and D groups, require site specific tests to confirm permeability. It is important to note, that many heavy-clayey C soils with poor permeability are capable of natural infiltration when not disturbed and compacted and when a natural vegetative cover is maintained, owing to the added permeability created by mature dense root systems that can make a C quite permeable.

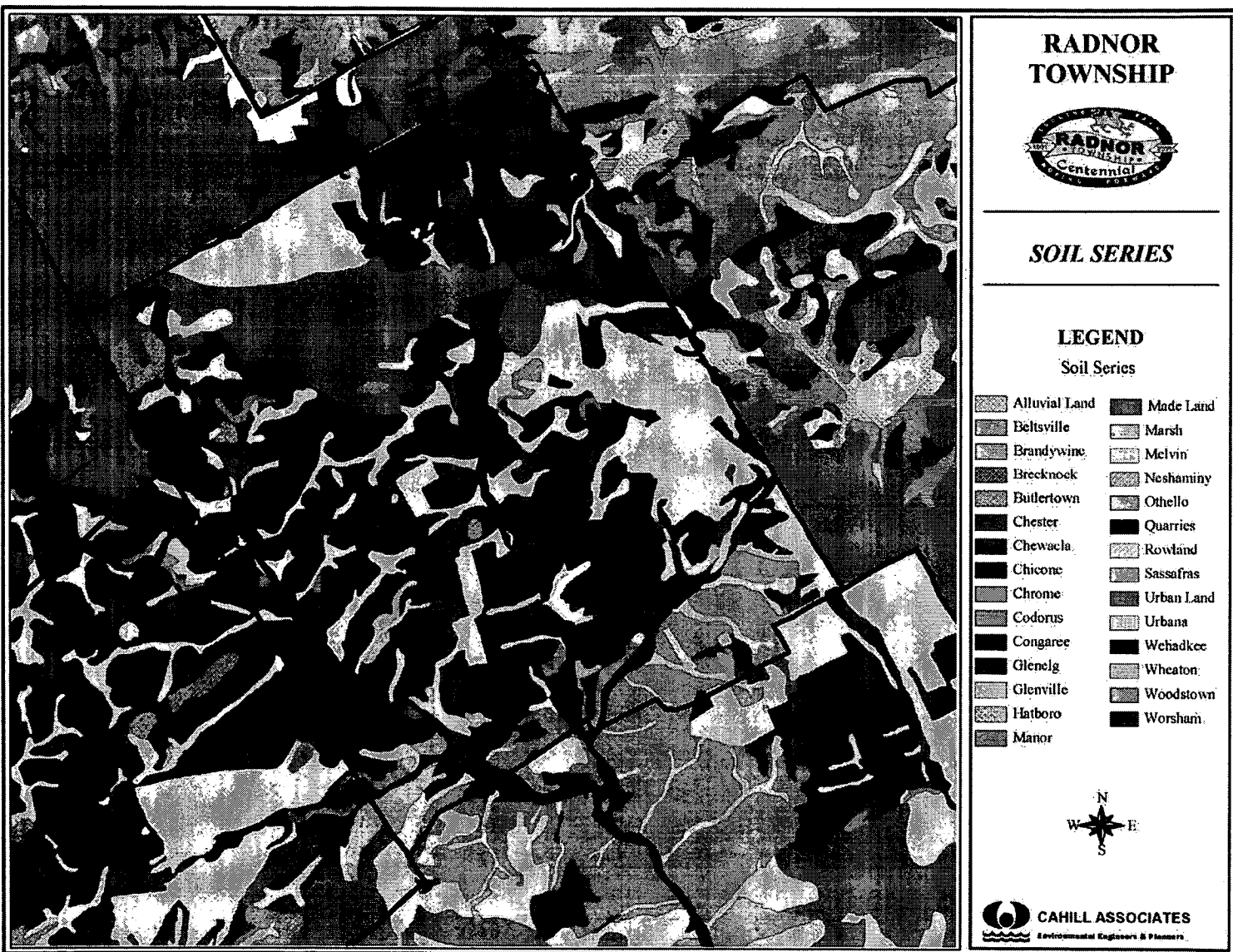


Figure 2-4. Soil Composition within Radnor Township



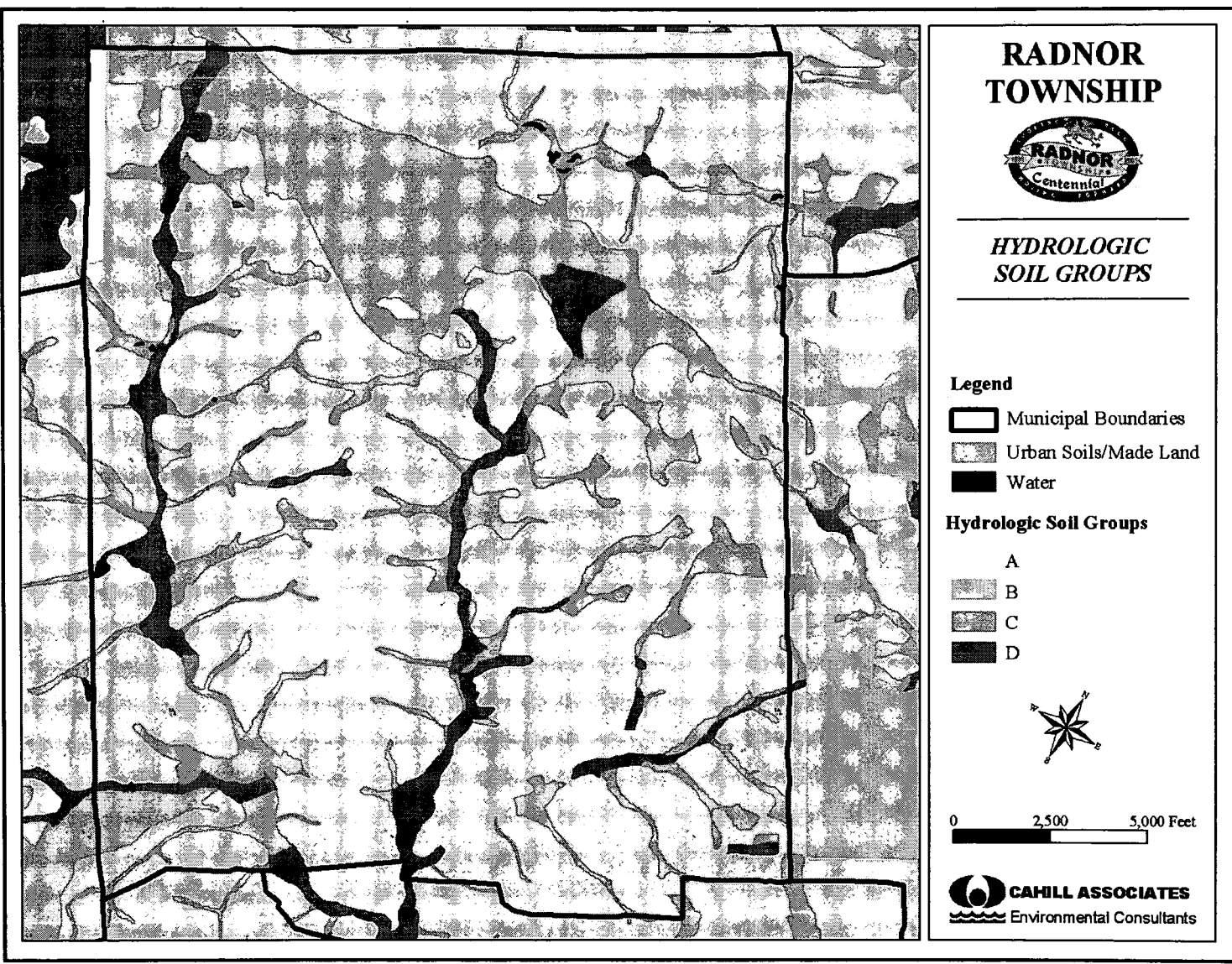


Figure 2-5. Hydrologic Soil Groups within Radnor Township

#### **4. Planning Issues**

Radnor Township is blessed with a relative lack of geological and soil-related constraints. The extensive development which has proliferated throughout the Township is testament to its general developability, enjoying the good rock foundations and the good soil which exist. With a few exceptions, even the lesser desirable soils and topographic situations (i.e., steep slopes) tolerate building from a builder's perspective, provided that certain accommodations are made. However, because these areas are more environmentally sensitive, the adverse impacts from their development are much greater than would occur from less sensitive areas. Therefore negative impacts from their development are greater as well. Development on slopes not only eliminates what might have been positive effects of a natural buffer, but increases runoff and erosion and a host of downstream problems. Development in the floodplain, even when properly floodproofed, eliminates all of the positive environmental benefits resulting from naturally vegetated floodplain areas where flood flows are slowed, retained, filtered, infiltrated, and so forth.

At this point, vacant land is a rare commodity in the Township (see Land Use section for further discussion), though parcels or portions of parcels with building constraints, such as wet soils and steep slopes and floodprone areas, may still remain. Unfortunately, as development pressures mount, the pressures to develop these especially sensitive and highly constrained sites also mount, with developers pressuring local officials to yield to their arguments and approve developments which impact on these most sensitive of resources. Threats to sensitive resources increase. And of course these threats to sensitive lands must be viewed together with the already extensive alterations made to vast areas of the Township, as discussed in the Water Resources and Biotic Resources sections of this Plan. As argued in these sections, the few remaining "islands" of undeveloped land--the very little remaining undisturbed vegetation and soil mantle--are all working double time, triple time and more from a natural resources perspective to counteract the natural system impacts which have already occurred. Their protection is of paramount importance.

## C. Water Resources

### 1. Surface Waters: Streams and Major Tributaries

Radnor Township is fortunate to have a significant amount of surface streams, allowing for many recreation and environmental assets. Figure 2-6 shows a detailed mapping of the existing stream system overlaid with the state-classified sub basins. Comprehensive Plan consultants updated the publicly available GIS stream coverage using the 2000 DVRPC digital aerial orthophotos with a small amount of field reconnaissance. Additional mapping of the surface stream system was necessary for a variety of reasons. First, public stream data is only mapped from US Geological Survey 7.5' quarter quads at a scale of 1" to 200 feet. Accuracy is therefore compromised as many stream segments and tributaries are overlooked. Second, as discussed in detail below, the riparian encroachment analysis required a more accurate stream coverage to assess the impact of a proposed stream buffer ordinance on landowners. Finally, this updated GIS information will be provided to the Township Engineering Department, and through even more accurate GPS field surveys can be updated accordingly for any Township needs.

Table 2-1 lists sub-basin areas and Table 2-2 lists stream lengths by sub-basin. Radnor Township has approximately 35 linear miles of surface streams (data extracted from GIS files). The major streams in the Township include Little Darby Creek, Ithan Creek, Meadowbrook Run, and the Darby Creek itself (all part of the Darby Creek Watershed); Gulph Creek encompasses the northern portion of the Township, flowing into the Schuylkill River. Most (87 percent) of Radnor is in the Darby Creek Watershed, with only 13 percent in the Schuylkill.

**Table 2-1. Radnor Township Watershed and Sub-basin Area**

Sub-Basin Name	Total Sub-basin Area		Sub-basin Area in Township	
	Acres	Sq. Miles	Acres	Sq. Miles
Abrahams Run	203	0.32	203	0.32
Browns Run	216	0.34	216	0.34
Camp Run	166	0.26	166	0.26
Cobbs Creek	3064	4.79	24	0.04
Darby Creek	10808	16.89	755	1.18
Foxes Creek	961	1.50	167	0.26
Gulph Creek	3825	5.98	1516	2.37
Hardings Run	534	0.83	506	0.79
Ithan Creek North	951	1.49	950	1.49
Ithan Creek South	1087	1.70	996	1.56
Julip Run	414	0.65	63	0.10
Kirks Run	314	0.49	314	0.49
Little Darby Creek	1475	2.30	1092	1.71
Meadowbrook Run	1129	1.76	900	1.41
Miles Run	149	0.23	149	0.23
Mill Creek	4510	7.05	132	0.21
Ramsey Run	96	0.15	96	0.15
Valley Run	383	0.60	383	0.60
Wigwam Run	208	0.32	208	0.32
	30493	47.65	8835	13.81

**Table 2-2. Sub-basin Area and Stream length for Radnor Township**

Sub-basin Name	Stream Length, Miles
Abrahams Run	0.97
Browns Run	0.98
Camp Run	0.80
Darby Creek	3.49
Foxes Run	0.74
Gulph Creek	5.69
Hardings Run	2.34
Ithan Creek North	2.09
Ithan Creek South	3.00
Julip Run	0.87
Kirks Run	0.95
Little Darby Creek	4.39
Meadowbrook Run	4.83
Miles Run	0.84
Ramsey Run	0.55
Valley Run	1.24
Wigwam Run	0.84
<b>TOTAL</b>	<b>34.62</b>

### Historic Streams

Figure 2-7 illustrates historical streams, based on a tax map from the mid-19<sup>th</sup> century (approximately 1870). Quick perusal indicates a substantial reduction in the total stream system extent, with many historical streams (see discussion below) no longer being mapped. Although there may be a variety of explanations for the difference between this historical stream mapping and the current mapping, certainly one explanation is that substantial development has reduced infiltration of precipitation into the groundwater aquifers, thereby lowering the water table and reducing stream baseflow. Reduction in stream baseflow, in turn, means that the smallest first-order streams cease flowing. Therefore, the mapping of perennial streams is reduced.

### Buried and Channelized Streams

Though not at all the same issue, another important characteristic of the stream system in the Township is “buried” and channelized streams. An example is shown in Figure 2-8, where the Little Darby Creek flows within a concrete channel. Burial of a stream through piping or other enclosure, though considered to be a viable engineering solution years ago, is now recognized as largely ineffective and environmentally destructive, depriving stream water of essential sunlight, exposure to the atmosphere, and vegetation which transforms, binds up, and neutralizes pollutants. Aquatic habitat, including species feeding and spawning areas, is virtually eliminated. Furthermore, increased runoff velocities and quantities have overtaxed “buried” streams, as has happened in some areas of Radnor Township. Portions of the Ithan Creek have been buried, namely those sections flowing through Wayne (both east and west of Wayne Avenue, both north and south of Lancaster Avenue). Additionally, many portions of streams, including the Ithan, have been channelized, and although the impacts of channelization are not as severe as those of total burial, channelizing also significantly reduces the ecological

functions of the stream. Furthermore, because channelized streams are deprived of streambanks and floodplains where flooding impacts are naturally mitigated, downstream flooding is actually worsened. Stream systems become “flashier” as a result of channelization.

This “out of sight, out of mind” burial, as well as channelization, should be an option of last resort. We should note here that Richard Pinkham’s *Daylighting: New Life for Buried Streams* (Rocky Mountain Institute 2000) provides a useful discussion of the problems relating to buried streams and the benefits accruing to their “liberation” through various daylighting techniques. Where feasible, daylighting strategies should be explored in all those areas in Radnor Township where streams have been buried (see discussions below). Similarly, channelization should also be eliminated in the future wherever possible.

### **Stream Order**

Another important characteristic of the stream system relates to the ordering of the stream system. First order streams are especially important to watershed life because they comprise the largest percentage of the total stream system on a lineal percentage basis. Headwaters are the locations of critical ecological functioning where exchange of energy from land to water occurs most directly and is most ecologically vital. Because flows in these small headwaters are especially small, these first order streams are extremely sensitive and are the first streams to dry up when water levels decline. Figure 2-9 is a map of first order streams in Radnor Township. One can imagine that a mapping of first order historical streams would show considerably larger first order stream watersheds, consistent with the scenario of an overall decline in water quality and aquatic biota with increased development.

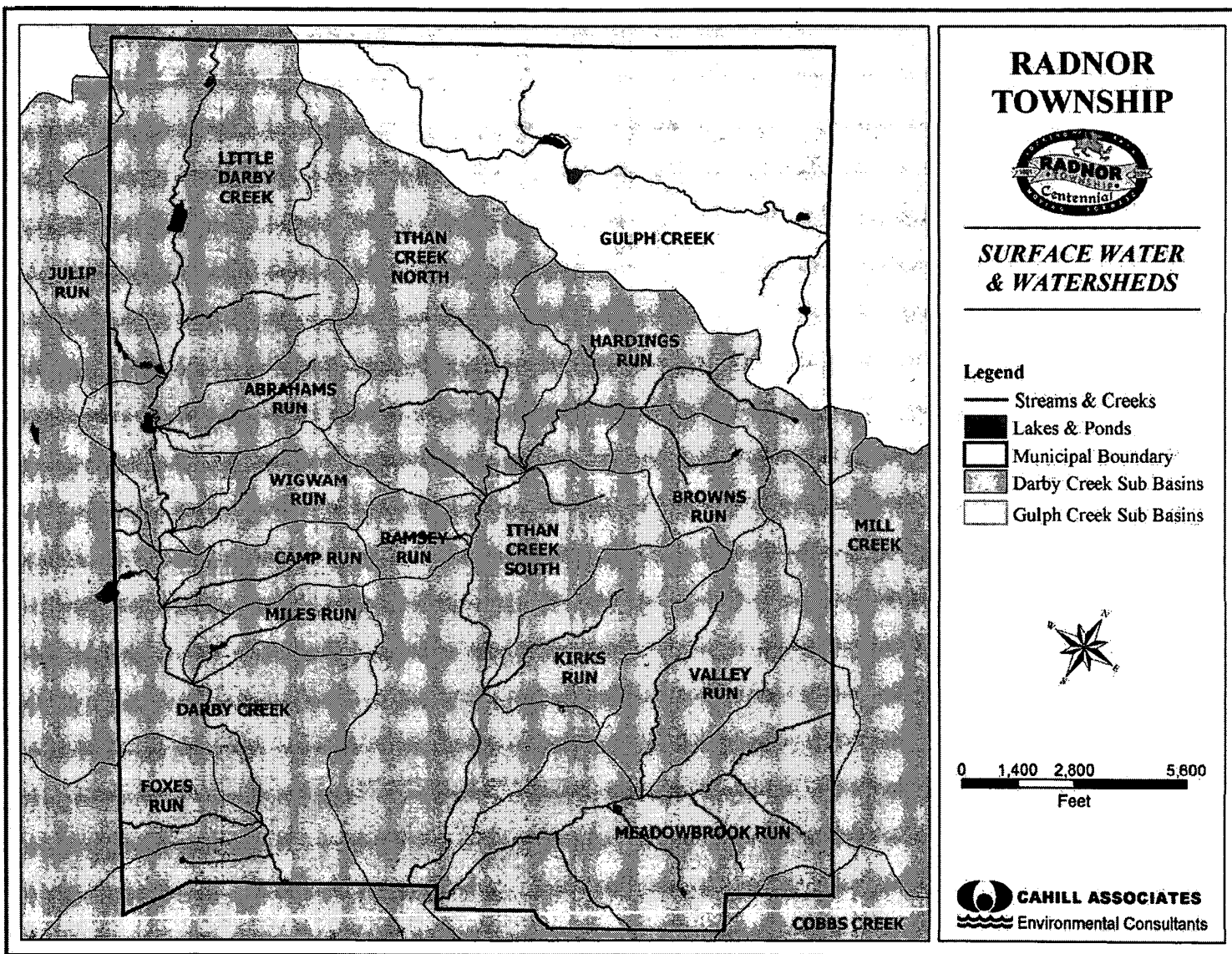


Figure 2-6. Radnor Township Sub Basins, Major Streams, and Tributaries

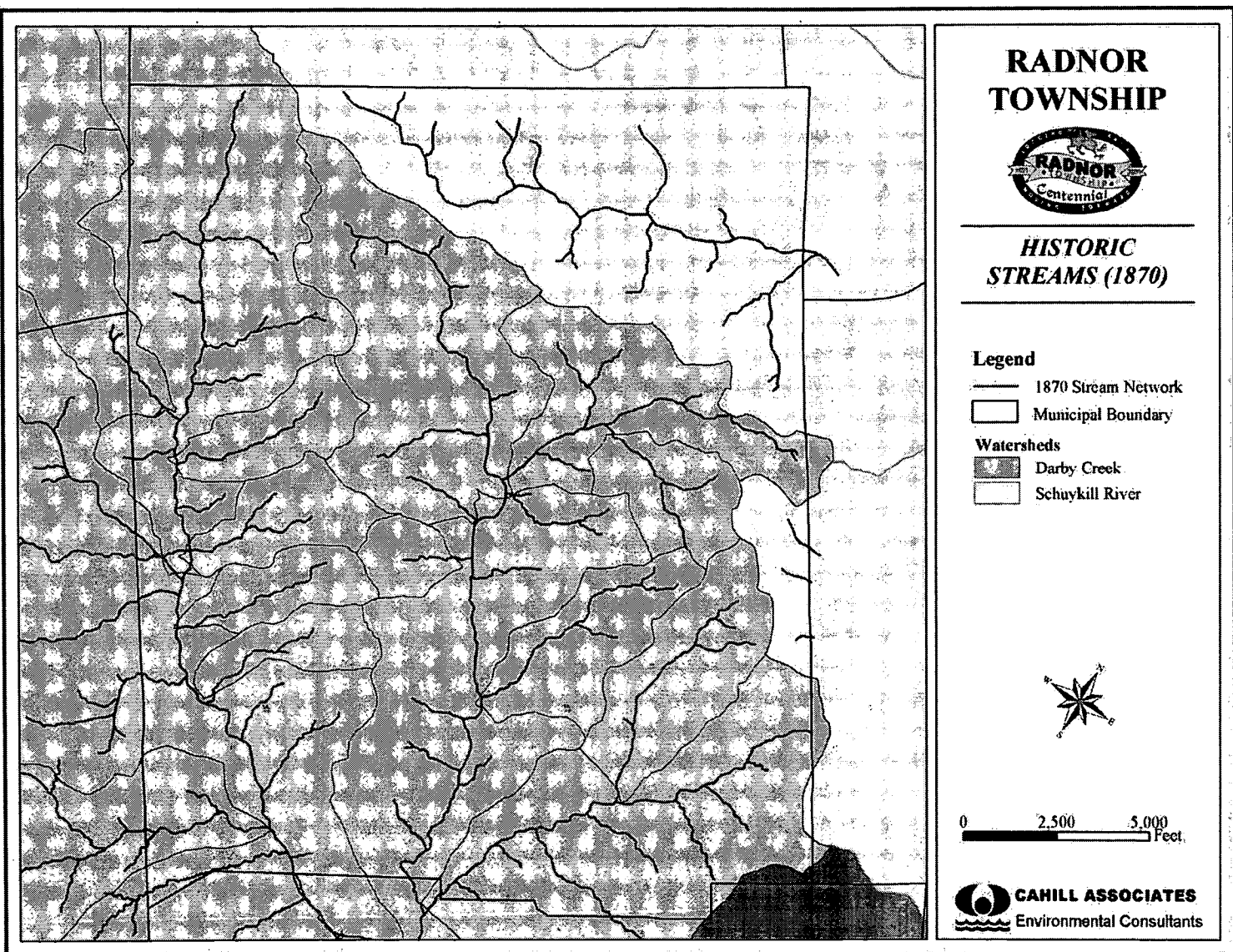


Figure 2-7. Historic Stream Network in Radnor Township based on 1870 mapping



**Figure 2-8. Channelization in the headwaters of Little Darby Creek off Sugartown Road**



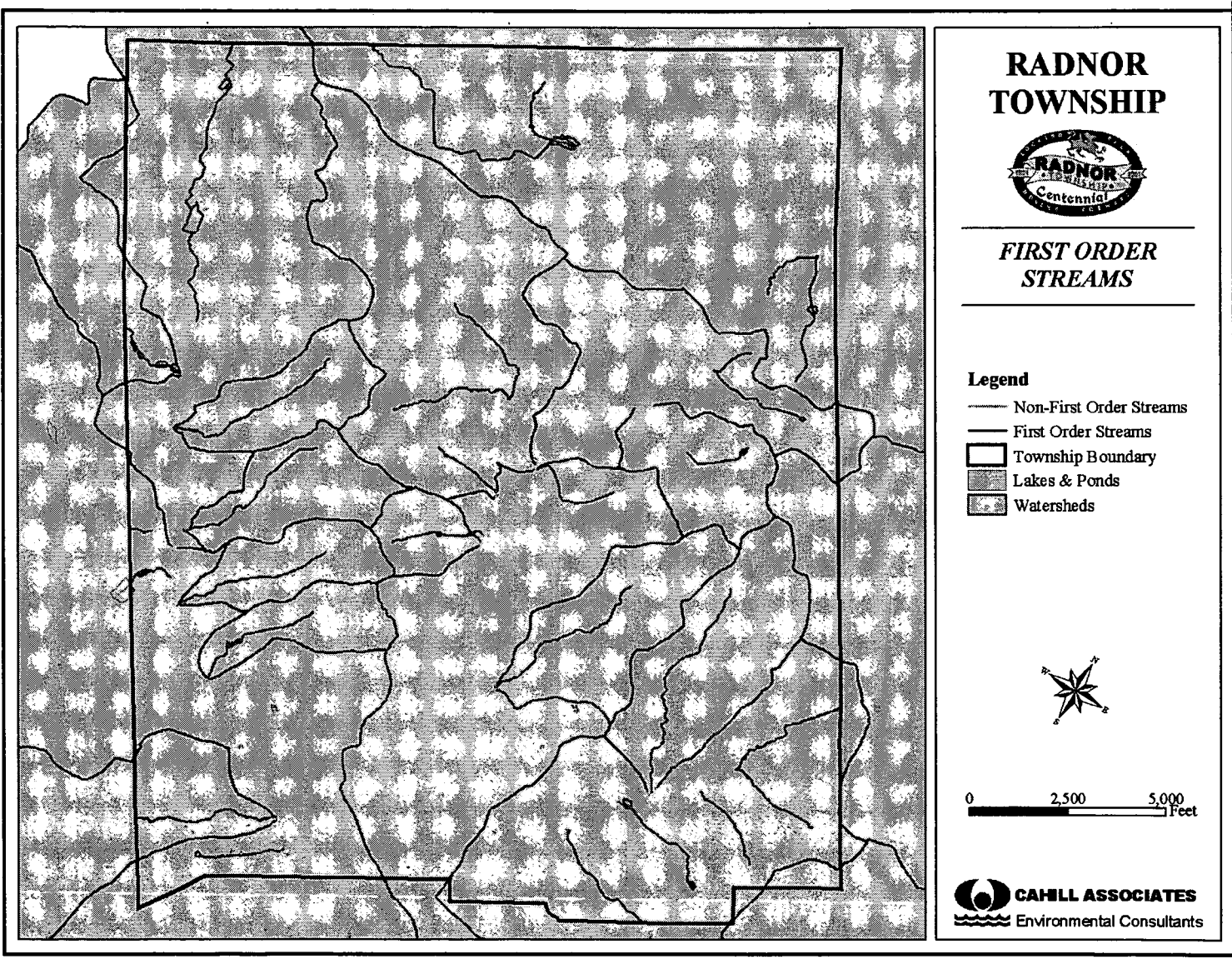


Figure 2-9. First Order Streams in Radnor Township

## **2. Floodplains, Riparian Zones, Riparian Buffers**

Floodplains and the riparian areas buffering streams, rivers, lakes, and other waterbodies are especially sensitive watershed zones. In their naturally vegetated and undisturbed state, floodplains and riparian areas provide critical stormwater management and flood control functions, both in terms of water quantity and water quality. For example, floodplains and riparian areas intercept and reduce unmanaged sheet flow runoff and absorb out of bank flows as storms increase in intensity. Flood flows are slowed, infiltrated into the vegetated floodplain zone, and actually “stored” when the entire watershed system is taken into account. Substantial physical filtering of nonpoint pollutants, especially particulates, occurs as stormwater and flood flows move across and through the vegetated floodplain, and a host of chemical and biological actions are at work both on the surface and in the sub-surface to reduce and convert nonpoint source pollutant loadings. The naturally vegetated floodplain and riparian zone typically provides substantial stream shading through the tree and shrub canopy; overheating of waters is reduced in the summer which is so important for sensitive aquatic species. The vegetation also provides a balanced level of detrital matter such as leaves and twigs which serves as an important food source for aquatic biota. Floodplain and riparian zone vegetation anchors the stream bank and prevents scouring, undercutting, and overall erosion, important to maintain the stream’s morphology, its system of meanders and riffles, and resulting aquatic habitat. Floodplains and riparian areas, when conserved, provide an effective system of greenways linking larger open space masses to support habitat for humans and non-human species. In short, undisturbed floodplains and riparian areas are absolutely essential watershed elements.

It should be noted that although these positive floodplain functions are closely interrelated to the positive functions of the riparian area buffer and in many cases floodplains and riparian areas may physically coincide, they are not necessarily the same area. In many cases, assuming a riparian buffer width of at least 50 to 100 feet or more, the designated floodplain may extend beyond the riparian buffer limit and vice versa, depending upon the upstream-to-downstream watershed location and a host of other factors. In this discussion, floodplain and riparian buffer functions and benefits are treated as one, with the strong recommendation being made that floodplains and riparian areas should be kept in a natural and undisturbed condition without structures and other improvements and without disturbance of the soil mantle and natural vegetation.

Floodplains are shown in Figure 2-10. If we hypothesize an average floodplain/riparian zone width of 75 feet (extending 75 feet on both sides of the stream) and apply this to the entire stream system of Radnor Township, floodplains/riparian zones potentially comprise 595 acres within Radnor (about 7 percent of total Township area). Over the years, development has encroached substantially into floodplains in many places in the Township. Sometimes, as discussed above, this development has resulted in total stream enclosure/burial with virtual elimination of any semblance of the floodplain. Elsewhere, streams have been substantially channelized with structures built into and onto the floodplain. Or substantial fill has been placed within floodplain areas to accommodate parking, roads, and other development elements, resulting in a broad array of floodplain functional impacts. Even the relatively inoffensive clearing of floodplain areas with replacement as lawn and other landscaped areas takes its toll on the important water quality and water quantity functions of the natural floodplain.

Furthermore, although this point has not been well-documented, the substantial alteration in natural hydrology of Radnor's watersheds including the Darby as the result of so much historical development which has increased runoff volumes and decreased infiltration volumes has translated into lower low flows and higher high flows (i.e., worsened flooding), such that the same size rainfall now produces a significantly different stream reaction with worsened flooding downstream. This means that, all else being equal, floodplains are actually expanding in their areal extent, aggravated by all the factors mentioned above as well.

*Floodplain/Riparian Zone Encroached Area Analysis:* Although detailed field inventory and analysis of the existing floodplain and riparian zone has not been undertaken during this comprehensive planning, approximate evaluation of the floodplain and riparian zone condition has been developed by combining the land use data file with the mapping of the Township stream system (Figure 2-11). Existing land use categories that encompass a 75' zone from the stream center, including Recreation, Agriculture, Conservation Easement, and Vacant, were assumed to be natural or relatively natural (a very forgiving and generous assumption; in truth, significant portions of these land use categories also could have been altered from their natural riparian condition). In addition, these uses were assumed to have some sort of existing riparian buffer and/or undeveloped floodplain condition. All other land use categories were assumed to constitute some sort of floodplain/riparian zone encroachment condition. Based on this combination of data layers, the resultant statistics indicate that 348 acres of the Township's total 595 acres of riparian area (about 58 percent) have experienced encroachment by development and are likely to have substantially reduced floodplain and riparian zone functions (again, this could well be a substantial undercount). In sum, substantial portions of the most sensitive and critical riparian zones in the Township have been adversely impacted by development. Clearly, restoration of these areas already impacted is important, and better management of the floodplain and riparian zones should be an important goal for the Township in the future.

Floodplain management in an undeveloped watershed is important, but effective management is especially important in developed watersheds where the benefits of the floodplain and riparian zone take on heightened importance. One problem, as the data indicate, is that much of Radnor Township has been developed before the emergence of either any stormwater management or floodplain regulations, most notably the Federal Emergency Management Agency (FEMA) set of minimum floodplain regulations. Radnor Township has incorporated minimum FEMA standards into its code and ordinances (Radnor like most municipalities has not gone beyond FEMA minimum requirements, although municipalities are constitutionally enabled to enact more rigorous floodplain and riparian zone controls). As a result, any new development project or redevelopment project which involves "substantial improvement" (defined as 50% or more of the market value) must comply with these minimum floodplain standards.

However, two important points need to be made here regarding these minimum FEMA requirements. The minimum FEMA standards themselves are inadequate and allow for substantial floodplain and riparian zone impacts to continue to occur. FEMA standards focus primarily on the protection of life, limb, and property. Although standards have improved in recent years, FEMA standards are not intended statutorily to be a program of floodplain

protection and watershed management. Filling and even structural construction may occur even within the highest risk floodway zone, provided that impacts are not substantial and the lowest habitable floor areas are properly flood-proofed. Furthermore, massive vegetative clearing, soil disturbance, paving, and so forth may occur in the floodplain under the FEMA program. Even more extensive filling is possible in the “flood fringe” portion of the floodplain. These very generous allowances in the existing FEMA regulations explain why development projects continue to be approved within the floodplain and riparian zone in so many areas and why impacts especially in terms of flooding have grown more serious.

Township action over and above FEMA requirements is critical. As challenging and difficult as this might be, rigorous floodplain and riparian zone protection is cost effective and ultimately the wisest course of action in the long run. Development and redevelopment projects must avoid floodplains and riparian zones totally. Rigorous regulations must be enacted so that natural floodplain/riparian zone functions are restored. Though this restoration will take many years, given the current level of impact, benefits will begin to accrue to all Township, not to mention downstream, residents who will also benefit in so many other ways from this floodplain and riparian zone restoration. The Township’s recent efforts to adopt riparian buffer regulations should be reinforced and led to a successful conclusion, using a buffer definition that is both reasonable and sensitive to property rights as well as environmentally rigorous.

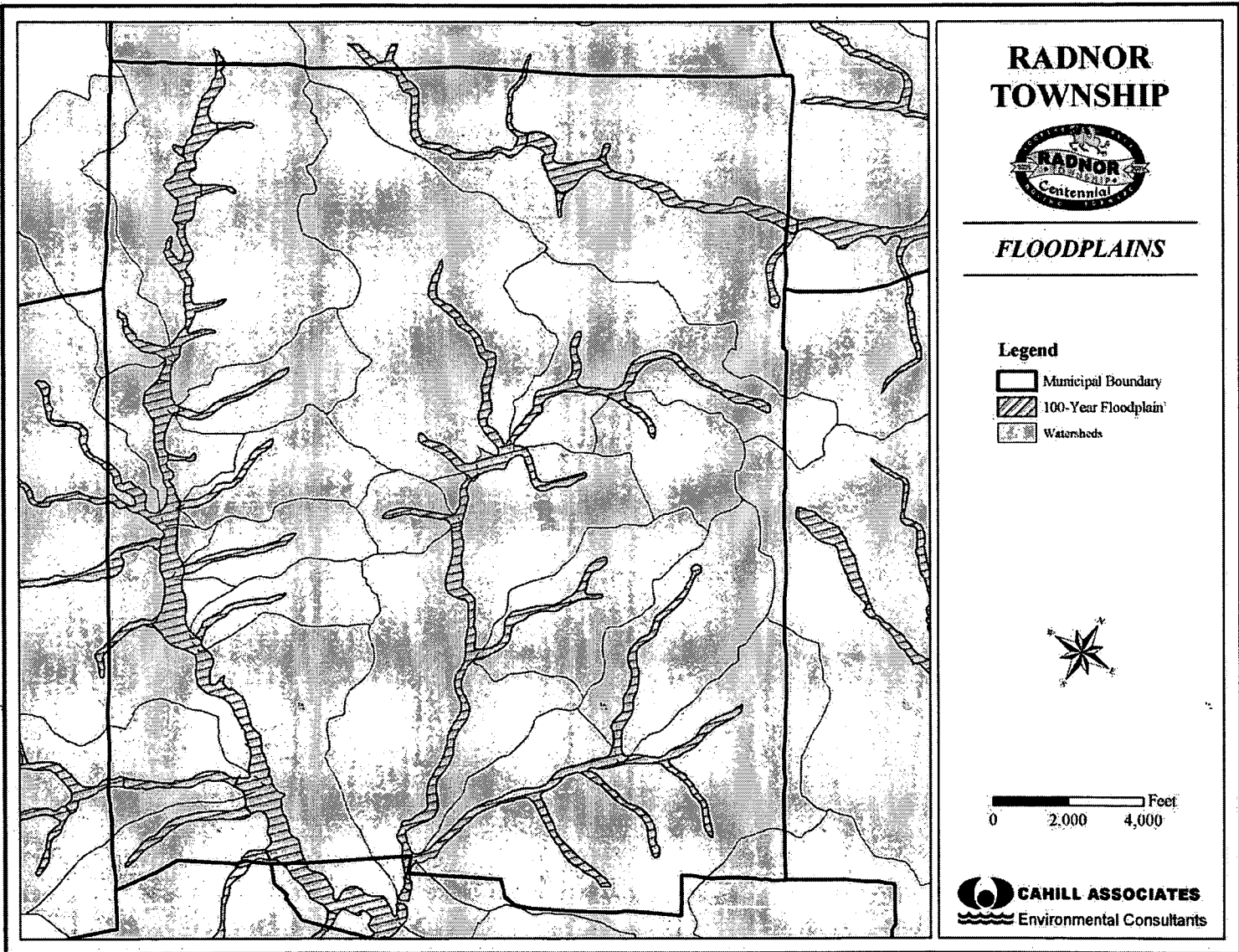


Figure 2-10. Floodplain Areas in Radnor Township

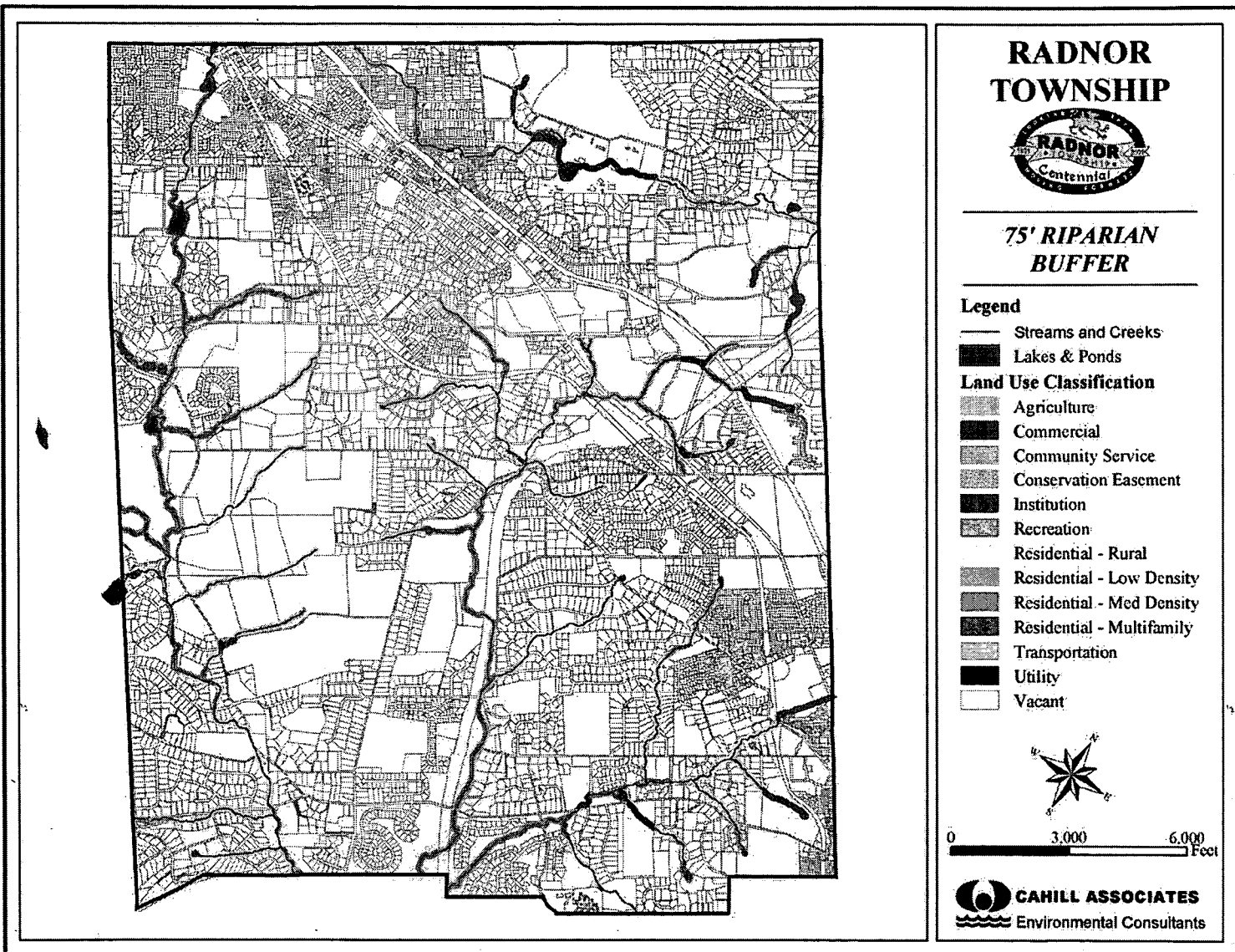


Figure 2-11. Riparian Area Encroachment Analysis in Radnor Township

### **3. Wetlands**

Wetlands are transitional lands between terrestrial and aquatic environments and include lands commonly known as swamps, marshes, and bogs; wetlands can also include areas which may not always have standing water and hydric soils are a strong indicator of wetlands. Wetlands are unique environments which provide critical ecological and overall environmental functions which ultimately have natural, economic, and even social benefits. These functions include water storage, flood water abatement, water quality improvement, provision of vital plant and wildlife habitat (including an inordinate proportion of Pennsylvania's rare, threatened, and endangered species), and groundwater recharge in some cases (in most cases wetlands are zones of groundwater discharge). In terms of Radnor Township, all of these benefits are of importance, though given the existing problems of both water quality and stormwater flooding in the Township, these wetland benefits undoubtedly top the list. Because an unknown quantity of wetlands have been lost to development (i.e., filled) over the years in the Township (it can be surmised that a considerable quantity of wetlands located adjacent to streams and tributaries have been filled as development has encroached across the floodplain and overall riparian zone), those wetlands which remain are of particular importance and are deserving of special protection.

Wetlands within the Township have been identified and mapped (Figure 2-12) based on National Wetland Inventory (NWI) data. The NWI wetland classification system is hierarchal, with habitats divided among five major systems at the broadest level. Only 1 percent of the Township is classified Palustrine (marsh or swamp), while the remaining land – almost 99 percent – is classified as Uplands (non-wetland classification). The NWI data source provides an approximate mapping of wetlands and is appropriate for use in this Plan. Wetland delineation is based on interpretation of high altitude aerial photography and should not be used for regulatory purposes. Some small wetlands (any less than 5 acres) typically are omitted from NWI mapping.

Few natural lakes exist in the Township. Several ponds such as at The Willows have been artificially created. These small bodies of water often have been created as part of landscape master planning for older estates and have varying though usually limited functional benefit for the overall aquatic life and water resources of the Township. As a matter of fact, many of these small constructed impoundments suffer from water quality problems; for example, the ponds at the Willows suffer from an abundant goose population with excessive goose droppings loaded with nutrient and other bacterial loadings.



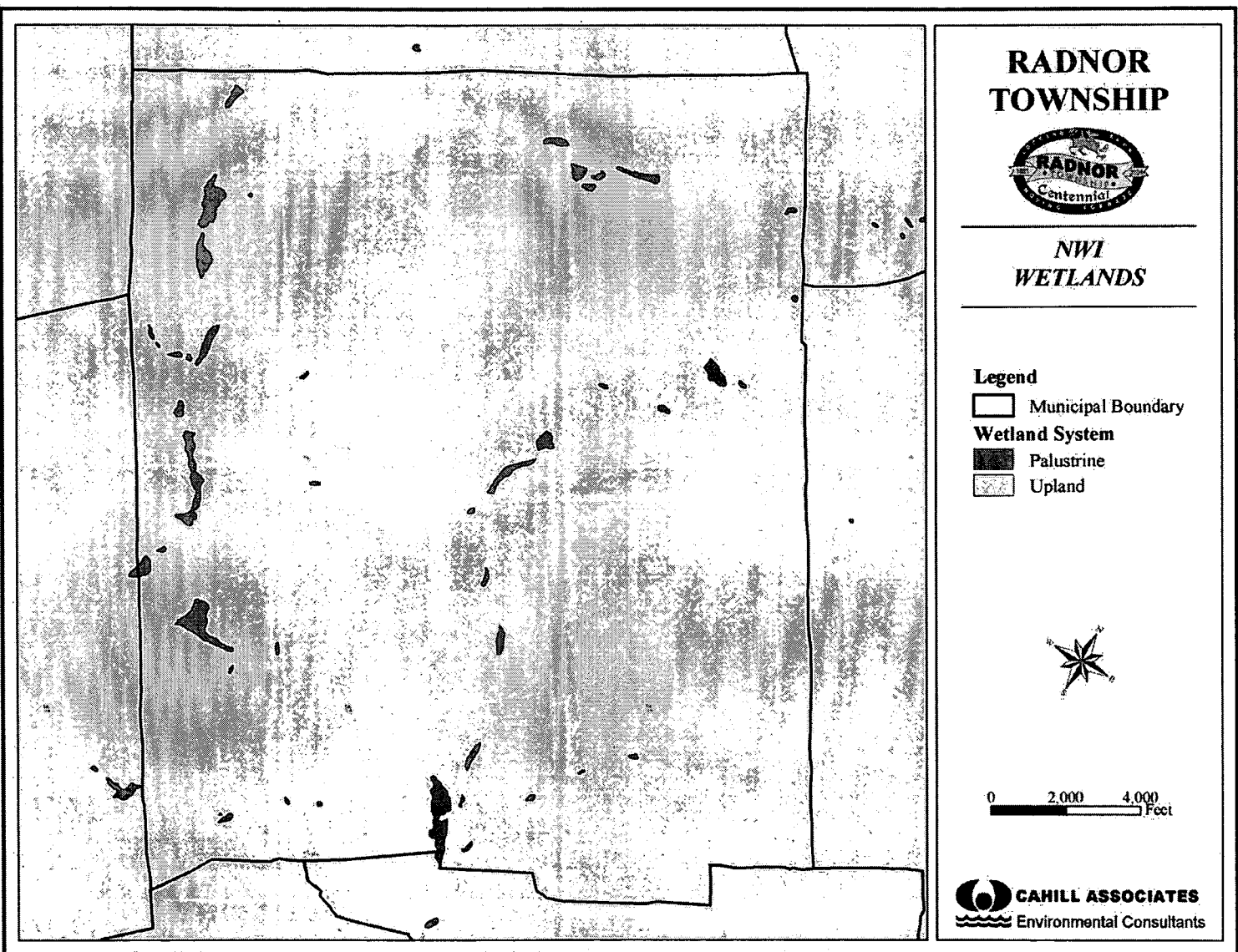


Figure 2-12. Wetland Systems in Radnor Township



#### 4. Water Quantity

Understanding the water cycle and how human development actions have affected this cycle is especially important in order to understand the natural resources of Radnor Township. Presented below is a brief summary of the water quantity issues; Appendix A discusses water resources in significant detail, comparing pre-development hydrologic conditions to post-development hydrologic conditions, and the effects of traditional stormwater management on the lost resource of stormwater. All environmental Appendices are available in hard copy only at the Radnor Township Building.

The natural hydrologic cycle is measured via precipitation gages and stream flow gages, and here in Radnor Township, as well as the greater Piedmont region, we typically see on average 45 inches of precipitation annually, with 15 inches of that 45 compromising stream baseflow (the water flowing in the stream in periods of little precipitation). Land development typically means a significant change in the natural landscape, including creation of impervious surfaces (roads, parking, roofs, other). When we pave over and make impervious surfaces, we increase surface runoff and decrease infiltration into the groundwater. Traditional stormwater management programs focus on managing stormwater peak rates, though much of Radnor's development occurred before any stormwater management regulations. Consequently, in areas like Wayne, stormwater runoff is directed into the nearest stream without any type of peak rate control, volume control, or water quality control. Presently, peak rate management for new development occurs through use of a detention basin, and current regulations do not provide for peak volume management. The result is an increase in downstream flooding as stormwater flushes first through the basin, then through the outlet structure into the nearest stream.

It is important here to appreciate that the water cycle system itself is a closed loop. What goes in must come out. Impacts on one part of the cycle by definition create comparable impacts elsewhere in the cycle. Through traditional stormwater management, stormwater is a lost resource. Innovative engineering and planning solutions must be instituted (and are presently being instituted in Radnor Township) in new development and redevelopment projects so that stream baseflows are maintained, downstream flooding effects are decreased, and valuable stream ecology is preserved.

*Impervious Cover Analysis:* Through the use of GIS files and literature-supported data, plan preparers analyzed the effects of existing land uses in terms of total impervious cover and its effects on stormwater runoff/loss of infiltration. Using the existing parcel-based land use coverage as a base, Cahill Associates has applied appropriate impervious cover assumptions to these land use categories.

Figure 2-13 illustrates the mapping of percent impervious cover in Radnor Township. Table 2-3 sums these statistics by the land use groupings and demonstrates, first, that the total impervious area for the Township itself is a moderately high 23 percent. Table 2-4 then translates this imperviousness into a water reality, indicating the loss or reduction in natural infiltration into the ground, again created by impervious surfaces in the Township land use sub-areas (calculations are based solely on imperviousness and not on reduced permeabilities which also been significant). The loss in infiltration is many millions of gallons each year. In sum, development has had a tremendous adverse impact on the water cycle in Radnor Township.

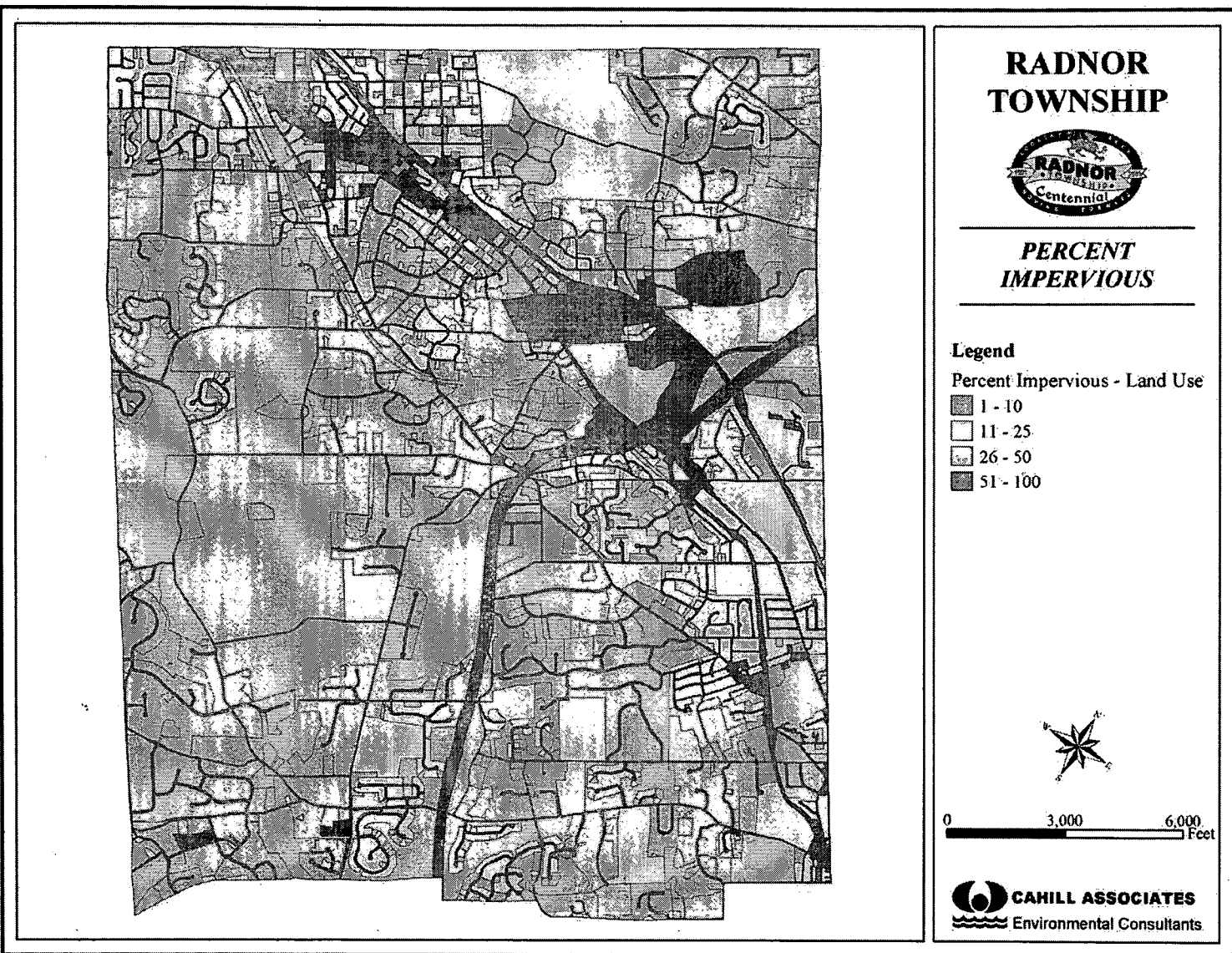


Figure 2-13. Impervious Area Percentages based on Existing Land Uses

**Table 2-3. Impervious Areas within Radnor Township (Cahill Associates, 2002)**

Existing Land Use Category	Area of Land Use within Township, (acres)	Percent Impervious Factor (based on Land Use)	Impervious Area within Township, (acres)
Residential - Low Density	2,657	10%	266
Recreation	1,097	5%	55
Utility	10	80%	8
Transportation	1,009	80%	807
Residential - Med Density	1,006	20%	201
Residential - Rural	801	5%	40
Institution	793	25%	198
Commercial	365	70%	255
Agriculture	310	2%	6
Conservation Easement	287	2%	6
Community Service	222	50%	111
Residential - Multifamily	213	30%	64
Vacant	61	1%	1
<b>TOTAL</b>	<b>8,831</b>	<b>n/a</b>	<b>2,018</b>

Percent Impervious Area =  $2018/8831 = 23\%$

**Table 2-4. Average Annual “Lost” Infiltration in Radnor Twp. (Cahill Associates, 2002)**

Existing Land Use Category	Area of Land Use within Township, (acres)	Percent Impervious Factor (based on Land Use)	Impervious Area within Township, (acres)	Rate of Baseflow Reduction (Baseflow reduction = 15 in/yr)	
				(acre-in/yr)	(gal/year)
Residential - Low Density	2,657	10%	266	3,986	108,239,134
Recreation	1,097	5%	55	823	22,334,455
Utility	10	80%	8	120	3,270,246
Transportation	1,009	80%	807	12,107	328,762,079
Residential - Med Density	1,006	20%	201	3,017	81,926,756
Residential - Rural	801	5%	40	601	16,321,645
Institution	793	25%	198	2,973	80,726,704
Commercial	365	70%	255	3,830	104,003,508
Agriculture	310	2%	6	93	2,523,716
Conservation Easement	287	2%	6	86	2,336,313
Community Service	222	50%	111	1,669	45,311,993
Residential - Multifamily	213	30%	64	957	25,998,859
Vacant	61	1%	1	9	250,412
<b>TOTAL</b>	<b>8,831</b>	<b>n/a</b>	<b>2,018</b>	<b>30,272</b>	<b>822,005,821</b>

## 5. Water Quality

The importance of water quantity issues notwithstanding, important points need to be made regarding water quality. In fact, water quality and water quantity are inseparable and unrelated; both aspects of water management are inextricably linked. Management strategies that effectively address water quantity will in many cases address quality as well. Runoff from newly paved surfaces – both the increased volume and rate of runoff – means that pollutants are scoured, suspended, and swept away. Strategies that reduce this impervious surface and/or immediately redirect runoff into natural swales directly reduce the source of stormwater and indirectly reduce the agent that transports stormwater-linked pollutants. If runoff is quantitatively eliminated, erosion by definition will be eliminated.

Once in the stream, increased volumes and rates of runoff mean streambank erosion, undercutting, flattening and straightening of the channel, re-suspension of sediment, all of which become serious quality problems. Even if flooding is not worst case, full or near full bank flooding has serious water quality ramifications. Therefore, although the focus of this discussion thus far has been on water quantity and the water cycle, both quantity and quality are very much at issue.

Even so, not all quality pollutant loads can be eliminated through quantity reduction techniques. Some roads and highways are necessary which will generate vehicle use and pollutant generation by definition (i.e., there is some proportion of these pollutant loads which are not variable and will be generated even if maximum reduction in quantity can be made to happen). At the other end of the quantity spectrum – reductions in stream baseflow – water quality and water quantity issues emerge as well. To the extent that any fixed or constant source of pollution – for example, point source discharges or malfunctioning onsite septic systems – continue to generate pollution – loads as infiltration and stream baseflow decline, this reduced stream baseflow translates into increased concentrations of instream pollutants with pollution-related problems growing more severe. Fortunately, Radnor Township has few “point sources” or wastewater treatment plants discharging wastewater effluent into its streams and waterways (the Sun Oil Company PA0056839 is the only listed point source discharger according to the PADEP inventory of NPDES permitted sources; Sun is permitted by PADEP for releases of benzene, ethylbenzene, toluene, total BTEX, total xylenes, and pH at levels which PADEP has determined will not prevent the stream from achieving State water quality standards).

Water quality aspects of stormwater management, or nonpoint sources, have become a major concern nationwide. In fact, stormwater-linked nonpoint source pollution – the mix of pollutants that is washed off the earth's surface with each precipitation event – is often cited as the primary water quality problem in the nation today. As a result, numerous manuals such as the new *Pennsylvania Handbook of Best Management Practices for Developing Areas* have been produced setting forth management programs designed to minimize stormwater-linked water quality problems. This is an important issue for Radnor, given the extensive development that exists in the Township.

Stormwater-linked pollutants vary with type of land use and intensity of land use and have been shown to include bacteria, suspended solids, nutrients, hydrocarbons, metals, herbicides and pesticides, other toxics, organic matter, and others. Pollutant loads are generated both from

impervious areas ("hot spots" such as gas stations, fast food parking lots, and heavily traveled roadways are primary culprits and which are common in Radnor), as well as from pervious zones, such as the chemically maintained lawns and landscaped areas where chemical maintenance can be considerable, also in great abundance in Radnor. Some nonpoint pollutants are even air-borne, deposited onto the land surface and then are washed into receiving waterbodies. Sources of this pollution include:

- Vehicles
- Vegetative decay (leaves, grass, etc.)
- Direct atmospheric deposition
- General litter, including pet litter
- Soil erosion
- Road surface applications (salt, sand, etc.)
- Fertilizers
- Pesticides/herbicides

There also appears to be serious problems of inflow and infiltration, or "I/I" as it is commonly called, throughout many portions of the Township which are sewered. As discussed in more detail in Appendix A, elevated pollutant loadings in both wet weather and dry weather in those stream reaches where large sanitary collection and conveyance systems parallel the stream suggest that these sewers are leaking their sanitary wastes directly into the streams during both wet and dry times. Also, although this issue has not been well documented, there is clearly a water quality problem in Radnor related to the increased Canadian geese population all too happily residing on both the extensive public and private lawn areas adjacent to water features which have been created in the Township. Pollutants of concern include bacteria and nutrients as well as special pollutants of concern such cryptosporidium. Given that the overall regional population of geese is increasing, management actions should focus on elimination or minimization of habitat which is creating the problem in the first place.

In such a highly developed watershed, point source wastewater treatment plants would be expected to be a pollutant source, but are not significant pollutant sources in the Darby Creek Watershed, given the export of wastewater to Philadelphia's Southwest Treatment Plant.

#### **State Stream Classifications**

As part of the water quality standards program, PADEP conducts stream use designation evaluations on an ongoing basis, pursuant to Chapter 93 of the Department's Rules and Regulations. All Commonwealth waters are protected for a designated aquatic life use as well as a number of water supply and recreational uses. The use designation shown in the water quality standards is the aquatic life use. These uses are Warm Water Fishes (WWF), Trout Stocking (TSF), Cold Water Fishes (CWF), and Migratory Fishes (MF). In addition, streams with excellent water quality may be designated High Quality Waters (HQ) or Exceptional Value Waters (EV).

Figure 2-14 indicates the DEP designated stream classifications for streams in Radnor Township. There are no Special Protection Waters designated in Radnor, either High Quality or Exceptional Value streams. Gulph Creek is classified as a Warm Water Fish; however, the Darby system is classified as either Cold Water or Warm Water Fish, all with a Migratory designation.

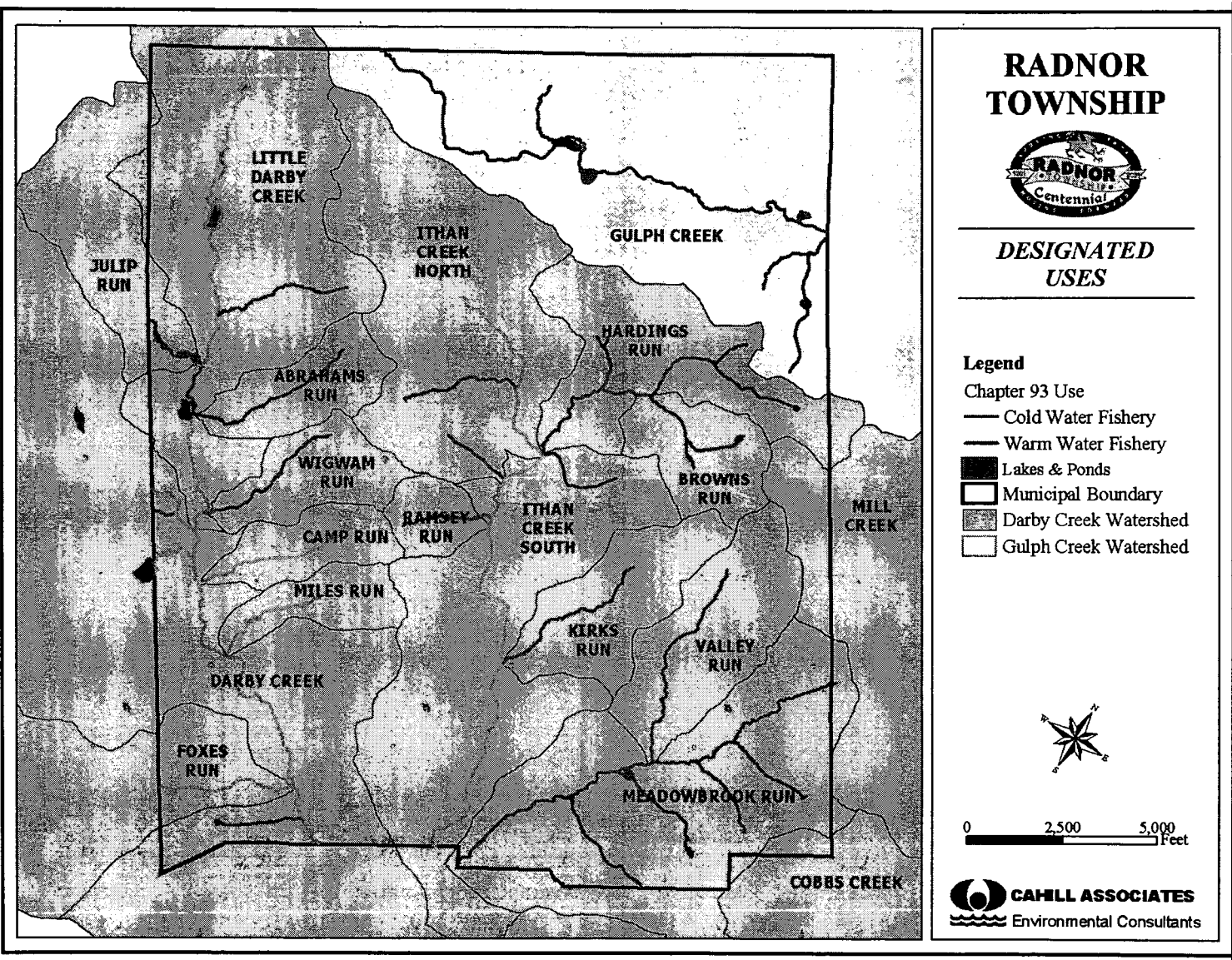


Figure 2-14. Pennsylvania Stream Designations for Radnor Township

## **D. Biological Resources**

### **1. Aquatic Biota**

As the natural flow patterns of Radnor's watersheds have undergone change, water quality and the aquatic biota present in the stream system typically have changed as well. Usually these changes have not been for the best. The considerable urbanization which has occurred in the Township's sub-basins has translated into encroachment into the floodplain and directly into the stream channel itself (in the most extreme, completely burying the stream underground in some cases). Changes in the natural hydrology – in the patterns of infiltration and runoff – have resulted in stream channelization, creating a system which is not in dynamic equilibrium. Time to peak has been decreased, sometimes dramatically; peak flow rates are increased equally dramatically. Smaller rainfall events produce more and more bankfull and out-of bank flooding, unable to be accommodated by the existing stream channels, floodplains, and wetlands, all of which have been diminished by development over time. More erosion has occurred; more sediment has been deposited. Increased flood flows scour stream banks, fill pools and cover riffles with sediment. A more short-lived, homogeneous, and unstable species system is created with increased sediment deposition and decreased habitat diversity. The aquatic ecosystem has lost much of its critical energy linkage in first order streams and wetlands, as these valuable areas are disturbed and often reduced and their ecological functions destroyed.

Benthic macroinvertebrates—the bottom dwellers of the stream—are critical links in the food chain and are critical for the support of the higher order fish community. Unfortunately, the impacts of urbanization have hit the benthic macroinvertebrate community especially hard. Because the benthic macros rely heavily on the stream's system of natural riffles as primary habitat for most of their life cycle activities, the increased flows plus sediment deposition and scouring that have resulted in the stream system have adversely impacted the reproductive and feeding activities of many macroinvertebrates. Eggs are either scoured downstream or covered with sediment. Many species have been eliminated; others tremendously reduced in terms of richness and abundance. Organisms adapted to hydrologic extremes proliferate.

Fish follow suit. Like the benthic macroinvertebrates, habitat change means fish species change. Those species reliant on riffles, rocks and vegetation for egg depositing, or those where egg nests located in larger constant pools are guarded by parents, are seriously impacted. Sudden changes in flow regimes physically destroy eggs which have been deposited and kill the fry. At the other end of the spectrum, sudden stream flow reductions and reduced stream baseflows means that biotic life in pools can be killed off quickly as these pools literally dry up.

Further, stormwater outfalls and combined sewer overflows worsen the overall stream condition for the aquatic community by increasing flood flows, increasing sedimentation and erosion, and then reducing water quality (e.g., fecal coliform releases ultimately result in increased biological oxygen demand with reduced dissolved oxygen levels as flows decrease, ultimately depriving fish life of oxygen).

### **Aquatic Biota Sampling**

The abundance and diversity of the aquatic biota, of course, are excellent indicators of water quality. In 1995 and 1996, Pennsylvania Department of Environmental Protection performed special investigations of the Darby Creek Watershed extending into Radnor, sampling for water quality, fish, and benthic invertebrates at a variety of stations. As reported in PWD's Technical Memorandum No. 1, the benthic was rated as "fair" at Station 2 with both benthic and fish rated as "very good" and "good" respectively farther downstream at Stations 3 and 4 in Radnor Township and as "poor" and "fair" at Station 5 in Radnor, and "good" and "fair" at Station 6 in Radnor. Ratings declined to "poor" and "fair" for benthic and fish immediately downstream, from Radnor down through Springfield Township. Based on this information, it would appear that pollution and pollution impacts on the aquatic biota are quite variable, though definitely do exist in portions of the Township, at least in the Darby Creek Watershed.

Finally, and perhaps most significantly, PADEP has performed biological assessment of the Darby Creek system in 1998 as part of the PADEP Unassessed Waters Program, including 28 stations using EPA's Rapid Bio-Assessment Protocol and habitat assessment methods. The purpose of this special study was to determine stream impairment, based on quality and quantity of habitat and the macroinvertebrate community data. This work also was to be used as the basis for the 303(d) list that PADEP is required to develop under the Federal Clean Water Act. Figure 2-15 indicates the 1998 findings based on this sampling. A portion of the Darby Creek system is classified as "impaired," specifically a portion of the Little Darby Creek. (Technical Memorandum No. 1, November 16, 1999)



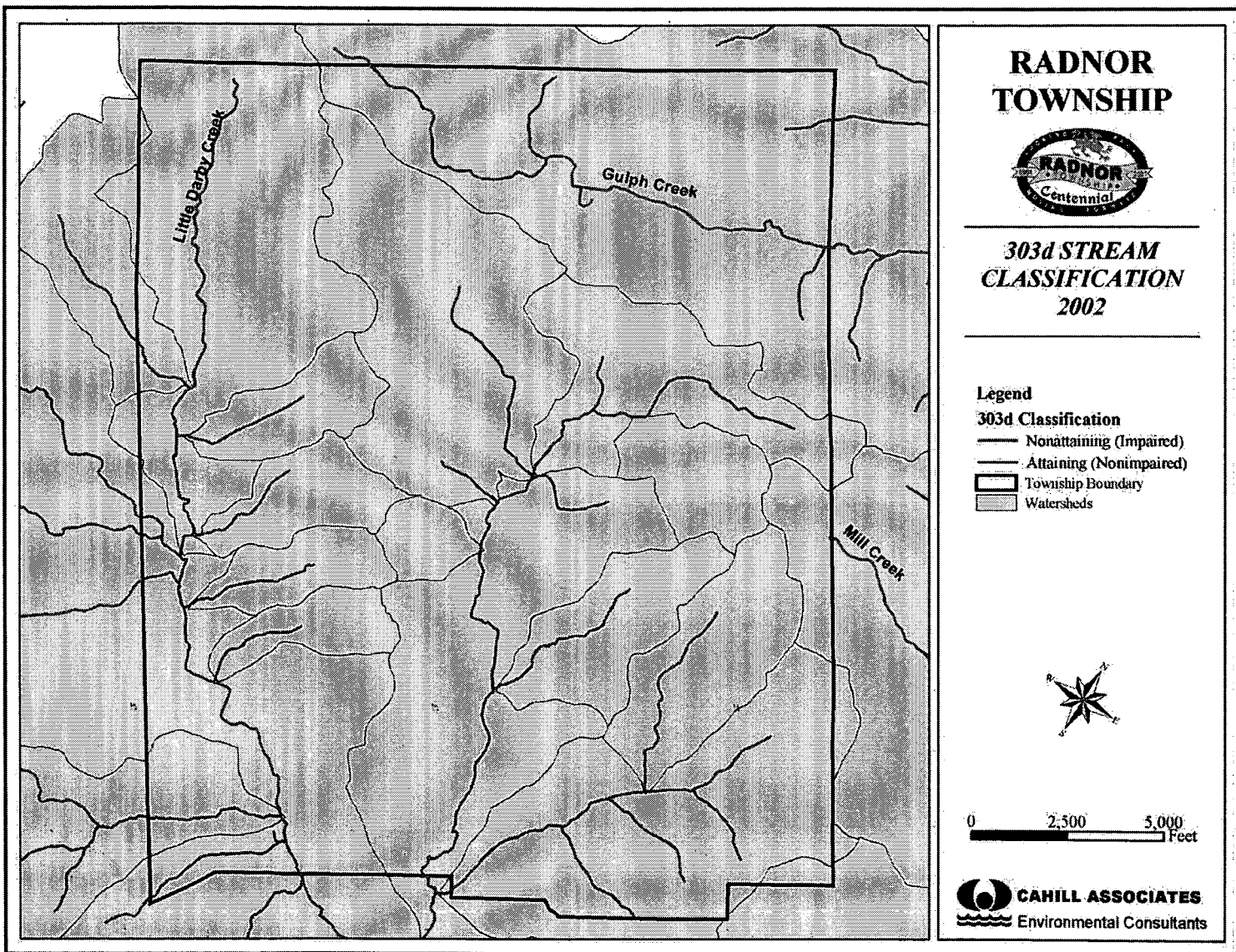


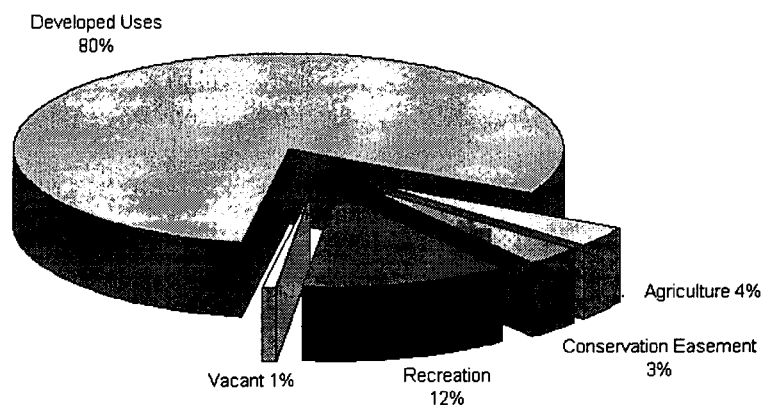
Figure 2-15. EPA Assessed Streams within Radnor Township

## 2. Terrestrial Biota

*“The soil is good, air serene and sweet from the cedar, pine and sassafras, with wild myrtle of great fragrance”* wrote Penn in an early description of Penn’s Woods. Pennsylvania was heavily forested upon Penn’s arrival, and he recommended, *“...care to be taken to leave one acre of trees for every five acres cleared.”* As discussed in other sections, the natural characteristics of Radnor Township had much to do with shaping its development. Radnor’s geographic location, natural resources, and soil and climate influenced the development of industry and commerce. This same development impacted and diminished much of the original natural landscape.

Undeveloped uses of the Township (Agriculture, Conservation Easement, Recreation, and Vacant) total a mere 20 percent of the total land area, with all other “developed” uses comprising 80 percent of the land area (Figure 2-16). These figures are based on the Townships existing land uses as classified from aerial interpretation of 2000 Digital Orthophotos (Figure 10-2).

When we use the Delaware Valley Regional Planning Commission’s 1995 Land Use data, which includes a Wooded category, we see that the naturally Wooded area that remains tends to follow stream valleys. The stream valley greenway that currently exists becomes the primary natural resource feature in this substantially developed Township, though the greenway remains a fragmented, disconnected resource. Such a fragmented natural habitat has serious implications for the natural biological systems including reduced species diversity, increased rates of species extinction, and establishment of invasive species. The existing greenway should be supplemented and reinforced with more and more “green” islands, in order to connect and expand the environmental natural features.



**Figure 2-16. Developed vs. Undeveloped Land Uses in Radnor Township**

### 3. Pennsylvania Natural Diversity Inventory (PNDI)

The Pennsylvania Natural Diversity Inventory (<http://www.dcnr.state.pa.us/forestry/pndi/pndiweb.htm>) was established in 1980 as a cooperative project with the PADCNr's Bureau of Forestry, The Nature Conservancy (TNC), and the Western Pennsylvania Conservancy. PNDI partners collect biological data and conduct inventories to describe and identify Pennsylvania's threatened and endangered and otherwise rare species ("special concern" species), storing this information in a computerized data management system. In addition to species, PNDI identifies the most outstanding examples of Pennsylvania's natural communities and geologic features ("critical sites" or "priority areas"). After surveying the ecological resources of a county and identifying the outstanding species and areas, each site is ranked from 1 to 5 (1 being the highest priority) in order to prioritize conservation of these areas. The goal of the PNDI program is "...to provide accurate and accessible ecological information needed for conservation, development planning, and natural resource management." Consonant with these goals, some countywide reports have been prepared and published, documenting results of PNDI inventory work. Delaware County has a 1992 (Updated 1999) PNDI report available.

Pulling from the County listing, TNC provided plan preparers a list of 'species of concern' found in Delaware County (Table 2-5) and GIS datasets to map the PNDI priority sites in the Township (Figure 2-18). The species list and the priority sites map characterize the current ecological information as monitored by PNDI. Radnor Township should work with PNDI partners to use the information as a guide for its comprehensive planning, zoning, and land development, as well as an input to future municipal open space planning.

- **Ithan Creek Wetland:** Bordered by the Blue Route, Bryn Mawr Avenue, Ithan Creek and a residential neighborhood, offers wildlife habitat and local landscape diversity. "Somewhat weedy wetlands with good representation of common, native wetland plants; adds to diversity of local landscape; provides some wildlife habitat and has educational value; protect from encroachment."
- **Radnor Woods:** "Moderately mature beech/oak forest on rocky slopes and floodplain along little Darby Creek; creek channel heavily eroded by high storm flows; fragment of original forest provides refuge for native flora and fauna and green space for humans; maintain closed canopy."
- **Skunk Hollow:** "Poor population of Pennsylvania Rare wildflower in moderately mature beech forest along Darby Creek; exotic species such as privet pose main threat; area protected in Skunk Hollow Park."

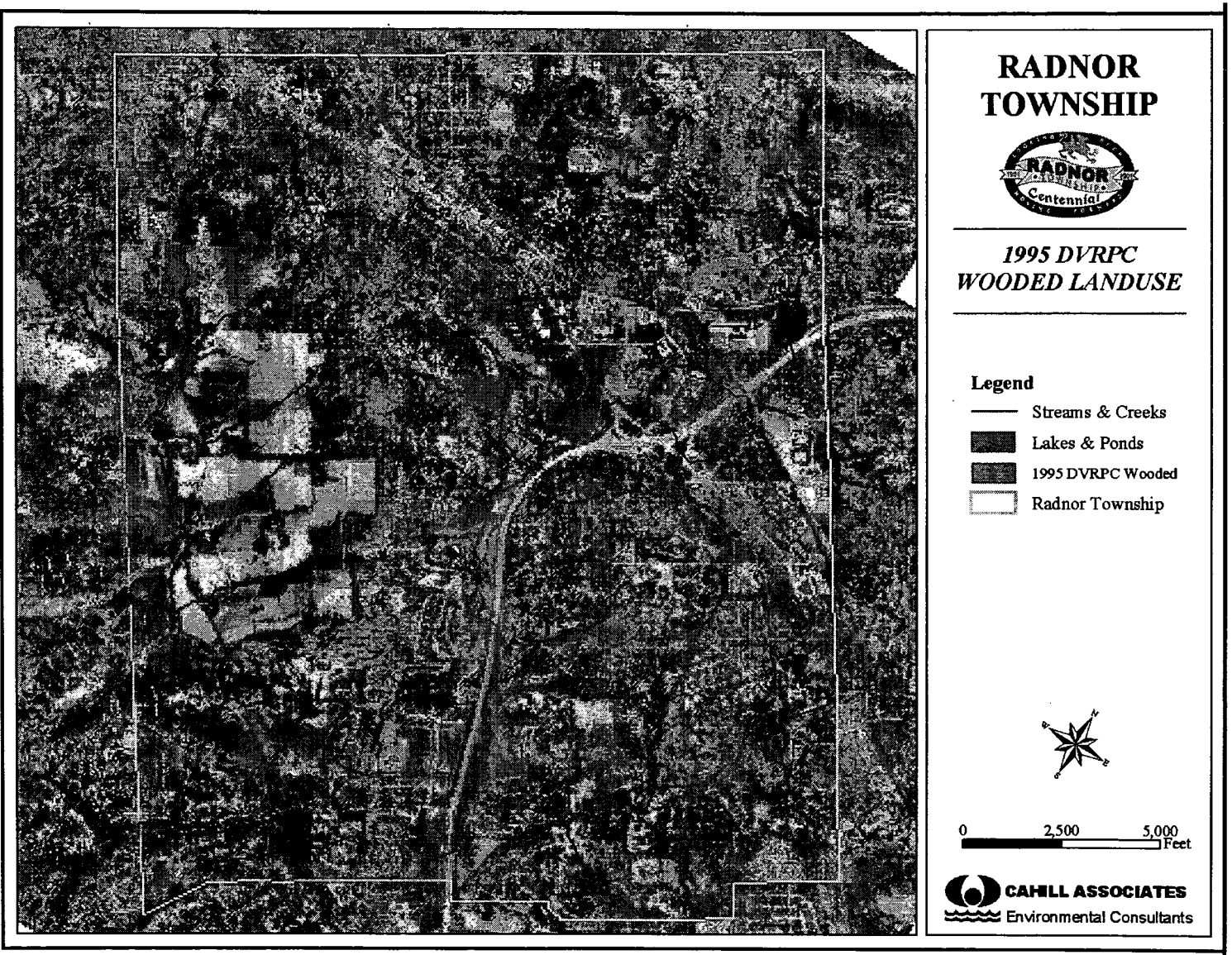


Figure 2-17. Wooded areas in Radnor Township according to 1995 DVRPC Land Use

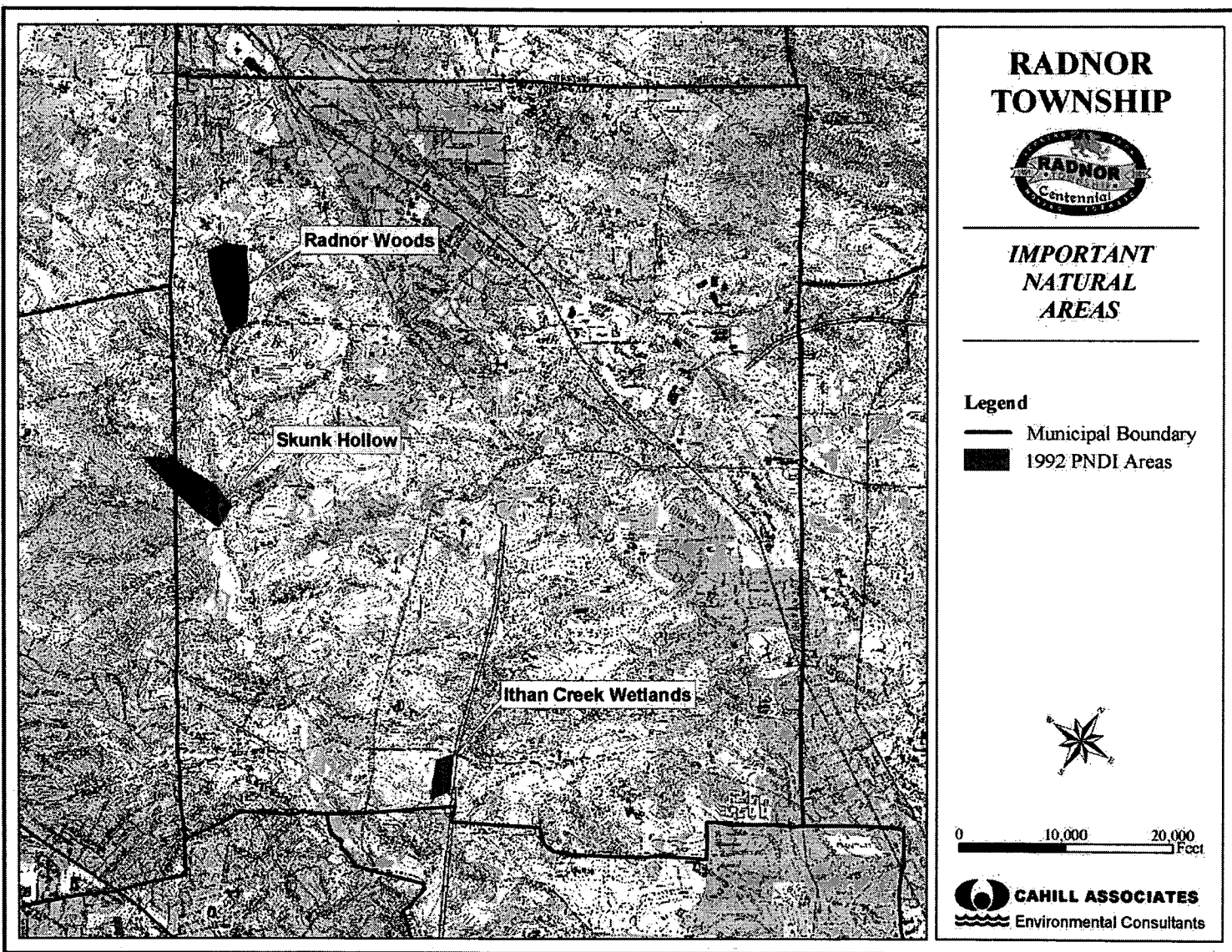


Figure 2-18. TNC/PNDI Areas of Concern in Radnor Township (1992)

**Table 2-5. TNC/PNDI Sites and Species of Concern within Delaware County, (2001)**

Species and Ecological Communities Tracked by PNDI within the Darby Creek Watershed			
SCIENTIFIC NAME	COMMON NAME	STATE RANK	STATE STATUS
FRESHWATER INTERTIDAL MARSH	FRESHWATER INTERTIDAL MARSH	S1	
POANES VIATOR ZIZANIAE	BROAD-WINGED SKIPPER	S1	
INCISALIA IRUS	FROSTED ELFIN	S2	
LYCAENA HYLLUS	BRONZE COPPER	S2	
CISTOTHORUS PALUSTRIS	MARSH WREN	S2S3B	
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	S2S3B	
EUPHYES CONSPICUUS	BLACK DASH	S3	
RALLUS LIMICOLA	VIRGINIA RAIL	S3B	
TYTO ALBA	BARN-OWL	S3B,S3N	
CIRCUS CYANEUS	NORTHERN HARRIER	S3B,S4N	
PONTIA PROTODICE	CHECKERED WHITE	SH	
KINOSTERNON SUBRUBRUM	EASTERN MUD TURTLE	SH	
PANOQUINA PANOQUIN	SALT-MARSH SKIPPER	SH	
ATRYTONE AROGOS AROGOS	AROGOS SKIPPER	SX	
DRYOPTERIS CLINTONIANA	CLINTON'S WOOD FERN	S2	N
HETERANTHERA MULTIFLORA	MULTIFLOWERED MUD-PLANTAIN	S1	PE
ECHINOCHLOA WALTERI	WALTER'S BARNYARD-GRASS	S1	PE
ELEOCHARIS PARVULA	LITTLE-SPIKE SPIKE-RUSH	S1	PE
ELEPHANTOPUS CAROLINIANUS	ELEPHANT'S FOOT	S1	PE
LYONIA MARIANA	STAGGER-BUSH	S1	PE
QUERCUS FALCATA	SOUTHERN RED OAK	S1	PE
VERNONIA GLAUCA	TAWNY IRONWEED	S1	PE
ELEOCHARIS OBTUSA VAR PEASEI	WRIGHTS SPIKE RUSH	S1	PE
BOTAURUS LENTIGINOSUS	AMERICAN BITTERN	S1B	PE
RALLUS ELEGANS	KING RAIL	S1B	PE
CASMERODIUS ALBUS	GREAT EGRET	S1B	PE
IXOBRYCHUS EXILIS	LEAST BITTERN	S1B	PE
NYCTANASSA VIOLACEA	YELLOW-CROWNED NIGHT-HERON	S1B	PE
ASIO FLAMMEUS	SHORT-EARED OWL	S1B,S3N	PE
QUERCUS PHELLOS	WILLOW OAK	S2	PE
RANA SPHENOCEPHALA	COASTAL PLAIN LEOPARD FROG	S2	PE
SAGITTARIA SUBULATA	SUBULATE ARROWHEAD	S3	PR
AMARANTHUS CANNABINUS	WATERHEMP RAGWEED	S3	PR
SCHOENOPLECTUS FLUVIATILIS	RIVER BULLRUSH	S3	PR
ZIZANIA AQUATICA	INDIAN WILD RICE	S3	PR
BIDENS BIDENTOIDES	SWAMP BEGGAR-TICKS	S1	PT
ELLISIA NYCTELEA	ELLISIA	S2	PT
PSEUDEMYIS RUBRIVENTRIS	REDBELLY TURTLE	S2	PT
SPIRANTHES TUBEROSA	LITTLE LADIES-TRESSES	S1	TU
TRADESCANTIA OHIENSIS	OHIO SPIDERWORT	S1	TU
EUPATORIUM ROTUNDIFOLIUM	A EUPATORIUM	S3	TU



#### **4. Significant Habitat Areas in Radnor Township: Landscape Ecology and Conservation Biology Principles**

The “natural landscape” of Radnor Township (Penn’s Woods) has been significantly altered and with it the habitats that that landscape supports. Without delving into the science in great detail, the dilemma confronting developing regions is to minimize the loss of species diversity by minimizing the loss of habitat. An important objective here is to minimize the impacts of habitat fragmentation and negative edge effects, which occur so frequently in developing suburban areas where small, isolated, unconnected and unplanned patches of natural habitat may be preserved, but with minimal habitat benefit if habitat is interrupted with frequent intrusions and interruptions. In order to maximize the important natural ecological functions (or “services”), the science of landscape ecology has demonstrated that the most beneficial or efficient way to optimize ecological functions provided by landscape is through a system of interconnected networks, linking core reserve areas with natural corridors. Such a system if properly planned can provide critical mating variety, food supply, shelter opportunities, and overall support to foster greater species diversity. Core reserve areas may be thought of as undisturbed islands or patches of natural habitat area; these areas must have depth, must have interior area where any number of “non-natural” development-related influences and effects are minimized if not eliminated. These areas are less vulnerable to invasion by alien plant species resulting from wind blown seed distribution or from vines and other invasives; these areas are most protected by existing tree canopy. Minimum distances or radii to define these “patches” will vary with habitat area and the species naturally supported by that habitat area. For the sake of this comprehensive plan, we are defining this critical interior depth at a distance of approximately 300 feet (i.e., masses of “core reserves” with an interior of at least 300 feet) linked together by corridors. Figure 2-19 illustrates all those remaining natural (i.e., wooded) areas in Radnor which satisfy this criterion, without taking into account parcel boundaries.

Figure 2-19 indicates mapping of wooded areas, in overlay with 2000 aerials; the map itself suggests a system of “core reserves,” heavily focused in the western half of the Township, with existing connections or the potential for linkage in many locations. The Comprehensive Plan strongly recommends that this map be used as the basis for a Township program which protects and preserves these existing natural areas to the maximum extent (this should be done in a variety of ways through the zoning and subdivision/land development regulations, as well as other Township-backed actions). This protection effort should be reinforced by a program which promotes the re-forestation of areas both within and adjacent to these “core reserve” areas, in order to reinforce and increase their positive ecological functions and “services.” Some of this effort could occur on publicly owned lands; some of this could occur on privately owned lands.

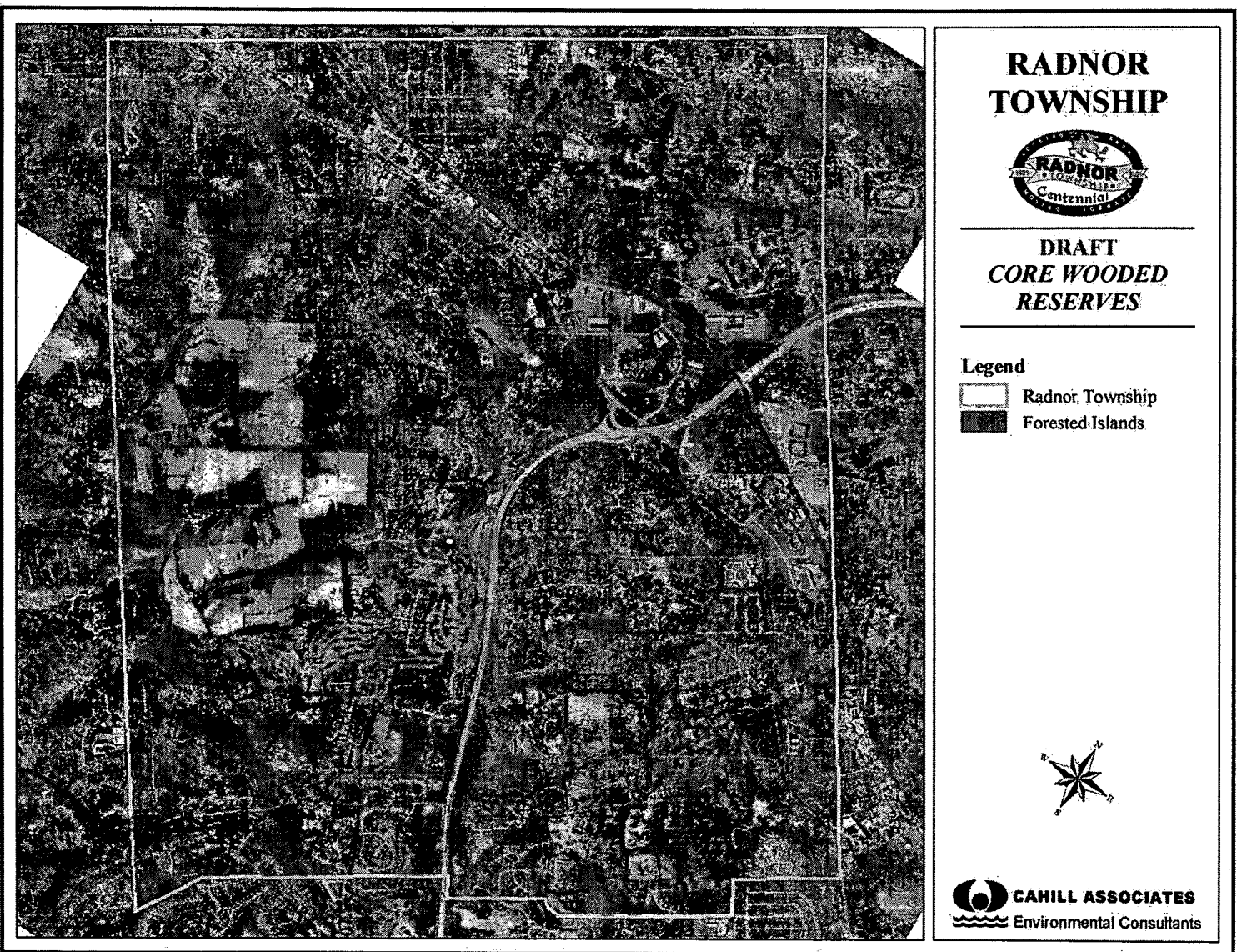


Figure 2-19. Core Reserve Wooded Areas in Radnor Township according to  
1995 DVRPC Land Use



## **E. Air Quality**

Amidst the “greene countrie” of Radnor, air quality is often dismissed as a secondary consideration. Furthermore, in terms of Radnor Township comprehensive planning, air quality issues tend to be the prerogative of Federal and State agencies, not really open to local initiative. At the same time, no other natural resource is more basic to life, to quality of life. Air quality is essential therefore to the quality of life in Radnor for all of its residents, its businesses and employees, its schools and colleges and other institutions, the successful utilization of all of its parks and recreational open spaces. Furthermore, mounting scientific evidence is demonstrating that human life is vulnerable to more subtleties in air quality than previously recognized.

Appendix A describes in great detail the regulatory framework under the Clean Air Act, sources of air pollution in our region and the health effects with specific pollutants, and data for air quality in Pennsylvania and the Radnor Township area.

## **F. Recommended Actions**

Repeated below is the overriding goal and the objectives for the environmental resources of the Township. Listed beneath each Objective are the *Recommended Actions* for the Township.

Additionally, the Delaware County Planning Department (DCPD), in cooperation with adjoining counties (Chester, Montgomery, and Philadelphia), is preparing an Act 167 Stormwater Management Plan for the Darby Creek Watershed, funded largely through a PADEP grant. Preparation of this watershed-level study involves a complex planning process, with detailed inventorying and complex hydrologic modeling. The 167 Plan will identify stormwater problems and include development of new regulatory requirements which Watershed municipalities such as Radnor will be required to adopt. Although these new requirements cannot be determined at this time, the recommendations in this Plan should be compatible with those contained within this Act 167 planning effort. It also should be noted that Act 167 plans are designed to address future stormwater impacts from new development, not correct problems resulting from existing development. Therefore, given the mostly developed status of the Darby Creek Watershed in Radnor, effectiveness of the Act 167 plan will be limited to its ability to control runoff from future development. Although Act 167 plans have historically focused only on water quantity issues, recent re-interpretation of the Act now requires water quality considerations to be taken into account when managing future runoff.

Another important program development affecting stormwater and overall environmental resource management in Radnor relates to the National Pollution Discharge Elimination System (NPDES) Phase II stormwater plan and permit program which targets Municipal Separate Storm Sewer Systems or MS4 communities. Radnor has been designated an MS4 municipality. All MS4 municipalities, defined as over a certain population and/or with a certain threshold population density, must be permitted under the requirements of this new program; in order to obtain these permits, detailed Phase II permit applications will have to be prepared and submitted by each affected municipality by Spring 2003 with the actual programs developed thereafter. These permit requirements are being phased in the future under the administration of both PADEP and the US Environmental Protection Agency. NPDES Phase II permit program requirements have been drafted by PADEP and are currently in various stages of final review. PADEP has drafted a model stormwater ordinance which is to be incorporated by MS4 municipalities (note that these NPDES Phase II ordinance requirements will have to be incorporated into the Act 167 stormwater management planning for the Darby Creek Watersheds and the model ordinance, as discussed above). Because the NPDES Phase II permit program has so many facets, a detailed description has not been provided in this Comprehensive Plan.

### **Goal**

*Protect the Township's vital environmental values, including water resources, wetlands, floodplains and riparian areas, woodlands and important habitat areas, balancing the needs of development with environmental values.*

### **Objectives**

*1. Direct development to areas of minimum environmental sensitivity; prohibit development in areas of heightened sensitivity and value, such as wetlands, floodplains, riparian zones, and steep slopes.*

- **Tighten existing natural resource regulations.**
- **Evaluate existing natural resource regulations in the Township for rigor; compare with regulatory programs being recommended by the Brandywine Conservancy, the Green Valleys Association, and other environmental organizations for a “tough but fair” test (e.g., carefully scrutinize exactly what is allowed to happen in the floodplain, look at what is happening under current regulations). A sub-committee of the PC, buttressed with volunteers, could do this and report back to the PC.**
- **Promote use of private tools such as conservation easements to permanently protect sensitive areas. Radnor could continue to rely on the Brandywine and other conservancies, but if other municipalities can support their own local land trusts, should Radnor start its own land trust as well?**

*2. Manage water resources, both water quality and water quantity, especially through a program of improved stormwater management.*

- **Modify the existing stormwater regulations to require comprehensive (peak rate, total, volume, water quality) management, encouraging low impact development/conservation design applications where feasible.**
- **Pursue comprehensive stormwater management at all Township projects; promote this approach at all School District and other public sites. This recommendation includes Meadow Management/Reforestation Pilot Projects, undertaken by the Township on Township-controlled parcels (e.g., The Willows) where water quality is so critical.**
- **Undertake special retrofit stormwater studies to solve high priority problem areas (already ongoing at Rosemont Business Campus and Strafford Office Complex); implement “greening” projects in the Wayne Business District.**
- **Develop Backyard Rain Garden model concept for voluntary application by homeowners, demonstrating how walkways, patios, other landscaping can be made to provide important water quantity and water quality functions; pursue funding for developing owner matching grant program to incentivize program in the highest priority areas (e.g., Ithan sub-basin drainage immediately upstream of existing Middle School site in Wayne).**

- **Education:** Using the EAC, the League of Women Voters and other resources, promote educational venues on all levels that communicate the importance of stormwater management and other essential elements of the water cycle and overall water resources management (e.g., a stormwater workshop is already being planned).
3. *Implement watershed-wide planning principles as developed by the Darby Creek River Conservation Plan and other appropriate watershed planning processes.*
- **Enact Riparian Buffer regulations!** This is the most critical single recommendation of the Darby Creek RCP. Radnor needs to be a leader riparian buffer management effort; reasonable distances must be determined!
  - **Develop Riparian Buffer Restoration/Reforestation programs** through the work of the EAC and other Township groups (various grant programs are available).
  - **Promote stormwater as above, natural resource management as above, open space conservation as below.** Place the highest priority on daylighting of enclosed streams and naturalizing of channelized streams; consider undertaking a Township-wide study of the streams to prioritize those stream segments most in need of restoration; then pursue restoration projects.
4. *Work to preserve the natural woodlands which remain in the Township through minimum disturbance/minimum maintenance land development techniques, site conservation, and other practices; reinforce tree protection requirements and promote re-vegetation and re-forestation strategies with native species, compatible with sound landscape ecology principles.*
- **Better tree/woodlands protection, management, and regulation.** Incorporate optimal tree protection regulations in Township regulations, including rigorous tree removal standards and rigorous tree replacement requirements. Provide incentives, positive and negative, in the subdivision/land development regulations for a minimum disturbance/minimum maintenance approach to site development.
  - **With EAC and other assistance, evaluate additional management actions (regulations?) which might be taken for those priority woodland masses and linking corridors identified in the Comprehensive Plan; also consider further evaluation of these priority Radnor township woodlands.**
  - **Establish pilot projects of reforestation on Township-controlled parcels, building onto existing forested masses with highest priority.**

- **With EAC and other assistance, develop private-owner-oriented woodland programs of reforestation.**
5. *Work to preserve those open spaces remaining in the Township, using all direct means such as acquisition, as well as less direct regulatory programs; prioritize those open spaces, taking into account factors such as proximity to wildlife habitat and forage areas, aesthetic values, water resource values, and other factors relating to landscape ecology management.*
- **Continue to implement the recommendations from the Township's existing Park and Recreation Plan, as updated and revised.**
  - **Consider formation of a Radnor Township land trust which would intensify private-owner oriented efforts for open space conservation and land stewardship; also reinforce linkages with existing land trusts such as the Brandywine Conservancy.**
  - **Develop an intensified program of Land Stewardship owner interaction, identifying and prioritizing all those property owners with conservation potential; outreach efforts that communicate the benefits of conservation techniques such as donation, bargain sale, and so forth should be developed (materials are readily available, such as from Chester County Planning Commission, the Brandywine Conservancy, elsewhere).**
6. *Integrate management of noise, artificial light, and odor into the Township's planning and management program.*
- **Better Regulations**
  - **Better Buffering Regulations**
7. *Work to protect air quality through mobile source emission strategies developed in the transportation-planning element of the comprehensive plan and through integrating transit oriented development and other auto trip reduction strategies into overall planning.*
- **Traffic mobility/traffic calming as elsewhere**
  - **Screening/landscaping/woodland protection as above**

## SECTION 3 HOUSING

### A. Introduction and Statement of Goals

Housing is a series of actions, a process that extends far beyond the brick and mortar end product that is the traditional definition of a housing unit. Housing is where you live, how you live, and what you live in. Because of these far reaching implications, this section of the Draft Comprehensive Plan often encroaches into other substantive planning areas and issues, into demographics, into economics, and other areas. At the end of this section, a special discussion on Radnor Neighborhoods has been included because although neighborhoods often include more than residential uses, more than housing strictly speaking, neighborhoods are where Radnor citizens live and in a sense are housed. Of course, in the case of Radnor, its neighborhoods vastly transcend physical housing stock to include so much more.

#### 1. Goals and Objectives

Housing goals were established early on in the planning process; four basic housing goals have been defined which relate in many different ways to the people, which make up Radnor and its many different neighborhoods:

##### Goals

*Conserve and maintain Radnor's existing housing stock and residential neighborhoods.*

*Provide housing opportunities for a diverse population, including low- and moderate-income residents and senior citizens.*

*Maintain a supply of affordable and market rate housing that meets Radnor's share of regional housing needs.*

*Promote conservation development strategies for new development on large parcels.*

##### Objectives

1. *Promote the rehabilitation of deteriorating or substandard residential properties.*
2. *Ensure that redevelopment within established neighborhoods is compatible in scale and character.*
3. *Discourage demolition and promote the preservation of residential structures of historic significance.*
4. *Support housing that incorporates facilities and services to meet the health care, transit, or social service needs of seniors.*

5. *Encourage and foster diverse housing opportunities for low- and moderate-income families.*
6. *Undertake a variety of strategies to preserve and/or increase housing density and diversity in appropriate locations.*
7. *Encourage mixed-use districts as a means of increasing the housing supply while promoting diversity and neighborhood vitality.*
8. *Discourage the conversion of lands designated as residential to nonresidential uses.*
9. *Investigate use of additional tools such as maximum lot size overlays with related restrictions and community land trusts.*
10. *Consider a variety of strategies that will promote cluster or conservation design in new land development.*

These goals are revisited at the end of this section discussion, with further Recommended Actions developed to implement various housing policies and goals. Additionally, a set of **General Goals** has also been defined at the outset of the planning process, which has relevance to housing as well:

**General Goals**

- *Accommodate reasonable growth, using innovative growth management techniques such as transit oriented development, traditional neighborhood design, and other flexible design techniques, which harmonize with and enhance the existing community.*
- *Maintain and protect the many small residential neighborhoods, which make the Township such a unique community, with attention toward special re-use and re development strategies.*
- *Provide for housing diversity in the face of changing local and regional demographics.*

This discussion begins with presentation of various demographic and socioeconomic data, which sets the stage for understanding the people of Radnor and their housing situation. Population forecasts are presented as well as other information describing the characteristics of Radnor residents, all-important in understanding housing issues and housing needs in the future.

**B: Demographics and Socioeconomics**

**1. Population Trends**

Radnor and surrounding municipalities experienced relatively low or no growth between 1990 and 2000. Radnor's 1990 total population (28,703) did increase by 2,175 persons during the

1990's decade, according to the US Census, which on the face of it isn't exactly compatible with the Census increase of only 151 housing units. Some of this increase could be attributable to an increase in the institutional (educational and other) population (e.g., new dorms at Villanova and the other colleges and universities). In fact, during the 1990's, Township records of subdivision and land development activity also suggest a larger increase in housing units than the Census is reporting, which would support the larger population increase which the Census itself has put forward. Alternatively, another explanation might be that average household size must have increased in Radnor during the period, which is unlikely and appears to be inconsistent with the documented trends.

The recent population increases for neighboring Newtown (11,366 to 11,700) and Marple (23,123 to 23,737) and Haverford (49,848 to 48,498) Townships are surprisingly small as well, 1990 to 2000. In fact, Haverford Township declined by 1,350 persons, making the sum of the three neighbors negative in total population, even in the last decade. In short, this general area is not experiencing significant growth, reflecting the much larger population declines being experienced elsewhere in Delaware County and other already developed portions of the region. The primary reason for this relative lack of growth is the fact that these municipalities are already highly developed. Overall, there is a lack of developable land, with remaining undeveloped parcels being tracts that are constrained and less desirable from a developer's perspective. Additionally, population is static, if not declining, because average household size continues to decline as the younger families of yesterday age, children grow up and move to other locations, and more and more empty nesters occupy the housing stock.

The population numbers are even more compelling when the adopted population projections or forecasts, 2000 to 2025, are reviewed (Table 3-1) for Radnor and its neighbors. These numbers have been prepared by the official regional planning commission, the Delaware Valley Regional Planning Commission (DVRPC), the federally and state designated Metropolitan Planning Organization charged with developing population projections and forecasts for use in highway and other planning in the region. Population forecasts are developed for the region and its member counties; these "control totals" are then disaggregated down to the municipal level. Radnor's population is forecasted to increase by only 2.0 percent during the 25-year period, with Newtown forecasted to increase by only 4.0 percent. The other Delaware County municipalities actually decline during the period, with Delaware County itself actually losing people. The two Chester County municipalities grow a bit more, with Tredyffrin increasing by 8 percent. Even so, this is a very low rate of growth over 25 years, especially when compared with the Chester County total 27.0 percent growth rate. Although Montgomery County is forecasted to grow moderately, Lower Merion is forecasted to decline moderately during this period. Again, all of these forecasts reflect the fact that all of these municipalities are relatively mature communities, already highly developed. These population dynamics are critical when addressing the issue of accommodating regional growth share, as has been historically put forward by Pennsylvania courts. Clearly, the question of how much growth Radnor Township should accommodate takes on special meaning when Delaware County is forecasted to decline, Radnor area municipalities are forecasted to remain stable or decline, and Radnor itself is forecasted to remain stable in population.



**Table 3-1. Population Forecasts for Radnor Township and Neighboring Municipalities (DVRPC, 2002)**

	US Census 2000	DVRPC 2025	Difference	Percentage Growth
Haverford	48,498	46,770	(1,728)	-3.7%
Marple	23,737	23,330	(407)	-1.7%
Newtown	11,700	12,140	440	3.6%
Radnor	30,878	31,480	602	1.9%
Delaware Co.	550,864	547,284	(3,580)	-0.7%
Easttown	10,270	10,700	430	4.0%
Tredyffrin	29,062	31,510	2,448	7.8%
Chester Co.	433,501	550,160	116,659	21.2%
Lower Merion	59,850	58,530	(1,320)	-2.3%
Montgomery Co.	750,097	857,030	106,933	12.5%

### C. Population Characteristics

#### 1. Age

Age and other population characteristics also need to be taken into account in terms of understanding Radnor and planning for its future. Age data presented in Table 3-2 indicate that Radnor has an inordinately large percentage of its total population in the teenage/early 20's age cohorts, to use the demographers' term. Radnor's percentages here are virtually three times its Delaware and Chester County neighbors, twice those for Lower Merion. The explanation likely can be related to the large number of educational institutions which are residential in nature and which inflate these statistics enormously, rather than to any other demographic aberration. The enormous "bulge" in these cohorts then serves to make Radnor's counts in the other age categories appear to be smaller than otherwise would be the case.

**Table 3-2. Age Characteristics of Radnor Township and Neighboring Municipalities (US Census, 2000)**

	Median Age	> 5		5-9		10-14		15-19		20-24		25-34	
		#	%	#	%	#	%	#	%	#	%	#	%
Haverford	39.2	3,202	6.6	3,351	6.9	3,542	7.3	2,978	6.1	2,099	4.3	5,843	12.0
Marple	43.3	1,135	4.8	1,434	6.0	1,617	6.8	1,474	6.2	1,023	4.3	2,226	9.4
Newtown	43.3	653	5.6	728	6.2	812	6.9	685	5.9	405	3.5	1,093	9.3
Radnor	31.7	1,528	4.9	1,678	5.4	1,733	5.6	4,645	15.0	3,841	12.4	2,998	9.7
Delaware Co.	37.4	34,394	6.2	38,774	7.0	40,062	7.0	40,349	7.3	32,347	5.9	69,089	12.5
Easttown	42.7	636	6.2	778	7.6	801	7.8	597	5.8	263	2.6	830	8.1
Tredyffrin	40.4	1,811	6.2	1,983	6.8	1,909	6.6	1,396	4.8	1,050	3.6	3,699	12.7
Chester Co.	36.9	29,330	6.8	32,556	7.5	33,105	7.6	29,600	6.8	23,410	5.4	54,720	12.6
Lower Merion	41.2	2,976	5.0	3,586	6.0	4,176	7.0	4,464	7.5	4,179	7.0	5,869	9.8
Montgomery Co.	38.2	47,280	6.3	51,341	6.8	52,874	7.0	45,759	6.1	36,970	4.9	100,931	13.5

(Table 3-2. Age Characteristics of Radnor Twp and Neighboring Municipalities cont.)

	35-44		45-54		55-60		60-64		65-74		75-84		85+	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Haverford	8,024	16.5	6,903	14.2	2,274	4.7	1,811	3.7	3,941	8.1	3,267	6.7	1,263	2.6
Marple	3,665	15.4	3,470	14.6	1,324	5.6	1,135	4.8	2,537	10.7	1,851	7.8	846	3.6
Newtown	1,764	15.1	1,760	15.0	683	5.8	553	4.7	1,181	10.1	966	8.3	417	3.6
Radnor	3,954	12.8	3,816	12.4	1,424	4.6	1,118	3.6	1,924	6.2	1,538	5.0	681	2.2
Delaware Co.	89,511	16.2	74,079	13.4	25,971	4.7	20,619	3.7	42,053	7.6	32,748	5.9	10,868	2.0
Easttown	1,635	15.9	1,719	16.7	673	6.6	577	5.0	1,010	9.8	609	5.9	202	2.0
Tredyffrin	5,047	17.4	4,710	16.2	1,844	6.3	1,338	4.6	2,445	8.4	1,444	5.0	386	1.3
Chester Co.	76,903	17.7	64,406	14.9	22,583	5.2	16,211	3.7	27,128	6.3	17,782	4.1	5,767	1.3
Lower Merion	7,892	13.2	9,319	15.6	3,553	5.9	2,793	4.7	5,034	8.4	4,163	7.0	1,846	3.1
Montgomery Co.	127,953	17.1	106,735	14.2	38,429	5.1	30,018	4.0	55,562	7.4	41,518	5.5	14,717	2.0

The above explanation notwithstanding, Radnor has an especially small percentage of its 2000 population in the older age (over 65 years) categories. Only 2.2 percent of Radnor's 2000 population was in the over 85 and over group, only 5.0 percent in the 75 to 84 group, only 6.2 percent in the 65 to 74 year old group, in contrast with the much larger percentages for Haverford, Marple, and Newtown. Again, part of the explanation relates to the preponderance of residents in the 15 to 19 and 20 to 24 year cohorts, but the percentages are still surprisingly low. These numbers are especially surprising given the existence of several large rental complexes in the Township, at least some of which are age restricted, which one would expect to attract an elderly clientele. Clearly many of these rental units are likely to be occupied by those who are younger.

## 2. Race and Ethnicity

Table 3-3 presents data on race and ethnicity. Radnor and adjacent municipalities have substantially larger proportions of its total population which are white, considerably more so than all of Delaware County and, to a lesser extent, Montgomery County. On the other hand, of the four Delaware County municipalities used in this comparison, Radnor is significantly less "white." Both Tredyffrin and Lower Merion have similar percentages of "non-white" racial and ethnic groups. Radnor's non-white share is clearly related to a much larger proportion of Black and Hispanic populations than its other Delaware County neighbors. Radnor also has a much larger Asian component (5.7 percent). Both Lower Merion and Tredyffrin have larger percentages in the Black and Asian groups as well. In the cases of Blacks and Asians, the total county level shares are much larger for all three counties, although the percentages of Hispanics even on the county level are quite small. In sum, from a race and ethnicity perspective, Radnor is not highly diversified. The counties themselves, not known for their diversity, are considerably more diversified than Radnor. At the same time, some of Radnor's neighbors are even significantly less diversified.

**Table 3-3. Race and Ethnicity for Radnor Township and Neighboring Municipalities  
 (US Census, 2000)**

	White		Black		Hispanic/Latino		Native Amer.*		Asian		Other	
	#	%	#	%	#	%	#	%	#	%	#	%
Haverford	45,585	94.0	1,028	2.1	431	0.9	1,034	2.1	1,338	2.8	204	0.4
Marple	21,980	92.6	261	1.1	156	0.7	21	0.1	1,307	5.5	62	0.3
Newtown	11,251	96.2	77	0.7	81	0.7	8	0.1	269	2.3	36	0.3
Radnor	27,652	89.6	953	3.1	628	2.0	29	0.1	1,750	5.7	241	0.8
Delaware Co.	442,449	80.3	79,981	14.5	8,368	1.5	944	0.2	18,103	3.3	5,157	0.9
Easttown	9,630	93.8	258	2.5	111	1.1	0.12	0.1	286	2.8	40	0.4
Tredyffrin	26,412	90.9	825	2.8	350	1.2	37	0.1	1,487	5.1	144	0.5
Chester Co.	386,745	89.2	27,040	6.2	16,126	3.7	785	0.2	8,468	2.0	7,221	1.7
Lower Merion	54,047	90.3	2,694	4.5	956	1.6	86	0.1	2,048	3.4	495	0.8
Montgomery Co.	648,510	86.5	55,989	7.5	15,300	2.0	1,103	0.1	30,191	4.0	7,975	1.1

\*American Indian, Alaskan Native, Hawaiian, Other Pacific

### 3. Educational Attainment

In terms of education attainment levels, Table 3-4 demonstrates the very high educational proficiency of most Radnor residents. Radnor has a very low “less than 9<sup>th</sup> grade” attainment score (1.8 percent), with only Tredyffrin (1.1 percent) being lower in terms of the six neighbors (the statistics for the respective counties, though quite low, are still much higher than the Radnor statistic). Conversely, Radnor has an extremely high level of both Bachelor Degree and Graduate/Professional Degree residents (32.8 and 33.6 percent respectively). Nearly two-thirds of the eligible populations have college degrees or more advanced degrees (Graduate and/or Professional), a very high level. Only Tredyffrin and Lower Merion have higher totals (68.8 and 66.7 percent respectively) and their totals are quite close to the totals for Radnor. These numbers are dramatically higher than those for the three counties, with Chester County’s 42.5 percent being the closest competitor.

**Table 3-4. Educational Attainment for Radnor Township and Neighboring Municipalities  
 (US Census, 2000)**

	Less than 9th Grade		Bachelor's Degree		Graduate/Profess.	
	#	%	#	%	#	%
Haverford	798	2.4	8,671	26.0	6,580	19.7
Marple	802	4.7	3,555	20.8	2,220	13.0
Newtown	198	2.4	2,244	26.7	1,473	17.5
Radnor	311	1.8	5,703	32.8	5,842	33.6
Delaware Co.	13,519	3.7	66,484	18.2	43,186	11.8
Easttown	173	2.4	2,876	40.0	1,867	26.0
Tredyffrin	222	1.1	8,240	39.2	6,227	29.6
Chester Co.	10,085	3.5	76,003	26.6	45,349	15.9
Lower Merion	586	1.4	11,820	29.1	15,245	37.6
Montgomery Co.	15,649	3.0	118,910	23.1	80,877	15.7

### 4. Employment and Income Characteristics

Educational statistics bear close relatedness to Employment Characteristics (i.e., increased educational attainment tends to be correlated with employment characteristics which require greater and greater educational levels), defined in terms of occupations (statistics in Table 3-5

indicate occupations of Radnor Township residents). By a wide margin, most Radnor residents (58.0 percent) are in the Management, Professional, Related Occupations category, comparing favorably to Lower Merion (65.6 percent), Tredyffrin (63.9 percent) and Easttown (63.2 percent). These percentages are much higher than those of the counties (Chester County at 45.2 percent, Montgomery County at 44.5 percent, and Delaware County at 39.3 percent). There is strong correlation here with both educational attainment statistics as well as income statistics as discussed in the next section. In terms of the remaining statistics, statistics do not indicate any notable trends. Radnor has no Farming, Fishing, and Forestry workers. Radnor has very few workers classified as Construction, Extraction, Maintenance or Production, Transportation, Material Moving.

In terms of Unemployment, Radnor is rated at a surprising 5.0 percent, in contrast to the much lower ratings of five of its six neighbors (Lower Merion has a surprisingly high 6.9 percent Unemployed). Even the percentages for the three counties are much lower than the Radnor 5.0 percent Unemployed. Possibly the presence of a large number of private schools, colleges and universities may have served to skew this number and add to Radnor's Unemployed. In terms of the other socioeconomic indicators, Radnor is the epitome of economic strength and robustness. This Unemployed number is not compatible with all of the other socioeconomic indicators, which are being presented here.

**Table 3-5. Employment and Occupation Characteristics of Radnor Township Residents and Neighboring Municipalities (US Census, 2000)**

	Employed (1)		Unemployed (1)		Management (2)		Service (3)		Sales/Office (4)	
	#	%	#	%	#	%	#	%	#	%
Haverford	24,296		617	1.6	12,216	50.3	2,311	9.5	6,898	28.4
Marple	11,187		290	1.5	4,643	41.5	1,317	11.8	3,689	33.0
Newtown	5,205		151	1.6	2,553	49.0	562	10.8	1,446	27.8
Radnor	13,502		1,275	5.0	7,837	58.0	1,172	8.7	3,773	27.9
Delaware Co.	258,782		13,310	3.1	101,646	39.3	34,370	13.3	75,885	29.3
Easttown	4,625		210	2.7	2,922	63.2	209	4.5	1,210	26.2
Tredyffrin	15,019		371	1.6	9,596	63.9	731	4.9	3,818	25.4
Chester Co.	221,255		8,214	2.5	99,985	45.2	24,066	10.9	58,170	26.3
Lower Merion	28,586		3,311	6.9	18,740	65.6	2,186	7.6	6,207	21.7
Montgomery Co.	384,688		17,965	3.1	171,063	44.5	40,413	10.5	108,422	28.2

	Farming (5)		Construction (6)		Production (7)	
	#	%	#	%	#	%
Haverford	-	-	1,601	6.6	1,270	5.2
Marple	5	0.0	754	6.7	779	7.0
Newtown	14	0.3	380	7.3	250	4.8
Radnor	-	-	311	2.3	409	3.0
Delaware Co.	241	0.1	21,648	8.4	24,992	9.7
Easttown	-	-	114	2.5	170	3.7
Tredyffrin	22	0.1	426	2.8	426	2.8
Chester Co.	2,267	1.0	15,208	6.9	21,559	9.7
Lower Merion	-	-	750	2.6	703	2.5
Montgomery Co.	405	0.1	26,380	6.9	38,005	9.9

- (1) 16 and over  
 (2) Management, professional, and related occupations

- (3) Service occupations
- (4) Sales and office occupations
- (5) Farming, fishing, forestry occupations
- (6) Construction, extraction, maintenance occupations
- (7) Production, transportation, material moving occupations

Household income is presented in Table 3-6. The data demonstrate that Radnor is clearly a very affluent community. Median household income (1999) for Radnor was \$74,272 with Easttown at \$95,548, Lower Merion at \$86,373, and Tredyffrin at \$82,258. The counties were all considerably lower (Chester at \$65,295, Montgomery at \$60,829, and Delaware at \$50,092). Radnor had the highest median household income of all neighboring Delaware County municipalities by a substantial margin. Reviewing income brackets is also worthwhile in order to understand extent of wealth in the Township. Focusing on the upper two categories including all yearly household incomes of \$150,000 or more, 24.0 percent or nearly a quarter of all Radnor households had incomes which were \$150,000 or more (in contrast to Lower Merion's 29.2 percent and Easttown's 27.3 percent). The county statistics for this \$150,000 and higher income category (11.6 percent for Chester, 10.0 percent for Montgomery, and 6.4 percent for Delaware) were much lower.

**Table 3-6. Household Income Characteristics for Radnor Township and Neighboring Municipalities (US Census, 2000)**

	Median	< \$10,000		\$10-\$14,999		\$15-\$24,999		\$25-\$34,999		\$35-\$49,999	
		#	%	#	%	#	%	#	%	#	%
Haverford	65,714	635	3.5	664	3.7	1,259	7.0	1,626	9.0	2,230	12.3
Marple	59,577	305	3.5	344	4.0	732	8.5	962	11.2	1,204	14.0
Newtown	65,924	148	3.3	139	3.1	389	8.6	369	8.1	669	14.7
Radnor	74,272	700	6.7	416	4.0	729	7.0	823	7.9	1,104	10.6
Delaware Co.	50,092	14,415	7.0	10,883	5.3	21,760	10.5	24,011	11.6	31,879	15.4
Easttown	95,548	119	3.2	108	2.9	134	3.6	229	6.1	240	6.4
Tredyffrin	82,258	386	3.2	270	2.2	791	6.5	849	6.9	1,246	10.2
Chester Co.	65,295	6,634	4.2	5,277	3.3	11,213	7.1	14,069	8.9	21,084	13.3
Lower Merion	86,373	1,103	4.8	646	2.8	1,262	5.5	1,480	6.5	2,156	9.4
Montgomery Co.	60,829	12,344	4.3	10,412	3.6	23,193	8.1	27,251	9.5	41,432	14.5

	\$50-\$74,999		\$75-\$99,999		\$100-\$149,999		\$150-\$199,999		> \$200,000	
	#	%	#	%	#	%	#	%	#	%
Haverford	3,964	21.9	2,954	16.3	2,986	16.5	1,026	5.7	402	4.0
Marple	1,845	21.4	1,189	13.8	1,255	14.6	417	4.8	370	4.3
Newtown	855	18.8	594	13.1	599	13.2	286	6.3	500	11.0
Radnor	1,453	14.0	1,209	11.6	1,459	14.1	930	9.0	1,560	15.0
Delaware Co.	42,841	20.8	26,014	12.6	21,284	10.3	6,496	3.1	6,789	3.3
Easttown	551	14.7	593	15.8	755	20.1	456	12.1	571	15.2
Tredyffrin	1,984	16.2	1,689	13.8	2,285	18.7	1,251	10.2	1,489	12.2
Chester Co.	32,407	20.5	24,098	15.2	24,851	15.7	8,853	5.6	9,539	6.0
Lower Merion	3,471	15.2	2,641	11.6	3,375	14.8	1,928	8.4	4,783	20.9
Montgomery Co.	61,745	21.6	42,693	14.9	38,727	13.5	13,091	4.6	15,367	5.4

Looking at the other end of the spectrum, Radnor has a surprisingly large count in the Less Than \$10,000 per year household income category (6.7 percent or 700 households) with another 4.0 percent (416 households) in the \$10,000 to 14,999 category (a total of 10.7 percent or 1,116 households under \$15,000). These Radnor proportions are much higher than those listed for most of its neighbors. A possible explanation again could be a skewing effect of at least some households comprised of college and university students, whose household incomes could be appearing to be inordinately low. Another 7.0 percent or 729 households in Radnor fall within the \$15,000 to 24,999 income category; another 7.9 percent or 823 households in the next category. A total of 25.6 percent or 2,668 households in Radnor have household incomes less than \$35,000, which is a surprisingly large number.

Table 3-7 presents data for those households classified as in poverty, as defined by the federal government (the Census Bureau uses a set of money income thresholds that vary by family size and composition to detect who is poor. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being "below the poverty level"). Statistics are disaggregated between households defined as Families and those defined as Individuals. Of all families in Radnor, 2.4 percent (153 families; total individuals not reported) are classified as at or below the federal poverty income limit; a considerably larger 6.7 percent (1,663) Individuals were counted by the Census. Again, a large percentage of this "poverty count" may well consist of the various student populations in the Township, given the large number of educational institutions which exist in or near Radnor and the number of students who are known to reside off-campus. Haverford and Lower Merion Townships had comparably sized numbers counted below the poverty threshold (again, these municipalities also could be characterized by relatively large numbers of off-campus student housing). Newtown and Easttown have far less poor, in both an absolute and relative sense.

**Table 3-7. Households Below Poverty Level in Radnor Township and Neighboring Municipalities (US Census, 2000)**

	Families		Individuals	
	#	%	#	%
Haverford	265	2.0	1,759	3.7
Marple	137	2.1	1,050	4.6
Newtown	59	1.8	401	3.5
Radnor	153	2.4	1,663	6.7
Delaware Co.	8,092	5.8	42,411	8.0
Easttown	19	0.7	274	2.7
Tredyffrin	171	2.2	1,068	3.7
Chester Co.	3,259	3.1	22,032	5.2
Lower Merion	283	1.9	2,512	4.5
Montgomery Co.	5,470	2.8	32,215	4.4

## D. Housing: Existing Conditions Affecting Radnor's Housing System

### 1. Recent Residential and Other Land Development Activity in Radnor

A variety of factors are important in determining future growth and development activity in Radnor Township. Of course, availability of vacant developable land, as discussed below, is very important, although with increasing frequency there appears to be a trend toward re-development of already developed sites, making the vacant land factor less and less interesting and compelling.

A second important indicator of future development is recent development trends. Tables 3-8 and 9 provide a listing of recent land development activity, based on data provided by the Township (Department of Community Development). Table 3-8 shows recent development statistics in the Township. Table 3-9 provides information on subdevelopments in the last five years. In general, building activity, however its measured, appears to be either static and possibly even on the decline. In any case, the absolute amount of activity is not great. More specifically, Total Building Permits data includes a wide range of both residential and non-residential building-related activity, including signs, demolitions, and other categories and therefore should not be interpreted simply as additional housing construction. New Construction indicates total units of all types for which building permits were issued; statistics include both residential and non-residential. The bulk of these units can be expected to be residential; for example, of the 18 permits issued in 2001, 17 were residential (all single family) and 1 was institutional. In 2000, 29 of the 33 total were residential (all single-family) with 3 institutional and 1 a public land use. The trend appears to be one of decline. States the Township: "The decline in new construction may also be a result of strong efforts by community leaders and the public to manage and conserve remaining open space, as well as the decline of available land for new construction." (2001 Construction Activity Report, Department of Community Development, Radnor Township).

**Table 3-8. Radnor Township Recent Development Statistics**

Year	Building Permits	New Construction	Accessories Additions	Subdivisions	Lots
2001	886	18	148	NA	NA
2000	962	33	152	NA	NA
1999	1,125	29	75	19	34
1998	1,515	35	143	13	27
1997	1,348	54	131	18	34
1996	1,425	34	116	21	38
1995	1,334	30	106	16	21
1994	1,365	45	111	21	55
1993	1,344	55	105	10	28
1992	1,343	69	108	16	52
1991	1,166	41	100	12	15
1990	1,317	49	120	11	56
<i>Total</i>	15,130	492	1,415	157	360
<i>Average</i>	1,261	41	118	15.7	36

Source: Radnor Township, Department of Community Development; NA not available from Radnor

Also of interest is both the total number of subdivisions being processed; looking over the last 12 years, a trend is hard to decipher, with an average of about 16 subdivisions of all types (the vast bulk of these are undoubtedly residential, although they could be commercial as well) being processed. The total number of lots in these subdivisions is similarly difficult to trend. There would appear to be somewhere between 30 and 40 new lots, probably mostly single-family residential lots, being created each year. Some of these lots could be further subdivisions of existing larger estates or parcels where there are existing homes; some simply could be subdivision of vacant parcels. It is clear that with the notable exception of the large Greythorne Woods townhouse development, there is a glaring absence of new non-single-family unit construction and development in Radnor since 1990. Almost everything that has happened has been upscale single-family homes.

The Township has summarized recent land development activity:

“Since 1990, 441 new structures have been completed in 173 new subdivisions, including St. David’s Square shopping center, Zany Brainy children’s store, the award-winning Anthropologie, new buildings on Villanova University’s Campus, Greythorne Woods (townhouses), Portledge Manor, Abraham’s Lane, Edenton, Brooke Farm, Ardrossan Farm, and several other new high-end residential developments. (Written Communication from Michael Fleig, Radnor Township Director of Community Development, 2002).

**Table 3-9. Recent Developments in Radnor Township  
 (provided by Radnor Township for recent 5-year period)**

Development Name	# Homes or Buildings	Average Sale or Construction Price
Cornerstone	91	\$475,000
Inverary	64	\$465,000
Greythorne Woods	49	\$225,000
Woodlands	48	\$500,000
Laurier	32	\$850,000
Ardrossan Farm	24	\$2,500,000
Stradley Run	23	\$750,000
Portledge Manor	22	\$700,000
Longworth	21	\$700,000
Edenton	18	\$750,000
Maplewood Road	15	\$350,000
Birches	11	\$600,000
Van Lear’s Run	10	\$750,000
Harford Estates	10	\$700,000
Abraham’s Lane	9	\$1,250,000
Ithan Woods	8	\$750,000
Biddulph Road	8	\$700,000
Fortenbaugh Woods	3	\$750,000



Major recent developments include the 67-acre Brooke Farm with its 30 large homes (\$1.0 to \$1.4 million sales prices) where more than half of the land has been set aside for open space. Laurier, a subdivision of the DeMoss estate approved by the Township in 1996, uses density modification for its 31 \$850,000 homes on 31 acres, with 15 of these acres permanently set aside as open space and the existing mansion on a 7.5-acre parcel preserved and sold separately. Of note is Ardrossan Farms, the last actively farmed land in the Township, where two subdivisions totaling 308 acres and 24 “mini-estate” lots have been approved and constructed. Also of note are the four large dormitories are to be constructed beginning in 2000 at Villanova University and provide living quarters for 1,000 students; resulted in building permit fees in excess of \$400,000.

Table 3-10 presents US Census Bureau’s housing data for Radnor and its neighboring municipalities. During the 1990’s, the US Census is showing a slight increase in total Radnor housing units, up by only 151 units (1.4 percent) to 10,731 by 2000. This very small increase was reflected in Radnor’s neighboring Delaware County municipalities, especially Haverford Township (0.9 percent) with both Newtown (6.0 percent) and Marple (4.3 percent) increases not much larger. Increases in Easttown (11 percent) and Tredyffrin (5 percent) in Chester County were somewhat larger, though still not large in the absolute. And Lower Merion actually had a decrease in total housing units (1 percent loss). All of these municipalities have “matured” and are substantially built out with a relative scarcity of undeveloped land. In all of these communities, a considerable amount of the housing stock is aged; there is a small number of demolitions occurring as well as loss by fire which is balanced by infill development and other typically small subdivisions on the rare vacant site. It is interesting to note that housing growth for all of Chester County and all of Montgomery County was considerably higher; for example, compare the averaged Chester County increase of 17 percent to Radnor’s 1.4 percent.

**Table 3-10. Housing Units and Housing Characteristics for Radnor Township and Neighboring Municipalities (US Census, 2000)**

	1990 Housing Units	2000 Housing Units	2000 Owner-Occupied		Vacancy Rate	2000 Rental-Occupied		Vacancy Rate
			#	%		#	%	
Haverford	18,210	18,378	15,399	85.3	0.6	2,662	14.7	2.6
Marple	8,433	8,797	7,221	83.7	0.3	1,402	16.3	3.9
Newtown	4,433	4,690	3,675	80.8	1.0	874	19.2	3.5
Radnor	10,580	10,731	6,545	63.3	0.5	3,802	36.7	3.9
Delaware Co.	211,024	216,978	148,384	71.9	1.4	57,936	28.1	6.0
Easttown	3,479	3,862	3,211	85.4	0.7	547	14.6	3.0
Tredyffrin	11,953	12,551	9,613	78.6	0.7	2,610	21.4	3.2
Chester Co.	139,977	163,773	120,428	76.3	1.0	37,477	23.7	4.8
Lower Merion	23,938	23,699	17,255	75.5	0.8	5,613	24.5	4.0
Montgomery Co.	265,566	297,434	210,233	73.5	1.0	75,865	26.5	5.6

## 2. Housing Occupancy

Table 3-10 also indicates owner occupancy of housing units (i.e., rental versus owner occupied). Traditionally, owner occupancy has been viewed as a positive factor by many municipalities, reflective of community stability and a wide variety of other values. As communities grow more cosmopolitan and more urban however (Manhattan being an excellent case in point), increased availability of rental units becomes essential for a fluid housing market and to support the more variable needs of community households. Based on Table 3-10, Radnor Township continues to have a remarkably low 63.3 percent rate of owner occupancy; conversely, Radnor has an equally remarkable 36.7 percent non-owner occupancy or rental rate proportion. First, this high rate can be attributed to a large extent to a series of large, medium to high density low- to mid-rise apartment complexes located generally along Lancaster Avenue in the eastern end of the Township (there are other rental complexes in scattered locations around the Township, plus rentals of other units not located in larger complexes). These complexes have existed for many years and in most cases they have aged “gracefully” and continue to provide excellent housing services to a broad and diverse group of people, to all types of households. **General support for “conservation” of these rental complexes will be increasingly important in the future, as the remainder of Radnor’s single family housing grows increasingly more costly (see below).** The Township should investigate mechanisms at its disposal, direct and indirect, which will protect the rental status of these residential complexes. Obviously rental units are not immune to increased prices and rents; nevertheless, even as rents increase, rentals still allow more households to gain access to the Radnor housing market, avoiding the large downpayments and lump sum payments required for purchase of ever more costly Radnor housing. It is likely that real estate dynamics will be such that some of these rental complex owners may be pressured to redevelop and convert to other uses, subject to Township regulation, or at least to renovate and convert to a condominium or non-rental form of ownership as has been done elsewhere. In these cases, densities may remain relatively constant (in some cases, they are actually reduced as the units are converted to condominium ownership); however, unit prices typically are increased, sometimes significantly. To the extent that these rental unit complexes are reduced in number or more limited, Radnor’s housing market can be expected to become even more restrictive and difficult to enter.

Radnor’s owner occupancy is interesting to compare to other more suburban municipalities. Newtown, Haverford, and Marple Townships, for example, all have a dramatically larger proportion of their total housing units as owner occupied units. Radnor’s large “share” of rental housing clearly stands out and is even considerably higher than that for all of Delaware County, and certainly higher than either Montgomery County or Chester County. Easttown and Tredyffrin in Chester County as well as Lower Merion in Montgomery County all have considerably higher owner-occupancy rates. In fact, there may well be no other municipality in the southeastern Pennsylvania region with both such highly valued real estate and with such a large proportion of rental units.

Owner occupancy also has been equated, and to some extent can be equated in Radnor, with type of housing stock: single family detached versus single family attached (rowhouse or townhouse) versus twins versus small (quadruplex) to large apartment complex. There is undoubtedly some single-family detached structures which are not owner-occupied and are rented. But not many. And there are some non-single-family structures, which are owner-occupied. But not many. In

fact, this ownership data can almost be used as a proxy for type of structure (i.e., single-family versus multi-family).

### **3. Housing Vacancy**

Housing analysts typically recommend that a modest amount of housing should be vacant at any one point in time, simply to maintain a reasonably fluid housing market and not create excessively high demand which artificially drives up prices. This vacancy rate, sometimes called the frictional vacancy rate, is sometimes estimated to be about 5 percent. According to the US Census (Table 3-10), of the 10,731 total housing units in Radnor in 2000, 384 units or 3.6 percent were not occupied and could be considered vacant (although some of these units may not necessarily have been on the market in the conventional sense; they simply were not occupied for some reason). The US Census further indicates that the vacancy rate for Owner Occupied units is 0.5 percent and 3.9 percent for rental units, as of the 2000 Census. Not surprisingly, all of these numbers are very low. In fact, the 0.5 percent for owner occupied units is so low that it would be considered “frictionally unhealthy:” by many housing analysts, likely to stimulate accelerated rises in prices as housing supplies have a difficult time meeting housing demands in the future. The further downside of this “more demand than supply” market condition above and beyond rapid increases in price (which of course is a highly desirable upside for anyone trying to sell already owned housing in Radnor or owners of rental units) is that households wanting to move into Radnor in the future for one reason or another simply will not be able to move in and will be forced to seek alternative locations. This factor may be more significant for certain types of households, certain age groups or ethnic and racial groups which are more income-constrained, all of which can have implications for future Radnor community building. Even the rental vacancy rate of 3.9 percent is quite low. Obviously finding any type of housing at just about any price level in Radnor Township is extremely difficult.

Vacancy rates for the neighboring municipalities aren’t terribly different, though Radnor has clearly just about the lowest vacancies (Marple’s owner-occupied vacancy rate is slightly lower than Radnor’s; several neighbors have lower rental vacancy rates). One is left to conclude that the housing market in Radnor as well as neighboring municipalities is generally extremely tight. The vacancy rates for the three counties, though low themselves, are considerably higher than vacancies for Radnor.

### **4. Household Size**

Table 3-11 provides a comparison of persons per household data for Radnor and its neighboring municipalities. Radnor’s statistic is remarkably lower than that for area municipalities and even for all of Delaware County (2.56 versus 2.63 in 1990), which is quite surprising. Radnor’s very low 2.39 persons per household number (2.44 in 1990) reflects the very large number of rental units (nearly 40 percent) in Radnor which tend to be smaller in size and therefore matched with smaller households. Decline in household size locally and regionally reflects a national trend, affected by an overall decline in number of children per family, increase in all types of households with single individuals (unmarried individuals, divorced individuals, widows/widowers, etc.), an increase in single head-of-household families, and so forth; this trend has continued for the last several decades, though the rate of decline now appears to be slowing. Given that Radnor’s rate at 2.39 persons per household is already so low, it is unlikely that future decline, 2000 to 2025, will be significant, at least when contrasted with neighboring

municipalities where household sizes are still (Year 2000) well above 3.0 persons per household. Radnor's marginal reduction from 2.44 in 1990 to 2.39 in 2000 indicates that the rate of decline is already "leveling out."

**Table 3-11. Persons Per Household for Radnor Township and Neighboring Municipalities (US Census, 2000)**

	Persons/Household *
Haverford	3.17
Marple	3.12
Newtown	3.06
Radnor	2.39
Delaware Co.	2.56
Easttown	2.64
Tredyffrin	2.36
Chester Co.	2.65
Lower Merion	2.42
Montgomery Co.	2.54

\* Based on Total Household Count

### 5. Characteristics of Recent Land Development Activity

**Values:** Although less and less development activity may be occurring in Radnor due to an ever-decreasing supply of development sites, especially vacant sites, what does happen is increasingly valuable, increasingly high end. Data in Table 3-8 on Accessories and Additions, is further indication of the lot-by-lot re-development efforts occurring throughout the Township, even in the least upscale neighborhoods, where more modest housing is being purchased and then renovated and expanded (in some cases, the house is purchased for the lot itself and then demolished, only to be replaced by a much larger and much more valuable structure; this issue is discussed in more detail below). Table 3-9 presents a simple listing of land development projects in the last five years, with actual prices/costs listed (no present valuing was undertaken; some of the values from the early 1990's would actually be considerably higher in today's dollars). This table does not include the recent purchase of the Wyeth-Ayerst Campus by the Rubenstein Group and the related re-development and reconstruction associated with this project. The bottomline is that Radnor development projects are attracting more and more dollars; as Radnor real estate grows ever more valuable.

Census data on housing values have recently been released for the 2000 Census. Tables 3-12, 3-13, and 3-14 summarize this data, both for owner-occupied housing and for rental housing. Median housing unit value in Radnor at \$326,500 (up from \$266,700 in 1990) emerges as the highest in Delaware County (\$128,800 up from \$113,200 in 1990) and certainly one of the highest in the region; the comparison with Delaware County is remarkable (253.5 percent of the County value). Even in comparison with well-to-do neighbors Newtown at \$209,700 (up from \$185,700 in 1990), Marple at \$183,600 (up from \$164,200 in 1990), and Haverford at \$162,600 (up from \$148,700 in 1990), Radnor's median value far out distances these other reasonably upscale communities and rose more rapidly than its neighbors, 1990 to 2000. In terms of Chester County, both Easttown (\$316,100) and Tredyffrin (\$269,800) have high values, though not as high as Radnor, with the Chester County median at \$182,500 in 2000. Only the Lower Merion

value \$341,100 is higher than the Radnor median value. In sum, Radnor housing is extremely costly both in an absolute and relative sense. And, again, values appear to be inflating rapidly.

In terms of rent for rental occupied units, Table 3-14 indicates the same differential, although in this case Radnor rents are also higher than Lower Merion rents. The comparison of the numbers, both with neighboring municipalities as well as with the counties, is not as large percentage-wise, given the reality of monthly rental rates in contrast to total unit values for owner-occupied housing.

**Table 3-12. Values of Owner-occupied Housing in Radnor Townships (US Census, 2000)**

Value Range	Count	Percentage
< \$50,000	43	1%
\$50,000-\$99,999	111	2%
\$100,000-\$149,999	597	10%
\$150,000-\$199,999	702	12%
\$200,000-\$299,999	1196	20%
\$300,000-\$499,999	1807	31%
\$500,000-\$999,999	1275	22%
> \$1,000,000	173	3%

Tables 3-12 and 3-13 present more detailed breakouts of values for owner-occupied housing units and for rental housing units in Radnor Township. In terms of owner-occupied housing, only 64 units or 2.6 percent of the total number of owner-occupied units were valued under \$100,000; only 12.7 percent were valued under \$200,000. Conversely, over 55 percent of all owner-occupied units were valued in the \$300,000 and over categories. In terms of rental units, only 4.5 percent of the total had rents less than \$500, only 16.3 percent had rents under \$750 per month, with 38.3 percent having rents at \$1,000 or more. In sum, Radnor Township housing by all counts appears to be very expensive.

**Table 3-13. Count of Monthly Rental Occupied Housing in Radnor Township (US Census, 2000)**

	Count	Percent of total rental units
< \$200	42	1.1%
\$200 - \$299	55	1.5%
\$300 - \$499	75	2.0%
\$500 - \$749	448	12.2%
\$750 - \$999	1605	43.6%
\$1,000 - \$1,499	1269	34.5%
\$1,500 +	187	5.1%

Finally, Table 3-14 presents data for both owner-occupied and rental housing units, which combines ability to pay for housing versus what is being paid. Housing planners have used one standard, 35 percent or more of total household income, as an upper limit for the share of income

which should be spent on housing. In other words, households spending more than 35 percent of their respective incomes on housing are likely to be experiencing potential problems because they spend an excessively high fraction of their incomes on housing (it should be noted that this standard has less and less meaning as incomes grow larger; the 35 percent standard has much more relevance where the household income is \$20,000 per year than where the household income is \$200,000 per year). The data for owner-occupied housing units in Radnor and its neighboring municipalities and the counties themselves indicate a remarkable clustering around the 16 percent level. As cited above, housing costs are widely divergent in these different jurisdictions, and income levels are equally widely divergent. Given this divergence, it is somewhat surprising that these percentages are so tightly and similarly clustered. Given the extremely high costs of Radnor housing, this 16.6 percent for owner-occupied units obviously is also related to the fact that although housing is extremely expensive in Radnor, household incomes are also extremely high, again as cited above.

On the other hand, Table 3-14 data for rental units only is significantly different. Over 40 percent of total households which rent are paying more than 35 percent of their household incomes on housing (1,537 households). Given the large proportion of Radnor's total households which rent, this data is more remarkable. Radnor's 40.5 percent is second only to Newtown's 42.3 percent. In fact all of the rental percentages are significantly higher than percentages given for owner-occupied housing (it should be noted that although the percentages for some neighboring municipalities such as Newtown are high, the absolute numbers are dramatically lower, the Newtown number being 365 households paying in excess of 35 percent of household income on rent; obviously Newtown's 365 households hardly compares with Radnor's 1,537 households).

Is the Radnor actual count of 1,537 households in this "danger" over-35 percent category an indication of serious housing imbalance, serious housing problems? Clearly, the problem of mismatch between income levels and housing costs levels is being felt much more strongly within the rental sector of the housing market. Although on the one hand, Radnor is fortunate to have as much rental housing as it does (and it clearly has much more rental housing than most other neighboring communities), at the same time this housing is costly and requires more than 35 percent of household income for 1,537 households. At the same time, the nature and extent of this potential housing problem needs to be understood in the context of Radnor's somewhat atypical demographic reality, as described above, linked very much to the many institutions of higher learning within and adjacent to the Township. Although we have no specific data to support this explanation, it is commonly accepted that large numbers of rental units are occupied by college-age students, not only from Villanova, Cabrini, Eastern and other Radnor-based schools, but also from institutions in nearby municipalities. Quite possibly, half and even more of the 1,537 households listed in Table 3-14 may consist of off-campus college students, where incomes appear to be inordinately low statistically (household income may consist only of summer work, possibly an occasional part-time job). At the same time, because these households receive substantial support from outside sources, it would be incorrect to view them in the same manner as conventional households. In sum, there is no doubt that there do exist lower income households in Radnor and that these households are being forced to pay ever larger and "unhealthy" percentages of their total household incomes on housing costs. Furthermore,

trends in housing values and rental levels would suggest that these problems are growing worse as the housing market in Radnor grows ever stronger and more robust.

**Table 3-14. Median Housing Values and Rents for Radnor Township and Neighboring Municipalities (US Census, 2000)**

	2000 Median Housing Value (1)	Owned Housing costs at 35% or more of 1999 Household Income (2)		2000 Median Gross Rents (3)	Gross Rent costs at 35% or more of 1999 Household Income (4)	
	\$	#	%	\$	#	%
Haverford	162,600	2,253	15.4	814	850	31.9
Marple	183,600	1,184	17.1	798	530	37.8
Newtown	209,700	551	17.0	816	365	42.3
Radnor	326,500	982	16.6	935	1,537	40.5
Delaware Co.	128,800	24,254	17.5	662	18,562	32.1
Easttown	316,100	527	16.9	688	124	13.5
Tredyffrin	269,800	1,276	15.7	928	658	25.3
Chester Co.	182,500	16,501	15.5	754	9,571	26.3
Lower Merion	341,100	2,318	16.4	904	1,609	28.9
Montgomery Co.	160,700	31,099	16.3	757	19,506	25.8

(1) Owner-Occupied Units

(2) Excessively high percentage of income required for housing expenditures

(3) Rental-Occupied Units

(4) same as (2) above

## E. Critical Housing Market Dynamics for Radnor's Future

### 1. Changing Radnor Demographics and Changing Households: Issues of Demand

Based on data in this section, Radnor and surrounding municipalities were relatively low or no growth between 1990 and 2000. Radnor's total population did increase by 2,175 persons in the decade, according to the US Census. The population increases for neighboring Newtown and Marple and Haverford are surprisingly small as well, 1990 to 2000. In fact, Haverford Township declined by 1,350 persons, making the sum of the three neighbors a decrease in total population, even in the last decade. Change in population has also been quite modest in neighboring Easttown, Tredyffrin, and Lower Merion Townships. In short, this general area has not been experiencing significant growth.

The numbers are more compelling when the adopted DVRPC population forecasts, 2000 to 2025, are reviewed. Only Newtown Township has a slight increase in population (up 180 persons or a miniscule 1.5 percent increase over 25 years). Radnor is forecasted to decline by 238 persons, admittedly a very small 0.8 percent but a decrease nonetheless. Somewhat larger declines are forecasted for both Haverford and Marple Townships. Delaware County similarly is forecasted to lose over 10,000 persons during the 25-year period. These population dynamics are critical when addressing the issue of accommodating regional growth share. Clearly, the question of how much growth Radnor Township must accommodate takes on special meaning

when Delaware County is forecasted to decline, Radnor area municipalities (i.e., its neighbors) are forecasted to decline, and Radnor itself is forecasted to decline in population.

Of course, housing demand is not only driven by population, but also by the count of total households. Even if population declines, reduction in household size can still generate an increase in total households. Data indicate here that Radnor's decline in household size appears to be "bottoming out." And although a modest decline may continue in the future, its very low Year 2000 level at 2.38 persons per household is likely not to go much lower.

Based on these basic simple demographics and the fact that population is decreasing, the counterintuitive case can be made that housing demand in Radnor should actually be decreasing in the future as well. Because the Radnor housing market is so regionally desirable, however, forecasting a decline in housing market demand defies common sense. The truth is, as has been pointed out by major regional developers in the Housing Focus Group conducted as part of this planning process and as is understood by anyone involved in the Radnor housing market, Radnor housing demand is tremendous. "Everyone wants to live in Radnor," stated a major regional real estate developer.

Age and other qualitative factors also need to be taken into account in terms of evaluating future housing demand. Age data presented here indicate that Radnor has an inordinately small percentage of its 2000 population in the older (over 65 years) category. Only 13.4 percent of Radnor's 2000 population was in the over 65 group, in contrast with the much larger 17.5 percent for Haverford, 22.0 percent for Marple, and 21.9 percent for Newtown. A large percentage of Radnor's population lies with the middle-aged 18 to 65 category, which is not surprising to those most familiar with Radnor. We conclude that, lacking any sort of major movement into and/or out of the Township, a large middle aged cohort "bulge" will move through middle-age and into the over 65 cohort in the coming years. Many (though not all) of these persons are currently housed in Radnor's wonderful supply of single-family housing stock. As they age, they may choose to remain in these larger and more maintenance intensive housing situations. However, experiences elsewhere indicate that at least a certain percentage will want to seek out housing stock that "fits" their needs (and capabilities). Although this analysis has not been quantified, there clearly will be increased demand for increased age-specific (i.e., elderly) housing. If this housing is not available, existing Radnor residents will be forced to move to other communities or to remain in their existing homes.

## **2. Undeveloped Land and Underdeveloped Land and Re-Development of Developed Land: Issues of Changes in Housing Supply in the Future**

**Undeveloped Land and Changes in Housing Stock:** There is very little reason to believe that the number of housing units in Radnor Township is going to change significantly, either up or down, in the next 25 years. Let's take the issue of increases in housing stock first. The Existing Land Use Map indicates that there is 61 acres of Vacant Land remaining in the Township (see Section 10), with the bulk of this land being in small parcels, some of which have poor or nonexistent access and most of which have a variety of environmental and other development constraints limiting their future residential development potential. Most of this Vacant land is zoned residentially, most in the R-1 category. Detailed analyses of development potential parcel



by parcel has not been undertaken for this planning. Some new residential development will occur to be sure, but it can be expected to be on the order of magnitude as has occurred in the last decade, which is to say very modest, possibly even less. It is not likely that more than 50 additional residential units could be developed on these Vacant parcels.

We would also note here that there is the potential for development of some unknown amount of land which is currently in institutional use. There is the possibility that private institutions may sell off land, either whole or in part; some institutions may choose to relocate. Although some or all of this land would have to be rezoned by the Township if these relocations were to take place, some of this land could be residentially developed, increasing available housing stock. It is extremely difficult to quantify how many, if any, additional residential units could result from re-development of existing institutional uses.

**Underdeveloped Land and Changes in Housing Stock:** There are also some parcels that exist which are Underdeveloped, and where additional subdivision potential of some limited extent is possible, although a home(s) or structure(s) already exists on the parcel (this issue has been explored in more detail for R-1 zoned parcels in Section 10 Existing Land Use and Land Use Plan; see Figure 4; there may exist other parcels in other residential zoning categories which also could be developed/re-developed at higher densities, although a summary review indicates that such parcels are few in number). In some municipalities, these parcels would go unnoticed and would remain undeveloped. However, in Radnor where some houses have already been bought for their lots, demolished, and rebuilt, where potential for creation of just one new lot may be worth hundreds of thousands of dollars, some of these “open space” lot opportunities can be expected to be developed. The potential for additional units is not large here but could add marginally to the total supply of housing stock, possibly adding another 50 to 100 residential units.

It should be pointed out that in many cases, existing and future owners of these “open space” lots may very much appreciate the additional open space and environmental values provided by these added undeveloped open spaces without exploiting the additional development potential; the open space values may be personally more valuable to them than the marketable real estate values. They may be very amenable to donation of conservation easements and other forms of land stewardship which could provide tax benefits even as their lands are conserved. Although major external land trusts and conservancies such as Brandywine Conservancy and Natural Lands Trust may not get too excited about these “small” conservation opportunities, more local land stewardship efforts should be focused on these more modest though somewhat more numerous cases, which are important to the Township nonetheless.

**Re-Development of Developed Land and Changes in Housing Stock:** This issue of re-development of already developed parcels is far ranging. The category technically includes what clearly is a major and significant trend in Radnor to purchase, renovate and improve, and sometimes expand older and smaller homes throughout the Township. In many cases, these efforts are viewed as extremely positive and worthy of merit, as wonderful older homes in need of rehabilitation are becoming attractive again in the market, new families are buying them, and considerable value and vibrancy is being added to formerly unnoticed neighborhoods. A few years ago, there were some “undiscovered” blocks, even neighborhoods in the Township;

however, at this point, these are few and far between. Substantial renovations are ongoing in what were formerly the most questionable areas of the Township. If this trend continues, the trend augurs well at least on one level for the preservation of Radnor's housing stock. Unfortunately, a corollary here is that housing values are increasing rapidly, including rents. For those homeowners with serious income limitations, increased values and gentrification are obviously a positive phenomenon. As discussed elsewhere, the robust local economy and other positive factors has allowed real estate taxes to remain relatively low in Radnor. Either through especially low assessed value/market value ratios or through modest millage rates themselves, effective real estate tax bills for \$100,000 worth of marketable real estate in Radnor is relatively low at least when compared with other Delaware County municipalities. Therefore those who are less well off but who are lucky enough to own a modest home which is inflating in value are fortunate and can choose to remain and enjoy their situation or cash in and sell out with a significant capital gain. Unfortunately for the many who do not own homes, rents will increase and will force out those unable to pay. Over time, this process of gentrification has in other communities and will in Radnor serve to remove the lower and more moderate-income segments of the Township.

Unfortunately the extreme of this positive trend for upgrading and reinvestment ends up being outright demolition of existing homes and replacement with monster homes, as they have come to be called. This happens when the neighborhood has come to be so desirable that land values have escalated to the point where the land itself – the lot – is more valuable than the existing house. Due to a shortage of vacant available lots, as is the case in Radnor, buyers start buying up existing lots, demolishing existing homes, and then redeveloping these lots with larger and more elaborate structures, complying with existing codes and ordinances, of course. Although this trend which is documented in other select communities across the country is just in its infancy in Radnor, Radnor has all of the prerequisites for heightened and accelerated "monsterization" as demand and values continue to mount.

In all of this, the prognosis for the housing stock itself is relatively positive, unless monsterization trends grow more pronounced and replacement of older stock increases. For example, in many formerly deteriorated neighborhoods, increased values has meant that reinvestment has increased, building improvements are on the rise, and neighborhoods at least in terms of the physical housing stock are on the upswing. Unfortunately, the "gentrification" that accompanies this process can force income-limited households out of the Township and lead to reduced age and racial and other forms of community diversity.

#### **F. "Fair Share" Issues**

Critical "fair share" issues relate to whether the municipality is in the path of growth, whether the municipality had developable land which can accommodate growth in the future, and whether the municipality is devoting a reasonable amount of that land to housing and a mix of housing types? As demonstrated above, the population forecasts for Radnor and its neighbors indicate either no-growth or actual decrease in population from current levels. This lack of growth is very much related to the fact that Radnor is virtually built out, a reality borne out by our analysis of vacant developable land remaining in the Township. Given all of the above, Radnor has passed its "fair share" tests, at least when viewed from a legal perspective. The lack

of “fair share” issue is reinforced by the reality of the extremely large number of rental units extant in the Township, many of which are contained within apartment complexes.

At the same time, there is clearly an income/housing costs issue in Radnor, which can be expected to worsen over time. As values and prices race ahead and the few remaining less expensive housing units are rehabilitated and improved, increasingly only upper income households will be able to remain in Radnor. In many ways, the community will grow less diverse. Only one subsidized housing complex exists in the Township at present. If present trends continue, these very small numbers of units will be the only places where low and moderate-income households will be able to live in the future.

#### **G. Recommended Actions**

The Pennsylvania Municipalities Planning Code states in Article III that all municipal comprehensive plans:

“...shall include...A plan to meet the housing needs of present residents and of those individuals and families anticipated to reside in the municipality, which may include conservation of presently sound housing, rehabilitation of housing in declining neighborhoods and the accommodation of expected new housing in different dwelling types and at appropriate densities for households of all income levels.” Section 301 (a) (2.1)

The information and evaluations contained within this Section of the Draft Comprehensive Plan together with the Goals-Objectives-Recommended Actions set forth in this final sub-section constitute the “housing plan” for Radnor Township.

#### **Goals**

*Conserve and maintain Radnor’s existing housing stock and residential neighborhoods.*

*Provide housing opportunities for a diverse population, including low- and moderate-income residents and senior citizens.*

*Maintain a supply of affordable and market rate housing that meets Radnor’s share of regional housing needs.*

*Promote conservation development strategies for new development on large parcels.*

#### **Objectives**

1. *Promote the rehabilitation of deteriorating or substandard residential properties.*
  - **Continue the Township’s property maintenance, inspection, and enforcement program.**

2. *Ensure that redevelopment within established neighborhoods is compatible in scale and character.*
  - **Enact regulations to manage and control monsterization.**
3. *Discourage demolition and promote the preservation of residential structures of historic significance.*
  - **Enact historic preservation overlay(s) and other development regulations that encourage rehabilitation of historic residential buildings.**
4. *Support housing that incorporates facilities and services to meet the health care, transit, or social service needs of seniors.*
  - **Protect and preserve the ample supply of rental units/complexes in the Township.**
  - **Develop and implement strategies for the careful senior housing re-use of those institutional parcels which become available in the future, provided that the other goals of the Comprehensive Plan are being respected.**
  - **Develop and implement strategies for the careful senior housing re-use of those “underdeveloped” parcels, provided that the other goals of the Comprehensive Plan are being respected.**
5. *Encourage and foster diverse housing opportunities for low- and moderate-income families.*
  - **Protect and preserve the ample supply of rental units/complexes in the Township.**
6. *Undertake a variety of strategies to preserve and/or increase housing density and diversity in appropriate locations.*
  - **Allow for increased housing density immediately surrounding commercial areas and particularly near transit centers.**
  - **Consider enacting minimum density requirements in the higher density residential districts.**
  - **Amend zoning regulations to permit smaller residential lots where smaller lots would be compatible with the surrounding neighborhood.**
7. *Encourage mixed-use districts as a means of increasing the housing supply while promoting diversity and neighborhood vitality.*

- **Use area plans and/or other tools to develop regulations that support the development of housing above and among commercial uses in the Wayne area and other appropriate locations.**
8. *Discourage the conversion of lands designated as residential to nonresidential uses.*
  9. *Investigate use of additional tools such as maximum lot size overlays with related restrictions and community land trusts.*
  10. *Consider a variety of strategies that will promote cluster or conservation design in new land development.*
    - **Investigate use of transfer of development rights.**
    - **Amend zoning to include a conservation design option.**

## SECTION 4 BUSINESS AND ECONOMIC DEVELOPMENT

### A. Introduction and Statement of Goals

Radnor is a highly desirable location for office and retail development due to its transportation accessibility, proximity to highly educated workers, and wealthy residents. Located along the Main Line, Radnor Township has a strong socioeconomic base, and the demographic strength of neighboring communities further boosts commercial demand in Radnor. Few suburban communities enjoy Radnor's locational advantage, with direct links to Lancaster Avenue, I-476, and Route 320, as well as quick access to the Schuylkill Expressway and Pennsylvania Turnpike.

#### 1. Goals and Objectives

Discussions with Radnor's planning task force and business focus group, along with field observations, point to a series of goals, issues, and strategies to improve business conditions and districts in the township. Below is a listing of Business and Economic Development Goals, followed by the objectives to accomplish the Goals. These are repeated at the end of this section along with specific Recommended Actions.

##### Goals

*Protect and enhance the character and mix of uses in Wayne as a special town center.*

*Protect and enhance the smaller commercial districts in the Township, including Garrett Hill and other neighborhood districts along Conestoga Road.*

*Restrict expansion of commercial zoning in areas near the I-476 interchange to reduce congestion and increase safety in the area.*

*Maintain the Township's commercial tax base to provide a balanced contribution for the finance of local public service needs.*

##### Objectives

1. *Provide adequate public parking in the Wayne Business District to serve businesses, other visitors, and commuters.*
2. *Improve the pedestrian environment in the Wayne Business District to make the area more attractive for shoppers.*
3. *Maintain and improve the mix of stores in the District to assure that the area remains a restaurant center, that it continues to provide needed basic services for Township residents, and that it expands the range of apparel and other shopping goods available.*

4. *Expand and enhance public spaces and cultural activities available in the Wayne Business District.*
5. *Assure that upper floor spaces in the Wayne Business District are reserved for residential use.*
6. *Strengthen the Garrett Hill district as a pedestrian-oriented neighborhood convenience district.*
7. *Assure that payments or services in lieu of taxes are provided by institutions utilizing their facilities for unrelated revenue generating purposes to compensate for the use of community transportation facilities and other infrastructure.*

## **2. U.S. Census Data**

Radnor's per capita income in 2000 was \$39,813, compared to \$25,040 for Delaware County, which ranked as the third wealthiest county in the state after Montgomery and Chester counties. Median household income for Radnor in 1989 was \$51,695. Correlated to this solid economic base, Radnor is well known for its quality school district. These factors make Radnor attractive for employers seeking educated workers, businesses looking to locate near disposable income, and families seeking quality schools. As a result, more than 25,000 jobs are located in the township – a total greater than the number of adults living in Radnor.

The township is home to over 1,520 businesses, which in 2000 generated more than \$1.2 billion in gross revenues and \$4.1 million in local business taxes. Almost one-fifth of these business-generated taxes went directly to the township's general fund. Commercial properties, assessed at \$961 million, make up 34 percent of the township's total property assessment.

In terms of employment located within the Township (this data is based on jobs located within the particular jurisdiction rather than for the residents living within the jurisdiction), DVRPC has recently prepared employment forecasts to Year 2025. Table 4-1 includes actual 1990 employment counts, together with 1997 employment estimates in addition to employment forecasts or projections from 2000 to 2025. Radnor statistics are remarkable with 28,446 jobs in 1990 increasing to 29,078 jobs by 1997 and to 36,350 by 2025, in impressive 23.4 percent increase. In an absolute sense, there currently is almost one job for every resident in Radnor, regardless of age. Few communities enjoy such a ratio. The projection, if accurate, indicates that employment growth will be robust, even as population projections have leveled. Perhaps most interesting is that the Radnor proportion of total Delaware County employment is already at a very high 12.4 percent or about one-eighth of total County jobs. Based on DVRPC's projections, Radnor's share increases to 13.5 percent by 2025. Clearly, Radnor Township has become a very important employment base for all of Delaware County, and even the region, although Lower Merion's more than 40,000 jobs and Tredyffrin's nearly 30,000 jobs also rank these municipalities clearly as significant centers of employment.

**Table 4-1. Employment Projections/Forecasts for Radnor Township and Neighboring Municipalities\* (DVRPC, 1999)**

	1990	1997, est.	2000	2025	2000-2025 difference	Percentage
Haverford	14,428	14,147	13,980	12,880	(1,100)	-7.9%
Marple	9,866	11,432	11,840	15,300	3,460	29.2%
Newtown	7,195	7,825	8,090	10,990	2,900	35.8%
Radnor	28,446	29,078	29,450	36,350	6,900	23.4%
Delaware Co.	230,459	234,406	236,330	269,890	33,560	14.2%
Easttown	5,418	6,190	6,200	5,700	(500)	-8.1%
Tredyffrin	25,206	28,625	29,200	35,000	5,800	19.9%
Chester Co.	197,752	224,178	230,350	289,000	58,650	25.5%
Lower Merion	42,889	43,596	42,850	41,950	(900)	-2.1%
Montgomery Co.	457,501	485,435	491,200	567,700	76,500	15.6%

\* Defined as At-Place Employment (i.e., jobs located within Radnor Township, etc.)

Most of Radnor's businesses are centered around Wayne, but five of the township's 10 largest mercantile taxpayers are located in the St. Davids Square shopping center. The largest real estate taxpayer is the 1.4 million square foot former Wyeth Ayerst office campus in St. Davids, which was purchased in spring 2001 by the Rubenstein Group for more than \$200 million.

Because of its commercial growth over time and healthy fiscal grounding, Radnor Township in recent years has placed an emphasis on controlling expansion of office and retail uses while preserving open space and residential areas. Radnor's biggest office and retail competition comes from either end of Lancaster Avenue, heading west into Tredyffrin Township and east toward Rosemont and Bryn Mawr.

### 3. Radnor Commercial Districts

The bulk of Radnor's commercial activity and image is focused on downtown Wayne. The pedestrian-oriented Wayne business district, shown in Figure 4-1, is defined by Aberdeen Avenue to the east, the middle school on South Wayne Avenue to the south, Bloomingdale Street to the west and the railroad tracks to the north.

One notable feature of downtown Wayne is that it is one of the few communities on the Main Line with a major cross street (Wayne Avenue) perpendicular to its main business route (Lancaster Avenue). This asset allows for Wayne to build upon its recent growth and further diversify its retail and commercial mix. While high volume along Lancaster Avenue generates exposure for businesses in downtown Wayne, heavy traffic can serve as a deterrent, especially for Radnor residents farther from the town center who might instead shop in nearby districts such as Bryn Mawr.

Radnor also has an array of smaller commercial districts that add to the township's character, shown in Figure 4-2 below. Commercial uses continue to the east and west of the Wayne business district along Lancaster Avenue in a more auto-oriented pattern. More woven into Radnor's residential areas are neighborhood commercial districts at Garrett Hill and along Conestoga Road.



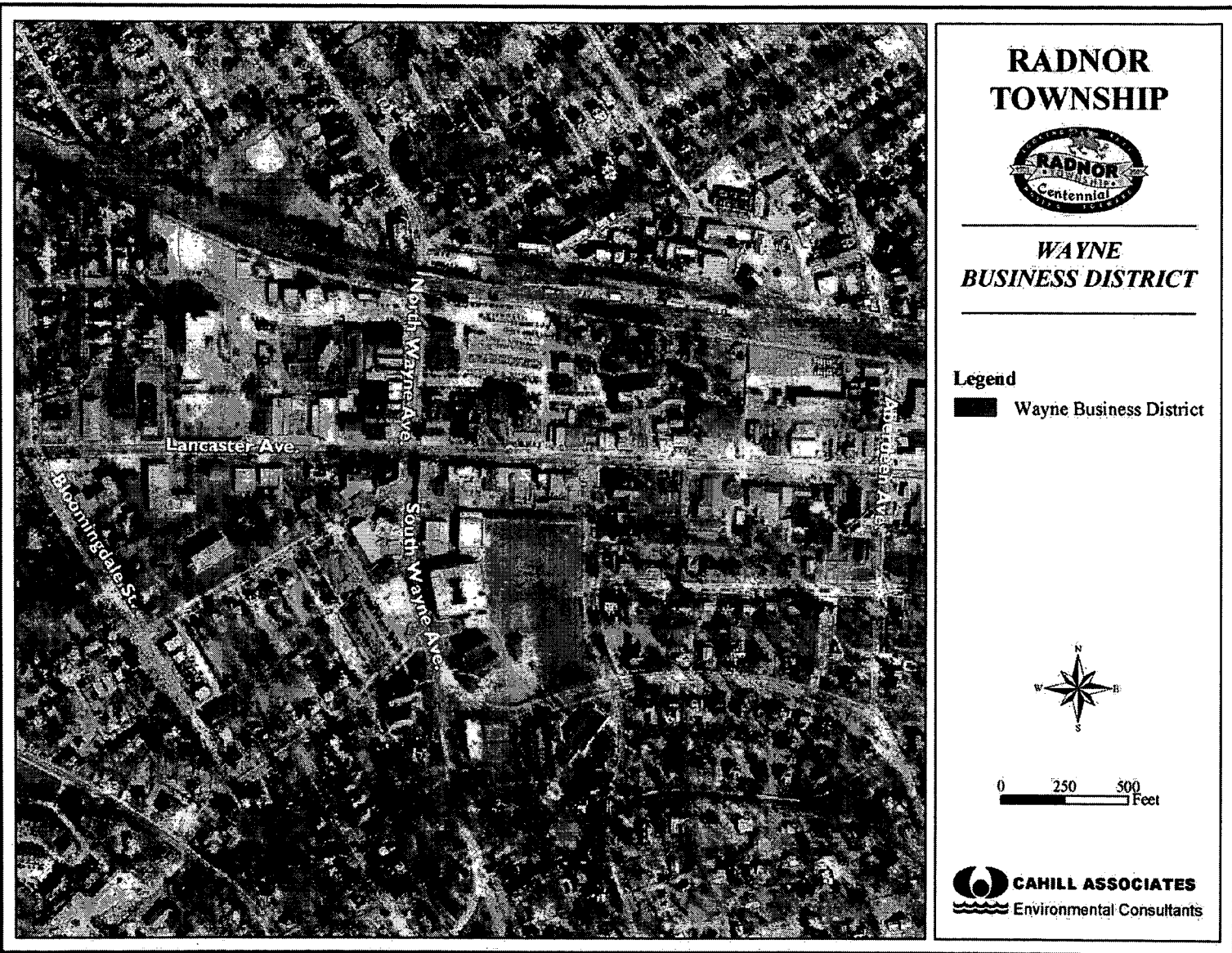


Figure 4-1. Wayne Business District

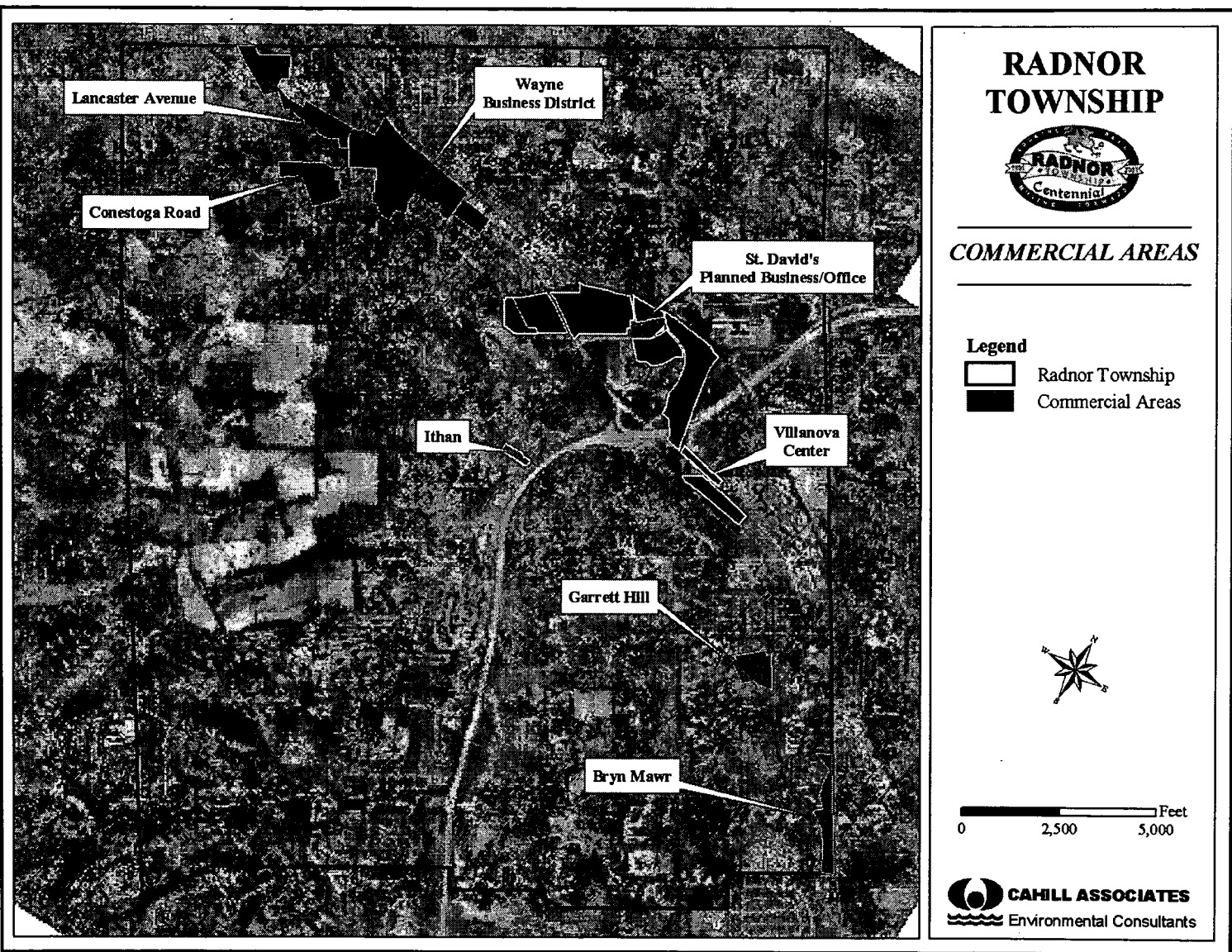


Figure 4-2. Commercial Areas in Radnor Township

The Wayne business district has a walkable core that stretches between Louella Court and Bloomingdale Street along Lancaster Avenue. Wayne Avenue, in particular north of Lancaster, has become more of a pedestrian shopping district in recent years. Beyond this center, Lancaster Avenue transitions into more automobile-oriented retail and office uses. Heading west from Wayne Avenue, the pedestrian streetscape of the town center shifts to diagonal parking set off from the main road by concrete barriers. Heading east along Lancaster from Wayne's main intersection, the physical character of changes somewhat abruptly to pull-in parking lots in front of stores beyond Louella Court. This change is largely due to setback ordinances that have affected newer development beyond the historic core.

#### **4. Trends in the Wayne Business District**

Radnor's commercial core in Wayne has experienced significant change in recent years. The retail mix has shifted more toward restaurants and specialty retail. Wayne has seen a notable surge in food and beverage establishments and entertainment uses, along with a loss of local businesses not surviving past one generation. With this activity, commercial rents have gone up, and some national retail chains, such as Anthropologie and the Gap, have moved in. Throughout these changes, Radnor largely has maintained its uniqueness as a human-scale downtown where shoppers can run errands and enjoy a fair diversity of retail.

North Wayne Avenue has experienced significant new development, especially restaurants. While this key street at the core of the business district has grown markedly in the past five years, opportunities remain to strengthen retail and commercial uses.

### **B. Business and Economic Development Goals, Issues, and Strategies**

Discussions with Radnor's planning task force and business focus group, along with field observations, point to a series of goals, issues, and strategies to improve business conditions and districts in the township.

#### **1. Wayne Business District**

The following economic development analysis will focus primarily on downtown Wayne, while a latter section will address neighborhood commercial districts. The scope of this analysis was limited, however, and Radnor may benefit from further studies about parking in downtown Wayne, the pedestrian environment, and the use of a Main Street coordinator, among other issues.

***Goal 1: Protect and enhance the character and mix of uses in Wayne as a special town center***

#### **Parking**

Parking within the Wayne Business District is limited, but adequate overall, according to a January 2001 parking study of the district. Still, during periods of peak demand, a parking deficit sometimes exists at the District's core. Recommendations from the 2001 parking study that apply to business activity in Wayne include:

- **Encourage relocation of long-term parking to the western areas.**

- **Increase parking rates in central locations, possibly with a digital meter program.**
- **Implement a parking guide sign program to increase awareness of parking in the western area, and offer public parking in the AT&T lot.**
- **Develop a master plan for parking to guide growth and assist with implementation of additional parking.**

Parking is more difficult during the day, especially at lunch. But there is concern that current resources will soon be unable to handle evening demand and hinder further restaurant growth in Wayne. One way to deal with the parking impacts of Wayne's recent restaurant boom would be to lower zoning densities for eating establishments, thereby distributing parking-intensive restaurants more evenly across the town. The township also should continue to encourage the use of parking cross-easements between businesses located in downtown Wayne.

While current demand does not justify construction of a multi-level parking facility or acquiring parcels for additional surface parking, these options should be reevaluated if there are significant changes to parking supply or demand. In anticipation of increased future demand, the township should begin to consider structured parking options in Wayne. Two sites adjacent to the "town commons" developments proposed in the comprehensive plan have been identified as potential locations. One location would be next to the current middle school on South Wayne Avenue; another structure could be developed on North Wayne Avenue at the site of the present surface lot. Both developments could include retail components.

The significant expense of such parking structures would require the investigation of subsidies, some of which might be available due to the train station's proximity. While concern exists about the potential community and financial impacts of structured parking in Wayne, the township should consider more formal study of this option.

Beyond parking supply issues, Wayne faces challenges with parking organization, management, and safety. Parking can be a logistical challenge along Lancaster Avenue, with high-speed traffic and pull-in spots impairing driver and pedestrian safety. Safety concerns increase along Lancaster Avenue beyond the Wayne town center with a series of dangerous parking lot driveways. The limited number of pull-in spots in front of the stores along Lancaster is part of an ongoing conflict between merchants who want easy parking access in front of their stores and transportation officials who seek to increase safety and traffic flows via off-street parking. A more consistent orientation of on-street parking along Lancaster Avenue should be encouraged for safety and design purposes. The township recently replaced its parking directional signage, but a need remains for maps that orient pedestrians within the larger Wayne business district.

An important player in business district development and parking issues is Wayne Presbyterian Church, which owns many of the lots behind the church and has a stake in several remaining vacant downtown parcels. The church is considering expansion plans that would create more demand and reduce the area devoted to parking.

*Objective 1.1: Provide adequate public parking in the Wayne Business District to serve businesses, other visitors, and commuters.*

**Strategic Parking Initiatives**

- Consider recommendations from the 2001 Wayne parking study.
- Promote the use of parking cross-easements between businesses.
- Create an on-street parking plan for the Business District.
- Encourage a consistent orientation of on-street parking along Lancaster Avenue.
- Upgrade parking directional signage.
- Lower restaurant zoning densities and distribute parking-intensive restaurants.
- Create a parking coordination/management entity.
- Study needs and costs for structured parking

**Pedestrian environment**

Heavy traffic and high speeds along Lancaster Avenue often make it unfriendly to pedestrians and retail customers. In particular, getting across Lancaster can prove difficult, with a lack of signals to accommodate pedestrian crossing. Traffic speeds tend not to be enforced, increasing accident rates and hurting local businesses. Sidewalks along Lancaster Avenue provide little buffer between traffic and pedestrians.

In addition these safety concerns, noise and congestion detract from the pedestrian experience in an otherwise pleasant town center setting – especially north and east of the main Wayne Avenue intersection. The stopping and starting of trucks at corners often dramatically lessen the quality of the pedestrian shopping experience.

The inconsistency of the Wayne Business District's sidewalk network further discourages pedestrian activity. Open parking fields serving businesses along Lancaster Avenue often interrupt sidewalks and expose pedestrians to conflicts with traffic at these uncontrolled accesses. The township should consider a variety of improvements to increase sidewalk continuity, including reconstruction of sidewalks with consistent surfacing, and texturing and landscaping to eliminate the frequent changes in grade and sidewalk widths.

*Objective 1.2: Improve the pedestrian environment in the Wayne Business District to make the area more attractive for shoppers.*

**Strategic Pedestrian Environment Initiatives**

- Use parking, plantings, landscape aisles, and other streetscape amenities to protect pedestrians from traffic, vehicular noise and fumes.

- **Improve the sidewalk network in the Wayne Business District through more consistent design.**
- **Explore the feasibility of a signalized pedestrian crossing along Lancaster between Aberdeen Avenue and Louella Court, as well as other mid-block crossings.**

#### Retail mix

An inventory of current retail businesses in Radnor indicates a fairly healthy mix to serve local residents and attract shoppers from outside the township. A catalog of stores present in the Wayne Business District, in smaller Radnor Township commercial areas, and elsewhere along Lancaster Avenue in Radnor is detailed in Appendix E (available at the Radnor Township Building). This data shows that Wayne has become increasingly attractive as a restaurant and shopping goods destination.

While Wayne has benefited from this trend, it must recognize that maintaining a healthy retail mix is a delicate balance. A by-product of Wayne's expanding restaurant and shopping goods activity has been rising rents and a reduction in the availability of basic convenience stores and service operations that have difficulty meeting higher rent requirements. Given Wayne's location and recent retail trends, it needs to protect these types of businesses that make Wayne function as a community main street as well as a shopping destination. This requires explicit coordination among individual Wayne businesses, property owners, and organizations such as the Wayne Business Association.

Wayne has several opportunities to expand and diversify its retail base. There is strong potential to increase retail uses on streets perpendicular to Lancaster such as Louella Court. With its median park and walkable scale, Louella is prime for an upgrade with more valuable stores to make it a pedestrian shopping destination within Wayne. The connection between the Wayne train station to the business district via North Wayne Avenue also could be strengthened. Finally, ground floor offices on prime blocks of Lancaster and Wayne avenues break up the pedestrian flow and should be converted to retail businesses where possible.

Attracting a critical mass of retail stores and shoppers to downtown Wayne depends significantly on creating a sense of place. Traveling along Lancaster Avenue, currently it is difficult for the uninitiated driver or shopper to know where the center of the Wayne business district is until they reach the main intersection. The dense, pedestrian-oriented center flows into auto-oriented uses on its edge, creating confusion about where Wayne begins and ends. The use of gateway design elements or stronger identifying visual symbols can help give downtown Wayne a more clear identity. While the clock at Lancaster and Wayne avenues currently serves as a central symbol, it tends to be obscured by activity and traffic at the main intersection.

***Objective 1.3: Maintain and improve the mix of stores in the District to assure that the area remains a restaurant center, that it continues to provide needed basic services for Township residents, and that it expands the range of apparel and other shopping goods available.***

**Strategic Retail Mix Initiatives**

- **Monitor the availability of basic services and encourage landlords to maintain space for convenience and service businesses.**
- **Employ a “Main Street” manager to coordinate Business District activities and provide an information clearinghouse on available properties.**
- **Support additional retail development by upgrading retail uses on Louella Court and other off-Lancaster locations.**
- **Encourage conversion of ground floor office uses on prime blocks of Lancaster Avenue and Wayne to retail.**
- **Promote a variety of retail uses along North Wayne Avenue to strengthen the link between the train station and Wayne center.**
- **Improve the identity of the Wayne as a shopping destination by:**
  - **creating a stronger visual symbol at the intersection of Lancaster and Wayne,**
  - **strengthening the district gateways along Lancaster Avenue at Bloomingdale and Louella Court.**

**Town Commons and Promenade**

With downtown Wayne’s high level of retail and office activity, its lack of a public gathering space is notable. The need for a plaza or park for Radnor residents, resting shoppers, and business district workers has existed for a long time. Such a space would provide community focus, a sense of public space, and activity in Wayne’s core. It should be centrally located and highly visible, and be used explicitly to enhance cultural activities in downtown Wayne.

Two sites that might be used as new “town commons” are located at the current North Wayne Avenue parking lot and at the existing middle school site on South Wayne Avenue (if the middle school is reconstructed to the south). These town commons would be high-activity areas and meeting locations, with landscaping and built features such as lighting standards, furniture, and possibly sculpture. A third possible location for public space would be at the southwest corner of Lancaster and Wayne avenues in front of the bank and old library. This site already has a modest green strip that could be expanded.

Another transformation is possible along North Wayne Avenue, where the current broad road could be converted into a European-style allée or promenade. For the road length, North Wayne Avenue would become two separated one-way lanes, with a landscaped pedestrian strip in the middle. This design could accommodate parallel or angled parking on both sides of the one-way lanes. Such a concept would have a dramatic effect on the North Wayne community and its users, improving both its pedestrian quality and business profitability.

***Objective 1.4: Expand and enhance public spaces and cultural activities available in the Wayne Business District.***

**Town Commons and Promenade Initiatives**

- Create “town commons” at the existing parking lot on North Wayne Avenue, along the southwest quadrant of the intersection of Lancaster and Wayne Avenues, and possibly at the current Middle School site along South Wayne Avenue.
- Develop a “promenade” vision for North Wayne Avenue.

**Residential Uses**

The walkable nature of the core Wayne Business District is a major component of its success. The mix of apartments above stores and their proximity to the train station adds to the pedestrian and mixed-use environment that lends vibrancy to downtown Wayne. A way to further promote this residential-commercial mix would be to assure that upper floor spaces in the Wayne Business District are reserved for residential use. Such a mixed-use strategy would be less parking intensive than commercial uses on both upper and lower floors since peak parking demand for residential uses is at night, while peak commercial demand occurs during the day.

***Objective 1.5: Assure that upper floor spaces in the Wayne Business District are reserved for residential use.***

**Strategic Residential Uses Initiative**

- Adjust zoning to eliminate parking requirements for upper floor residential uses in downtown Wayne.

**2. Other Commercial Districts**

Radnor has several small neighborhood commercial districts throughout the township adjacent to residential areas. Several are located along Conestoga Road at intersections with West Wayne Avenue, Ithan, Garrett Avenue, and Haverford Road on the border of Bryn Mawr. These four districts have a total of 23 businesses and are dominated by convenience goods and services (see Appendix E). These districts have four full-service restaurants, five limited-service restaurants, two convenience stores, two bars, and four laundromats. Residents aim to maintain the strength of these districts while preventing their encroachment on existing residential areas, especially north of North Wayne Avenue and along Conestoga.

***Goal 2: Protect and enhance the smaller commercial districts in the Township, including Garrett Hill and other neighborhood districts along Conestoga Road.***

Garrett Hill is the largest of the neighborhood commercial districts, with 11 businesses, and is the only one susceptible to detailed development analysis. With its assets, Garrett Hill could be strengthened as a pedestrian-oriented neighborhood convenience district. A physical barrier to upgrading the district is the gas station at Conestoga Road and Garrett Avenue, which detracts



from the pedestrian character of the district. The district would be improved by mixed-use development with ground-floor retail and upper-floor apartments, and increased parking.

***Objective 2.1: Strengthen the Garrett Hill district as a pedestrian-oriented neighborhood convenience district.***

**Strategic Garrett Hill Initiatives**

- **Rezone to prohibit gas stations and other auto-related businesses.**
- **Promote multi-story mixed-use buildings by adjusting zoning to eliminate parking requirements for upper floor residential uses.**
- **Encourage zero-front setbacks in any new development.**
- **Provide a community/shopper parking lot.**
- **At the auto repair site, develop a multi-story mixed use building with retail, condos, and parking in the rear.**

***Goal 3: Restrict expansion of commercial zoning in areas near the I-476 interchange to reduce congestion and increase safety in the area.***

The main concern in areas near the I-476 interchange is limiting the expansion of commercial zoning near the highway interchange to reduce congestion and increase safety in the area. Villanova University has expressed interest in purchasing some of these small strip developments at the edge of its campus.

**3. Business Development Policy**

Because of its commercial growth over time and healthy tax base, Radnor Township in recent years has placed an emphasis on controlling expansion of office and retail uses while preserving open space and residential areas. At the same time, expanding and maintaining commercial uses where appropriate is crucial to the fiscal health of the Township.

***Goal 4: Maintain the Township's commercial tax base to provide a balanced contribution for the finance of local public service needs.***

Radnor's strong commercial base is a major component of the Township's overall fiscal stability. The township aims to maintain this base to provide a balanced contribution for the finance of local public service needs. One way for the Township to shore up Radnor's commercial base would be to seek payments or services in lieu of taxes from institutions that utilize their facilities for unrelated revenue generating purposes. This would compensate the Township for use of community transportation facilities and other infrastructure for special events held by institutions such as Villanova University.

*Objective 4.1: Assure that payments or services in lieu of taxes are provided by institutions utilizing their facilities for unrelated revenue generating purposes to compensate for the use of community transportation facilities and other infrastructure.*

### **C. Recommended Actions**

#### **Goals**

*Protect and enhance the character and mix of uses in Wayne as a special town center.*

*Protect and enhance the smaller commercial districts in the Township, including Garrett Hill and other neighborhood districts along Conestoga Road.*

*Restrict expansion of commercial zoning in areas near the I-476 interchange to reduce congestion and increase safety in the area.*

*Maintain the Township's commercial tax base to provide a balanced contribution for the finance of local public service needs.*

#### **Objectives**

1. *Provide adequate public parking in the Wayne business district to serve businesses, other visitors, and commuters.*

##### **Recommended Actions: Parking**

- **Consider recommendations from the 2001 Wayne parking study.**
  - **Promote the use of parking cross-easements between businesses.**
  - **Create an on-street parking plan for the Business District.**
  - **Encourage a consistent orientation of on-street parking along Lancaster Avenue.**
  - **Upgrade parking directional signage.**
  - **Better manage restaurant zoning densities in order to distribute parking-intensive restaurants.**
  - **Create a parking coordination/management entity.**
  - **Study needs and costs for structured parking.**
2. *Improve the pedestrian environment in the Wayne Business District to make the area more attractive for shoppers.*

**Recommended Actions: Pedestrian Environment**

- Use parking, plantings, landscape aisles, and other streetscape amenities to protect pedestrians from traffic, vehicular noise and fumes.
  - Improve the sidewalk network in the Wayne Business District through more consistent design.
  - Explore the feasibility of a signalized pedestrian crossing along Lancaster between Aberdeen Avenue and Louella Court, as well as other mid-block crossings.
3. *Maintain and improve the mix of stores in the District to assure that the area remains a restaurant center, that it continues to provide needed basic services for Township residents, and that it expands the range of apparel and other shopping goods available.*

**Recommended Actions: Retail Mix**

- Monitor the availability of basic services and encourage landlords to maintain space for convenience and service businesses.
  - Employ a “Main Street” manager to coordinate Business District activities and provide an information clearinghouse on available properties.
  - Support additional retail development by upgrading retail uses on Louella Court and other off-Lancaster locations.
  - Encourage conversion of ground floor office uses on prime blocks of Lancaster Avenue and Wayne to retail.
  - Promote a variety of retail uses along North Wayne Avenue to strengthen the link between the train station and Wayne center.
  - Improve the identity of the Wayne as a shopping destination by:
    - creating a stronger visual symbol at the intersection of Lancaster and Wayne;
    - strengthening the district gateways along Lancaster Avenue at Bloomingdale and Louella Court.
4. *Expand and enhance public spaces and cultural activities available in the Wayne Business District.*

**Recommended Actions: Town Commons and Promenade**

- Create “town commons” at the existing parking lot on North Wayne Avenue, along the southwest quadrant of the intersection of Lancaster and Wayne

Avenues, and possibly at the current Middle School site along South Wayne Avenue

- Develop a “promenade” vision for North Wayne Avenue.

5. *Assure that upper floor spaces in the Wayne Business District are reserved for residential use.*

**Recommended Actions: Residential Uses**

- Adjust zoning to eliminate parking requirements for upper floor residential uses in downtown Wayne.

6. *Strengthen the Garrett Hill district as a pedestrian-oriented neighborhood convenience district.*

**Recommended Actions: Garrett Hill**

- Rezone to prohibit gas stations and other auto-related businesses.
- Promote multi-story mixed-use buildings by adjusting zoning to eliminate parking requirements for upper floor residential uses.
- Encourage zero-front setbacks in any new development.
- Provide a community/shopper parking lot.
- At the auto repair site, develop a multi-story mixed use building with retail, condos, and parking in the rear.

7. *Restrict expansion of commercial zoning in areas near the I-476 interchange to reduce congestion and increase safety in the area.*

8. *Assure that payments or services in lieu of taxes are provided by institutions utilizing their facilities for unrelated revenue generating purposes to compensate for the use of community transportation facilities and other infrastructure.*

## SECTION 5 TRANSPORTATION AND CIRCULATION PLAN

### A. Introduction and Statement of Goals

The history and growth of Radnor have been intimately tied to transportation as yesterday's Indian trails have grown into today's major roadways, and as trains that once connected "long-distance" travelers to Philadelphia and Lancaster now carry busy commuters through the "Main Line." It is evident that the transportation and circulation network has played an important role in defining past and present development patterns within the Township, and will continue to play a major role in Radnor's future. Since the Township last completed its Comprehensive Plan, the transportation network of the Township has been significantly altered by the opening of the Mid-County Expressway (Interstate 476), also known as the Blue Route, and its interchange across U.S. Route 30 in Radnor.

As residential, commercial, industrial and virtually all other forms of activity have always been influenced by their proximity to major transportation corridors within the Township, it is therefore essential that Township planning be sensitive to the relationship between land use and transportation to maintain efficient circulation patterns, as this relationship will continue to be intertwined in the future. Accordingly, this Chapter provides an inventory and evaluation of the current transportation and circulation network in Radnor Township, which includes both an evaluation of vehicular facilities (i.e., roadways and intersections), transit opportunities, and multi-modal facilities (i.e., pedestrian and bicycle facilities) and provides recommendations to address the future needs of the Township. Discussions regarding traffic calming, parking, access management, regional influences, and funding mechanisms for transportation improvements have been included and both general and specific recommendations are provided throughout the text and again at the end of this discussion.

#### 1. Goals

This Chapter focuses on the following set of Goals facing the Township as it plans for the future and seeks to establish policies and planning/design criteria for the future transportation and circulation plan.

##### Goals

*Develop a transportation capital improvement plan with recommendations for safety and capacity-related traffic improvements to accommodate future traffic demands.*

*Implement traffic improvements for key roads and intersections to improve traffic flow and to encourage traffic to remain on the major routes.*

*Develop traffic calming strategies for implementation, as appropriate, to help preserve neighborhoods.*

*Use landscaping, gateways, and street furniture, etc. to integrate the road system and traffic within the community to enhance and preserve the rural and scenic character of the streets, without sacrificing safety.*

*Preserve the rural and scenic character of the streets, without sacrificing safety.*

*Improve pedestrian circulation by implementing of pedestrian facilities as well as planned trail and bicycle facilities.*

*Encourage increased use of public transit.*

*Encourage opportunities for transit-oriented development and limit intensive uses to areas close to public transit where such uses are compatible with adjacent uses and would cause no adverse impact on the residential neighborhoods.*

*Enhance regional rail use through accommodation of commuter parking needs in a manner consistent with the Comprehensive Plan.*

*Promote ride sharing or carpooling as well as other trip reduction strategies to reduce single occupant, private vehicle commuting by employees of major businesses.*

*Support a coordinated/planned private transit service through a cooperative partnership between the major employers, institutions and the Township.*

Existing weekday morning and afternoon, commuter peak hour traffic volumes were collected for 16 key intersections selected by the Township and the Steering Committee. Capacity/level-of-service analyses were performed and transportation improvements have been recommended, as necessary. Furthermore, 20-year traffic volumes were forecasted for these intersections, and the intersections were reanalyzed to identify needed future improvements.

## **B. Road Network**

Vehicular use constitutes the primary form of circulation and transportation in Radnor, which is common for many suburban communities in the region. As such, it is important to ensure that the roadways within the Township operate safely and efficiently. Furthermore, it is important that the Township plan accordingly to implement strategies and improvements necessary to accommodate existing and future traffic and, where feasible, to encourage more use of public transit, ridesharing, bicycling, walking, and alternative work arrangements to reduce future traffic.

### 1. Current Roadway Inventory

Currently, there are approximately 140 linear miles (see Existing Land Use chapter for road coverage within Radnor Township) of roadway within the Township, which includes state and local roadways. The primary roadways, which comprise important transportation links through Radnor Township, as well as some of the operating characteristics of each of these roadways, are summarized in Table 5-1.

**Table 5-1. Existing Roadway Inventory and Classification**

Roadway	Route Number	Current Ownership	Functional Classification <sup>1</sup>	Current ADT <sup>2</sup>	Potential Reclassification <sup>3</sup>
Mid-County Expressway	Interstate 476	State	Expressway	122,400 (2000)	---
Lancaster Avenue	U.S. Route 30	State	Arterial	38,700 (1997)	---
Sproul Road	PA Route 320	State	Arterial	13,800 (2000)	---
Spring Mill Road	PA Route 320	State	Arterial	8,600 (1997)	Major Collector
Conestoga Road	S.R. 1019	State	Major Collector	13,600 (2002)	Arterial <sup>4</sup>
Bryn Mawr Avenue	S.R. 1032	State	Major Collector	15,900 (1997)	Arterial
Radnor-Chester Road	S.R. 1021	State	Major Collector	6,500 (2000)	---
Godfrey Road	S.R. 1036	State	Minor Collector	---	---
Darby-Paoli Road	S.R. 1015	State	Major Collector	7,800 (1998)	---
Goshen Road	S.R. 1034	State	Minor Collector	---	Major Collector <sup>(4)</sup>
North Wayne Avenue	S.R. 1046	State	Major Collector	8,500 (1998)	---
South Wayne Avenue	S.R. 1046	State	Major Collector	3,400 (1998)	---
Eagle Road	S.R. 1042	State	Major Collector	5,600 (2002)	---
King of Prussia Road	S.R. 1021	State	Major Collector	18,000 (2002)	Arterial
Matsonford Road	S.R. 1038	State	Major Collector	7,800 (1998)	---
Newtown Road	S.R. 1021	State	Minor Collector	6,400 (1998)	Major Collector <sup>4</sup>
Brooke Road	S.R. 1046	State	Minor Collector	---	---
County Line Road	S.R. 1001	State	Major Collector	28,200 (1997)	Arterial
St. Davids Road	S.R. 1046	State	Minor Collector	2,300 (2001)	Major Collector <sup>(4)</sup>
Sugartown Road	S.R. 1044	State			
Gulph Creek Road	S.R. 1040	State			
Coopertown/Landover Roads	S.R. 1009	State			
Upper Gulph Road	---	Township	Major Collector	5,300 (1999)	Arterial <sup>(4)</sup>
Clyde Road	---	Township	Minor Collector	---	---
Iven Avenue	---	Township	Minor Collector	---	---
Lowry's Lane	---	Township	Minor Collector	---	---
Malin Road	---	Township	Minor Collector	1,800 (2001)	---
Maplewood Road	---	Township	Minor Collector	1,200 (2001)	---
Newtown Road	---	Township	Minor Collector	---	---
North Ithan Avenue	---	Township	Minor Collector	---	---
Wylldhaven Road	---	Township	Minor Collector	---	---
Pine Tree Road	---	Township	Minor Collector	---	---
Radnor Street Road	---	Township	Minor Collector	3,400 (2001)	---
Roberts Road	---	Township	Minor Collector	3,500 (1999)	---
Sinkler Drive	---	Township	Minor Collector	---	---
Church Road	---	---	Minor Collector	---	Major Collector <sup>(4)?</sup>
Mill Road	---	---	Local	---	Minor Collector <sup>(4)?</sup>
Saw Mill Road	---	---	Local	---	Minor Collector <sup>(4)?</sup>
South Aberdeen Avenue	---	Township	Minor Collector	---	---
South Devon Avenue	---	Township	Minor Collector	---	---
South Ithan Avenue	---	Township	Minor Collector	6,600 (2001)	---
Valley Forge Road	---	Township	Minor Collector	2,000 (2001)	---
West Wayne Avenue	---	Township	Minor Collector	---	Major Collector <sup>(4)</sup>

<sup>1</sup> Based on the *Township of Radnor Subdivision and Land Development Ordinance*.

<sup>2</sup> Historic ADT (Average Daily Trips) data adjusted to reflect 2002 traffic conditions in some cases, actual year of traffic count shown (1998).

- <sup>3</sup> Reclassification may be justified based on current traffic volumes as compared to the Township's traffic volume criteria. Further study recommended. Additionally, future traffic volumes should be monitored to determine the need for reclassification along all roadways.
- <sup>4</sup> Reclassification as recommended by the *Township of Radnor Comprehensive Plan, 1988*. Parenthesis <sup>(4)</sup> indicate that available traffic volumes alone do not constitute reclassification in accordance with Township criteria, or current traffic volumes are not available.

There are hundreds of intersections of public roadways within the Township, of which the majority are unsignalized intersections controlled by stop signs on the minor, side street approaches, or in some cases all-way stop control. The intersections of the most heavily traveled roadways within Radnor are controlled by traffic signals to move traffic through these intersections safely and efficiently. The intersections in the Township that are presently signalized are indicated in Table 5-2.

**Table 5-2. Current Traffic Signal Inventory**

Signalized Intersection	Signalized Intersection
Lancaster Avenue and Lowry's Lane	Eagle Road and Radnor Street Road
Lancaster Avenue and Ithan Avenue	Eagle Road and King of Prussia Road
Lancaster Avenue and Villanova Parking Lot	King of Prussia Road and Matsonford Road
Lancaster Avenue and Sproul Road (PA Route 320)	Conestoga Road and West Wayne Avenue
Lancaster Avenue and Interstate 476 Northbound Ramp	Conestoga/Church Road/Iven Avenue/Aberdeen Avenue
Lancaster Avenue and Interstate 476 Southbound Ramp	Conestoga Road and Radnor Chester Road
Lancaster Avenue and King of Prussia Road	Conestoga Road and Sproul Road (PA Route 320)
Lancaster Avenue and Radnor Chester Road	Conestoga Road and Ithan Avenue
Lancaster Avenue and Genuardi's Driveway (west)	Conestoga Road and Garrett Avenue
Lancaster Avenue and Genuardi's Driveway (east)	Conestoga Road and County Line Road
Lancaster Avenue and Chamounix Road	Haverford Avenue and Brvn Mawr Avenue
Lancaster Avenue and Aberdeen Avenue	Bryn Mawr Avenue and Sproul Road (PA Route 320)
Lancaster Avenue and Louella Avenue	Bryn Mawr Avenue and Mill Road
Lancaster Avenue and N. Wayne/S. Wayne Avenues	Bryn Mawr Avenue and Malin Road
Lancaster Avenue and Bloomingdale/Banbury Avenues	Sproul Road and Clyde Road
Lancaster Avenue and Conestoga/Eagle Roads	Sproul Road and Godfrey Road
Lancaster Avenue and Sugartown/Old Eagle School Roads	Radnor Chester Road and Kravco Driveway
North Wayne Avenue and West Avenue	Matsonford Road and County Line Road
North Wayne Avenue and Eagle Road	Matsonford Road and N. Centennial Drive/Carroll H.S.
North Wayne Avenue and Station Road	Matsonford Road and S. Centennial Drive
North Wayne Avenue and Poplar Avenue	Sugartown Road and Morris Road

### Current Functional Classification of Roadways

The functional classification is an organization method by which roadways are categorized into a system based on the function they serve. These systems designate roadways according to average daily traffic volumes, roadway design, relationship to other network roadways, and function (access versus mobility). Furthermore, highway functional classification is a means by which federal, state, regional, county and municipal planners describe the hierarchy of roadway importance based upon the level of service the roads are intended to provide.

The inverse relationship between access and mobility is the principal concept for the functional classification of a roadway. Accessibility relates to the amount of opportunities to enter or exit a



roadway from an adjacent property or a surrounding area. Mobility involves the ability or capacity of the roadway to accommodate traffic flow. Typically, the higher the roadway's capacity to facilitate traffic flows, the lower its ability to provide efficient access to adjacent properties and surrounding areas, and vice versa. The functional classification allows the prioritization of maintenance and improvements. The general classifications of roadways in terms of capacity/mobility from highest-order to lowest-order includes expressways, arterial roads, collector roads, and local roadways, and are more thoroughly described below. A second level of classification (i.e., major/minor or primary/secondary designations) is often utilized to more appropriately describe a roadway's function and to more precisely apply classification criteria.

*Expressways* have as their major function the movement of large volumes of traffic at relatively high rates of speed. These roads provide higher types of service and facilitate traffic over long distances on an inter-county and interstate basis. Access points are limited and controlled. The only road in Radnor Township that functions as an expressway is the Mid-County Expressway (Interstate 476). This highway is a limited access road that travels through Delaware and Montgomery Counties providing access to other regional expressways and other major roadways. Local access to the Mid-County Expressway is provided at the interchange located along Lancaster Avenue (U.S. Route 30). According to Township criteria, an expressway is classified as a roadway that carries an average daily traffic (ADT) volume of 10,001 or more vehicles per day.

*Arterial Roads* provide service to trips of moderate length, usually provide a high degree of mobility, and have relatively controlled access points. Arterial roads provide greater access to the adjacent roadway network than expressways, and are intended to carry the highest traffic volumes at the highest speeds, with the exception of expressways. According to Township criteria, an arterial road is classified as a roadway that carries an ADT volume of 10,001 or more vehicles per day, similar to expressways. Most arterial roads are owned and maintained by the State.

*Major Collector Roads*, in general, connect municipalities and major traffic generators. These roads are the major contributors to arterial traffic and convey fairly heavy traffic volumes at moderate rates of speed. Access points are usually controlled on collector roads. It is not uncommon for a major collector road to span the entire length of a municipality. According to Township criteria, a major collector road is classified as a roadway that carries an ADT volume between 3,501 and 10,000 vehicles per day. Most major collector roads are owned and maintained by the State.

*Minor Collector Roads* facilitate low volumes of traffic at lower speeds. They gather traffic from local roads and direct it to the arterial and major collector road networks. Minor collectors often provide traffic circulation between and within larger residential neighborhoods. According to Township criteria, a minor collector road is classified as a roadway that carries an ADT volume between 651 and 3,500 vehicles per day.

*Local Roads* provide the greatest access to adjacent land. They provide for short distance, low speed travel and constitute the majority of the Township-owned roads. The

number of access points is greatest on local roads. Local roads often have their own hierarchy and are reclassified accordingly because they serve various functions, such as primary and secondary distributor roadways within residential neighborhoods and subdivisions. Furthermore, the overdesign of a local road is costly and negatively affects the safety and residential quality of a neighborhood, the environment, and future maintenance costs. When a local road is excessively wide it encourages motorists to travel at higher speeds thereby reducing safety for pedestrians. Therefore, a hierarchy of local roads can positively affect the neighborhoods and the roads they serve; however, Radnor Township currently does not distinguish between the various types of local roads, other than *courts* (less than 100 vehicles per day). According to Township criteria, local roads carry an ADT of less than 651 vehicles per day.

Table 5-1 displays the existing functional classification and average daily traffic volumes of the major roadways within the Township, as well as some other roadways classified as local roads. The growth that has occurred in Radnor and in neighboring municipalities, and the completion of the Mid-County Expressway (Interstate 476), have contributed to the increase of traffic volumes in the Township, and may require some roads to be reclassified to higher-order roads in accordance with the Township criteria, as indicated in Table 5-1.

#### **Future Functional Classification of Roadways**

The Radnor Township *Subdivision and Land Development Ordinance* establishes the criteria for the classification of roadways based on daily traffic volumes. As such, the potential reclassifications noted in Table 5-1 are solely based on current (2002) daily traffic volumes. While actual current daily traffic volumes are often a satisfactory criterion for evaluating the use and purpose of a roadway, it is important that the Township must also consider the design, location and intended purpose of each roadway before reclassification, as well as the nature of the traffic volume increases and appropriateness of the potential reclassification. For example, a local road in a residential neighborhood experiencing traffic increases due to cut-through traffic avoiding congestion areas on higher-order roadways should not necessarily be reclassified to a higher-order street; rather, the congestion areas should be addressed.

#### **Recommended Actions**

Since the classification, design, and service of roadways should be determined based on a number of factors – including traffic volume, roadway design capacity, relationship of the roadway to other roads, and the function of the roadway (access versus mobility) – traffic generated by future development (occurring in the Township and the surrounding region) may affect these factors. Therefore, the Township should continue to monitor future traffic volumes and patterns along the local roadway network and take the following initiatives to maintain the adequacy of the roadway network:

- **Reclassify several roadways within the Township to reflect current traffic conditions and future needs (refer to Table 5-1 for potential reclassifications).**
- **Continue to monitor future traffic conditions to determine if reclassification is necessary.**

- **Upgrade roadways to satisfy the design criteria of newly reclassified roadways.**
- **Future development should be monitored and regulated so that subsequent traffic generation does not alter the designated function of individual roads unless the design can be upgraded and is consistent with both the future land use and circulation plans. Developments should not cause restrictions on the ease of entering or exiting a roadway from adjacent properties, or increase traffic to encroach upon or exceed the capacity of a road.**

## **2. Traffic Volumes and Operating Conditions**

Traffic volumes provide valuable information when assessing a roadway network, as they indicate the level of usage of a particular roadway and are important for planning and design purposes. Traffic volumes are typically assessed for roadways on a daily basis while intersections are evaluated on a peak hour (the 60-minute period of the day that experiences the highest volume of traffic) basis, typically during the weekday morning and afternoon commuter rush hours.

### **Current Traffic Volumes**

Traffic counts were collected along major roadways within the Township and at key intersections to establish current traffic volumes. Additionally, recent traffic counts have been examined to supplement the newly collected traffic data and to further assess traffic volumes for roads in the Township, including traffic volumes collected previously by Radnor Township, the Pennsylvania Department of Transportation, the Delaware Valley Regional Planning Commission, and other available recent traffic studies.

Daily traffic volumes that were adjusted according to seasonal variations are referred to as Annual Average Daily Traffic (AADT). Daily traffic volumes that were not seasonally adjusted are referred to as Average Daily Traffic (ADT) volumes. Figure 5-1 illustrates recent and historic traffic volumes for various roadway facilities consisting of either ADT or AADT volumes, which have been adjusted to reflect 2002 traffic volumes utilizing a traffic growth rate of one percent per year. These ADT and AADT traffic volumes have also been presented in Table 5-1.

Intersection manual turning movement counts were recently conducted at selected key intersections in the Township during the weekday morning and afternoon commuter peak hours. These key intersections are listed in Table 5-3. These peak hour traffic volumes were obtained from traffic counts conducted in February 2002. The summarized weekday morning and afternoon commuter peak hour traffic volumes are illustrated in Figures B-1 through B-16 for these key intersections within the Township, and are contained in Appendix B, hardcopy available at the Radnor Township building.

**Table 5-3. Intersections Studied in the Comprehensive Plan**

Reference No.	Intersection	Current Traffic Control Type
1	Lancaster Avenue and Old Eagle School Road/Sugartown Road	Traffic Signal
2	Lancaster Avenue and Conestoga Road/Eagle Road	Traffic Signal
3	Lancaster Avenue and N. Wayne Avenue/S. Wayne Avenue	Traffic Signal
4	Lancaster Avenue and Aberdeen Avenue	Traffic Signal
5	Lancaster Avenue and Radnor-Chester Road	Traffic Signal
6	County Line Road and Roberts Road	Stop Sign
7	County Line Road, Conestoga Road, Thomas Avenue, Glenbrook Avenue	Traffic Signal
8	County Line Road, Bryn Mawr Avenue, and Glenbrook Avenue	Traffic Signal
9	Conestoga Road and S. Wayne Avenue	Stop Sign
10	Conestoga Road and Brooke Road	Stop Sign
11	Conestoga Road, Iven Avenue, Aberdeen Avenue, Church Road	Traffic Signal
12	Conestoga Road and Radnor-Chester Road	Traffic Signal
13	Conestoga Road and Newtown Road	Stop Sign
14	Conestoga Road and Ithan Avenue	Traffic Signal
15	Darby-Paoli Road and Brooke Road	Stop Sign
16	Bryn Mawr Avenue and Sproul Road (PA Route 320)	Traffic Signal

### **Future Traffic Volumes**

The significant increase in traffic volume levels resulting from the opening of the Mid-County Expressway (Interstate 476) will likely not be repeated anytime in the near future. Instead, development within Radnor and the surrounding region, coupled with natural increases in traffic (i.e., as a result of increased population, automobile ownership, etc.) will account for the majority of traffic increases along the Radnor roadway network in the near future. For the purposes of this evaluation, future traffic volumes were projected utilizing an annual traffic growth rate of one-percent, or 20 percent total, to reflect year 2022 traffic conditions. Examination of historic and current traffic volumes revealed an average traffic growth rate of nearly one-percent per year along major roadways within the Township. The 2022 future traffic volume projections are also summarized in Figures B-1 through B-16 (see Appendix B located at the Radnor Township building) for the weekday morning and afternoon peak hours.

### **Intersection Capacity**

While traffic volumes indicate the use of a particular road or intersection, they do not fully describe traffic conditions or the capacity of the facility to accommodate traffic. A common method of analyzing operational deficiencies for the roadway network is to compare traffic

volumes to the designated capacity of the roadway. The volume to capacity (v/c) analysis, or the ratio of peak hour traffic volume to roadway/intersection capacity, is an indicator of congestion resulting in a reduction in vehicle speed or an increase in travel delay. Capacities are based upon the maximum number of vehicles, which can reasonably be expected to pass through a given segment or intersection under normal conditions. Control delay also provides a measure of traffic operations at intersections, which is expressed in terms of seconds of delay per vehicle per lane group, which is then expressed in terms of a level of service. The standard breakdown of control delay and levels of service is depicted in Table 5-4 and Table 5-5 for unsignalized and signalized intersections, respectively, based on the methodologies of the *Highway Capacity Manual, 2000*.

**Table 5-4. Level of Service for Unsignalized Intersections**

Level of Service	Description	Control Delay Per Vehicle (Sec)
A	Little or no delay	≤ 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delay	25.1 to 35.0
E	Very long traffic delay	35.1 to 50.0
F	Demand exceeds capacity of the lane or approach	> 50.0

**Table 5-5. Level of Service for Signalized Intersections**

Level of Service	Description	Control Delay Per Vehicle (Sec)
A	Very low delay, high quality flow	≤ 10.0
B	Low delay, good traffic flow	10.1 to 20.0
C	Average delay, stable traffic flow	20.1 to 35.0
D	Longer delay, approach capacity flow	35.1 to 55.0
E	Limit of acceptable delay, capacity flow	55.1 to 80.0
F	Unacceptable delay, forced flow	> 80.0

### Current Levels of Service

The weekday commuter peak hour traffic conditions typically represent the worst-case operating conditions of the roadway network, and for most other hours of the day, the traffic conditions are generally improved. The results of the capacity/level-of-service analyses for the key study intersections (refer to Table 5-3) within the Township are illustrated on Figures B-1 through B-16 (see Appendix B located at the Radnor Township building) for the existing weekday morning and afternoon commuter peak hours.

Excluding the Mid-County Expressway (Interstate 476), Lancaster Avenue currently carries the highest volume of traffic through the Township on a daily basis and during the weekday morning and afternoon peak hours. Accordingly, the U.S. Route 30 corridor experiences the most significant delays during the peak hours due to the lack of capacity provided at some of the intersections along the corridor, which exacerbates operational problems along the corridor. For example, traffic congestion along U.S. Route 30 in the vicinity of its intersection with Radnor-Chester Road is partially a result of poor signal timings at the intersection (lack of coordinated signal progression), and due to the heavy traffic volumes along the corridor. As a result, traffic congestion and queues typically extend beyond other adjacent intersections, thereby creating traffic delays that would not otherwise be realized.

Some other intersections within the Township, which are not located along the U.S. Route 30 corridor, also experience delay. These delays are caused by several reasons, including outdated traffic signal timings and phasing, heavy traffic volumes at unsignalized intersections, multi-approach intersections, or lack of sufficient capacity (i.e., turning lanes and through lanes). Relative to the key intersections evaluated in the Comprehensive Plan, the intersections that are currently operating with poor levels of service (LOS E or F) are listed in Table 5-6.

#### **Planned Short-term Improvements**

- A traffic signal upgrade improvement project is currently being considered for 14 signalized intersections along Lancaster Avenue within Radnor, and is contained on the PennDOT *12-Year Transportation Improvement Program*. This improvement is the only improvement contained on the current *12-Year Transportation Improvement Program* to address capacity-related issues in Radnor Township. The traffic signal upgrade program is expected to add a closed-loop traffic control system that will interconnect the operations of the 14 traffic signals and improve capacity and efficiency, and is currently scheduled for implementation in 2004.
- There is an immediate traffic signal improvement project that the Township is currently in the processes of implementing. These traffic signal improvements consist of timing optimization and improved timing coordination along Lancaster Avenue at the signalized intersections between St. David's Square (westernmost access) and the Mid-County Expressway (Interstate 476) northbound on-ramp.

#### **Recommended Actions**

The Township should consider the following, to maintain efficient traffic operations along Radnor roads and at intersections within the Township:

- **The potential short-term intersection improvements contained in Table 5-6 should be further evaluated and considered by the Township.**
- **Traffic signal equipment (i.e., controllers, loop detectors, etc.) and programming (i.e., timings, phasing, offset timings, clocks, etc.) should be properly maintained to ensure proper operations.**

- Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the PennDOT *Twelve Year Transportation Improvement Plan*). See the Highway Project Funding section of this Chapter.
- Improve interface between automobile traffic and pedestrian movement.

Moreover, as traffic volumes increase in the future, there will be a need for additional capacity improvements (i.e., signal optimization, turning lanes, etc.), and other improvements, which will be evaluated under future conditions.

**Table 5-6. Current Intersection Operating Deficiencies and Potential Short-Term Improvements**

Intersection	Current LOS Deficiencies AM (PM)	Potential Short-Term Intersection Improvements
Lancaster Avenue and Aberdeen Avenue	LOS F(F) – Southbound Aberdeen Avenue approach	Optimize traffic signal timings.
Lancaster Avenue and King of Prussia Road/ Radnor- Chester Road <sup>1</sup>	LOS E (F) <sup>2</sup> – Overall; Poor LOS for multiple movements during both peak hours	Optimize signal timings to reduce delay and improve progression along Lancaster Avenue. Geometric/ widening improvements for additional lanes will also be necessary to eliminate all poor levels of service.
County Line Road and Roberts Road	LOS F(E) for the northbound Roberts Road stop-controlled approach.	Traffic signalization currently not warranted by existing traffic volumes.
County Line Road and Conestoga Road/Thomas Ave/ Glenbrook Ave	LOS F(F) – Overall; eastbound Conestoga Road approach	Optimize traffic signal timings.
County Line Road and Bryn Mawr Ave/ Glenbrook Ave	LOS (E) for the southbound Bryn Mawr Avenue through movement	Optimize traffic signal timings.
Conestoga Road and South Wayne Avenue	LOS E(F) for the stop-controlled South Wayne Avenue approach	Traffic signalization, as currently warranted.
Conestoga Road and Brooke Road	LOS F(E) for the stop-controlled Brooke Road approach	Traffic signalization in coordination with Conestoga Road/S. Wayne Avenue signalization, as traffic volumes do not satisfy signalization warrants as an isolated intersection.
Conestoga Road and Church Road/Iven Avenue/ Aberdeen Avenue	LOS D(F) – Overall; Poor level of service for the eastbound Conestoga Road approach and southbound Iven Avenue approach during the PM peak hour	Optimize traffic signal timings.
Conestoga Road and Newtown Road <sup>1</sup>	LOS F(F) for the northbound Newtown Road approach	Traffic signalization, as currently warranted.
Darby-Paoli Road and Brooke Road <sup>1</sup>	LOS F(F) for the southbound Brooke Road left-turn movement	Traffic signalization, as currently warranted.
Bryn Mawr Avenue and Sproul Road <sup>1</sup>	LOS F(F) – Overall; Poor levels of service for shared through/right-turn movements during both peak hours	Optimize traffic signal timings. Geometric/ widening improvements will also be necessary to eliminate all poor levels of service.

1 – Long-term improvements needed to address existing traffic as well as future traffic (See Table 5-7).

2 – Due to heavy volumes along U.S. Route 30, poor delays effect other adjacent intersections not identified by the analysis.

Potential Short-Term Improvements appearing in Table 5-6, as well as those Long-Term Improvements in Table 5-7, are based on accepted traffic planning and engineering methodologies, such as Level of Service standards. In some cases (e.g., intersection of Conestoga Road and Brooke Road), the potential improvements to these intersections may not be consistent with the rural nature of the roads themselves as well as the surrounding neighborhoods and may need additional consideration. In all cases, these intersection improvements should be viewed as “potential” or “preliminary.”

#### **Future Levels of Service**

As traffic volumes increase along roadways, the delay experienced by motorists will also increase without a future transportation improvement plan. To properly plan for the future and develop an efficient future transportation network, potential improvements to the roadway network must be considered, which include improvements such as traffic signal timing/phasing optimizations, geometric improvements at intersections and along roadways, installation of traffic signals, possibly new roadways, as well as ridesharing, mass transit and other means of traffic mitigation. Therefore, utilizing the future 2022 traffic volume projections previously described, capacity/level-of-service analyses were conducted for the key study intersections during the weekday morning and afternoon peak hours to determine future operating conditions and identify long-term improvements to accommodate these future traffic volumes.

The results of the capacity/level-of-service analyses for the key study intersections (as noted in Table 5-3) within the Township are illustrated on Figures B-1 through B-16 (see Appendix B, located at the Radnor Township building) for the 2022 future weekday morning and afternoon commuter peak hours. Furthermore, the base future conditions analyses conservatively do not include any potential short-term improvement recommendations, as presented in Table 5-6. Relative to the key intersections evaluated in the Comprehensive Plan, the intersections that are projected to operate with poor levels of service (LOS E or F) are listed in Table 5-7, in addition to potential long-term improvements required to remedy these conditions.

#### **Planned Long-Term Improvements**

- Currently, there are no long-term roadway/intersection improvements for roadways and intersections within Radnor that are contained on the PennDOT *12-Year Transportation Improvement Program*.
- Although none of the following improvements is currently planned for implementation, it is important to note that the previous Comprehensive Plan recommended for study the following new roadway alignments:
  - A Major Collector roadway between Lancaster Avenue and Conestoga Road following the former rail right-of-way. This road would relieve Radnor-Chester Road and Iven Avenue of traffic traveling between King of Prussia Road and Lancaster Avenue and areas to the southwest of the Township.
  - A Minor Collector roadway between Newtown Road and Godfrey Road at a location approximately midway between Sproul Road and Darby-Paoli Road. This road



would serve new development and carry neighborhood traffic to other collector streets.

- A Minor Collector roadway of much less importance than the previous roadways would connect Mill Road from Bryn Mawr Avenue through to Wyldhaven Road, providing added access for the area. This roadway was recommended only if institutions in the area were developed more intensely or were redeveloped.
- The second and third new roadway alignments should be re-evaluated to determine if their construction is still feasible and necessary. Additionally, if either of these roadways were to be constructed in the future, the long-term recommendations for improvements at nearby intersections may be affected.
- Every effort should be made to optimize the use of innovative traffic calming techniques in solving the mounting transportation and traffic problems throughout the Township.

#### Recommended Actions

The Township should consider the following improvements and issues, to maintain efficient traffic operations along roads and at intersections within the Township, making sure in all cases that proposed transportation improvements are consistent and compatible with all other Recommended Actions set forth in this Comprehensive Plan:

- **The potential long-term intersection improvements contained in Table 5-7 should be further evaluated and considered by the Township.**
- **As long-term improvements are selected for implementation by the Township, the Township should then pursue their selection by Delaware County, DVRPC, and PennDOT for their respective transportation improvement plans, as appropriate. Further discussion of this process is included later in this Chapter.**
- **Plan for the potential long-term improvements by acquiring the necessary right-of-way for geometric road configuration improvements, as necessary and when available.**
- **Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the PennDOT *Twelve Year Transportation Program*). See the Highway Project Funding section of this Chapter.**
- **In all of its roadway and intersection improvements, make sure that pedestrian movement is given a high priority.**

**Table 5-7. Preliminary Long-term Intersection Improvements**

<b>Intersection</b>	<b>Preliminary Improvement Recommendations</b>	<b>Resulting Overall LOS <sup>1</sup> AM (PM)</b>
Lancaster Avenue and Old Eagle School Road/Sugartown Road	Optimize traffic signal timings.	C(D)
Lancaster Avenue and Conestoga Road/Eagle Road	Widen Lancaster Avenue to provide a separate eastbound right-turn lane. <sup>2</sup>	C(C)
Lancaster Avenue and N. Wayne Avenue/S. Wayne Avenue	Optimize traffic signal timings.	C(C)
Lancaster Avenue and Aberdeen Avenue	Optimize traffic signal timings.	B(C)
Lancaster Avenue and Radnor-Chester Road	Widen for additional through and left-turn lanes on Lancaster Pike in both directions; widen northbound Radnor Chester Road for separate left-turn lane; provide westbound right-turn overlap phase and northbound left-turn advance phase; optimize signal timings. <sup>2</sup>	C(D)
County Line Road and Roberts Road	Traffic signal not warranted under existing or projected future conditions based on available data. Further study required.	--
County Line Road/Conestoga Road/Thomas Avenue/Glenbrook Avenue	Widen Conestoga Road to provide additional right-turn lane; optimize signal timings. (Through movements and left turns from Conestoga Road are not permitted but still occur – enhanced prohibitive measures should be evaluated.)	C(C)
County Line Road/Bryn Mawr Avenue/Railroad Avenue/Glenbrook Avenue	Widen northbound Bryn Mawr Avenue for separate right-turn lane; optimize signal timings.	C(D)
Conestoga Road and S. Wayne Avenue	Signalize and coordinate with future signal at Brooke Road/Conestoga Road; widen Conestoga Road for separate westbound right-turn lane. (Signal presently warranted.)	A(B)
Conestoga Road and Brooke Road	Signalize and coordinate with future signal at S. Wayne Avenue/Conestoga Road; widen Conestoga Road for separate eastbound right-turn lane. (Signal warranted under projected conditions.)	B(B)
Conestoga Road/Iven Avenue/Aberdeen Avenue/Church Road	Widen Conestoga Road for separate left-turn lanes in each direction; widen northbound Church Road for separate right-turn lane; optimize signal timings.	D(E)
Conestoga Road and Radnor-Chester Road	Widen Radnor Chester Road for separate left-turn lanes in both directions; widen westbound Conestoga Road for separate right-turn lane; provide southbound left-turn advance phase; optimize signal timings.	C(C)
Conestoga Road and Ithan Avenue	Widen Conestoga Road for separate westbound left-turn lane; optimize timings.	B(B)
Darby-Paoli Road and Brooke Road	Signalize; widen Darby-Paoli Road to provide a separate eastbound left-turn lane; current bridge along Darby-Paoli Road may require widening. (Signal warranted under existing conditions.)	B(B)
Bryn Mawr Avenue and Sproul Road	Widen all approaches to provide a separate left-turn lane and two through lanes <sup>2</sup> ; provide left-turn advance phase on each approach; optimize signal timings.	C(D)

<sup>1</sup> – With implementation of preliminary improvements

<sup>2</sup> – Right-of-way is likely required, and therefore, further evaluation is needed to determine the feasibility of the improvements or alternative improvements should be identified.

### 3. Accident Locations and Deficient Roadway Conditions

The evaluation of accident locations is another measure of the efficiency and safety of the roadway network within the Township. Radnor maintains computerized records of reported and unreported accident locations on file at the Township Building. The Pennsylvania Department of Transportation also summarizes municipal traffic accident reports for State-owned and maintained roads. These two sources serve as an excellent database to examine accident locations.

Narrow cartways, skewed intersections, restricted sight distance, poor access/driveway configuration, multiple-approach intersections, or other geometric (horizontal/vertical alignment) deficiencies including sharp curves and steep grades are typical deficient conditions on roads within Radnor.

#### Planned Safety Improvements

- PennDOT 12-Year Transportation Improvement Program currently identifies one safety improvement within Radnor Township, which consists of aligning Goshen Road, in the vicinity of Darby-Paoli Road, to soften the curve presently signed at 10 mph in a 35 mph zone.

#### Recommended Actions

- **The Township should continue to periodically review accident reports to identify accident trends and safety issues.**
- **Solutions to the most prevalent roadway deficiencies should be examined and implemented to reduce the potential for accidents.**
- **Re-evaluate the merit of the Penn DOT 12-Year TIP improvement involving aligning of Goshen Road in the vicinity of Darby-Paoli Road, given the overall rural road context and neighborhood concerns.**

### 4. Regional Influences

The location of Radnor along major transportation routes has historically made the Township an attractive place to live and work, whether it was the availability of trails, convenient transit, or major thoroughfares and expressways. Therefore, future roadway improvements coupled with continued residential and commercial development in neighboring townships will continue to impact the transportation network in Radnor. Radnor will also face development and redevelopment pressure in the future and will also experience the traffic associated with growth in neighboring townships.

Lower Merion Township recently completed a transportation study of the Lancaster Avenue and Montgomery Avenue corridors within its municipal borders, which resulted in improvement alternatives for the corridors. Since any major improvements to either of these roadways will likely impact traffic conditions along Lancaster Avenue and other roadways within Radnor Township, **Radnor Township should coordinate with Lower Merion Township relative to any selected improvements, and address any related traffic impacts.** It is our understanding that at the present time, Lower Merion Township has not elected to implement any specific improvements along these corridors. Additionally, **Radnor should work to better coordinate all of its transportation**

*planning with neighboring municipalities (Newtown, Marple, and Haverford in Delaware County, Easttown and Tredyffrin in Chester County, as well as Lower Merion in Montgomery County).*

Recommended Actions

- **Radnor Township should continue to proactively plan for its future transportation network, including all modes of transportation, in a coordinated effort with surrounding municipalities, the Delaware County Planning Commission and Department, the Delaware Valley Regional Planning Commission, and the Pennsylvania Department of Transportation, and local and regional Transportation Management Associations.**

**C. Transit**

The primary means of transit that is available within Radnor is train service provided by the Southeastern Pennsylvania Transportation Authority (SEPTA). Additional transit opportunities available to Radnor residents include bus service and a shared-ride paratransit service.

**1. Current Transit Services**

The SEPTA R-5 regional rail line provides service between Philadelphia (and other connecting regional rail lines) and the Thorndale station located in Caln Township. There are four R-5 stations located within Radnor, including the Villanova Station, the Radnor Station, the St. Davids Station, and the Wayne Station. Amtrak train service is also provided at the nearby 30<sup>th</sup> Street (Philadelphia), Ardmore, Exton, and Paoli stations, each located along the R-5 rail line, and it provides service across the country. SEPTA also maintains Light Rail service along its Route 100 line within Radnor and the surrounding area, exclusive of the regional rail service, and provides service at the County Line Station, Radnor Station, Villanova Station, Stadium Station, Rosemont, Bryn Mawr, and Garrett Hill Station.

Transit provides a great benefit to the surrounding roadway network as it relieves traffic demand; however, the usage of transit depends upon a number of factors including location, convenience, accessibility, cost, etc. Due to the number of convenient regional rail stations located in the area, both within Radnor and the adjacent municipalities, it is important to evaluate more than just the four stations within Radnor. Also, it is important to consider that Radnor residents may not utilize the closest station to their home, but may utilize a station with more convenient parking or that is near a spouse's work or child's school, which may even be outside of the Township. This important factor should also be considered for non-Radnor residents using regional rail stations within the Township. The current operating conditions of the SEPTA R-5 rail service and SEPTA Route 100 Light Rail Service within the Radnor area are summarized in Table 5-8 and Table 5-9, respectively.

**Table 5-8. Current Operating Conditions of the SEPTA R-5 Regional Rail Service<sup>1</sup>**

Station	Township	Available Parking <sup>2</sup>	Parking Utilization Rate <sup>2</sup>	Peak Fare (Off-Peak Fare)	Fare Zone
Strafford	Tredyffrin	Lot	N/A	\$4.50(\$3.50)	3
Wayne	Radnor	84	99%	\$4.50(\$3.50)	3
St. Davids <sup>3</sup>	Radnor	57	93%	\$4.50(\$3.50)	3
Radnor <sup>3</sup>	Radnor	82	100%	\$4.50(\$3.50)	3
Villanova <sup>3</sup>	Radnor	89	94%	\$4.50(\$3.50)	3
Rosemont	Lower Merion	91	100%	\$4.50(\$3.50)	3
Bryn Mawr <sup>3</sup>	Lower Merion	46	100%	\$4.50(\$3.50)	3
Haverford	Lower Merion	50	100%	\$3.75(\$3.00)	2
Ardmore	Lower Merion	Permit Only	N/A	\$3.75(\$3.00)	2

<sup>1</sup> Service provided in 30-minute intervals during the weekday morning and afternoon commuter peak periods.

<sup>2</sup> Based on information provided by SEPTA.

<sup>3</sup> Express service to Philadelphia provided during the AM peak (inbound) and PM peak (outbound) at varying times.

**Table 5-9. Current Operating Conditions of the SEPTA Route 100 Light Rail Service<sup>1</sup>**

Station	Township	Available Parking <sup>2</sup>	Parking Utilization Rate <sup>2</sup>	Fare	Service Type
County Line	Radnor	None	N/A	\$2.00	Local
Radnor	Radnor	20	N/A	\$2.00	Local
Villanova	Radnor	42	N/A	\$2.00	Local
Stadium	Radnor	None	N/A	\$2.00	Local
Garrett Hill	Radnor	None	N/A	\$2.00	Local
Rosemont	Radnor	None	N/A	\$2.00	Local
Bryn Mawr	Radnor	102	N/A	\$2.00	Local

<sup>1</sup> Service provided in six-minute intervals during the weekday morning and afternoon commuter peak periods.

<sup>2</sup> Based on information provided by SEPTA.

The majority of Radnor residents utilizing transit generally are employed in Center City Philadelphia and ridership along the R-5 is popular as it provides fast, direct service to the City. As a result, parking at the regional rail stations is often at or near capacity during the weekday morning and afternoon commuter peak hours.

The SEPTA Route 105-bus line is currently the only standard bus service provided within the Radnor area. The Route 105 bus line services the Lancaster Avenue corridor through Radnor Township, connecting between the 69<sup>th</sup> Street Terminal and Paoli Memorial Hospital. Although limited bus service is provided within Radnor, there are numerous convenient bus routes within adjacent municipalities providing connecting service to even more bus routes (including the Route 105 bus line), as well as service to other regional rail train stations.

The County shared-ride paratransit service provides rider-determined destinations and schedules (with a 24-hour advance reservation), and generally operates during weekday business hours. The fare structure is based on zones of approximately one square mile, and this service is available for free to senior citizens, and discounted fares apply to multiple riders.

## **2. Future Transit Services**

As traffic volumes along major roadways within the Township and surrounding region increase, the desirability public transportation may increase if future traffic volumes cannot be accommodate efficiently by the future roadway network. Currently, there are no major plans to expand transit service within Radnor, although SEPTA is continually modifying schedules along its various rail and bus routes. However, the DVRPC TIP and PennDOT *12-Year Transportation Program* include several enhancement improvements to train stations along the R-5 regional rail line including the Wayne stations. Enhancements to the Radnor station have been completed.

Regionally, the proposed Schuylkill Valley Metro will provide train service between Philadelphia and Reading; however, no direct connections to this service are currently proposed within the immediate Radnor area. Given the concentration of jobs and people in Radnor, potential for a connection should be investigated (SEPTA is currently performing an alternatives analysis for an extension of the Route 100 line to King of Prussia, where it would connect with the proposed Schuylkill Valley Metro).

### **Recommended Actions**

- **As the most popular and utilized form of public transportation, the R-5 regional rail service will continue to serve the majority of public transportation users. Accordingly, the Township should coordinate with the SEPTA and the adjacent municipalities to ensure that the best service possible is provided to its riders, which would include convenient train schedules, express service, etc.**
- **Major expansion or improvements to the R-5 regional rail service within Radnor is currently limited by the ability to expand parking, and therefore, the Township should support and encourage initiatives by SEPTA to provide adequate parking in the future, if done properly; any major improvements to transit service or increased parking initiatives implemented by SEPTA and/or the Township should first be available to residents of Radnor, before providing additional regional transportation service to non-Radnor residents.**
- **Due to the limitations of parking at regional rail stations within Radnor, the proximity of the stations to residential neighborhoods, and the traffic problems generated at peak hour in-bound commuting periods, expansion of service at regional rail stations must be carefully considered, especially at the Wayne, Radnor, and Villanova stations. For example, rail station-related actions in and around the Wayne station must be consistent with the plan for Wayne, as set forth herein. Priority should be given to AM arrivals at Radnor stations, possibly adding shuttles to major Township destinations.**
- **Given the concentration of jobs and people in Radnor, potential for a connection to the proposed Schuylkill Valley Metro should be**

investigated (e.g., the Township could request that project sponsors evaluate this issue).

- **Support and expand shuttle bus service during peak hours (including lunch time) from the major office parks and employment centers, to the Wayne Business District and rail station.**

#### **D. Multi-modal Facilities**

Multi-modal forms of transportation include non-vehicular means of travel including walking and bicycling. Safe, well-established non-vehicular networks serving these activities (i.e., sidewalks, trails, and bicycle lanes) can enhance the transportation network of a community, and in some cases, help to relieve traffic congestion.

##### **1. Pedestrian Facilities**

Sidewalks are provided along a significant amount of local roadways within Radnor, on at least one side of the roadway, or in some cases the traffic volumes are low enough such that pedestrian activity occurs within the roadway. However, with the exception of Lancaster Avenue, the provision of adequate pedestrian facilities is limited along higher-order streets. Sidewalks along many collector roads are provided sporadically, thus requiring pedestrians to walk within roadways with high traffic volumes or on shoulder areas.

Sidewalks are provided within the Wayne Business District; however, like many of the sidewalks throughout the Township, they provide little buffer between vehicular traffic and the pedestrian, and are often incongruent and sporadic. Open parking fields serving businesses along Lancaster Avenue frequently interrupt sidewalks and expose pedestrians to conflicts with traffic at these uncontrolled accesses. Given these various shortcomings, it is reasonable to conclude that the sidewalk network within Wayne does not encourage pedestrian activity within the Business District.

Adequate pedestrian facilities at major intersections are also important, particularly at signalized intersections where higher volumes of traffic intersect. Table 5-10 indicates the pedestrian facilities that are currently provided at signalized intersections within Radnor, including sidewalks, pedestrian crosswalks, and pedestrian traffic signal phasing. It is noted that pedestrian crosswalks and pedestrian traffic signal phasing are necessitated by traffic, pedestrian volumes, and intersection geometry, and are not appropriate or required at all signalized intersections.

##### **Recommended Actions**

- **The Township should complete a full inventory of its sidewalk facilities to determine the adequacy of the current sidewalk network.**
- **The Township should ensure to the extent feasible that all sidewalk facilities, namely curb cuts, are ADA compliant, provide an adequate buffer area between pedestrians and vehicular traffic, and are continuous to promote safe pedestrian travel.**

- **The sidewalk network within the Wayne Business District should be improved to provide a consistent design of sidewalks, which will help to encourage pedestrian traffic within the District, and should be considered in the implementation/adoption of any roadway/intersection improvements, streetscape enhancements, access management initiatives, and redevelopment applications.**
- **Explore the feasibility of providing a signalized pedestrian crossing along Lancaster Avenue between Aberdeen Avenue and Louella Avenue due to the heavy pedestrian and vehicular traffic levels and the lack of traffic signals to accommodate crossing of Lancaster Avenue; and/or provide pedestrian facilities (i.e., crosswalks and pedestrian signal phases) at the Lancaster Avenue/Louella Avenue intersection.**
- **Ensure that adequate sidewalks are available along the roadways surrounding public transportation facilities (i.e., train stations and bus stops) to encourage residents to walk to these facilities, which in turn would reduce the number of vehicle trips on the roadway network and reduce the parking demand in the area of these facilities.**

## **2. Bicycle Facilities**

Currently, there are no exclusive bicycle lanes provided along roadways or other on-road bicycle facilities within Radnor. A connective network of sidewalk, trails, and bicycle facilities would provide a highly desirable multi-modal transportation and circulation network encouraging pedestrian, bicycle and other non-vehicular travel within Radnor.

### *Planned Improvements*

- Currently, the DVRPC TIP and PennDOT *12-Year Transportation Program* identify the construction of a 10-foot wide bicycle/pedestrian trail along the former Philadelphia & Western railroad line between Sugartown Road and Radnor-Chester Road, which is 2.2 miles in length. This is scheduled to be constructed in 2003.
- Currently, there are no other trails or on-road bicycle lanes planned within the Township.

### *Recommended Actions*

- **The Township should pursue providing on-road bicycle facilities on some of its collector and local roads to enhance bicycle mobility throughout the Township and provide links between other bicycle facilities and desirable destinations (i.e., recreational facilities, transit facilities, schools, businesses, etc.).**
- **The Township should create an Official Trail Map to establish current and future bicycle, pedestrian, and multi-use trails. This Trail Map should be incorporated into the Official Township Map.**



**Table 5-10. Current Pedestrian Facilities at Signalized intersections<sup>1</sup>**

Intersection	Sidewalk along Approach				Pedestrian Crossing				Pedestrian Phasing			
	EB	WB	NB	SB	Ebs	WB	NB	SB	EB	WB	NB	SB
Lancaster Avenue/Lowry's Lane	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Ithan Avenue	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lancaster Avenue/Villanova	✓	✓			✓	✓	✓				✓	
Lancaster Avenue/Sproul Road												
Lancaster Avenue/I-476 NB						✓		✓			✓	✓
Lancaster Avenue/I-476 SB												
Lancaster Avenue/King of Prussia Rd												
Lancaster Avenue/Radnor Chester Rd	✓			✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Genuardi's (west)	✓	✓	✓						✓	✓	✓	✓
Lancaster Avenue/Genuardi's (east)	✓	✓							✓	✓	✓	✓
Lancaster Avenue/Chamounix Road	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Aberdeen Avenue	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Lancaster Avenue/Louella Avenue												
Lancaster Avenue/N. Wayne/S. Wayne	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lancaster/Bloomington/Banbury												
Lancaster/Conestoga/Eagle	✓	✓		✓	✓	✓	✓	✓			✓	✓
Lancaster/Sugartown/Old Eagle School	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
North Wayne Avenue/Station Avenue	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
North Wayne Avenue/Poplar Avenue		✓	✓	✓		✓		✓		✓		✓
North Wayne Avenue/Eagle Road												
Sugartown Road/Morris Road			✓	✓	✓		✓					
Eagle Road/Radnor Street Road												
Eagle Road/King of Prussia Road											✓	✓
King of Prussia Road/Matsonford						✓				✓		
Conestoga Road/West Wayne Avenue			✓	✓		✓		✓	✓	✓	✓	✓
Conestoga/Church Road/Iven												
Conestoga Road/Radnor Chester Road												
Conestoga Road/Sproul Road												
Conestoga Road/Ithan Avenue					✓	✓	✓	✓				
Conestoga Road/Garrett Avenue	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Conestoga Road/County Line Road	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Haverford Avenue/Bryn Mawr Avenue	✓	✓	✓	✓	✓	✓	✓	✓				
Bryn Mawr Avenue/Sproul Road											✓	✓
Bryn Mawr Avenue/Mill Road									✓	✓	✓	✓
Bryn Mawr Avenue/Malin Road												
Sproul Road/Clyde Road							✓		✓	✓		
Sproul Road/Godfrey Road									✓	✓		
Radnor Chester Road/St. Davids Ctr.		✓						✓				
Matsonford Road/County Line Road												
Matsonford Road/N. Centennial Drive												✓
Matsonford Road/S. Centennial Drive			✓	✓	✓		✓				✓	✓

1 – Source: Traffic signal permit plans obtained from PennDOT in December 2001.

### 3. Scenic Roads

Scenic roads provide drivers and residents with a sense of open space. The general population frequently enjoys scenic roads because they provide for sightseeing opportunities as well as enhancing the driving experience.

Roadways are scenic due to both the landscapes they traverse and the roads themselves. The roads can be rolling or curving, and/or lined with trees, stone walls, steep banks, or other aesthetic features. Radnor contains many roads that have high visual quality. The recommended

scenic roadways within Radnor Township, as defined in the 1988 Comprehensive Plan, are listed below and mapped in Figure 5-1.

- Conestoga Road
- Darby Paoli Road
- Spring Mill Road
- Upper Gulph Road
- Radnor Chester Road
- Maplewood Avenue
- North Wayne Avenue
- Sproul Road
- Roberts Road
- Newtown Road
- Eagle Road
- Brooke Road
- Saw Mill Road
- Bryn Mawr Avenue
- King of Prussia Road
- Church Road
- Iven Avenue
- Radnor Street Road
- Lancaster Avenue
- South Wayne Avenue
- Ithan and South Ithan Avenue
- Goshen Road
- Godfrey Road
- Matsonford Road
- Abrahams Lane
- Earles Lane

**Recommended Actions**

- **The Township should utilize conservation easements as well as special ordinance provisions as methods of protecting the scenic quality and openness of the landscape, minimizing the disruption of areas of high visual quality and maintaining the character along scenic roads.**
- **Preserve the rural and scenic quality of streets without compromising safety, and when possible, roadway capacity.**
- **The Township should periodically review its current Scenic Roadways designations for adequacy and make any appropriate adjustments.**

# RADNOR TOWNSHIP



## SCENIC ROADS

### Legend

- Scenic Roads
- Parcels

*Scenic Roads were identified  
in the 1988 Comprehensive Plan*

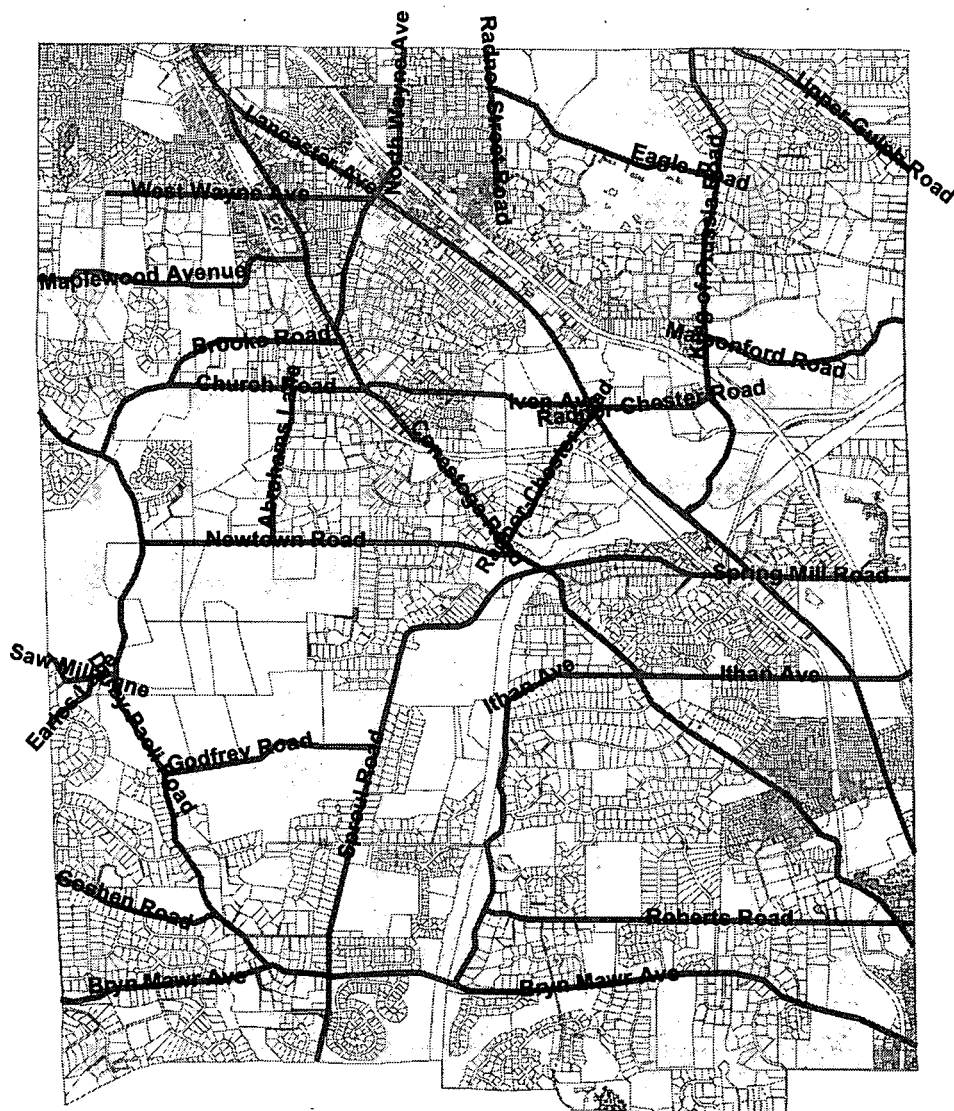
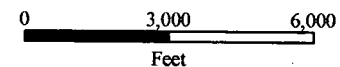


Figure 5-1. Recommended Scenic Roads, taken from Radnor Township  
 1988 Comprehensive Plan

## **E. Parking**

### **1. Wayne Business District Parking Study, 2001**

Based on a recent parking study of the district entitled, *Parking Study, Wayne Business District*, January 2001, parking within the Wayne Business District is limited, but generally adequate overall, as it serves local businesses, restaurants, schools, churches, and the Wayne regional rail train station. A combination of parking exists in Wayne, and includes on-street parking, off-street parking, short-term parking, long-term parking and unrestricted parking. While the Township has promoted shared-parking opportunities between some businesses and several new restaurant and retail establishments, surveys reveal that respondents believe there is insufficient parking and most support a parking garage. The conclusions and recommendations of the 2001 Wayne parking study reveal the following:

- Develop a Master Plan to guide growth and assist with implementation of additional parking.
- Encourage relocation of long-term parking to the western areas.
- Provide small, widely distributed, strategically located parking opportunities, rather than large concentrations of spaces.
- Evaluate removal of unnecessary uses such as the postal distribution center and their potential for providing parking.
- Increase the parking rates in the premium (central) locations, possibly with a digital parking meter program.
- Increase the fines for parking violations.
- Increase the parking enforcement.
- Implement a parking guide sign program to increase awareness of the parking in the western area, and offer public parking in the ATT Lot.
- Remove parking meters from the western end of West Avenue and West Wayne Avenue.
- Convert 20 spaces in municipal Lot-3 to two-hour parking.
- Install 15 two-hour parking meters on Louella Avenue north of Midland Avenue.
- The parking spaces on Louella Avenue adjacent to the athletic fields should be converted to permit parking only.
- Implement programs to promote increased transit use.

Overall, there is sufficient parking currently available within the Wayne Business District; however, there is insufficient parking within the central portion of the district during periods of peak demand, and this insufficiency will be exacerbated by continued redevelopment. At this time, there does not appear to be a sufficient demand to justify the construction of a multi-level parking facility or acquiring large parcels of land for additional surface parking. However, the need for additional parking (i.e., parking structure of surface parking) should be monitored as redevelopment occurs and should be re-evaluated if there are any major changes to the amount of parking within the district as a result of any future roadway improvements, streetscape projects, access management programs, etc.

Parking in the Wayne Business District consists of a significant amount of on-street parking along Lancaster Avenue, North Wayne Avenue, South Wayne Avenue, and many other streets.

On-street parking along these roadways consists of parallel parking, angle parking, and perpendicular parking. The parking in the district is inconsistent in terms of the type and design of parking, which disrupts the pedestrian and sidewalk facilities, as well as the flow of traffic along Lancaster Avenue and other roadways within the district.

Recommended Actions

- **The recommendations contained in the Parking Study, Wayne Business District, January 2001 report, where appropriate, should be implemented by the Township.**
- **The Township should encourage the use of parking cross-easements between businesses located in Wayne and along Lancaster Avenue.**
- **A detailed on-street parking plan for the Wayne Business District, and specifically along Lancaster Avenue and North Wayne Avenue should be developed in conjunction with the creation of any streetscape plans for the District.**
- **A consistent design of on-street parking along Lancaster Avenue in the Wayne Business District should be encouraged to the extent feasible.**
- **Coordinate with PennDOT for their final approval of the on-street parking along State Highways, specifically North Wayne Avenue and Lancaster Avenue.**

**F. Highway Project Funding**

The transition from project identification and estimated cost to the appropriation of project funds is essential in the completion of roadway improvements. The Township usually follows one of two directions once improvements are prioritized. Improvements to Township-owned roads require specific procedures to allocate and release funds. Potential projects must be identified as capital, safety, or maintenance projects. Each method involves a different implementation program.

Capital projects generally include all major construction projects such as drainage improvements, signalization, paving, bridge replacement, realignment, widening, roadway relocation and roadway reconstruction. Funding is dependent on the ownership and Federal designation of individual road segments.

Safety projects include any improvement that eliminate or alleviate hazardous conditions. Such improvements include warning signs, signalization, grading, and guide-rail installation.

Maintenance projects include shoulder repair, drainage and surface improvements, and are handled by the appropriate Township or State authorities primarily using Liquid Fuel Allocation Funds.

Identification and prioritization of highway improvement projects by the Township are the first steps in the process of securing funds. The project then must be endorsed by the County and placed on its suggested Program of Highway Improvements List. The suggested Program of Highway Improvements prepared by the Delaware County Planning Department is updated on an ongoing basis and gathers local input for highway projects affecting that municipality. Project costs are calculated and the proposal is included on a regional list of projects known as the Transportation Improvement Program. The project then must be placed on the State 12-Year Highway Program to receive funding. Because the State continually rearranges its priority list, timing for the pending improvement projects is subject to fluctuation.

Table 5-11 provides a description of current funding programs that are potential sources of funding for improvements. Recent Federal legislation, such as the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Clean Air Act Amendments of 1990 and the Transportation Efficiency Act for the Twenty-first Century (TEA-21), emphasizes providing funding for transportation projects that are inter-modal and that improve air quality. Priority projects that should receive increased funding are bikeway and trail corridors, public transit, and park-and-ride facilities. This is not a complete list of projects; the listing indicates that the emphasis for funding transportation projects has shifted.

**Table 5-11. Transportation Funding Opportunities**

Source	Funding Title	Types Of Eligible Projects	Funding Split	Eligibility	Required Programming
Federal (TEA-21)	National highway system (NHS)	Construction or reconstruction of "major" roads	80% Federal 20% State	Roads must be on the designated National Highway System	PennDOT 12 Year Program, DVRPC TIP
Federal (TEA-21)	Surface transportation program (STP)	Construction, reconstruction, rehabilitation, resurfacing, restoration and operational improvements for highways and bridges; Transit capital costs; and travel demand reduction improvements	80% Federal 20% State or Local	For use on any federal-aid roads.	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Safety Component of STP	Various types of safety improvements which mitigate documented safety problems	80% Federal 20% State	For use on any federal-aid roads.	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Transportation enhancement activities	Bicycle and pedestrian facilities; Acquisition of scenic easements and scenic or historic sites; landscaping and beautification; and other environmental related programs	80% Federal 20% State or Local	Must relate to surface transportation	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Bridge	Construction, reconstruction or rehabilitation of bridges	80% Federal 20% State or Local	For any bridge on a public road	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Congestion mitigation and air quality improvements (CMAQ)	Transit improvements, bicycle and pedestrian projects, travel demand management strategies, traffic flow improvements, and public fleet conversions to cleaner fuels	80% Federal 20% State or Local	Projects which contribute to meeting the attainment of National Ambient Air Quality Standards	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal (TEA-21)	Toll roads	Construction and rehabilitation of toll facilities including roads, bridges and tunnels	50% Federal 50% State or Local	For use on publicly owned facilities and in some cases privately owned facilities	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget
Federal	Community Development Block Grant	Construction and rehabilitation of streets, bridges, pedestrian or parking facilities	100% Federal (HUD)	Project must benefit low-to-moderate income housing	Approval from County Office of Housing and Community Development and State Department of Community and Economic Development
State	Bridges	Construction, reconstruction or rehabilitation of bridges	100% State or 80% State & 20% Local	For use on State and Local Bridges	PennDOT 12 Year Program, DVRPC TIP, State Capital Budget

**Table 5-11. Transportation Funding Opportunities, continued**

Source	Funding Title	Types Of Eligible Projects	Funding Split	Eligibility	Required Programmin
State	Cooperative agreements	Limited safety and maintenance improvements	Materials Provided by PennDOT, labor provided by municipality	State roads only, Less than \$5,000 cost	
State / Federal	Betterment or "3R"	Minor reconstruction or major resurfacing of roads and bridges	80% Federal 20% State	For use on State Roads	PennDOT 12 Year Program, DVRPC TIP (If Federal Funds are used)
County	Vision Partnership Program	Plans/Studies/ZO-SLDO Amendments	75% County 25% Municipality	Consult Chester County Planning Department	Grant Agreement, Scope of Work.
County	Bridges	Construction, reconstruction or rehabilitation of County Bridges	80% Federal 15% State, and 5% County	For use on county bridges	County Public Works Department
State / Municipal	Transportation partnership	Various safety and capacity improvements	Federal or state share varies by project	Based on the requirements of State Act 47 of 1985	PennDOT 12 Year Program, DVRPC TIP (If Federal Funds are used)
State/ Municipal	Traffic impact fees	Various capacity improvements as defined in the required Land Use and Traffic Studies conducted by the municipality	Funding share is determined in the capital improvements plan; maximum state participation is 50%	Based on the requirements of State Act 209 of 1990	Municipal Capital Improvements Plan, State Capital Budget, DVRPC TIP (if Federal Funds are used)
Municipal	Debt financing	Various capacity, safety or maintenance improvements as defined by appropriate statute	100% Municipal	Limit of indebtedness regulated by State statute; projects must be approved by the governing body and in some cases by the electorate	Municipal Budget
Municipal	General fund	Various capacity, safety or maintenance improvements as defined by appropriate statute	100% Municipal	Projects must be approved by the governing body; Restrictions are identified in the municipal code	Municipal Budget
Municipal	Liquid fuels fund	Construction, reconstruction or maintenance of bridges and roads	100% State Municipal Allocations Are Based On Legislative Formula	Projects must be approved by the governing body and PennDOT; Road must be on the approved liquid fuels system	Municipal Budget Program



## G. Access Management Program

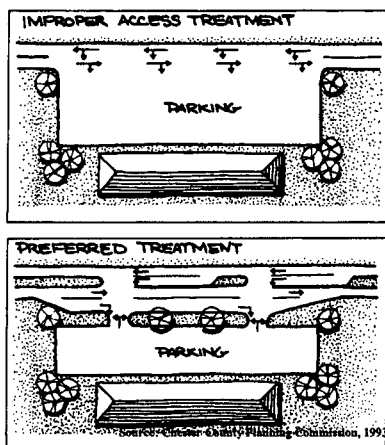
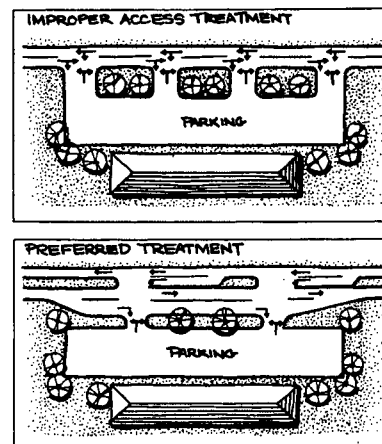
Access management in Radnor is important for both addressing safety issues and for maintaining traffic flow with a minimum of interruption, not only along major roadways within the Township, such as U.S. Route 30, but also on other roadways in the Township. Access management should apply to all roads in the Township, as practical. Reducing the amount of unnecessary curb cuts and access points can also help to reduce delays in traffic flow, accident levels, and pedestrian conflicts.

### 1. Methods

In developed areas, such as along Lancaster Avenue where existing businesses are involved, changes in access design may have to wait until a change in the use of a property occurs. Depending on the particular situation, a variety of techniques are available to address existing access problems. Some relatively simple methods for addressing existing access problems include the following:

- *Reduce Number of Access Points and Channelized Access*

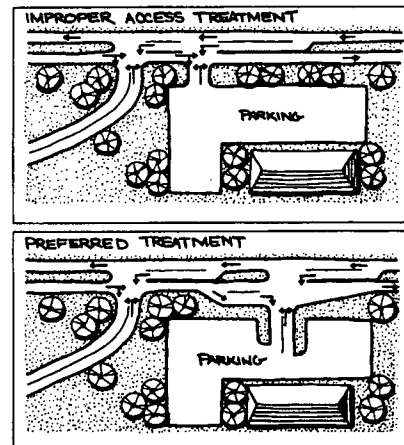
Eliminating excessive driveways and concentrating access at one location reduces the potential for accidents. Turning movements to or from large parcels without control of access can cause rear end accidents, sideswipe accidents, and queuing on the primary road.



In cases where the depressed curb is one continuous means of access across the site frontage, creating a limited number of access points would eliminate uncontrolled turning movements to and from the site.

- *Relocate Access Points*

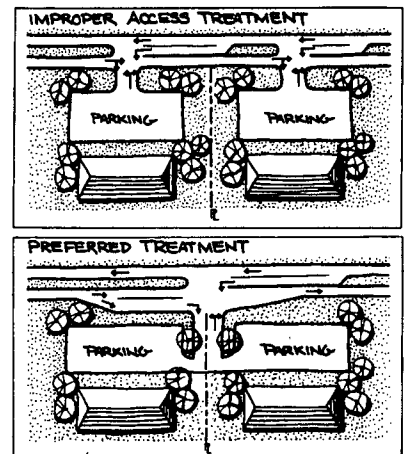
This technique involves shifting the access point to a safer, more convenient location. For example, if two access points are too close to each other, one can be moved farther away. When access points on either side of a road are slightly off-set, they can be relocated directly across from each other.



Source: Chester County Planning Commission, 1993.

- *Combine Access Points*

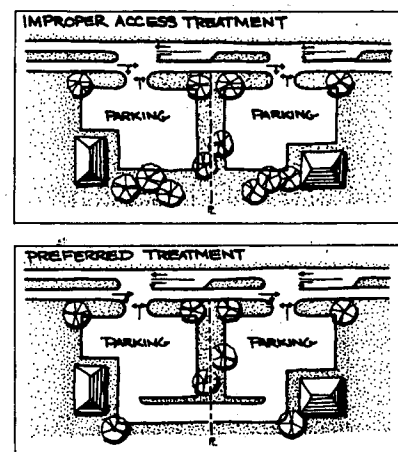
Where feasible, access points on the same parcel or on adjacent parcels should be combined to reduce the total number of access points on the road.



Source: Chester County Planning Commission, 1993.

- *Side Access*

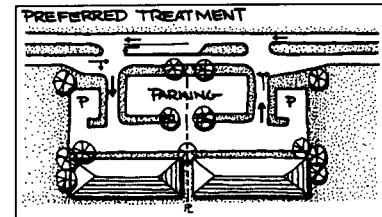
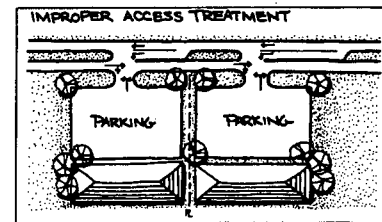
Side access refers to access between adjacent parcels allowing traffic to move from parcel to parcel (or store to store) without using the primary road. This does not involve any physical change in frontage access but reduces the need to use the primary road.



Source: Chester County Planning Commission, 1993.

- *Create One-Way Patterns*

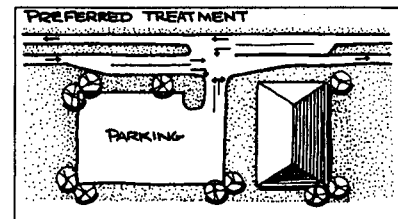
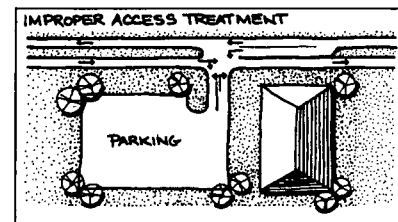
Separating ingress and egress movements can reduce accidents. For example, two existing two-way driveways could be converted into one-way in and one-way out drives. This can be done on one parcel or in combination with other parcels.



Source: Chester County Planning Commission, 1993.

- *Deceleration Lanes*

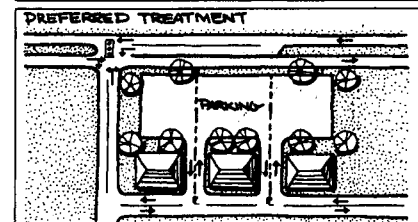
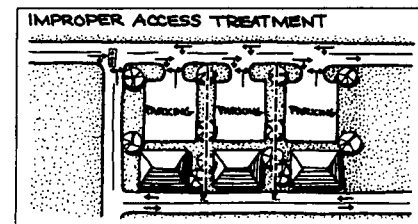
A deceleration lane separates through traffic from decelerating right-turn traffic on the primary road and can reduce rear end accident rates.



Source: Chester County Planning Commission, 1993.

- *Reverse Frontage Road*

Access to the primary road is denied along the property frontage and is, instead, directed to a roadway along the rear lot line.



Source: Chester County Planning Commission, 1993.

Given the high number of driveway accesses along Lancaster Avenue, particularly within the Wayne Business District, the Township should encourage access management techniques.

*Recommended Actions*

- **The Township should encourage such access management methods along U.S. Route 30 like *side access, one-way access patterns, combination/relocation of access points*, and provide *access easements* through adjoining parcels. The Township should require these techniques for re-developing land uses along Lancaster Avenue and possibly along other roadways within the Township.**
- **To the extent feasible, any streetscape initiative planned for the Wayne Business District should address access management issues along Lancaster Avenue and other roadways within the district.**
- **The Township should proactively work to promote and facilitate use of access management measures between adjacent but separately-owned parcels. The Township should encourage practical access management measures in its review of commercial developments.**

## **H. Traffic Calming**

### **1. Background**

Traffic calming has been defined in the *PennDOT Publication 383, Pennsylvania's Traffic Calming Handbook, January 2001* as "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users." More specifically, traffic calming has gained popularity in recent years as a method to reduce speeds of traffic along local roads or to decrease the amount of non-local traffic utilizing neighborhood streets as a cut-through route, especially as traffic congestion has increased on surrounding roadway networks forcing motorists to seek alternative routes.

When evaluating traffic calming measures, the Township should refer to the PennDOT publication, *Pennsylvania's Traffic Calming Handbook, Publication 383, January 2001* and the Institute of Transportation Engineers publication, *Traffic Calming – State of the Practice, 1999*. A toolbox of traffic calming measures is currently available to municipalities to address speeding and cut-through traffic concerns of residents, and are further described in the PennDOT and ITE publications. Accordingly, some of the available traffic calming measures include the following:

- Signing and pavement markings
  - Roadway narrowing with pavement edge lines
  - Transverse pavement markings
  - Turn prohibitions
  - Speed limit signing
- Horizontal Deflection

- On-street parking
- Gateway
- Bulb-out/curb extension
- Chicane
- Raised median island
- Traffic circle/roundabout
- Vertical Deflection
  - Textured crosswalk
  - Speed hump
  - Raised crosswalk
  - Raised intersection
- Physical Obstruction
  - Semi-diverter
  - Diagonal diverter
  - Right-in/Right-out island
  - Raised median through intersection
  - Street closure

The above traffic calming measures have varying levels of effectiveness in reducing traffic volume, speeds, and traffic conflicts. Additional issues to consider when selecting a traffic calming measure is the effect on emergency vehicles, roadway maintenance and snow removal, as well as standard issues such as cost and legal issues. Furthermore, the need for traffic calming is often a result of traffic problems on the surrounding roadway network, and therefore, these problems should be evaluated and subsequently addressed, if possible, prior to consideration of traffic calming measures.

#### Recommended Actions

- **The Township should increase attention to traffic calming solutions and should create a well-defined traffic calming master plan policy, educational campaign, and approval process to evaluate when and where traffic calming is appropriate, to avoid sporadic and ineffective traffic calming usage, and to provide the Township with standardized and consistent criteria for traffic calming decision making. Many municipalities have implemented a three-step process, as outlined below, which Radnor should consider as part of this traffic calming program:**
  - **Educating the public regarding the traffic problem (i.e., speeding through neighborhoods, etc.),**
  - **Enforcing speed limits**
  - **Engineering traffic calming solutions (study and design aspects)**
- **Any streetscape initiative planned for the Wayne Business District should address traffic calming issues along North Wayne Avenue, South Wayne Avenue, Lancaster Avenue, and other roadways within the area.**

**Specifically, these traffic calming measures within the district may include the following:**

- ***Landscaped Median*** – along North Wayne Avenue between Lancaster Avenue and Station Road, which should be designed to accommodate the necessary turning lanes at intersections, a pedestrian crossing(s), and turning movements to/from the municipal parking lot.
- ***Raised Pedestrian Crosswalks*** – along roadways within the district, which may promote driver awareness of pedestrians, reduce vehicle speeds, and provide aesthetic benefits as well.
- **Public involvement throughout the process is recommended, as the implementation of traffic calming measures may be controversial.**
- **As with any improvement to a State roadway, PennDOT approval will be required for the implementation of traffic calming measures on any State roadways; therefore, the Township should work closely with the Department through the planning and design process.**

#### **I. Recommended Actions**

Below we revisit the Goals for the Transportation and Circulation Plan section, followed by the Recommended Actions for the Township. The Recommended Actions are categorized according to the individual elements within this Transportation plan.

#### **Goals**

***Develop a transportation capital improvement plan with recommendations for safety and capacity-related traffic improvements to accommodate future traffic demands.***

***Implement traffic improvements for key roads and intersections to improve traffic flow and encourage traffic to remain on the major routes.***

***Develop traffic calming strategies for implementation, as appropriate, to help preserve the neighborhoods and communities.***

***Use landscaping, gateways, and street furniture, etc. to integrate the road system and traffic within the community to enhance and preserve the rural and scenic character of the streets, without sacrificing safety.***

***Preserve the rural and scenic character of the streets, without sacrificing safety.***

***Improve pedestrian circulation by implementing pedestrian facilities as well as planned trail and bicycle facilities.***

***Encourage increased use of public transit.***

***Encourage opportunities for transit-oriented development and limit intensive uses to areas close to public transit where such uses are compatible with adjacent uses and would cause no adverse impact on the residential neighborhoods.***

***Enhance regional rail use through accommodation of commuter parking needs.***

***Promote ride sharing or carpooling as well as other trip reduction strategies to reduce single occupant, private vehicle commuting by employees of major businesses.***

***Support a coordinated/planned private transit service through a cooperative partnership between the major employers, institutions and the Township.***

## **Recommended Actions**

### **Road Network**

- **Reclassify several roadways within the Township to reflect current traffic conditions and future needs (refer to Table 5-1 for potential reclassification of roadways).**
- **Continue to monitor future traffic conditions to determine if reclassification is necessary.**
- **Upgrade roadways to satisfy the design criteria of newly reclassified roadways.**
- **Future development should be monitored and regulated so that subsequent traffic generation does not alter the designated function of individual roads unless the design can be upgraded and is consistent with both the future land use and circulation plans. Developments should not cause restrictions on the ease of entering or exiting a roadway from adjacent properties, or increase traffic to encroach upon or exceed the capacity of a road.**

### **Existing Traffic Volumes and Capacities**

- **The potential short-term intersection improvements contained in Table 5-6 should be further evaluated and considered by the Township.**
- **Traffic signal equipment (i.e., controllers, loop detectors, etc.) and programming (i.e., timings, phasing, offset timings, clocks, etc.) should be properly maintained to ensure proper operations.**

- Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the Penn DOT *Twelve Year Transportation Improvement Plan*).
- Improve interface between automobile traffic and pedestrian movement.

#### **Future Traffic Volumes and Capacities**

- The potential long-term intersection improvements contained in Table 5-7 should be further evaluated and considered by the Township.
- As long-term improvements are selected for implementation by the Township, the Township should then pursue their selection by PennDOT, Delaware County, and DVRPC for their respective transportation improvement plans, as appropriate.
- Plan for the potential long-term improvements by acquiring the necessary right-of-way for geometric road configuration improvements, as necessary and when available.
- Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the PennDOT *Twelve Year Transportation Improvement Plan*).
- In all of its roadway and intersection improvements, make sure that pedestrian movement is given a high priority.

#### **Deficient Roadway Conditions**

- The Township should periodically review accident reports to identify accident trends and safety issues.
- Solutions to the most prevalent roadway deficiencies should be examined and implemented to reduce the potential for accidents.
- Re-evaluate the merit of the Penn DOT 12-Year TIP improvement involving aligning of Goshen Road in the vicinity of Darby-Paoli Road, given the overall rural road context and neighborhood concerns.

#### **Regional Framework**

- Radnor Township should continue to proactively plan for its future transportation network, including all modes of transportation, in a coordinated effort with surrounding municipalities, the Delaware County Planning Commission, the Delaware Valley Regional Planning Commission, and the Pennsylvania Department of Transportation, and local and regional Transportation Management Associations.



### **Future Transit Services**

- As the most popular and utilized form of public transportation, the R-5 regional rail service will continue to serve the majority of public transportation users. Accordingly, the Township should coordinate with the SEPTA and the adjacent municipalities to ensure that the best service possible is provided to its riders, which would include convenient train schedules, express service, etc.
- Major expansion or improvements to the R-5 regional rail service within Radnor is currently limited by the ability to expand parking. Therefore, the Township should support and encourage initiatives by SEPTA to provide adequate parking in the future, if done properly. Any major improvements to transit service or increased parking initiatives implemented by SEPTA and/or the Township should first be available to residents of Radnor, before providing additional regional transportation service to non-Radnor residents.
- Due to the limitations of parking at regional rail stations within Radnor, the proximity of the stations to residential neighborhoods, and the traffic problems generated at peak hour in-bound commuting periods, expansion of service at regional rail stations must be carefully considered, especially at the Wayne, Radnor, and Villanova stations. For example, rail station-related actions in and around the Wayne station must be consistent with the plan for Wayne, as set forth herein. Priority should be given to AM arrivals at Radnor stations, possibly adding shuttles to major Township destinations.
- Given the concentration of jobs and people in Radnor, potential for a connection to the proposed Schuylkill Valley Metro should be investigated (e.g., the Township could request that project sponsors evaluate this issue).
- Support and expand shuttle bus service during peak hours (including lunch time) from the major office parks and employment centers, to the Wayne Business District and rail station.

### **Pedestrian Facilities**

- The Township should complete a full inventory of its sidewalk facilities to determine the adequacy of the current sidewalk network.
- The Township should ensure to the extent feasible that all sidewalk facilities are ADA compliant, provide an adequate buffer area between pedestrians and vehicular traffic, and are continuous to promote safe pedestrian travel.
- The sidewalk network within the Wayne Business District should be improved to provide a consistent design of sidewalks, which will help to encourage pedestrian traffic within the District, and should be considered in the implementation/adoption of any roadway/intersection improvements,

**streetscape enhancements, access management initiatives, and redevelopment applications.**

- **Explore the feasibility of providing a signalized pedestrian crossing along Lancaster Avenue between Aberdeen Avenue and Louella Avenue due to the heavy pedestrian and vehicular traffic levels and the lack of traffic signals to accommodate crossing of Lancaster Avenue; and/or provide pedestrian facilities (i.e., crosswalks and pedestrian signal phases) at the Lancaster Avenue/Louella Avenue intersection.**
- **Ensure adequate sidewalks are available along the roadways surrounding public transportation facilities (i.e., train stations and bus stops) to encourage residents to walk to these facilities, which in turn would reduce the number of vehicle trips on the roadway network and reduce the parking demand in the area of these facilities.**

#### **Bicycle Facilities**

- **The Township should pursue providing on-road bicycle facilities on some of its collector and local roads to enhance bicycle mobility throughout the Township and provide links between other bicycle facilities and desirable destinations (i.e., recreational facilities, transit facilities, schools, businesses, etc.).**
- **The Township should create an Official Trail Map to establish current and future bicycle, pedestrian, and multi-use trails.**

#### **Scenic Roads**

- **The Township should utilize conservation easements as well as special ordinance provisions as methods of protecting the scenic quality and openness of the landscape, minimizing the disruption of areas of high visual quality and maintaining the character along scenic roads.**
- **Preserve the rural and scenic quality of streets without compromising safety, and when possible, roadway capacity.**
- **The Township should periodically review its current Scenic Roadways designations for adequacy and make any appropriate adjustments.**

#### **Wayne Business District Parking Study**

- **The recommendations contained in the Parking Study, Wayne Business District, January 2001 report should be reconsidered by the Township.**
- **The Township should encourage the use of parking cross-easements between businesses located in Wayne and along Lancaster Avenue.**

- A detailed on-street parking plan for the Wayne Business District, and specifically along Lancaster Avenue and North Wayne Avenue should be developed in conjunction with the creation of any streetscape plans for the District.
- A consistent design of on-street parking along Lancaster Avenue in the Wayne Business District should be encouraged to the extent feasible.
- Coordinate with PennDOT for their final approval of the on-street parking along State Highways, specifically North Wayne Avenue and Lancaster Avenue.

#### **Access Management Program**

- The Township should encourage such access management methods along U.S. Route 30 like *side access, one-way access patterns, combination/relocation of access points*, and provide *access easements* through adjoining parcels. The Township should require these techniques for re-developing land uses along Lancaster Avenue and possibly along other roadways within the Township.
- To the extent feasible, any streetscape initiative planned for the Wayne Business District should address access management issues along Lancaster Avenue and other roadways within the District.
- The Township should proactively work to promote and facilitate use of access management measures between adjacent but separately-owned parcels. The Township should encourage practical access management measures in its review of commercial developments.

#### **Traffic Calming**

- The Township should increase attention to traffic calming solutions and should create a well-defined traffic calming master plan policy, educational campaign, and approval process to evaluate when and where traffic calming is appropriate, to avoid sporadic and ineffective traffic calming usage, and to provide the Township with standardized and consistent criteria for traffic calming decision making. Many municipalities have implemented a three-step process, as outlined below, which Radnor should consider as part of this traffic calming program:
  - Educating the public regarding the traffic problem (i.e., speeding through neighborhoods, etc.),
  - Enforcing speed limits
  - Engineering traffic calming solutions (study and design aspects)
- Any streetscape initiative planned for the Wayne Business District should address traffic calming issues along North Wayne Avenue, South Wayne

**Avenue, Lancaster Avenue, and other roadways within the area. Specifically, these traffic calming measures within the district may include the following:**

- ***Landscaped Median*** – along North Wayne Avenue between Lancaster Avenue and Station Avenue, which will be designed to accommodate the necessary turning lanes at intersections, a pedestrian crossing(s), and turning movements to/from the municipal parking lot.
- ***Raised Pedestrian Crosswalks*** – along roadways within the district, which may promote driver awareness of pedestrians, reduce vehicle speeds, and provide aesthetic benefits as well.
- **Public involvement throughout the process is recommended, as the implementation of traffic calming measures may be controversial.**
- **As with any improvement to a State roadway, PennDOT approval will be required for the implementation of traffic calming measures on any State roadways; therefore, the Township should work closely with the Department through the planning and design process.**

## SECTION 6 OPEN SPACE AND RECREATION

### A. Introduction and Statement of Goals

The role that Open Space and Recreation play in any community is often underestimated and sometimes taken for granted. This is not the case in Radnor Township. For many years, Radnor Township has made open space and recreation a priority. The Township's outstanding park system and its many recreation programs evidence this. In addition, Radnor has long recognized the value in acquiring passive, undeveloped land that has ecological benefits for the Township's ecosystems. However, many challenges remain for the Township in both programming and facilities.

#### 1. Goals and Objectives

In the comprehensive planning process, two goals have been established followed by a set of objectives needed in order to meet these goals.

##### Goals

*Provide for the recreational needs of all Township residents through a balanced mix of active and passive recreational facilities and programs.*

*Protect and enhance the character of the Township through the acquisition and protection of open space.*

##### Objectives

- 1. Continue to improve the high quality of existing Township open space and recreational facilities.*
- 2. Continue to acquire, protect, and preserve open space in the Township. Coordinate these efforts with protection and enhancement of natural resources. Assess various methods for acquiring land or interests in land for the purpose of conserving open space.*
- 3. Document all open space in the Township, including all conservation easements in favor of the Township, the Radnor Conservancy or another nature conservancy or other public body, and any open space created as a result of the use of density modification in the development of residential tracts.*
- 4. Continue to improve management of the use of Township recreational facilities in order to maximize the utilization and enjoyment of these facilities.*
- 5. Continue to expand and/or modify Township recreational programming to fill gaps in services from existing recreation services providers.*

6. *Create non-motorized linkages between recreation and open space facilities and Township residences, businesses and schools and between the facilities themselves. Create linkages to regional trail systems.*
7. *Study need for and feasibility of developing an indoor recreational facility in Radnor Township.*
8. *Explore the issuance of a new bond issue to help attain Open Space and Recreation Objectives.*
9. *Continue to expand and improve communications to Township residents about recreational opportunities and programs offered by both the Township and other area recreational service providers.*

## **2. Open Space and Recreation as Community Infrastructure**

A municipality's park and recreation department is often the most visible point of contact for residents. Residents often have questions (and occasionally concerns) about programs, facilities, upcoming events, maintenance and other aspects of the department's operations. Many residents' primary interaction with local government is often centered on the recreational activity of resident children in Township parks and through Township participation in recreational programming. For example, over the past few years, participation in Radnor Township's youth basketball league has grown from 200 children to over 1,300 participants.

Park and open space facilities are similarly many residents' most visible, daily reminder of the role of local government in their lives. Open space and parks are located in every Township ward, and their appearance, use, and perceived importance speak directly to each and every resident as to the efficiency of local government.

Parks and recreational programs are arguably the most utilized service or "product" provided by Radnor Township to its residents.

Radnor Township is fortunate to have a strong partner, the Radnor Township School District, in providing recreational facilities and programs. In addition to student utilization of school district facilities, they also provide recreational opportunities for the general Township population. Programming of school district facilities (both indoor and outdoor facilities) and maintenance of school district fields is done in cooperation between the Township and the school district (maintenance agreement).

However, even with close cooperation and joint maintenance agreements, there is a shortage of facilities for all types of recreational activity. In the case of active sports fields, use is so heavy that it is virtually impossible to allow fields to lie "fallow" to be rehabilitated, increasing the importance (and cost) of high quality maintenance, critical to both athletic field use and user safety.

Radnor Township is the home of many educational institutions, such as Villanova University, Cabrini College, Eastern University, Valley Forge Military Academy and others that contribute to the attractive Township character and contribute to the amount of open space and recreational fields in the Township. These institutions also have extensive recreational facilities –some of which are regularly used by Township residents – and present a resource for the Township through continuing cooperative efforts with these institutions.

Since completion of the last Radnor Township Comprehensive Plan in 1988, the importance of and interest in the natural systems in our communities has grown. Over the last decade in Pennsylvania, conservation activists, planners, government officials and others have converged around the issue of “sprawl,” or uncontrolled suburban growth. This convergence has led to changes to the Pennsylvania Municipalities Code (MPC) to encourage better and more comprehensive planning and cooperation among municipalities. Additional revisions to the MPC are being considered in the areas of water resource planning.

In 2002, there is a greater and growing awareness in the general population about the issues of planning, best management practices for stormwater management, watershed-based planning and the interrelationship between how and where we live and these effects of that life style on our natural and built environment.

Open Space and Recreation have a direct relationship to the Environmental Resources component of the Comprehensive Plan. Stormwater management, urban area “greening” projects, riparian buffer reestablishment, reforestation projects, and environmental education all have direct impact on open space and recreation. Closely coordinating these efforts will have benefits for both, and more importantly, for the Township as a whole.

The visual enjoyment of the Township’s open space and recreational resources is an important yet often overlooked use of these facilities. The visual environment is an important and unique attribute that helps make Radnor “Radnor.” Many elements and proposed actions of the Environmental Resources component of the Comprehensive Plan have tremendous potential for further enhancing the charm and character of the Township.

The basic elements that comprise a community’s open space and recreation system constitute essential community infrastructure, nearly as important as roads, utilities, schools and the other components of a community. Some would contend that a community’s open space and recreation system is more important than the other mentioned elements. Through its well-maintained and well-used park system and extensive recreation programming, Radnor Township has exhibited that Open Space and Recreation is a community priority. The challenge that lies ahead will be to continue this commitment and to maintain and improve this important community infrastructure.

## B. Existing Open Space Resources

### 1. Public Lands / Recreational Resources

Radnor Township owns and maintains 23 parks. These parks have a total acreage of 346.8 acres. Eleven of the parks provide active recreation with facilities that include athletic fields, tennis, basketball and volleyball courts, and playgrounds. An itemized listing of current Township facilities is shown on Table 6-1.

The Radnor Township School District owns six properties (five schools and one passive open space) that cover 184.4 acres (this acreage includes all school facilities, not only athletic fields). The school properties include athletic field and indoor gymnasium facilities that are important community assets used by the general Township population. A listing of school district facilities is also contained in Table 6-1. The combined acreage of Township and School District lands is 530.4 acres or approximately 6.6% of the Township.

**Table 6-1. Radnor Township Recreational Resources**

<b>Parks</b>		<b>School District Facilities</b>	
	<b>Acres</b>		
Chew Tract	10.00	Radnor High School	80.00
Clem Macrone Park	9.00	Radnor Middle School	10.30
Cowan Park	3.00	Ithan Elementary School	50.00
D'Antonio Parcel	2.30	Radnor Elementary School	11.80
Encke Park / Municipal Building	33.00	Wayne Elementary School	19.80
Fenimore Woods	11.00	Martha Brown's Woods	12.50
Fifth Ward Park	10.00	Emlen Tunnell *	5.00
Garrett Avenue	0.63	North Wayne Park *	4.60
Harford Park	31.00	<b>Total</b>	<b>194.00</b>
Ithan Valley Park	19.00	<b>Township Total</b>	<b>538.68</b>
James C. Dittmar Park	13.00	* Leased to Township	
John L. Cappelli Driving Range	3.70		
Leaming Parcel	TBD		
Levin Tract	6.50		
Odorisio Park	25.00		
Petrie Park	0.11		
Radnor Memorial Park	4.90		
Radnor Nature Park	3.00		
Saw Mill Park	4.30		
Skunk Hollow Park	93.00		
South Devon Park	9.00		
St. Davids Community Park	1.60		
Unkefer Park	0.25		
Warren Filipone Park	9.00		
The Willows	47.00		
Young Tract	5.39		
<b>Total</b>	<b>344.68</b>		



## **2. Standards for Community Park Land**

The National Recreation and Park Association (NRPA) is an organization that has developed community standards for the minimum amount of parkland that will meet community recreational needs. These standards are used nationally as a guide for communities in planning for open space acquisition and preservation.

NRPA standards recommend a community possess between 7.5 and 12.6 acres of parkland for every 1,000 residents. Radnor, with a year 2000 population of approximately 31,000, therefore, needs between 232.5 and 390.6 acres of parkland. The Township's 396.8 acres of parkland exceeds the upper limit of the recommended open space acreage.

School district lands should also be considered in this compilation. When actual school district athletic field and open space lands (approximately 45 acres out of the total of 184 acres) are added to Township-owned parks, total acreage for open space grows to a total of 442 acres, adding to the total parkland acreage, in excess of NRPA standards.

The NRPA also recommends a division of parkland in any community between neighborhood and community park facilities. NRPA recommends that approximately 75% of a community's parkland should be contained in "neighborhood" parks and 25% of a municipality's parkland be contained in "community" parks.

A neighborhood park is generally defined to be 5 to 20 acres and meant to serve an area within a one-quarter mile walk or less from the park. Radnor Township has 13 neighborhood parks that total 148.8 acres (37.5% of its parkland total).

A community park is generally 20 acres or larger and serves an area approximately one-half mile walk or 15 minute motor vehicle drive from the park. Radnor Township has six parks that are conform to the size definition of a community park. These six parks total 248 acres or approximately 62.5% of the Township's parklands.

While the division of community parks vs. neighborhood parks is roughly opposite NRPA recommendations, school district facilities should also be considered in this analysis. Of the approximately 45 acres of actual school district open space, 28 of these acres are small sites, fitting within the neighborhood park category. This increases the percentage of Township "neighborhood" parklands to approximately 45%.

The 1991 Radnor Township Parks, Recreation and Open Space Plan identified this apparent deficit in neighborhood sized park facilities. Recent Township purchases, such as the Levin Tract, Dittmar Park, St. Davids Park and Petrie Park have responded to easing this apparent shortfall in neighborhood park acreage. This trend should continue.

Of greater importance is actual travel distance and time to and from community recreation sites and homes and businesses. While any park site within the Township is accessible via a fifteen-minute automobile trip, non-motorized access to and from park sites is more difficult and remains a major open space and transportation challenge in the Township.

### **3. Trails and Open Space Linkages**

Construction of the first phase of the P&W Multi Use Trail in the Township is scheduled to begin in Fall 2003. The trail, which will be built with federal and state funds and maintained by the Township, will extend from Old Sugartown Road to Radnor-Chester Road. This PennDOT owned and publicly accessible off-road trail will be 2.2 miles in length and will connect directly to two existing Township-owned parks (Levin Tract and Encke Park). The trail will have a significant impact on the very notion of parks and open space use in Radnor Township.

The P&W Multi Use Trail will not only be a transportation route, it will be a recreational facility in itself. It will also have the potential to begin to reduce the number of short vehicle trips in the Township. This reduction may occur in terms of residents using the trail to access the above mentioned park sites, and/or it may eliminate the need for nearby residents to get into their automobiles to drive to a park facility to walk or jog.

The 1991 Radnor Township Parks, Recreation and Open Space Plan recommended that an extensive network of Pedestrian – Bicycle Trails and routes be established in the Township. Over the last decade, only one of these proposed pedestrian-bicycle routes – the P&W Multi Use Trail – has moved ahead.

Certainly, there are obstacles – physical, educational and financial – to the establishment of pedestrian and bicycle routes in Radnor Township. However, as Radnor Township develops the last of its old farmlands and underdeveloped lands, non-motorized connections to and linkages between existing park and open space lands become the last and most important open space and recreation challenge and opportunity in the Township. These linkages, as proposed in the 1991 plan, and others that may present themselves in the future, have direct relevance and applicability to Township efforts in Environmental Resource Protection and Transportation Management and Planning.

### **4. Privately (Temporarily) Protected Lands**

Privately Protected Lands can be defined as lands that are currently in open space or conservation use and will continue to be used in this manner for the foreseeable future. However, these lands for the most part do not have permanent open space easements nor is there a definite commitment to keep these lands in open space, conservation or recreational use. These lands, taken as a whole, comprise a significant portion of Township lands (1051 acres or 12.6% of the Township). Many of these lands are in high visibility locations and positively contribute to the special visual character of Radnor Township. Many of these lands, most notably the educational institutions and golf courses, also make significant contributions to recreational opportunities in the Township.

These lands include the following sites:

- Villanova University
- Cabrini College
- Valley Forge Military Academy and College
- Eastern University

- Archbishop Carroll High School
- Notre Dame Academy
- Radnor Valley Country Club
- Overbrook Golf Club
- Chanticleer Gardens
- St. Edmunds Home
- Presbyterian Children's Village
- American College

#### **5. Existing Recreation Programs**

The Township provides many recreation programs. Most of these programs are self-supporting; with a portion of overall cost being subsidized by Township tax dollars. Radnor Township School District makes many of its facilities available for these programs as per the Township/Radnor School District Maintenance Agreement.

The Radnor Township Department of Parks and Recreation served more than 20,000 people in 2002 - 6,500 residents in 2002 Summer programs alone; over 4,000 people participated in other programs; and 1,100 people attended the 2002 summer concert series at The Willows and at other Township parks.

In addition, an estimated 16,000 people use Township picnic facilities each year, 1200 children participated in the biddy basketball program, 950 children played in softball and baseball leagues, and 1,200 boys and girls played organized soccer.

#### **Summer Recreational Programs**

The Summer recreation programs service over about 6,500 Township residents each year. These programs include:

- Radnor Day Camp (also serving children with special needs), Radnor Tot Lot, and playground programs
- Tennis program
- Creative theater
- Nature program/Environment camp
- Summer basketball
- Mini Hawk and Multisport Camp
- Lacrosse, baseball, softball, field hockey, roller hockey and golf clinics
- Cheerleading, Baton Twirling and Dance classes
- Fishing Derby
- Cultural Music series at the Willows and other parks
- Coed- strength and conditioning camp
- The Roving Nature Center program
- Summer pool program (operated by Radnor School District)
- Judo and adult self-defense classes
- Soccer camp
- Lacrosse camp

- Volleyball program
- Piano Lessons

#### **Other Programs**

Other programs either sponsored by the department or those in which the Township participates include:

- Men's and women's pick-up basketball
- Wrestling, judo, and biddy basketball (for 1,300 boys and girls) programs
- Orienteering clinics
- Stretch and grow
- Golf clinic
- Memorial Day and 4th of July parades
- Lacrosse program for girls and boys
- Wayne Senior Center Holiday Parties/Luncheon
- Holiday at the Willows (for over 400 children and adults)
- Ski program (with 7 ski trips to the Poconos, serving 450 children)
- Roller skating program
- Annual 5-mile run (which attracted over 700 runners and raised \$20,000 for the American Lung Association)
- Annual Arbor Day (which attracted over 200 children and adults)
- Earth Day clean-up and celebration
- National Trail Days Program
- Bus trip to the Philadelphia Flower Show
- Volleyball program
- Soccer (for 1,200 boys and girls)
- Softball and baseball leagues (for over 850 children)
- Bird watching
- Environmental Park Clean-Up Days
- Excursions to 76ers games in Philadelphia, Hockey games in Washington D.C. and New York City, On-Your-Own trips to Washington D.C., Baltimore and Annapolis, Md., Radio City Music Hall, U.S. Open Tennis Tournament, Orioles and Phillies Baseball Games
- Park clean-ups
- Science workshops
- Arts and crafts workshops
- Dance programs

#### **6. Radnor Township Parks and Recreation Survey**

In 2001, the Township Parks and Recreation Department conducted a mail survey on recreational services and facilities provided by the Township. Seven hundred surveys were mailed randomly to Township residences – 100 in each of the Township's seven wards. One hundred and sixty-two completed surveys were returned for a response rate of 23%.

Several results from the survey are noteworthy and relevant to the Open Space and Recreation component of the Comprehensive Plan.<sup>1</sup>

- 79% of respondents reported that they had utilized Township Park and Recreation Department services.
- 28% of respondents use the Township walking and exercise paths.
- When asked what emphasis should be place on the following actions, respondents responded as follows:
  - 38%: Acquiring new land for undeveloped conservation and green space areas
  - 14%: Acquiring new land for passive park activities
  - 14%: Constructing a multi-purpose indoor recreation center
  - 10.5%: Developing new facilities on existing park land
  - 9.8%: Maintaining exiting facilities with no growth
  - 7.4%: Improvement and replacing the exiting facilities with Township parks
  - 5.5%: Acquiring new land for active park development
- 86% of respondents responded “yes” to the question, “Would you support the Township to develop bicycle / walking trails in the community.”

### **C. Recreation and Open Space Focus Group<sup>2</sup>**

As a part of the Comprehensive Plan Planning Process, a Focus Group on Recreation and Open Space was convened to identify the major issues and challenges. The major issues and challenges identified were as follows:

- Development of a Township-wide trail/greenway system to provide non-motorized linkages between parks, schools and other Township destinations. Include consideration of more sidewalks.
- Development of an indoor Township recreation facility.
- Additional sports fields also seem to be needed. Regardless, if additional fields can be acquired or developed, maximize the use of existing Township recreational facilities. For example, consider adding lights at athletic fields to increase the hours of potential use so long as such lighting is not unreasonably disturbing to the adjacent property owners; or consider scheduling play field use in “off-peak” times.
- Consider another open space bond issue to supplement the Park Improvements and Open Space Fund.
- Develop a better inventory of remaining Township vacant/underutilized parcels.
- Combine open space conservation with natural resource protection.

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<sup>1</sup> See Appendix C for complete survey results, available in hard copy at the Radnor Township Building.

<sup>2</sup> See Appendix C (available at the Township Building) for Recreation and Open Space Focus Group participants.

In general, there was the sense in the group that needs for both active and passive recreation as well as for untouched open spaces were critical and of the highest priority. Unfortunately, there is also recognition that there are few undeveloped parcels of any size remaining in the Township.

#### **D. Recommended Actions**

##### **Goals**

*Provide for the recreational needs of all Township residents through a balanced mix of active and passive recreational facilities and programs.*

*Protect and enhance the character of the Township through the acquisition and protection of open space.*

##### **Objectives**

1. *Continue to improve the high quality maintenance of existing Township open space and recreational facilities.*
2. *Continue to acquire, protect, and preserve open space in the Township. Coordinate these efforts with protection and enhancement of natural resources. Assess various methods for acquiring land or interests in land for the purpose of conserving open space.*
3. *Document all open space in the Township, including all conservation easements in favor of the Township, the Radnor Conservancy or another nature conservancy or other public body, and any open space created as a result of the use of density modification in the development of residential tracts.*
4. *Continue to improve management of Township recreational facilities in order to maximize the utilization and enjoyment of these facilities.*
5. *Continue to expand and/or modify Township recreational programming to fill gaps in services from existing recreation services providers.*
6. *Create non-motorized linkages between recreation and open space facilities and Township residences, businesses and schools and between the facilities themselves. Create linkages to regional trail systems.*
7. *Study need for and feasibility of developing an indoor recreational facility in Radnor Township.*
8. *Explore the issuance of a new bond issue to help attain Open Space and Recreation Objectives.*
9. *Continue to expand and improve communications to Township residents about recreational opportunities and programs offered by both the Township and other area recreational service providers.*

**Recommended Actions**

1. **Promote the acquisition of open space; inventory and identify key vacant and underutilized parcels (or portions of parcels) for acquisition as Township open space.**
  - **Develop strategies for acquisition and/or protection of these parcels. Consider outright transfer or restricted transfer. Proactively initiate informal discussions with property owners of key parcels concerning protection of these important lands. Explore funding options for the acquisition of open space, including grants and government funding opportunities.**
  - **Evaluate without delay the feasibility and desirability of establishing a second municipal bond fund, patterned after Radnor's successful initial bond fund, intended to support additional open space acquisition by the Township.**
  - **Continue to earmark an allocated portion of the Township transfer tax for the purchase of open space and other park improvements.**
  - **Develop strategies such as conservation easements for permanent protection of open space lands now only temporarily protected. Proactively seek out these arrangements. Consider the formation of a conservation conservancy.**
  - **Develop a plan to inventory all open space in Radnor Township in order to identify potential future purchases of land for conservation purposes.**
  - **Develop an information packet for landowners regarding conservational alternatives and benefits. Develop and implement a campaign to educate residents about conservational alternatives and the need for land conservation. Work with the Radnor Conservancy and other land conservancies to pursue landowners potentially interested in conservation alternatives.**
2. **Develop plans and recommendations for a pedestrian and bicycle trail network which will provide linkages between parks, neighborhoods, and public facilities as well as create a recreational resource for all users.**
  - **Using the 1991 Parks, Recreation and Open Space Plan as a starting point, create a master plan for implementing a combination on-road and off-road non-motorized trail and greenway system for pedestrians and bicyclists. Create a funding strategy that will promote construction of this transportation system.**

- Plan for and fund the construction of new sidewalks in neighborhoods lacking these important infrastructure elements.
- Seek to acquire easements across privately-held lands in order to connect public open spaces.
- Embark on a comprehensive educational campaign regarding the community benefits of such a trail/greenway system to overcome misconceptions and fears regarding trails and greenways. Sponsor recreational events and trips to existing trail/greenways in the region.
- Dovetail greenway/trail development efforts with stormwater management and riparian buffer reestablishment in the Township.
- Collaborate with adjacent municipalities to coordinate and cooperate on trail and greenway efforts.
- Create a Township-wide trail marking or “wayfinding” system for trail and pedestrian transportation facilities.
- Create ADA-accessible paths in existing parks as linkages to trail system.
- Consider extending the Radnor Multi-Purpose Trail from its terminus at Radnor-Chester Road to Martha Brown’s Woods.

**3. Determine the need for and feasibility of a Township indoor recreation facility.**

- Conduct a market feasibility study for such a facility. Examine existing gaps in the recreation provider market. Examine other similar area facilities. Establish a program for this facility and determine projected use and costs if the decision is made to construct an indoor recreational facility.
- If possible, locate the Township indoor recreation facility in a location served by mass transit and/or near the Radnor Multi-Purpose Trail.
- Consider combining the indoor recreation facility with parking, retail or other types of development. Consider the local economic affect of visitation to and from this facility.
- Consider inclusion of facilities specifically designed to serve both teens and seniors.



**4. Create greenway linkages and new open space opportunities throughout the Township in conjunction with improved stormwater management measures and the reestablishment of former riparian buffers and forested areas.**

- Some greenway linkages should provide for trail access. Others that do not should function as wildlife corridors and visual amenities as well as meeting functional stormwater best management functions.
- Provide Township technical and funding assistance to property owners who establish and maintain these greenway linkages in exchange for permanent conservation easements on these areas.
- Promote reforestation of turf covered corporate, private, or other sites as the establishment of “water gardens” – areas that capture and return precious groundwater to local water tables. Assist private property owners to fund these efforts in return for public passive open space access or easements on the reforested areas.

**5. Update the 1991 Parks, Recreation and Open Space Plan in order to meet identified open space and recreation needs.**

- Consider a Joint Municipal Open Space and Recreation Plan with one or more of the seven adjacent municipalities. The goals of this collaborative effort will be to identify opportunities for sharing facilities, services, or programs that may result in cost savings and/or more efficient facility utilization.
- Examine Radnor Township and School District active sports fields to determine if there are opportunities for facility improvements that will result in greater and more efficient facility utilization.
- Continue a comprehensive 5-year maintenance plan for all Township parks. Examine methods for improved maintenance, cost savings, and increased efficiency in the maintenance of all parks.

**6. Improve communications about Township and School District recreation and open space facilities and programs to Township residents and the general public.**

- Update the Township website on a more frequent basis. Seek to establish additional links to the Township web pages from related sites.

**7. Support the Radnor Township Conservancy, generally and specifically, in all ways, which are feasible for the Township.**

- **Plan and establish a specific public relations and educational campaign to inform the general public about the benefits of greenway and trails networks. Plan this program over a two to three year period.**
- **Develop a public relations campaign on Township success stories in recreation and open space and environmental resources planning.**
- **Initiate regular, scheduled meetings and information sharing with adjacent municipalities regarding open space and recreation. Sharing resources, ideas, and concerns may lead to new solutions or efficiencies.**
- **Consider retaining outside professional assistance to seek funding at the state and federal levels for Township environmental resources and recreation improvements and programs.**

## SECTION 7 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

### A. Introduction and Statement of Goals

The social, economic, educational, and aesthetic benefits of Radnor Township's historical and archaeological resources, as well as the contribution historic places make to community identity, is enormous. One overriding goal has been established for historical and archaeological resources in this comprehensive planning process:

#### **Goal**

***Protect and conserve historic and cultural assets.***

Several simple statements can be made regarding the historical and archaeological resources in Radnor Township. First, the resources and the values in Radnor are plentiful. The Township has a rich history, of which it is justifiably proud. Fortunately, for a number of reasons, many of these historical and archaeological assets have been maintained and remain standing and many of the archaeological assets have not yet been disturbed. Many are in surprisingly good condition. Through the work of the Radnor Historical Society, the League of Women Voters, and many committed individuals in the Township, many of these historical and archaeological values have been identified and inventoried. Some are listed on the prestigious National Register. Two historic districts, the North Wayne Historic District and the South Wayne Historic District, have been designated and listed on the National Register of Historic Places. In many ways, these efforts imply that the goal of protecting and conserving historic and archaeological resources is well on its way to being accomplished.

Nothing could be further from the truth. Resources remain almost totally unprotected. Far more worrisome is the fact that as land values increase, the trends for redevelopment will intensify, and as discussed elsewhere in this Comprehensive Plan, the potential for loss of Radnor's valuable historic and archaeological resources will increase. Consequently, better management of historic and archaeological resources is of paramount importance.

#### **1. A Brief History of Radnor Township**

Radnor Township, originally settled by the Leni Lenape Indians, has always been a popular place to live. The Welsh settlers, attracted to the area in the 1680s, purchased land for farms and generally thrived for many years. Given Radnor's central location compared to other settlements that were emerging in the Philadelphia region, a number of transportation routes grew into importance early in colonial history: Conestoga Road, Lancaster Pike, Darby-Paoli Road, and Radnor Chester Road had all been built by the 1730s, connecting Philadelphia with the agricultural areas west of the City. Lancaster Pike was built as a toll road to Lancaster in 1794. The earliest settlements in Radnor occurred along Conestoga Road, at the intersection of Conestoga and Sproul Roads, and other locations.

Of course, the construction of the Pennsylvania Railroad Main Line, begun in 1834, became tremendously important to this Main Line municipality. Residential development proliferated

with the newfound ability to commute into the City; at the same time, substantial commercial development—towns—occurred at and around the railroad stations to support this residential growth. Development occurred first to the east and moved ever westward. The suburbs had been born (see examples of Wayne development). By the 1880s, Wayne had become a summer resort for well-to-do Philadelphia residents, many of whom bought up farms and developed large year-round estates.

By 1900, Radnor had grown to more than 6,000 people, although only about 5 percent of the total land area had been developed. Most was still in farms and large estates. By 1930, the population had doubled, occupying three times the developed area that existed in 1910. Focal points were Wayne itself and Rosemont-Garrett Hill. The post World War II development boom brought considerably more development, mostly single-family residential in nature such that by 1960 more than half the land area of the Township was developed. By 1980, population had increased additionally to 27,676 with nearly 85 percent of the total land area developed. The 1990 Census counted 28,703 persons and the 2000 Census a modest increase to 30,878

This history is abbreviated. Readers interested in finding out more about Radnor history are encouraged to consult the excellent *Radnor: A Rare and Pleasing Thing* by Kathryn Cummin, available at the Radnor Historical Society Library (open on a limited schedule). Other useful resources are the Delaware County Historical Society in Marple Township, the library at the Delaware County Planning Department in Media, and the Radnor Memorial Library's Historical Collection.

## **2. Inventory of Radnor Township Historic Resources**

As the result of work by the League of Women Voters and the Radnor Historical Society as part of the last Comprehensive Plan preparation, the first inventory of Township historical structures and districts was compiled, including 102 listings. This Radnor Township Historic Property Inventory appears in Table 7-1 and Figure 7-1 (see Appendix D for the detailed inventory, available at the Radnor Township Building). Some of these resources are listed on the National Register of Historic Places, some have been deemed Eligible for Listing, some have been deemed of State Importance (a prior designation by the State), and others are deemed to be of local importance. As lengthy as this list may appear to be, there is broad consensus that there are many additional structures that have not been included in this inventory and need further documentation (see discussion of PHMC grant below in 4.). Additionally, those most familiar with Radnor's wealth of historic and archaeological resources believe that the Inventory, even without the much-needed additions, includes many structures, which alone or in concert with adjacent structures and areas, would be prime candidates for inclusion on the National Register.

**Table 7-1. Radnor Township Historic Inventory Key to Properties and Roads**

SITE ID	SITE NAME AND ADDRESS
1	Friends Meeting, Sproul and Conestoga Rds.
2	Old Coventry Store, 601 Conestoga Rd.
3	Schoolhouse, 610 Newtown Rd.
4	The Peak, corner of Newtown, Conestoga, and Radnor-Chester Rds.
5	Schoolhouse lot, 583 Conestoga Rd.
6	Green Hedges, 581 Conestoga Rd.
7	Wayside, 569 Conestoga Rd.
8	Atterbury House, 615 Newtown Rd
9	Todd House, 230 Sproul Rd
10	Joseph Harding House, 620 Lancaster Ave.
11	Fendall House, 734 Lancaster Ave.
12	Bel Orme, County Line & Matson Ford Rds.
13	Ashwood Manor, 208 Ashwood Rd.
14	Gate House of Ashwood Manor, 801 Lancaster Ave.
15	Oddfellows Hall, 641-643 Conestoga Rd.
16	David Leedom House, 634 Conestoga Rd.
17	Matlack House, Darby - Paoli Rd.
18	Springhouse, South Ithan Ave
19	Spring Valley, Darby, Sproul Rds. & Bryn Mawr Ave.
20	Robert E. Strawbridge House, Mill Rd.
21	Boling Brook, King of Prussia Rd
22	Chuckswood, 101 S. Spring Mill Rd.
23	Finely House, West Beechtree Lane
24	Hillside, 512 King of Prussia Rd.
25	Launfal, Sproul Rd.
26	Wayne Cricket Clubhouse, West Beechtree Lane
27	Sorrel Horse Inn, Conestoga & Ithan Rds.
28	Woodstock, 158 Vassar Circle
29	Woodstock Barn, Vassar Circle
30	Wootton, St. Aloysius Academy
31	Holly Tree House, Darby-Paoli Road east of Newtown Rd.
32	Brooke Farm House, Brooke and Church Rds.
33	North Wayne Historic District
34	Springhouse, Godfrey Rd.
35	812 Maple Wood Rd.
36	300 Landover Rd.
37	1000 Sproul Rd.
38	500 Conestoga Rd.
39	Cornog House, Church Rd. on Ardrossan Property
40	Simon Matlock House, Newtown & Darby-Paoli Rds.
41	700 Sproul Rd.
42	Abraham House, Abraham Lane
43	House Bryn Mawr Avenue, near to and southwest of Castlefinn Ln.
44	Tolstoi House, Hunt Rd.
45	Kinterra, 676 Church Rd.
46	221 Atlee Rd.
47	765 Conestoga Rd.
48	House, Coopertown Rd.

**Table 7-1. Radnor Township Historic Inventory Key to Properties (cont'd)**

SITE ID	SITE NAME AND ADDRESS
49	House, Earles Lane and Sawmill Rds.
50	Conestoga Mill Restaurant, Conestoga Rd.
51	Hickory Hall, Darby-Paoli Rd.
52	The Grange, Newtown Rd.
53	Baptist School House, W. Wayne Ave. near Conestoga Rd.
54	751 Conastoga Rd.
55	St. Rita's Hall, Villanova University
56	Louella Mansion, Louella Court
57	Colonial Building (once the Lyceum), Lancaster Ave and N. Wayne Ave.
58	Saturday Club, W. Wayne Ave.
59	School House, Darby-Paoli Rd.
60	Bloomington Ave.
61	Glenays, Landover Rd.
62	Montgomery Apartments
62A	Godfrey Road
62B	Newtown Road
62C	Riding Stables and House
63	Radnor Hunt, Roberts & Darby-Paoli Rd.
64	Poplar House, 752 Brooke Rd.
65	Campwoods, 745 Newtown Rd.
66	Ardrossan, Newtown Rd.
67	Harford, Hares Lane
68	Beaupre', Presbyterian Village
69	Woodcrest, Cabrini College
70	Walmathan, Eastern College
71	Wayne Nursing Home
72	Laurier, Bryn Mawr Ave.
73	Toll House, Lancaster Ave & Airedale Rd.
74	Wayne Hotel, Lancaster Ave.
75	Ravenscliff
76	Willows, Darby-Paoli Rd.
77	Milldam Club, Maplewood Ave.
78	Chanticleer, Brooke to Church Rd.
79	Glencoe, Roberts Rd.
80	Faunamede, Colony & Darby-Paoli Rds.
81	Wayne, Lancaster Ave. south and east of N. Wayne Ave.
82	Conestoga Road
83	Darby-Paoli Rd.
84	Horace Trumbauer House, Louella Ave.
85	Ballyshannon, 325 Bryn Mawr Ave.
86	Blabon Mansion, Mill Rd.
87	Bloomfield, Ewing Estate, Ithan Ave.
88	Pennsylvania and Western Substation #1, Conestoga Rd.
89	Wayne Train Station, N. Wayne Ave.
90	Wayne Presbyterian Church, Lancaster Ave.
91	Radnor Methodist Church, Conestoga Rd.
92	St. Mary's Episcopal Church, Lancaster Ave.
93	Central Baptist, Lancaster Ave.
94	St. Thomas of Villanova, Villanova University

**Table 7-1. Radnor Township Historic Inventory Key to Properties (cont'd)**

SITE ID	SITE NAME AND ADDRESS
95	St. John A.M.E., W. Wayne Ave.
96	Second Baptist, Highland Ave.
97	St. Martin's Episcopal, King of Prussia Rd.
98	Christ Church Ithan, Conestoga Rd.
99	Sarah Siter's House, Lancaster Ave. & Sugartown Rd.
100	Lancaster Ave.
101	Sproul Rd.
102	Small House, 752 Brooke Rd.

### 3. State and Federal Role in Protecting Historic Resources

The Pennsylvania Historical and Museum Commission's (PHMC) Bureau for Historic Preservation (<http://www.phmc.state.pa.us/>) is the official agency in the Commonwealth for the conservation of Pennsylvania's historic heritage. The Bureau manages the National Register of Historic Places for the state through the National Historic Preservation Act of 1966. Resources (properties) listed in the Register include sites, buildings, structures, objects and districts that are significant in American history, architecture, archaeology, engineering, and culture. Properties considered potentially eligible for the National Register are generally more than 50 years old, and follow some general guiding criteria:

- Are associated with events that have made a significant contribution to the broad patterns of our history;
- Are associated with the lives of persons significant in our past;
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;
- May be likely to yield or have yielded information important in prehistory or history.

The process of listing a property in the National Register is thorough and complex, yet encourages public participation in the protection of local historic resources. To be considered for the Register, an individual (or local government or local historical society) must first submit a *resource inventory form* to the Bureau. Once the resource information is processed through the Bureau's database system, the state's review board – composed of professionals in the fields of American history, architectural history, architecture, prehistoric and historic archaeology, and other related disciplines – provides a Determination of Eligibility (DOE) for each resource. The board (through the DOE assignment process) assigns a status of Eligible, Ineligible, or Contributing to the resource. If deemed to be Eligible, the property owner can then move forward in the formal nomination process for entry onto the National Register itself. Assuming enough supporting information has been provided for the resource, the nomination (only for Eligible or Contributing resources) is then submitted to the National Park Service to determine whether the resource actually becomes Listed on the National Register. The status of Contributing generally refers to being a contributing resource to an eligible historic district.

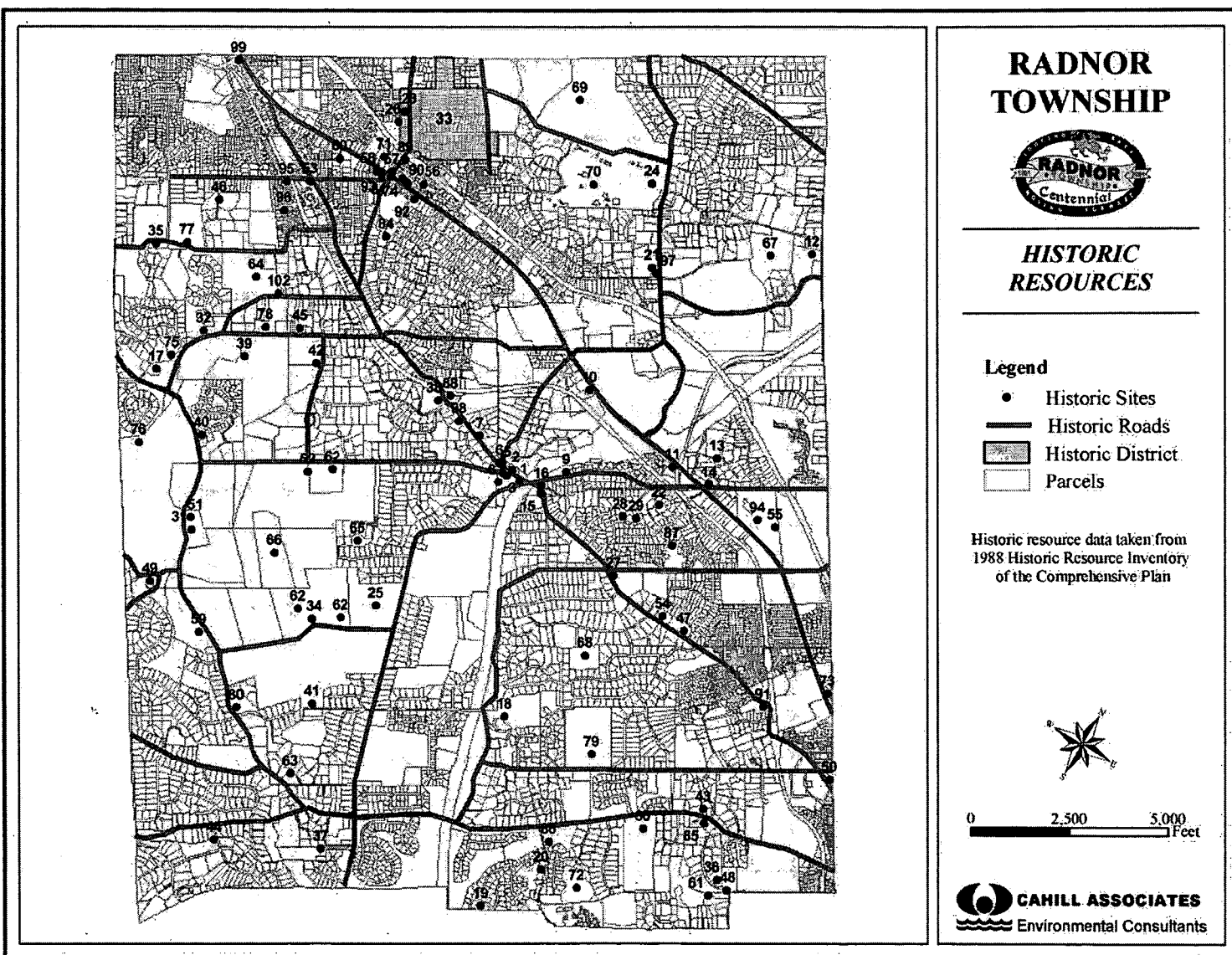


Figure 7-1. Historic Assets from Radnor Township 1988 Historic Resource Inventory



Listing in the National Register (or being deemed to be Eligible for Listing on the National Register) does not interfere with a private property owner's right to alter, manage or dispose of property, for good or for bad. Listing in the National Register contributes to preserving historic properties in a number of ways:

- Recognition that a property is of significance to the nation, the state, or the community
- Consideration mandatory in the planning for federal or federally assisted projects
- Eligibility for federal tax benefits
- Qualification for federal assistance for historic preservation, when funds are available
- Eligibility for certain State grants

A common misconception is that listing in the National Register provides special protection. In fact, this protection is limited to actions by Federal agencies, possibly by State agencies, where Federal funding is being used or some Federal action/permit decision/approvals are involved. However, no protection is provided in terms of actions by private owners.

#### **4. Radnor Township Grant for Additional Historic Resources**

Radnor Township, in conjunction with Wise Preservation Planning and the Brandywine Conservancy, has been awarded a grant by the Pennsylvania Historical and Museum Commission to subsidize a three-phased project:

##### **Phase I: Surveying/Inventorying/Mapping Known Historic Resources**

This task includes field surveying of the existing Radnor Township Historic Property Inventory, including physical descriptions, photographs, classifications, property information, historical narratives and other information to be entered onto Pennsylvania Historic Resource Survey Forms. Locational data will be used to compile a detailed Geographic Information System (GIS) database of locations and additional property information. Both the North Wayne and South Wayne National Register Districts have been documented with resource survey forms for the two Districts; a master list and map will identify individual properties within the two Districts. This phase also includes preparation of an additional list of historic resources not currently included in the Inventory and which will have been identified during the field surveying.

##### **Phase II: Additional Field Surveying/Mapping of Additional Historic Resources**

This phase applies the same Phase I process to all additionally identified historic resources resulting from the Phase I process, including GIS mapping. Approximately another 100 resources are expected to result from this process; it is expected that the Survey at this point will be substantially, though not totally, complete. As with Phase I data, a concerted effort will be made to compile all of this data in electronic form.

##### **Phase III: Development of Specific Historic Resource Protection and Management Provisions**

This last phase of the study involves development of an overall management plan, including regulatory initiatives, which is based on a full understanding of Township historic assets and the perceived threats to these assets. The resulting program, which must emerge from a process of consensus with Township officials and community stakeholders, should be built

on a creative blend of positive and negative incentives, carrots and sticks, sensitive to private property values and landowners' concerns, and recognizing the broader context of continual change taking place within Radnor over time. The resulting program will exploit to the maximum extent possible those other programs in practice in comparable municipalities. This phase also will include careful evaluation of all existing Township regulations affecting historic resource conservation. Important issues to be weighed and balanced include:

- Legislative processes for dealing with designation of regulatory status and/or classification of historic resources
- Incentive provisions for economic re-use of historic structures
- Design and conservation requirements upon which approval of incentives may be conditioned
- Permit process for demolition of historic structures
- Provision for delay of demolition and requirements for historical documentation when demolition is permitted
- Provision for potential denial of demolition
- Historic resource impact study requirements
- Buffer provisions
- Administrative and enforcement provisions

Although this task is not specifically described, this work program should conclude with a review of the recommendations made in the 1988 Comprehensive Plan and revise these recommendations in light of the findings of this project. Township representatives should guide the implementation of this grant-related work program and, upon its completion, review its recommendations for integration into the recommendations developed below.

## **B. Archaeological Resources**

Radnor Township is located in the Upland section of the Piedmont Province of southeastern Pennsylvania. The Piedmont separates the Appalachian Mountains from the Atlantic Coastal Plain. This area is dominated by the presence of granite gneiss. The aboriginal land provided a source of quartz, quartzite, and possibly steatite (soapstone), and jasper. The Pleistocene (15000 BP) climate of the area was likely to have encouraged a forest of spruce intermingled with dwarf birch. As the climate became warmer, fir, pine, and alder joined the forest growth. By 8000 BP, hemlock and chestnut had appeared.

Although evidence suggests that the Amerindian populations relating to the Paleo-Indian Period (15000 BC – 6500 BC) and the Archaic Period (6500 BC to 3000 BC) existed within Delaware County, archaeological investigations have not produced any similar evidence within the Township. During the Late Woodland period (1000 BC to 1600 AD), prior to European settlement, the Amerindian populations, like the Lenni Lenape who settled the Township, had cleared the forests for fuel, lumber, and agricultural purposes, thus beginning the destruction of the existing biotic community. Similarly, the existing animal life including the elk, deer, bear, wolf, fox, rabbit, hare, beaver, turkey, partridge, and other fowl were being exploited; however, their habitats were substantially destroyed by the European settlement, causing severe species

depletion. It was the settlements along the waterways, like Darby Creek, that led to increased quantities of resources being exploited. These waterways supplied transportation, which in turn facilitated trade. Also serving the Lenape's agricultural and trade needs, the floodplains within the Township area offered fertile fields for the production of crops including maize, beans, squash, and pumpkins.

Following the Late Woodland period, the Contact Period (1600 AD to 1720 AD) marks the period of European contact, which appears in archaeological investigations as an intrusion of European artifacts into the Native American artifacts. The Europeans interacted with the Native American Indians, such as the Lenape, through trade and/or hostilities. As a result, the contact between these two different cultures ultimately led to the disintegration of the Lenape culture.

#### **1. Delaware County Archaeological Resource Inventory and Management Plan**

The Delaware County Archaeological Resource Inventory and Management Plan, completed in 1991, provided the County Planning Department with township-based archaeological resource information in the form of mylar map overlays, a computer database, and published report. The Inventory – now somewhat outdated as the result of recent increasing development – classifies sensitive areas that warrant further investigation, showing all known and likely archaeological sites, while keeping the location of potential and undisturbed sites confidential to protect them from theft and illicit unauthorized removal. Radnor Township has no documented archaeological sites in the Inventory, possibly because not enough investigations have taken place to provide an accurate account of prehistoric settlements in the Township.

In neighboring Marple and Newton Townships, there are a total of three known prehistoric sites presented in the Inventory. The two sites documented in Marple Township were both found on Langford Run in the late 1940's, one dating to the Late Woodland period and the other from the Contact period. Stone, bone, and ceramic artifacts were excavated from these Lenape Rock Shelters. The Contact Period site contained a burial ground. Because of the potential for illicit unauthorized removal, archaeological resources have not been electronically mapped in this Comprehensive Plan. Interested parties should contact the Delaware County Planning Department for additional details relating to archaeological data.

As with existing historical sites, unidentified archaeological sites are possibly being lost and/or destroyed within the continuing developments and existing uses within the Township. Without the local protection of remaining resources, the story of the prehistoric development of the Township area will be lost or permanently destroyed.

**Basic archaeological questions should be required to be asked during the subdivision and land development review process, based, at minimum, on information that already exists. Radnor Township officials should review important data sources such as the Delaware County Archaeological Resource Inventory and Management Plan and the information already available which relates specifically to Radnor, evaluate the significance of this data, and consider ways to integrate this information into the subdivision and land development review process in the future, and possibly into other elements of Township planning work.**

Further archaeological investigations of the Township should be executed especially around rock shelters or possible settlement sites. Existing wetlands, areas with slopes greater than 15 percent, and areas with extensive disturbance already present – are believed to have no or very low potential of containing prehistoric archaeological sites.

## **C. Management Tools for Historic and Archaeological Resources**

### **1. Historic Resources Zoning Ordinance**

The Municipalities Planning Code authorizes municipalities to enact zoning ordinances that take into account historic and archaeological resources. Enactment of historic preservation regulations to accomplish these objectives is authorized as well. One technique is to prepare an historic resources overlay which may be included in the zoning ordinance. Such an overlay, as has been undertaken in neighboring Lower Merion Township, may divide historic resources into classes: Class I (resources already on the National Register or Eligible); Class II (resources important historically but which have been already altered); Class III (a broad class often just relating to age, such as anything over 100 years in age). Special ordinance provisions applying to this overlay may include demolition permits, delay of demolition, area and bulk waivers, special buffering requirements, expanded use opportunities and other special provisions.

### **2. Historical Commission**

Another management tool permits the municipality to establish a Municipal Historical Commission (in contrast to the Historical Architectural Review Board or HARB; see discussion below) to support overall historic resource protection planning. This Commission, appointed by the governing body, can act as a planning, advisory, and review body for both the local planning commission and governing body for all historic resource issues (beyond any Act 167 jurisdiction, if any). The Commission can manage all Survey work and oversee all ordinance development and actions related to such ordinances (e.g., reviewing all building and demolition permit applications which have the potential to threaten the municipality's historic resources).

The Commission can initiate Act 167 districting and HARB formation and can oversee National Register nominations and other historic preservation-related activities, such as grant applications. Historical commissions and HARBs may rely on a wide variety of published resources to accomplish their work, such as the U.S. Department of the Interior's *Standards for Rehabilitation* and *Guidelines for Rehabilitating Historic Buildings*, plus their own standards tailored for their specific communities.

### **3. Act 167 Historic District**

Pennsylvania's Act 167 allows municipalities to create local historic districts; these Act 167 districts should be distinguished from historic districts listed on the National Register of Historic Places. A formal resource survey and documentation must be presented to the Pennsylvania Historical and Museum Commission, which must then determine that the proposed Act 167 historic district is significant and worthy of preservation. Act 167 requires municipalities to appoint a Board of Historical Architectural Review (HARB) whose role is to

review plans for the erection, reconstruction, restoration, or demolition of any building within the historic district.

Act 167 historic districts are accompanied with historic protection ordinances, which can take a variety of forms; from the relatively stringent to the very flexible, these ordinances should be tailored to fit local tastes and preferences. This mode of management and protection is the most far-reaching and effective available in Pennsylvania communities; at the same time, it is workable only in those cases where historic resources are highly concentrated in a “district” configuration.

It is important to differentiate a HARB created under an Act 167 historic district from an historical commission. Typically, municipalities may create an historical commission whether or not they have created an historic resources protection ordinance enabled under the Municipalities Planning Code. These historical commissions may perform a variety of tasks, including overseeing preparation of resource inventories, preparation of protection ordinances, nomination of structures for the National Register, preparation of grant applications, preparation of historic resources plans, as described below, and other program activities. Additionally, a major function of the historical commission is to review all building and demolition applications with potential impact on historic resources throughout the municipality (as opposed to a HARB’s function with its particular focus on the created local historic district). The historical commission then recommends action by the governing body.

#### **4. Historic Resources Protection Plan**

Because there are multiple aspects to historic resource inventorying, evaluation, and management, Radnor could consider unifying all of its work program into a local preservation plan, or Historic Resources Protection Plan, which integrates all of the elements discussed above. The framework for a preservation plan is contained within this Comprehensive Plan. Such a Plan could formally establish Radnor’s general history and the nature and extent of its historic and archaeological resources, as well as establish consensus on the nature and extent of protection to be achieved. The Plan could unify both public sector and private sector initiatives.

On the public sector side, the Plan could integrate federal, state, county, and local historic resources. A critical step in this Plan process is the clear identification of goals, more explicit objectives related to these goals, and finally the implementing actions needed to make the Plan a reality. This framework provides essential guidance and structure as the many different challenges are confronted and surmounted. It should be noted that the work program contained within the PHMC grant provides a major step forward in the preparation of an historic resource plan for Radnor.

#### **5. Grants and Other Resources Available**

Although volunteer support for historic and archaeological resources protection is tremendously important, money – grants – helps, too. Currently, a surprising number of grant programs may be relevant to Radnor’s program. For example, on the broadest of levels (federal or national), the National Historic Preservation Fund provides funding for the Certified Local Government Program, under the U.S. Department of the Interior, National Park Service.

This source is best accessed via the PHMC. The federal government also has a program of Technical Preservation Assistance, as well as the Archaeological Assistance Program. The Community Development Block Grant program, administered by the Office of Housing and Community Development in Delaware County, also can be used for cultural resource protection and enhancement. The National Trust for Historic Preservation has a Grant Program as well as a National Preservation Loan Fund, and there are a variety of private programs (Inner-City Ventures Fund, Critical Issues Fund, Preservation Services Fund, Preservation Pennsylvania) and private foundations (Pew Charitable Trust, William Penn Foundation, Stockton Rush Bartol Foundation), all of which have supported cultural resources programming. Of course, there is the PHMC's program of "Keystone" grants, which will fund (50 percent match) Radnor's grant program.

#### **D. Recommended Actions**

The Comprehensive Plan's theme of "making a great community grow even better" is embodied in the area of historical and archaeological resources. Much work has already been done. But because of the incredible richness of the resources that remain, because of the numbers of resources that abound in the Township, because of the wealth of colonial structures that continue in use, because of the wonderful concentrations of resources in the North Wayne and South Wayne Historic Districts and the exciting Wayne Business District, because of the number of historic stone bridges and arches and pillars and walls that dot the landscape and make so many of the roads a rich and memorable aesthetic experience – most of which are unprotected and vulnerable – better management of these resources for the future is of paramount importance.

Radnor's 1988 Comprehensive Plan has a special focus on protection and conservation of historical and archaeological resources. The detailed discussion in the 1988 Plan sets forth a variety of recommended actions, which were carefully considered and virtually all of which remain to be acted upon. Additionally, the 1988 Plan states that the Historic Preservation Ordinance should create historic districts in area with concentrations of historic assets, such as "...North Wayne, West Wayne, Bloomingdale Avenue, and appropriate sections of the Wayne Business District. The ordinance should also provide incentives to save and improve historic buildings/districts, and discourage demolition or other damage to historic properties. Such an ordinance could take the form of an overlay zoning district which would require special controls over development or alterations which affect the historic features of an area. Additionally, all development plans should include a statement regarding known historic features affected by the plan and the predicted impacts and mitigation measures proposed so that the historic assets which are affected by development are carefully considered in the review of such plans."

The 1988 Plan argues for creation of an Historical Architectural Review Board(s) to advise both the Commissioners and the Planning Commission as matters of historic interest emerge; as a technical body, such a Board could prepare special evaluations regarding impacts on historic resources potentially affected by development projects. The Board would maintain the Radnor Township Historic Property Inventory, including nomination of additional properties to the

Inventory, and would generally support and promote preservation of historic and archaeological features in the Township.

Finally, the 1988 Plan recommended that better technical standards for historic preservation be developed, following additional evaluation. Specifically, these technical standards should address:

- Age of property
- Parcel size and property area important to historic setting
- Nature of historic significance
- Condition of the property plus apparent improvements needed to prevent deterioration
- Rating of overall importance of the property, with special focus on any unique values or special features at the property
- Photographic documentation

All of these 1988 Plan recommendations continue to be potentially valid and are incorporated below into this Plan. Additionally, the new Comprehensive 2002 Plan recommended actions are presented below along with the goal for the Township's Cultural Resources.

#### **Goal**

*Protect and conserve historic and cultural assets*

#### **Recommended Actions** (from 1988 Comprehensive Plan)

- **"Draft and adopt an Historic Preservation Ordinance and/or an Historic Overlay District Zoning Ordinance and designate historic resources on the Zoning Map.**
- **Adopt Technical Appendix D as the official Radnor Historic Property Inventory (until the programmed historic resources inventory is completed).**
- **Amend the Subdivision Ordinance to require the identification of any property that is listed in the Radnor Historic Property Inventory that is within the land being developed or within 500 feet of the development.**
- **Establish a Historical Commission.**
- **Review the Zoning and Subdivision Ordinances to evaluate whether present ordinances adequately encourage the preservation of estate properties and create incentives which will permit appropriate reuse of such property."**

#### **Recommended Actions**

- **Implement all of the recommendations of the 1988 Comprehensive Plan relating to historical and archaeological resource protection and conservation.**
- **Consider establishing a Historical Architectural Review Board(s) as needed.**

- **Implement PHMC Work Program recommendations without delay. Because timing is critical, a special sub-group or sub-committee for historical resources and archaeological resources planning and programming should be formed to assist in the implementation of these recommendations, targeting both short terms actions as well as longer term actions. Make sure that important resources such as Banjo Town are included in the expanded resource inventory being undertaken as part of this effort.**
- **Consider unifying the entire historical and archaeological work program into a local preservation plan, or Historic Resources Protection Plan, integrating all of the elements discussed here.**
- **Review the Delaware County Archaeological Resources Inventory and Management Plan and data available that relates specifically to Radnor; evaluate the significance of this data; and consider ways to integrate this information into future subdivision and land development review processes and other elements of Township planning work.**



## SECTION 8 INSTITUTIONAL USE

### A. Introduction and Statement of Goals

Radnor Township has been blessed with a large number of public and private educational, religious, health care-related and recreation-related institutions (the latter include the Overbrook Golf Club and Radnor Valley Country Club which technically are recreational facilities; public schools are discussed in the Community Services and Facilities Section below). Because these institutions are such an extremely important part of the Radnor Township community, both directly in terms of their primary functions, as well as secondarily, in terms of the reality of their physical facilities, employment, transportation needs, cultural benefits, impacts on adjacent neighborhoods, and so forth, a separate Institutional Use section has been developed for this Comprehensive Plan Update.

#### 1. Goals and Objectives

Goals for Institutional Use were discussed and identified early on in the planning process; they appear below. These goals reflect the focus group discussions (separate focus groups were held for Major Institutions and Minor Institutions, given the very substantial differences which were felt to exist between a Villanova University versus a St. Edmonds Home for Children). In some cases, these institutional goals are more specific than the general goals developed for other Sections of the Draft Comprehensive Plan and can be understood to be a blend of both Goals and more specific Objectives, although formatted somewhat differently than those appearing in the other Sections of this Draft Comprehensive Plan. Obviously, each institution has its own set of goals focusing on its particular mission, which is not the focus here. Recommended Actions relating to these Goals are repeated at the end of this Section.

#### Goals

*Encourage sound planning of institutional property, congruent with Township-wide principles, while preserving the existing character of the institutional properties.*

*Work to harmonize Radnor's existing institutions with adjacent land uses, promoting physical buffering, better programs of communication, and the like.*

*Integrate institutional traffic issues with the transportation planning element of the Comprehensive Plan.*

*Improve communication from the Township to the institutions and vice-versa, especially in areas of potential concern such as student housing, traffic, and other major issues.*

*Ensure compliance with Township revenue-producing code, especially those dealing with non-student revenue producing events.*

***All institutional use code requirements should be reviewed; in the event that existing institutional uses cease in their present form, ensure that any re-development which results is compatible with the total Goals, Objectives, and Recommended Actions of this Comprehensive Plan.***

Major institutions in Radnor include Villanova University, Cabrini College, Valley Forge Military Academy, and Eastern University, all of which have large campuses and which have major bearing on Radnor Township. The Township includes a large number of smaller institutions, including Agnes Irwin School, American College, Hilltop School, Notre Dame Academy, Presbyterian Children's Village, St Aloysius Academy, St. Edmonds Home, and Sacred Heart Academy, as well as St. Katherine's and Archbishop Carroll High School parochial schools (part of the Archdiocese of Philadelphia), and the public schools included in the Radnor Public School District (public schools are discussed in the Community Services and Facilities Section although both public and parochial schools are shown here in Figure 8-1). Radnor also has some rather unique institutions such as The American College, which operates highly specialized professional service programs for the insurance industry.

Planning issues surrounding the smaller institutions tend to be somewhat different from issues related to major institutions. For example, there continues to be considerable interest in and attention given to the continued existence of some of these smaller institutions at least at their Radnor sites. The possibility of selling off all or portions of their extremely high valued real estate holdings and relocating to less costly campus settings remains an ever-tempting option. In all likelihood, these purchasers would be residential real estate developers, eager to build more homes which are so much in demand in Radnor (see Housing Section). At the same time, the larger institutions like Villanova tend to be more interested in acquiring more land for their expanding programs.

Because of their unique importance to Radnor's future, Institutional Use has been highlighted as a separate Comprehensive Plan Section. Furthermore, the decision was made early on in this planning process to utilize the focus group technique in developing this section, in identifying planning issues relating to these institutional uses, and in arriving at planning solutions. The focus groups also described the individual comprehensive planning (short- and long-term) being undertaken by the institutions themselves. In fact, unlike the other topical areas identified, three separate focus sub-groups resulted, each having its own focus group, some of which opted to hold multiple meetings.

Institutional uses are mapped in Figure 8-1. Community Services are also included here, including Archbishop Carroll High School and St Katherine's Elementary School, both Catholic Schools and part of the Archdiocese of Philadelphia (these schools have been included as Community Services, similar to schools of the Radnor Township School District, in contrast to other private preparatory school institutions). Again, both the Overbrook Golf Club and Radnor Valley country Club have been mapped as Recreation on the existing Land Use Map.

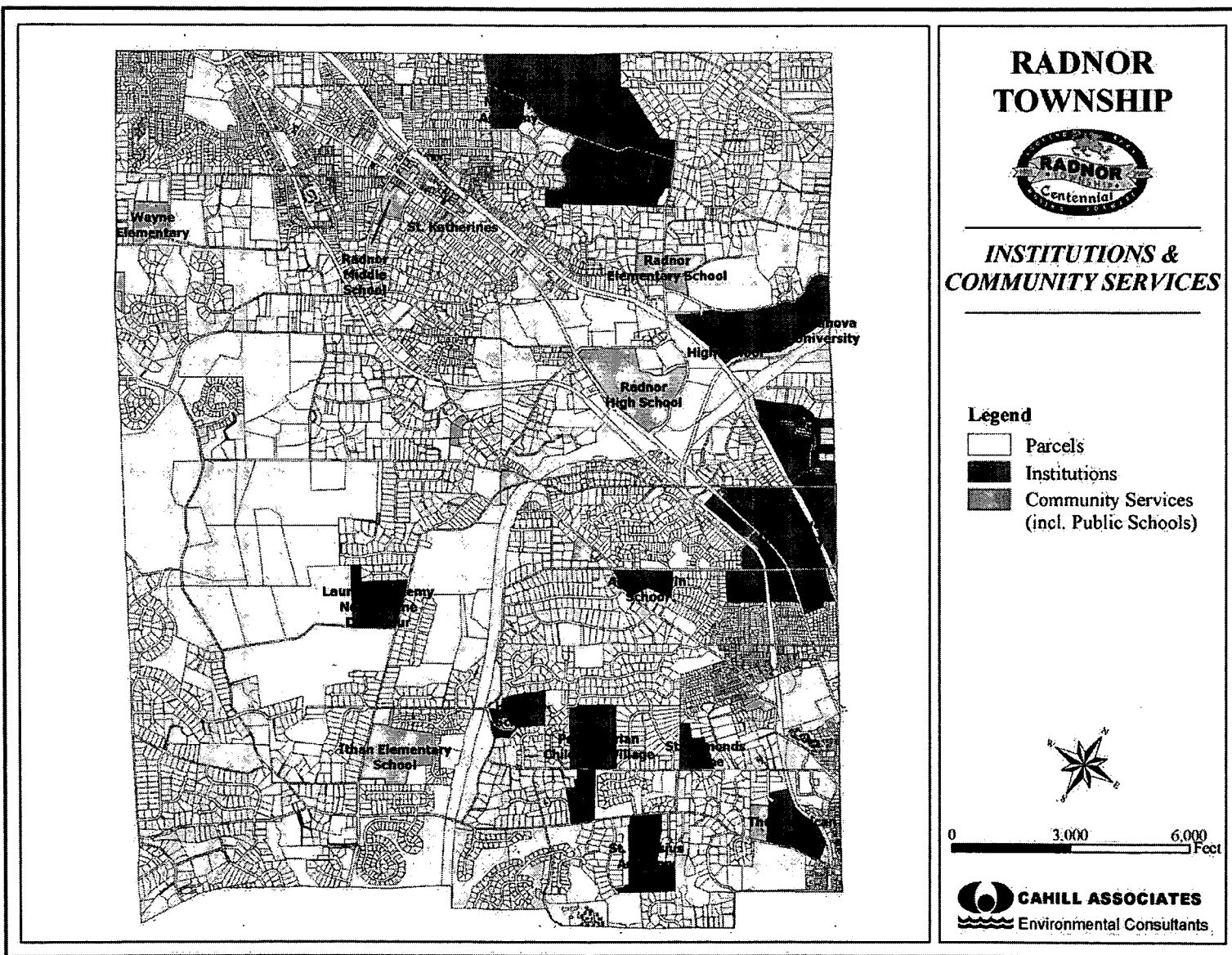


Figure 8-1. Institutional and Community Service Land Uses in Radnor Township

## **B. Institutions in Radnor Township**

In the summaries below, highlights of the “major” and “minor” institutions in Radnor Township are presented, with emphasis on those institutional elements which especially relate to larger Township comprehensive planning. These summaries are based largely on focus group discussion held during the comprehensive planning process. These institutions are primarily educational in nature, although the smaller institutions also have a health care focus. Clearly each institutional story could continue for many pages and has been substantially condensed here. As commented on in the Housing Section, there is a lack of senior citizens-related institutions, public or private, in the Township, with or without health care facilities.

### **1. Major Institutions**

**Cabrini College:** Cabrini College welcomed its largest student enrollment of 1,200 full time students this past year, 760 of which reside on its 114-acre campus (dormitory capacity of 800) with the remainder being commuters. The College is focused on the Philadelphia metropolitan area. Historically, a major institutional issue at Cabrini has been loss of students either through transfer to other institutions or for personal reasons. Cabrini is working to improve student retention through promoting residency and recently completed a new residence hall. At the same time, given the demographic and economic trends characterizing the Cabrini market, there is reluctance to undertake considerable additional building. Cabrini officials indicate that transportation for their services employees is an issue of growing importance, with cost of transportation a problem for some of their lower paid employees (SEPTA trains are expensive). Cabrini has tried to maintain good relations with its residential neighbors in Radnor through maintenance of a physical “buffer.” Its campus site has multiple physical constraints like steep slopes. There are no plans to expand or contract its campus; there are no plans for significant campus modification and/or construction at the present time.

**Eastern University:** A faith-based liberal arts university on 87 acres, Eastern offers a variety of undergraduate and graduate academic programs in its rapidly growing array of programs. Programs include: School of Arts and Sciences, Templeton Honors College, School of Professional Studies (undergraduate in organizational management, information systems, RN and BSN; graduate in MBA, MBA in health care administration, MS in health services management, nursing informatics).

**Valley Forge Military Academy:** Private VFMA includes about 275 employees and 2,500 students (generally pre-college) on its 98-acre campus. All students are housed on campus in a total of 820 dormitory rooms (730 of which are currently occupied). This situation has not changed measurably in the last 10 years. There are no commuter students. Generally, VFMA views its Radnor Township ties as very positive and its location as excellent, one of the best features of being in Radnor. Access is excellent, both in terms of student and employee needs. VFMA officials did indicate that VFMA is having increasing difficulty getting staffing for its service contractors because transportation for them is difficult (i.e., a lack of public transportation). Some rehab of existing facilities is ongoing and is expected to continue. Facility infrastructure also needs work. In terms of proposed facility changes, plans for one new building (a new dining hall and performing arts center to be used in conjunction with the community)

have been submitted to and permitted by the Township. VFMA will work with the Township's Design Review Board to finalize siting and related details for these projects. Historically some tensions/issues have arisen with some residential neighbors, though problems are minimal at present. Traffic problems at some of the entrances/exits have now been resolved with selective gate closures which appear to have been successful.

**Villanova University:** Villanova University is clearly the largest (257 acres) and most significant private institution in Radnor. Although there have been numerous major building projects completed in recent years and there are more in planning, University officials are quick to point out that enrollment growth is a myth. Over the past decade, Villanova has deliberately reduced its undergraduate enrollment from approximately 6,750 students to an average yearly enrollment of 6,150 students. The institution has established this goal in order to focus on student quality and quality of student life, rather than quantity. As part of that decision, the further decision has been made to provide more campus dormitory space and to reduce need for off campus student housing. Campus dormitories now provide housing for approximately 70 percent of the total undergraduate student enrollment, in contrast to 45 percent a few years ago (1988). The University hopes to reduce the off campus proportion even further. Over the past decade, fourteen new residence halls have been constructed at a cost of over \$90 million; in 2001, 600 additional students were accommodated in new campus housing. Fewer students commute; only about 100 students out of the total 1,600 students in last year's freshmen class commuted to the University. Undergraduate students are guaranteed housing through their junior year. The addition of residential facilities on the campus also will serve to reduce community issues, which have often occurred as the result of the considerable number of Villanova students who live off campus and conduct their affairs in an especially exuberant way.

These policies, promoting expanded housing opportunities as a major goal and highlighting the need for "living/learning communities," are consistent with the University's 1991 Strategic Plan, which the University has been implementing energetically. The Plan, updated in 2001 with *Villanova University: A Host for Community Learning*, acknowledges the real physical constraints of the main campus. Recent developments have included a new engineering research building and an expansion of the science center. The University has a policy of acquiring certain properties contiguous to the campus to establish a permanent green buffer between the campus and the surrounding neighborhoods. At the same time, one of the Recommended Actions of this Comprehensive Plan update is to "...limit expansion of institutional uses to areas within the present limits of campus areas which are zoned as Institutional Districts."

Traffic near the Villanova campus is a major issue, but traffic problems are serious even when school is not in session. Traffic can be especially problematic when major special events, including athletic events, are scheduled. When parking on campus cannot meet the demand caused by an event, the University has used shuttle buses to transport people from remote parking locations. This has helped ease traffic problems associated with events in the past and will be considered as part of future traffic planning. Additionally, Villanova coordinates traffic related issues with the Radnor Police Department and procures the Department's officers to assist in traffic control activities on Township roads during events. Villanova has actively considered ways to ease traffic congestion around its campus and is continuing to do so. The University has an established policy that freshmen and sophomores may not have cars unless

they receive a waiver of the policy due to extenuating circumstances. Continued coordination between the University and the Township on traffic and transportation planning is very important for the future.

Villanova together with SEPTA is also pursuing a major Federal/ISTEA grant to construct an intermodal transportation improvement project on the existing parking lot next to the R5 Villanova Rail Station adjacent to Spring Mill Road near its current School of Law. The project envisions an improved station, handicapped access and additional parking. It also includes a pedestrian overpass which will offer safe crossing of the rail line and improved connectivity to the University campus. The location of the project has been selected in order to minimize significant traffic congestion in the immediate community. In January 2002, the University commissioned a traffic study that showed that by controlling where University commuters park and diverting a portion of those commuters to the envisioned structure, traffic congestion could be reduced on Spring Mill Road, Ithan Avenue, and Lancaster Avenue.

An especially important issue to the community relates to Villanova's long range plans for its large land holdings south of Lancaster Avenue; this area is currently mostly unattractive parking lots (also SEPTA has two trolley stations located along the lots). Villanova has considered various uses for this land. The University has considered the development of a major new convocation center here, including a bookstore plus structured parking with related facilities. According to the University, changes in the uses of the parking lots south of Lancaster Avenue are not part of Villanova's near term priority projects. If and when the University would consider alternative uses for that land, Villanova has indicated that it would be interested in discussing this planning in more detail with the Township and possibly other stakeholders, including specific plans for Lancaster Avenue frontage, possible application of traffic calming techniques, application of gateway enhancement techniques and other aesthetic provisions.

University officials indicate a strong desire to work closely with the Township and to work proactively to develop land use and transportation solutions, which not only benefit Villanova University, but also work for the good of the Township as whole. If this world-class university is to grow and prosper in this world-class municipality, they must work together. Members of Villanova's administration meet frequently with Township officials, Township Commissioners, and neighborhood associations to discuss common issues. Additionally, every two years the University's Director of Facilities Management sends the Township a written summary update of the University's land use plans.

Villanova is committed to its immediate community. Villanova has recently created a Director of Community Relations position to facilitate relationships and serve as a liaison to the larger community, including Radnor Township. The University has initiated enhanced communication efforts with the community including web site additions, distribution of information highlighting relevant University functions and developments of community and neighborhood significance, and attendance upon invitation to neighborhood association meetings.

Summary: All of these 'major' institutions (all educational) are quite active. There is every reason to believe that they will continue to be vibrant parts of Radnor Township throughout the life of this Radnor Township Comprehensive Plan and beyond. Although the specific issues

vary from school to school, clearly traffic and neighborhood relations emerge as consistent issues and themes. There appears to be broad consensus that these institutions should work more actively with Township officials and the neighborhoods themselves to improve communication and reduce friction. In many cases, the clear communication of institutional-and the elimination of misguided rumors-would avoid problems in the future and improve relationships. Villanova has special challenges and opportunities, with its Lancaster Avenue project being of special interest.

Overall, it is interesting to note that there are no major physical plans for major changes of any type in terms of the future of these institutions and their respective campuses. All of these institutions enjoy the many values of their Radnor locations. The Township's new comprehensive plan should work to support, reinforce, and build onto the excellent institutional elements already there.

## **2. Minor Institutions**

The list of "minor" institutions is somewhat longer and does not include some institutions, such as the American College and the Hilltop School, which are certainly noteworthy. The list simply is too long! In most cases, these institutions did not attend the focus group meetings. Curiously, many of these institutions have moved to Radnor in recent years from more urban (often Philadelphia) settings.

**Academy of Notre Dame:** Their 500-student enrollment including grades 6 through 12 is at a maximum on their 38.5-acre campus. In the last three years, they have completed a building program and don't expect to make additional changes in the foreseeable future, other than some playing field development. They want to maintain the open space which remains. Traffic is their worst problem and is worsening, especially their Sproul Road exit onto Godfrey which backs up substantially. As required, the Academy has submitted their 5-year plan to Radnor Township.

**Agnes Irwin School:** This highly reputed 130-year old private preparatory school for young women, one of the first schools in the nation to focus on the education of young women, continues to try to work with the Township's relatively new institutional zoning requirement. Agnes Irwin is landlocked and surrounded by residential zoning districts and must balance school needs with the local demands and rigorous Township requirements imposed on its 18.5-acre site. For example, there is competition to accommodate the School's playing field needs, plus the broader needs of the community. School currently has an enrollment of 622 out of max capacity of 640 and has no intent to expand this capacity. In recent years, the community has indicated an interest in having Agnes Irwin expand and offer a pre-kindergarten program, but growth constraints are very real for Agnes Irwin. Traffic has been and is a major issue, with the busy Conestoga Road and Ithan Avenue intersection a special problem. In the morning when commuting traffic is already heavy, all students and staff are arriving at the same time, creating added congestion (a pre-kindergarten program could actually help here, as many would arrive earlier in a more staggered manner, avoiding the peaking problem related to the start of school). In the afternoon, departures are more staggered due to after school activities (e.g., athletics program departures occur later in the afternoon). Juniors and seniors may drive although sophomores are restricted. The cooperative work between Agnes Irwin and the developer of the

adjacent Edenton development resulting in a deceleration lane is an excellent example of coordination between a private developer and a private institution (the traffic situation is better now than it was before the development!). Agnes Irwin has Township approval for a new \$8 million 25,000 sq ft arts and science center. The expanded facility's building footprint will not be significantly expanded; floor area will be added vertically. The School has undertaken a major new development program and fundraising campaign to support physical facility development projects as well as to significantly expand the School endowment.

**Archbishop Carroll High School:** This Catholic high school is part of Archdiocese of Philadelphia; the high school, with a 22 percent enrollment growth this year, is at 1,160 with a maximum rated capacity of 1,300 (it should be noted that the facility was constructed originally for an enrollment of 2,600, with duplicate facilities for both girls and boys). The current 1,300 capacity reflects the grades 9 through 12 assembly capacity being able to meet together; School officials want the entire student body to be able to meet together. Approximately 75 feeder parishes, even extending into Philadelphia, supply students to the School. About 65 buses bring students each day from these parishes, eight from Philadelphia. Junior and seniors may drive but many students use the two fixed rail systems, which are nearby (perhaps as many as 250 to 300 students rely on mass transit, although accurate records are not kept). Also, the St. Carbine's Day School is also located at the 52-acre campus, providing 60 mentally/physically challenged students with own program. Traffic is a major problem with the new public elementary school and corporate park making overall traffic that much worse (nearby traffic signals need to be reviewed and evaluated). There is another older building of special high quality on the site, formerly used by the Christian Brothers, which is now leased to the Aramark Corporation; the Archdiocese may rethink this in the future and use it for Archdiocese functions, given its rich potential.

**Country Day School of the Sacred Heart:** The Country Day School is a Catholic independent college preparatory school for young women, founded in 1865 and now part of a national network of 21 private schools nationwide, 120 schools worldwide. Their 16-acre landlocked campus, relocated from Overbrook in 1978, is located on Bryn Mawr Avenue; enrollment varies between 350 and 400 students, K through 12. Traffic is the most critical issue here, with a larger entrance needed on the busy Bryn Mawr Avenue. Even attempts at staggering arrivals and departures have not substantially helped traffic problems. An easement exists to Roberts Road, though that option is likely to cause neighborhood opposition. The School, which has appreciated working with the Township in the past, is considering expanding parking facilities as well as expanding dining room facilities and the School House. A Long Range Plan 2000-2005 has been prepared, which includes: "...continue to increase enrollment; investigate opportunities for additional property; complete the Dooley Building expansion; expand the dining room facilities; determine additional requirements needed to handle increased enrollment; upgrade the landscape...."

**Presbyterian Children's Village:** Founded in 1877 as an orphanage in Southwest Philadelphia, the Village provides service to abused children; in 2001 the Village served approximately 2,500 different children and their families out of its 43.5-acre Radnor Township campus on South Roberts Road. The Village includes a 60-bed residential treatment center for adolescent boys and girls, plus limited independent living accommodations for older adolescents. Village



programs include many different types of community services in an “out patient” capacity. The institution has a regional focus; many clients are from Philadelphia and Delaware County. Programming includes job training and violence prevention; the Village conducts other satellite programs in Philadelphia and elsewhere in the region (e.g., the Southwest Family Center, the 21<sup>st</sup> Century Community Learning Centers, the Truancy Prevention Program, Consultation and Educational Specialists Services).

Neighborhood relations have been a primary concern in the past. Problems have arisen, but most issues have been resolved. A second concern is educational needs (all educational programming is currently provided on campus). They rely on the Radnor Township School District heavily, as well as local services such as Township police force which has been of great support in the past. Traffic is not a major problem given the institution’s staggered 24-hour operation with frequent comings and goings around the clock. Physically, their campus has good accessibility with two points of ingress/egress.

The Village plans to increase staffing to increase security. In 1993 the Village forfeited the idea of expanding their residential units on campus. The concept received generally negative reaction from the community. Given overall trend away from residential treatment and to more outpatient programs, this expansion is unlikely in the future. Growth in their programming is for early intervention programming. The Village has no plans for any major physical changes at its campus. Its \$12 million budget is supported by 85 percent public funding and 15 percent private funding; a relatively small endowment exists.

**St. Edmonds Home for Children:** The Home is a 40 bed residential facility dedicated to treatment of severely mentally/physically challenged children, ages 2-21. Clients, some of which are nonverbal, have many medical needs; they all travel to off-campus educational facilities during the workweek. The campus encompasses 16 acres. Currently, there are no physical expansion plans. No specific traffic flow problems have been identified. The institution receives excellent support from Radnor township police, fire, ambulance, other services, as well as substantial local volunteer support. In the past, some “friction” with residential neighbors has developed (e.g., the proposed “sensory garden project,” which involved a handicapped playground with more outside activities of clients, created some adverse neighborhood reaction; the second phase of the project was put on hold due to the controversy).

Overall, traffic conflicts emerge as a major theme with these minor institutions. Understanding and improving pedestrian circulation including the potential need for more sidewalks is vital for virtually all of the major institutions and needs to be addressed in more detail in their respective institutional planning (especially Eastern, Cabrini, and VFMA), as well as by the Township. Working to improve community relations also emerges in selected instances. In virtually all cases, better communication would be desirable, from the institutions to the neighborhoods and to the Township and vice-versa. Virtually, all of these institutions, major and minor, agreed that the many “values” of their respective Radnor Township locations are very important for them as institutions and constitute a real positive force in their respective futures. They like being in Radnor. They want to stay in Radnor, if at all possible. Several of the institutions described plans for expanding their facilities; most have prepared long range plans as are now required by

the Township, and several have embarked on ambitious capital development programs to fund their development programs.

At the same time, we are aware that at least a few of these institutions have under active consideration relocation from their extremely highly valued campuses to less costly real estate. If one or more of these relocations were to occur, the likely outcome would be conversion of the campus to residential use (profit from the sale would be the motivating force for the sale in the first place). Such a move, of course, would be subject to Radnor Township zoning and other regulations. Radnor Township might also have the option of purchasing all or portions of the relocating institution at fair market value. Use of eminent domain in the acquisition may or may not be an option.

### **C. Recommended Actions**

Although many of the recommendations contained within the Township's existing 1988 Comprehensive Plan have not been acted on, most of the recommendations relating to Institutional Use have been implemented and therefore serve this current planning as well. These 1988 Plan Recommendations include:

- **Limit expansion of Institutional use to areas within the present limits of campus areas which are zoned as Institutional Districts, consistent with the institutional objectives and use elements herein.**
- **Modify the existing Zoning and Subdivision Ordinances to require the submission of a long-range land use plan as a condition of approval for any new construction or use change.**
- **Modify the Zoning Ordinance for Institutional Districts so that if institutional use ceases, the district affected should be rezoned for residential use in accordance with this Plan.**
- **Amplify the existing zoning ordinances for institutional districts to provide different setback requirements for the various uses allowed within institutional districts. Uses which are less compatible with adjacent zoning districts should be set back farther than more compatible uses. The setbacks may be different depending upon the adjacent zoning.**

Virtually all of these recommendations have been implemented and have contributed to real improvements in the ties with the Township as well as with the respective neighborhoods in which they are located. Recommendation 3 remains "active." To the extent that institutional uses cease functioning, zoning should revert to the pre-existing residential zoning category.

In addition, several action items remain unaddressed:

- Traffic Problems
- Continuing Community/Neighborhood Relations
- Special Villanova Planning Issues
- Some Township Planning Process Mechanism to Bring the Institutions into the

### Life of the Township More Directly

Each of these action areas is addressed in more detail, below. Recommended Actions are developed, area-by-area.

**Traffic Problems:** Problems range from the very focused problems of a specific campus entrance or exit to the much broader issues surrounding Villanova with its special events and pending projects along Lancaster Avenue. Of course, there are specific codes and ordinances, both on the Radnor Township level and on the PennDOT level, which must be respected regardless of Recommended Actions developed in this Comprehensive Plan. There exists an official transportation planning process, involving Delaware County and the Delaware Valley Regional Planning Commission, which may be useful in addressing some though not necessarily all of these transportation issues. **As set forth below under Planning Process, Radnor Township should host an annual planning information exchange with these institutions during which traffic and transportation issues are identified and shared with the Township, for appropriate sorting and direction.**

**Continuing Community/Neighborhood Relations:** The consistent theme raised in the focus groups is more communication, better information. If more neighborhood residents correctly understood institutions and their planning, misconceptions would be reduced and relations would be improved, at least to some extent. **Radnor Township publishes a periodic newsletter which could reserve a page or two for institutional notes. Radnor also has a website which could devote space to institutional notes.** These recommendations would be of minor cost to the Township; if they are successful, more intensive efforts could be planned.

**Special Villanova Planning Issues:** In addition to the Annual Planning Information Exchange meeting described below, more intensive exchange should occur with Villanova University, possibly extending into multiple sessions strategically scheduled throughout the year (to be determined). At the present time, it is not clear exactly how this process should unfold in order to benefit both the University and the Township to the maximum extent. An intensive Villanova-specific session could be scheduled in coordination with the Annual Planning Information Exchange (second half of the same day or perhaps on a following day), in order to maintain the dialogue and information flow. For a variety of reasons, this discussion should not be combined with the larger group of institutions, in order to avoid Villanova's likely dominance of the group.

**Some Township Planning Process Mechanism to Bring the Institutions into the Life of the Township More Directly:** Of course, all institutions and their representatives are welcome to attend all official Township planning process meetings, from special presentations at the Board of Commissioners meetings to Planning Commission meetings to any other planning-related functions, in addition to any specific project-related meetings which evolve in the future. But that's not enough. Notwithstanding the fact that no one wants more meetings to attend, **Radnor Township should host an annual planning information exchange with these institutions during which all relevant planning issues, including problem of community relations and traffic and transportation issues and anything else which is relevant are**

identified and shared with the Township, for appropriate sorting and direction. All institutions should be invited, including the Radnor Township School District.

**Goals**

*Encourage sound planning of institutional property, congruent with Township-wide principles, while preserving the existing character of the institutional properties.*

*Work to harmonize Radnor's existing institutions with adjacent land uses, promoting physical buffering, better programs of communication, and the like.*

*Integrate institutional traffic issues with the transportation planning element of the Comprehensive Plan.*

*Improve communication from the Township to the institutions and vice-versa, especially in areas of potential concern such as student housing, traffic, and other major issues.*

*Ensure compliance with Township revenue-producing code, especially those dealing with non-student revenue producing events.*

*All institutional use code requirements should be reviewed; in the event that existing institutional uses cease in their present form, ensure that any re-development which results is compatible with the total Goals, Objectives, and Recommended Actions of this Comprehensive Plan.*

**Recommended Actions:**

- As stated in the 1988 Plan, limit expansion of institutional uses to areas within the present limits of campus areas, which are zoned as Institutional Districts.
- Require that the long range land use plan, a condition of approval for any new construction or use change at institutions, be updated every 2 years.
- As stated in the 1988 Plan, modify the Zoning Ordinance for Institutional Districts so that if institutional use ceases, the area affected should be rezoned for residential use in accordance with the Goals, Objectives, and Recommended Actions of this Comprehensive Plan; special attention should be given to provision of assisted living and other senior-related housing.
- Refine as necessary the existing zoning ordinances for institutional districts so that different setback requirements for the various uses allowed within institutional districts are provided. Uses which are less compatible with adjacent zoning districts should be set back farther than more compatible uses. The setbacks may be different depending upon the adjacent zoning.

- **Radnor Township staff should host an annual planning information exchange with these institutions during which all relevant planning issues, including problems of community relations and traffic/transportation, should be identified and discussed. This meeting should also feature updates of the respective institutions' long-range plans, highlighting any major changes to these plans.**
- **Radnor Township publishes a periodic newsletter which could reserve space for institutional notes; Radnor's website also could devote space to institutional notes.**

## **SECTION 9 COMMUNITY SERVICES AND FACILITIES**

### **A. Introduction and Statement of Goals**

Radnor Township is a thriving, robust community, with a substantial residential and economic base. Radnor constituents demand an ample array of high quality services. Appropriately, Radnor has developed highly sophisticated public service and facility systems to serve its constituents. Figure 9-1 maps these service and facility systems (note that public recreation and open space features are mapped separately in the Open Space and Recreation Section and both public and parochial schools are also included in the Institutional Uses Section maps). Whether it is the Library, the Senior Center, the School District, the Fire Company, Radnor Township works hard to make sure that its public services and facilities provide an exceptional value for Township residents. The Township Municipal Building is “command central” for a multitude of public services, including Police, Engineering, Community Development, Parks & Recreation, Finance, and Administration. The Township’s Public Works Maintenance Facility houses crews and equipment for the maintenance of parks, sewers, highways, and vehicles, and for refuse and recycling collection.

#### **1. Goals and Objectives**

Although Radnor’s public service and facility systems already are highly developed and have been the recipient of many awards and honors, there is always room for improvement, including room for improved efficiency. In fact, given the reality of increasing costs of service delivery, the challenges of improved efficiency are likely to be a more serious issue in many of Radnor’s service systems. Additionally, the changing nature of Radnor’s population, including more older households, may also indicate the need for somewhat different services. Goals include:

##### **Goals**

*Provide a full range of public facilities that are conveniently located and accessible to all residents.*

*Maintain the high level of services offered to Township residents.*

*Anticipate and plan for future public facility needs.*

### **B. Services**

#### **1. Police Protection**

The Radnor Township Police Department (RTPD) ensures public safety by protecting Township residents and their property, as well as the broad array of businesses and other public and private facilities. The Police Department has 50 uniformed officers, 11 full-time civilians, and seven part-time school crossing guards. The RTPD comprises four divisions: Patrol, Criminal Investigations Unit; Traffic Safety; and Administration. Each member of the RTPD receives 672 hours of annual training in accordance with the Pennsylvania State Municipal Police Officers Education and Training Commission.

## RADNOR TOWNSHIP



### COMMUNITY SERVICES & FACILITIES

- ▲ 1. Municipal Building
- ⊙ 2. Radnor Fire Co.
- ▲ 3. Memorial Library
- ▲ 4. Wayne Art Center
- ▲ 5. Wayne Post Office
- ▲ 6. Wayne Senior Center
- ▲ 7. Women's Resource Center
- ▲ 8. Villanova Post Office
- ▲ 9. Radnor Elementary Sch.
- ▲ 10. Wayne Elementary Sch.
- ▲ 11. Radnor Middle Sch.
- ▲ 12. Radnor High Sch.



0 3,000 6,000 Feet



**CAHILL ASSOCIATES**  
 Environmental Consultants

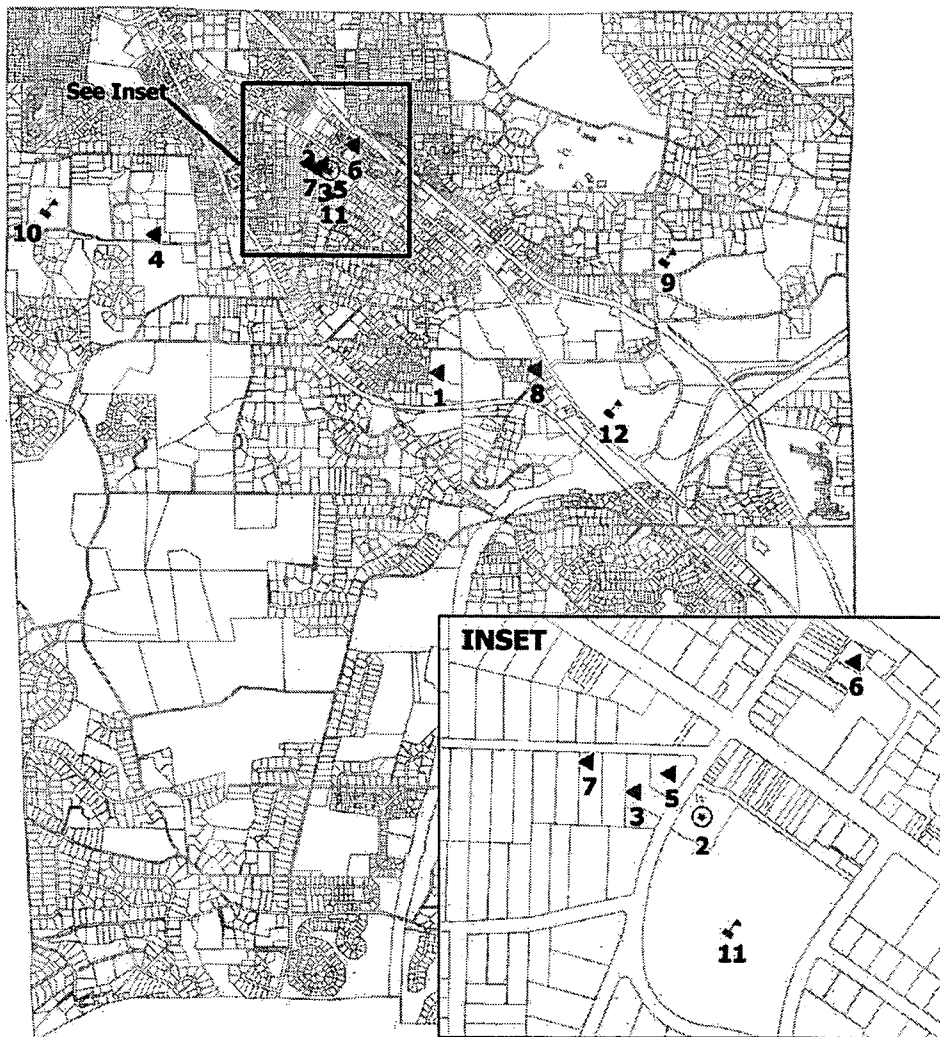


Figure 9-1. Community Service & Facility Locations in Radnor Township

Historically, Radnor Township has a low crime rate and is known as a safe place to live. In 1999 and 2000 Radnor experienced a decline in Class-One criminal offenses, including assault, burglary, larceny and arson. In addition, the Township experienced a drop in acts of vandalism, underage drinking, disorderly conduct, and driving while under the influence of alcohol. The low crime rate of the Township has won recognition by *Philadelphia* magazine, which in 1995 rated Radnor as one of the safest places to live in the Philadelphia region. The Township and the broader community appreciates and respects the hard work of the Police Department; in 1997, the RTPD was awarded the “Readers Choice as the Best Police Force” serving the Main Line and Western Suburbs.

## **2. Fire and Emergency Services**

Three fire and rescue companies serve Radnor Township: Radnor Fire Company (Figure 9-2), Bryn Mawr Fire Company, and Broomall Fire Company. The Radnor Fire Company, located on South Wayne Avenue in the heart of Wayne, has approximately 65 volunteers, four paid certified emergency medical technicians, and provides service to most of Radnor Township and the panhandle of Tredyffrin Township. The Bryn Mawr Fire Company is located on Lancaster Avenue in Lower Merion Township, Montgomery County. Bryn Mawr has 45 volunteer firefighters and serves Lower Merion Township and the portion of Radnor Township east of Route 320. Broomall Fire Company has 75 volunteer firefighters who serve Marple Township and portions of southwestern Radnor Township.

The Radnor Fire Company was the original fire company for Wayne, responding to 13 alarms using a one-horse hose cart and a two-horse chemical engine during the first year of duty in 1906. The Radnor Fire Company currently operates three Engines, one Ladder Truck, one Rescue Truck, and two Ambulances. The Firehouse has been reconstructed three times at the same location at 121 South Wayne Avenue, the last renovation and expansion having been completed in 199\_. The Fire Company uses a thermal imaging camera system to detect hot spots and locate victims.



**Figure 9-2. Radnor Fire Company**



The Ambulance Division of the Radnor Fire Company provides 24-hour emergency medical assistance to Radnor and Tredyffrin residents. The Ambulance Division has a paid and volunteer staff of 26 active members, 8 probationary members, and 2 junior members. This Division has two fully staffed and equipped ambulances, each equipped with state-of-the-art tools and technology. The Ambulance Division responds to over 1,800 medical emergencies per year, and provides an invaluable resource to Radnor residents. Advance Live Support Services, which used to be provided by Main Line Health out of Bryn Mawr Hospital, have been handled by Narberth Ambulance in cooperation with the Radnor Fire Company, which administers the service, since 2001.

### **3. Public Works Department**

The Public Works Department of Radnor Township is divided into six divisions, whose overall mission is to enhance the quality of life in the Township. The Public Works Department is responsible for the upkeep of roadways, snow removal, leaf collection, trash and recyclable materials collection, sanitary and storm sewer maintenance, parks maintenance, as well as maintenance of the Township's fleet of vehicles.

**Sanitary Sewer Maintenance Division:** The most important charge for this Division is to ensure that wastewater is carried away efficiently without causing any health hazards to the public. Property owners connected to the sanitary sewer system pay an annual sewer rent which funds the operations of this Division. As of 2002, the rate for sewer services was \$3.19 per 1,000 gallons of water used the previous year.

Virtually the entire Township is connected to public sewers. The system of sewer-mains conveys sewage flows by gravity through regional interceptors to large pump stations located at the "bottom" of Delaware County. Sewage is then pumped to the Southwest Wastewater Treatment Plant in Philadelphia. The wastewater is treated and ultimately discharged into the Delaware River.

The regional system, known as DELCORA – the Delaware County Regional Water Quality Control Authority – was designed many years ago and is not without age-related issues. Data from the Philadelphia Water Department and the Delaware County Act 537 Sewage Facilities Plan Update indicates that the collection and conveyance system of interceptors is prone to leaking. The system is extremely old in many locations, and erosion and settling forces have served to weaken the system, exposing piping in some highly eroded places, and jeopardizing its integrity. Because of these issues, Inflow and Infiltration (I&I) problems have been identified in the Act 537 Plan. Radnor Township is part of the Radnor-Haverford-Marple Sewer Authority (RHM), which has been conducting I&I studies for the past seven years. RHM has an ongoing maintenance program that involves the repair of leaking pipe joints and cracked pipes.

Virtually the entire Township is connected to public water through the privately owned Philadelphia Suburban Water Company (PSW). PSW manages and operates the public water supply for the Township, and the larger region alike, through a vast interconnected water supply system, both surface and groundwater-based. Many surface water intakes and reservoirs have been constructed around the County and region, including the Geist Reservoir and multiple

Schuylkill River intakes, and it is therefore difficult to isolate the direct source of Radnor Township's drinking water.

**Solid Waste Collection and Recycling Division:** This Division is responsible for the twice-weekly collection and transfer of all refuse, paper, and recyclable products disposed of by households and other uses in the Township. During 2001, workers collected over 13,000 tons of materials – 26 percent of which was mixed-recyclables. Radnor Township's recycling program requires residents to recycle all clean paper products, clear, brown, and green glass, steel and bi-metallic cans, aluminum cans, and two types of plastic.

After household trash is collected from Township residents, the waste is relocated to one of two Delaware County Solid Waste Authority-managed Transfer Stations located in Marple Township and Chester Township. Solid waste is sorted at the transfer stations and some materials are sent to American Fef-Fuel's Chester Resource Recovery Facility (RRF), a burning facility located in the City of Chester; all other waste materials are shipped to Rolling Hills Landfill in Earl Township, Berks County. Approximately 400,000 tons of commercial and residential trash annually generated in the County is burned at the RRF with the ash residue shipped to Rolling Hills Landfill. The ash residue from the burning facility is shipped to the landfill.

#### **4. Township Municipal Building**

The Radnor Township Municipal Building is situated adjacent to Encke Park on Iven Avenue. The Radnor Township building accommodates the Township Manager's Office, Finance Department, Treasurer's Office, Community Development Department, Parks and Recreation Department, Engineering Department, Police Department, and the Public Information and Telecommunications Office. The Township has determined that a significant increase in building space is needed to adequately service residents over the next several decades. As a result, the Municipal Building will undergo an expansion and renovation at its current site in 2003-2004.

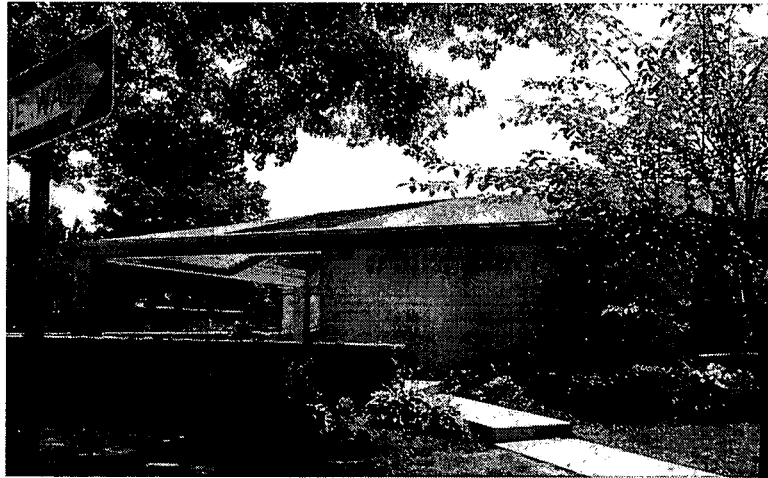
### **C. Facilities**

#### **1. The Memorial Library of Radnor Township**

The Memorial Library of Radnor Township is the community's free public library. Radnor Township has had a library since 1809 when a subscription library was established near the Radnor Friends Meeting House; the first collection consisted of 17 books. The charter was established in 1892. In 1940, the Library was opened to the general public with support from the Township and the School District. In 1946, the Library was enlarged and changed its name from the Wayne Library to the Memorial Library of Radnor Township to commemorate the men and women of the community who died in World War II. In 1980, the Library moved to its current location on West Wayne Avenue, funded by bonds issued by the Township (Radnor Township owns the building), with increased space for its collections and programs and improved access for the disabled. The Library celebrated its Centennial Anniversary in 1992.

The Library is open 7 days a week. It is a member of the Delaware County Library System. The collection contains over 100,000 titles for adults, young adults and children that support a variety of educational, recreational and life-long learning needs. The children's department

offers regularly scheduled story hours and frequent programs and craft activities. Residents have access to information and reference assistance, Internet for public use, online subscription databases, homework help, homebound service, lectures, book discussion groups, and other special events, many of them sponsored by the Friends of the Library. The Library's Winsor Room is a frequent meeting place for community groups.



**Figure 9-3. Memorial Library of Radnor Township**

The Library plans to continue its role as a center of community activity by providing Library programs and services that meet the changing needs of Radnor Township. The Library is experiencing an increased demand for children's services (story-times, programs and reference service to support school work), for access to information in new formats due to developments in technology, for business and investment reference information and for training and guiding those we serve in the wise use of Internet resources. The Library Board has placed a high priority on the Library's continued location in the heart of Wayne. It is exploring its needs for increased space to provide those services in an attractive facility. Providing adequate parking for the needs of library users is an ongoing concern. Attracting and retaining competent, computer-literate and service-oriented staff is also a priority. The Board is examining its needs for ongoing funding and resources to address these concerns. As a Recommended Action, this Comprehensive Plan recommends that the Township continue to support the existing Library facility in Wayne, including any expansion that may be necessary.

## **2. Post Office**

Two United States Postal Service facilities are located within the Radnor Township and serve Township businesses and residents: the Wayne Post Office and Villanova/St. Davids Post Office. The Wayne Post Office is located at 104 South Wayne Avenue (610-964-0208) and is the primary distributor of mail for most Township addresses; there is also a mail distribution function located at Wayne which requires added truck and terminal space. The Villanova/St Davids Post Office is located at 560 East Lancaster Avenue (800-275-8777) and offer similar postal services. Although the existing Wayne Post Office function should continue, the

distribution center function should be relocated from the Wayne location, thereby freeing up needed space for other uses.



**Figure 9-4. Wayne Post Office**

### **3. Radnor Township School District**

The public school system in Radnor Township includes one high school, one middle school, and three elementary schools (see Figure 9-1 for locations). The School District is an extremely important and integral part of the community, in terms of its primary educational function, as well as in terms of its physical facilities, employment, and recreational and cultural benefits. This Township Comprehensive Land Use Plan does not constitute the official plan for the School District, which has its own detailed planning process and outputs including: The Five-Year Capital Improvement Plan, Strategic Plan, and the Technology Plan. Readers interested in obtaining more information about the School District plans should contact the School District at 610-688-8100.

The Radnor Township School District administrative offices are located at 135 South Wayne Avenue. A nine-member elected School Board, each elected at-large for a four-year term, governs the School District. The Delaware County Intermediate Unit, a regional education service agency, provides state-sponsored support for schools in Radnor Township and throughout the County. The School District has won numerous awards for the high quality of education; most recently, RTSD is the recipient of a 2001 Governor's Award for Environmental Excellence for the construction of the Radnor Elementary School.

Student enrollment projections are important when considering the carrying capacity of school facilities. The 10-year enrollment projections for the elementary schools (three facilities) show a decrease in student populations, though only by 66 students in ten years. Though elementary school student populations generally rise until 2005, the enrollment is projected to decrease from

1,452 (actual 2001-2002 figures) to 1,386 by the year 2010. The total *functional* capacity for all three schools equals 1,560, demonstrating that the School District is prepared to handle an unanticipated increase in elementary school population.

The actual enrollment for the Middle School during 2001-2002 totaled 726 students. It is projected that enrollment will increase to 798 during 2004-2005, then slowly taper off to 757 students for the school year 2010-2011. The Middle School – wherever it is constructed – will be designed to have ample room to support any increase in Middle School student enrollment, projections notwithstanding. Current enrollment numbers for the Radnor High School are 1,010, with projected enrollment figures increasing in the next 10 years. By the 2010-2011 school year, it is projected that Radnor High School will serve 1,147 students. The functional capacity of the High School facility is estimated to be 1,200, though total capacity is rated as 1,411 students.



**Figure 9-5. Radnor High School**

In the months leading up to this Plan's completion, the Radnor Board of School Directors has determined that a new middle school facility is needed. Significant attention has been directed towards the existing facility and options for its continued use and re-use, including the reuse of the site as a civic-oriented facility; the demolition of the existing structure and re-development of the site with reconstruction of its current educational use; and the relocation of the Middle School outside of Wayne.

This Plan concludes that the Middle School should remain in Wayne for a number of important Comprehensive Planning reasons. The Middle School is important to the Wayne Business District and broader Wayne community, as are our churches, our Post Office and Fire Department, our Library, and the many special services, facilities, and institutions which define life in this very special town center. The Middle School reinforces residential and commercial vitality which makes Wayne such a special place. The School and Business District complement one another in a variety of mutually supportive ways, with the positive effects of the School extending beyond the Business District itself into the surrounding tightly-knit dense and compact residential neighborhoods. As a catalyst for many of the activities that are so essential for the

life of the town, the Middle School complements the Village-like atmosphere which promotes walking through the downtown area where shoppers are served by an ever-widening and diverse group of retailers.

The conclusion reached in the previous paragraph is based solely on comprehensive planning factors. While these comprehensive planning factors should be considered in any decision relating to the relocation of the Middle School, it is not within the scope of this Plan to determine their specific interplay with the equally important educational and site-specific planning factors relating to this decision. However, should the School Board determine that the Middle School is to be relocated, the School site should be used for institutional/community purposes and should not be converted to commercial, office or residential uses, for all of the reasons stated above. The site must continue in some civic-related function.

In addition to the Middle School issue, this Comprehensive Plan concludes that the Township's communication with the Radnor School District (and vice versa) should be expanded and improved. Effort should be made on an ongoing basis to better integrate the School District's planning process more directly with Township comprehensive planning and vice-versa.

#### **4. Other Services**

**Wayne Senior Center:** The Wayne Senior Center is a non-profit, full-service senior center run by paid and volunteer staff who are experts in gerontology, social work, fitness, exercise physiology, marketing, placement, and counseling. The Center provides many free services including meals, health screenings, counseling, transportation, fitness classes, and continuing education. The Wayne Senior Center is funded by Delaware County Office of Services for the Aging, Radnor Township, Tredyffrin Township, the United Way, and individual and corporate donations. Its location in Wayne is appropriate and useful, and the Plan recommends that the Senior Center remain in the center of Wayne.

**Wayne Art Center:** The Wayne Art Center is a non-profit community organization that was established in the 1930's as the first art center on the Main Line. The first classes served 119 students lodged in a carriage house, and current classes comprise over 4,000 students enrolled in over 400 classes. The Art Center's Ethel Sergeant Clark Smith Gallery presents up to 12 exhibits annually, highlighting the work of local, regional and national artists. The adjoining Gallery Shop provides a venue in which artists can sell their work and community members can purchase unique crafts.

The Wayne Art Center provides valuable community resources for the pursuit of the fine arts, music and drama, and visual arts. Beginning in 1999, the Center has started on a site expansion program, beginning with acquisition of the neighboring Masonic Temple. The expansion program at the Wayne Art Center should minimize the impact to neighboring land uses and special care should be taken to address any concerns with that and any future development.

**Women's Resource Center:** The mission of the Women's Resource Center, which is a private, nonprofit organization, is to respond to the needs and issues of women and their families in the Delaware Valley. The Center's goal is to strengthen families and the community by helping residents act on their own behalf. Since 1975, Women's Resource Center has provided free and

low-cost programming to women and their families. Averaging 5,000 clients per year, the Women's Resource Center meets the needs of the community by ensuring that there is an open door for individuals to get help when they think they have nowhere else to turn.

The Women's Resource Center accomplishes this mission by offering a confidential information and referral service, free and low-cost counseling with therapists, and free consultations with attorneys for legal issues. Other programs include: Free Single Mothers' Program that includes dinner and child care for participating families, a Girls Leadership Program that encourages middle school girls to discover their leadership strengths, and Legal Direct a free legal service that helps clients gain information and options within the legal system. The Women's Resource Center has a telephone room for helpline volunteers, individual counseling room for drop-in counseling clients, and two group-meeting rooms for support groups and workshops.

#### **D. Recommended Actions**

Repeated below are the Goals for the Community Services and Facilities section of the Comprehensive Plan, followed by a repeat of the Recommended Actions as set forth in the text.

##### **Goals**

*Provide a full range of public facilities which are convenient and accessible to all residents.*

*Maintain the high level of services offered to Township Residents.*

*Anticipate and plan for future public facility needs.*

##### **Recommended Actions**

- The Township should support the volunteer-based Radnor, Bryn Mawr, and Broomall Fire Companies and the emergency medical services as appropriate.
- The Township should support all of its local government departments as appropriate.
- The Township should continue to support the existing Library facility in Wayne, including any expansion that may be necessary.
- The distribution center function of the Wayne Post Office should be relocated, thereby freeing up needed space at the Wayne location for other uses.
- This Plan concludes that the Middle School should remain in Wayne for a number of important Comprehensive Planning reasons. The Middle School is important to the Wayne Business District and broader Wayne community, as are our churches, our Post Office and Fire Department, our Library, and

the many special services, facilities, and institutions, which define life in this very special town center. The Middle School reinforces residential and commercial vitality, which makes Wayne such a special place. The School and Business District complement one another in a variety of mutually supportive ways, with the positive effects of the School extending beyond the Business District itself into the surrounding tightly-knit dense and compact residential neighborhoods. As a catalyst for many of the activities that are so essential for the life of the town, the Middle School complements the Village-like atmosphere, which promotes walking through the downtown area where shoppers are served by an ever-widening and diverse group of retailers. This conclusion is based solely on comprehensive planning factors. While these comprehensive planning factors should be considered in any decision relating to the relocation of the Middle School, it is not within the scope of this Plan to determine their specific interplay with the equally important educational and site-specific planning factors relating to this decision. However, should the School Board determine that the Middle School is to be relocated, the School site should be used for institutional/community purposes and should not be converted to commercial, office or residential uses, for all of the reasons stated above. The site must continue in some civic-related function.

- Effort should be made on an ongoing basis to better integrate the School District's planning process more directly with Township comprehensive planning and vice-versa.
- The Wayne Senior Center should remain in the center of Wayne.
- The expansion program at the Wayne Art Center should minimize the impact to neighboring land uses and special care should be taken to address any concerns with future development.



## SECTION 10 EXISTING LAND USE AND LAND USE PLAN

### A. Introduction and Statement of Goals

In general, there is much more to a comprehensive plan than just land use and a land use plan. That is especially true in this case, where, as will be seen below, virtually all of Radnor Township is already developed and where changes in land use are not likely to be great in the future. As emerges from virtually every section of this Plan, almost all uses of land in Radnor are delighted with their respective locations. The prevailing theme is "...keep it just the way it is," although almost all uses would like to grow and expand. More of the same. That simply cannot happen.

The objective of this critical section of the Comprehensive Plan Update is to describe existing land use in the Township, set forth goals and objectives relating to land uses in this already highly developed Radnor Township context, and, pursuant to the Municipalities Planning Code, set forth a plan for land use in the future. Because of the special "already developed" nature of Radnor, this land use planning component has focused on two especially important maps to guide and influence land use-related actions in the future: the "concept plan" for the Wayne Business District and the Preliminary Map of Neighborhoods for Radnor Township, admittedly a somewhat unorthodox approach to the conventional land use plan. Nevertheless, the Wayne Business District and Radnor neighborhoods have emerged as most critical for future land use planning during this comprehensive planning process, although it should be noted that there are numerous land use-related issues dealt with in detail in the other sections of the Comprehensive Plan Update as well. This land use discussion concludes with a review of land use issues in neighboring municipalities and planning ongoing in these communities.

#### 1. Goals and Objectives

Although the Mission of the Comprehensive Plan and the General Planning Goals, as set forth below, do not specifically focus on land use, use of land is essential to their successful implementation.

##### Goal

*Mission of the Comprehensive Plan: To maintain the excellent quality of life in Radnor Township, preserving the community and its character and accommodating additional development with strict adherence to sustainable design principles.*

##### Objectives

*General Planning Goals (Note: Specific functional area goals are addressed in their respective sections in this Plan and are not repeated here).*

1. *Accommodate reasonable growth, using innovative growth management techniques such as transit oriented development, traditional*

*neighborhood design, and other flexible design techniques that harmonize with and enhance the existing community and promote overall sustainability of the community.*

- 2. Maintain and protect the many residential neighborhoods that make the Township such a unique community.*
- 3. Reinforce the excellent overall business climate within the Township, with special emphasis on strategies to enrich business districts including Wayne and Garrett Hill.*
- 4. Protect existing aesthetic values and restore areas where aesthetics have been degraded through use of appropriate planning techniques and rigorous performance standards.*
- 5. Work to preserve as many remaining open spaces in the Township as possible through a full range of direct and indirect open space protection strategies.*
- 6. Work carefully to preserve the balance of land uses and ensure adequate buffering in the many critical interfaces between commercial, residential, and other different land uses.*

The dominant planning theme that has informed so much of this comprehensive planning process has been to “maintain” and “protect” and “enhance” so many different features of the Township which already exist, including overall existing patterns of land use. With the possible exception of the Wayne Business District, where some new development concepts are set forth below, Radnor Township stakeholders clamor for “business as usual.” In a strange way, the plan almost becomes a “non plan”--at least in terms of physical land use planning. Maintaining existing patterns, however, is not necessarily a simple matter. The reality is that, confronted by powerful economic and land development forces, Radnor Township with its strong and excellent markets will naturally evolve. “Business as usual,” so simple sounding, is actually much more challenging and complex to achieve than one might expect.

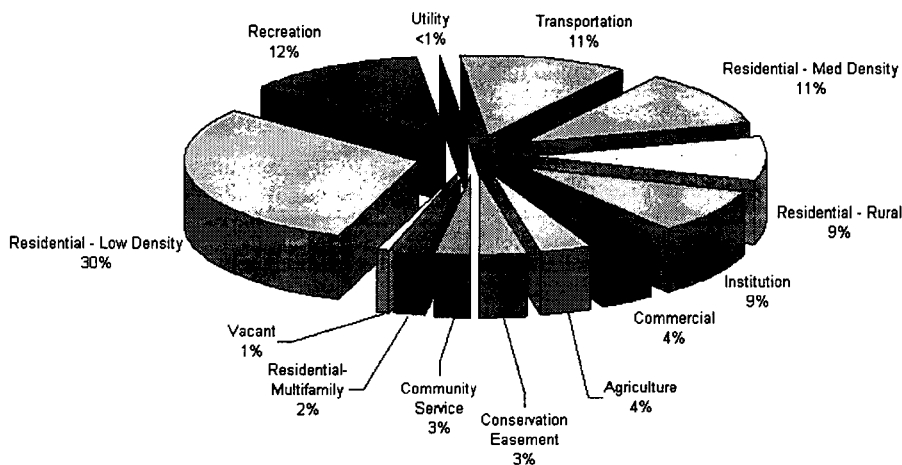
## **B. Existing Land Use**

Table 10-1 and Figure 10-1 summarize existing land use in Radnor Township, and Figure 10-2 maps these uses as of 2000. Not surprisingly, Table 10-1 indicates that the primary land use in Radnor by a wide margin is Residential Low Density (half acre to 2 acre lots). Residential Rural adds another 9 percent, with Residential Medium Density another 11 percent. In total, single-family residential uses comprise a very large 51 percent of the total area of the Township, with another 2 percent being residential Multi-Family (a total of 53 percent for all residential uses). Based on this data, it is tempting to conclude that Radnor is largely a “bedroom community.”

Obviously, there are other land uses represented as well. Beyond the Residential categories, Recreation is the next largest category, including the two large public/private golf courses and country clubs and Chanticleer (see discussion in Recreation and Open Space Section). Radnor plans to increase this considerable inventory of facilities, of which it is quite proud, as difficult and challenging (and expensive) as these additions may be. Transportation gets a surprising 11 percent (1,009 acres). Clearly the construction of I-476, the Blue Route, added substantial acreage to this category, although at the same time the Township is criss-crossed with a grid of large and small local streets and roadways. Additionally, the two major commuter rail lines also add to the Transportation land use total. The Institution use gets an inordinately large 9.0 percent (793 acres), again larger than one might expect. Villanova University, Eastern University, Cabrini College, and Valley Forge Military Academy and College make up the lion's share of this category. The Institutional Use Section discusses this land use in much greater detail. Despite losses in local real estate taxes resulting from most institutions' tax exempt status, this Institutional land use ought to be viewed as a municipal asset as well. Community Services, which includes public schools and parochial schools as well as other Community Services uses, adds another 2.5 percent (222 acres) to the total.

**Table 10-1. Existing Land Uses within Radnor Township**

Land Use	Area, Sq. Miles
Residential - Low Density	4.15
Recreation	1.71
Transportation	1.58
Residential - Med Density	1.57
Residential - Rural	1.25
Institution	1.24
Commercial	0.57
Agriculture	0.48
Conservation Easement	0.45
Community Service	0.35
Residential - Multifamily	0.33
Vacant	0.10
Utility	0.02
<b>TOTAL</b>	<b>13.80</b>



**Figure 10-1. Percentage of Land Uses within Radnor Township**

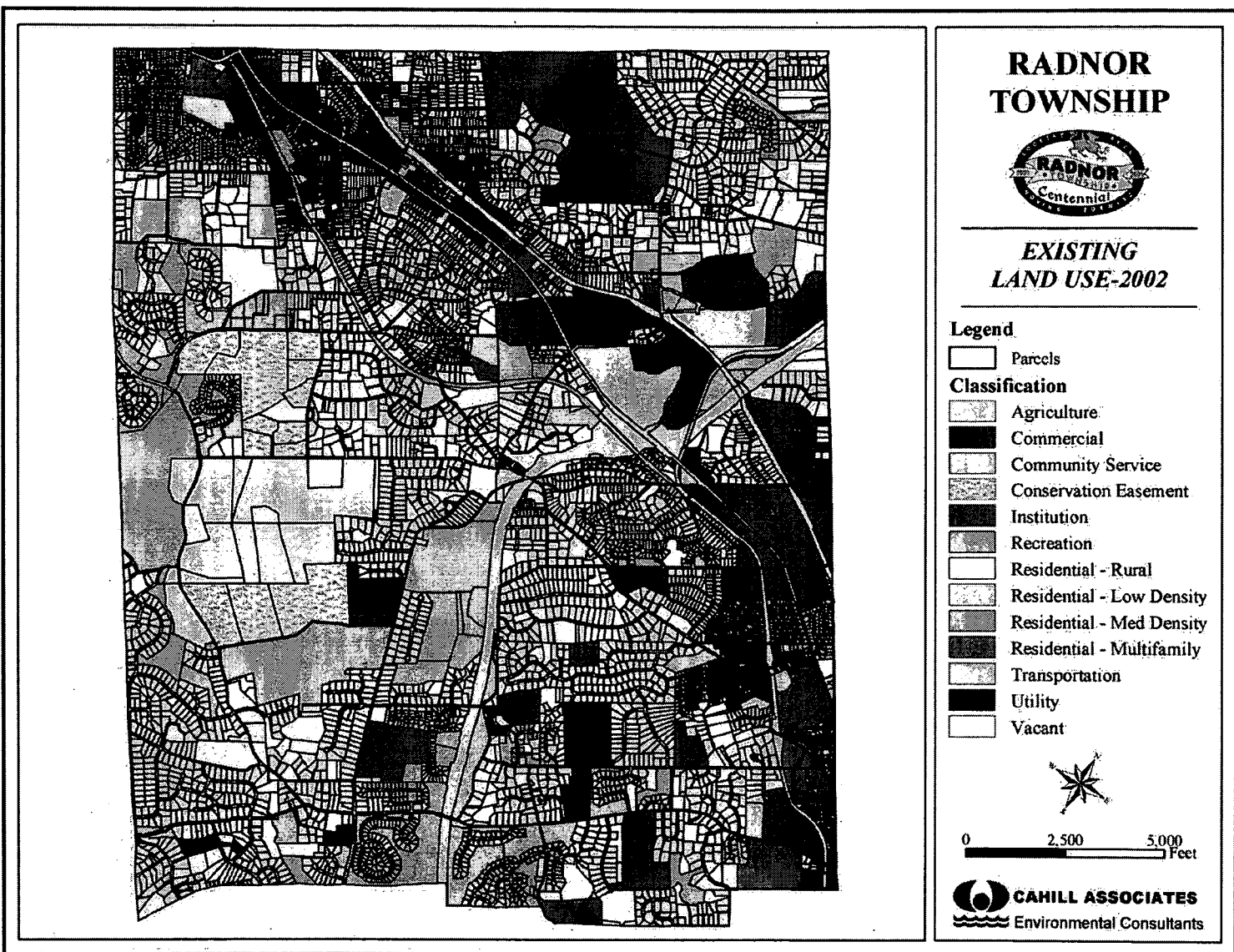


Figure 10-2. Existing Land Use Map for Radnor Township

Commercial uses account for only 4 percent (365 acres) of total land use. By most measures, this 4 percent appears to be quite modest. Perhaps most remarkably, this total comprises most all of the employment locations (i.e., businesses, large and small) located within Radnor Township. What makes the smallness of the number so remarkable is the fact that, as discussed in the Economics and Business section, Radnor is home to a relatively large number of jobs, listed as 29,450 (full-time, part-time, seasonal) by the Delaware Valley Regional Planning Commission as of Year 2000. Though many of these jobs are dispersed along the Lancaster Pike commercial retail corridor, a very large number of these jobs are extremely concentrated in the major business park(s). Given this employment count, which is projected to increase more than the residential population, calling the Township a “bedroom community” is hardly an accurate statement. Radnor is an extremely diverse and balanced community in terms of its total land use array.

Finally, it is clear from the table and figures that Radnor Township is virtually totally “developed.” Furthermore, although some new development will occur, it is not likely that there will be significant changes in the existing land use patterns in the Township. Undeveloped or Vacant land use (excluding the undeveloped land at the Ardrossan Farm, classified as Agriculture; see below) is listed as a scant 61 acres or less than 1 percent of the total land area of the Township. These few parcels, typically quite small, are dispersed and scattered about the Township, not focused in any one location. There also exist a small number of “underdeveloped” sites, where parcels are developed, typically with single-family residences, but where the parcel is large enough for some further residential subdivision. This further development may or may not occur in the future.

Given skyrocketing land prices and residential demand, a case can be made for existing owners to exploit the subdivision potential. On the other hand, many owners seem to increasingly appreciate and value undeveloped open space buffering their properties from encroaching development; these larger lots command a premium and may be viewed as a sound investment for the future such that owners are content with holding them as “undeveloped” opportunities for the future.

Agriculture, measured at 310 acres or about 4 percent of the total Township, is often construed to be Undeveloped or Vacant land; however, in this case, this cultivated land must be viewed as something of a special case. Virtually all of this Agriculture land is part of the Montgomery-Scott Family’s Ardrossan Farm estate, much of which has already been incrementally developed and converted to Conservation Easement. Currently, this large holding of an estimated 310 acres is being used as Agriculture and is in no way protected or removed from the development market. In that sense, this land might be included in the Vacant category.

In reality, the Montgomery-Scott Family itself has been undertaking various evaluations of this exceptional property which surrounds the Ardrossan Farms mansion itself. Some of these evaluations have involved Radnor Township directly, and would serve to potentially increase the inventory of Recreation and Open Space facilities in the Township. Evaluations also have involved private recreational facility development (golf course), also increasing Recreation and Open Space facilities. There is likely to be additional “mini-estate” development as well,

adding to the existing mini-estate development (Conservation Easement land uses) which already has occurred at Ardrossan.

It goes without saying that this remaining Ardrossan holding is extremely valuable and one of the most coveted sites in the Philadelphia metropolitan area. Coincident with this comprehensive planning process, intensive discussions have been occurring with Township officials and Ardrossan representatives to carefully plan and consider the future of the remaining acreage here. Although final disposition is not clear at this time, this Agriculture acreage, or the bulk of this acreage, is likely to cease to exist in the relatively near future. This change would constitute the largest single land use change in the Township.

### **1. Existing Land Use Mapping Methodology**

Land use categories themselves are important for a variety of reasons. Only ten land use categories were used in the previous 1988 Radnor Township Comprehensive Plan. For the sake of consistency, there is an advantage in making current categories used in this planning process compatible with these previous categories. DVRPC uses a different category system of 28 categories, applied in their 1995 existing land use mapping and likely to be used in their update of existing land use in the near future. Again, for the sake of consistency, making the Radnor land use category system compatible with this expanded DVRPC system would be useful for a variety of planning reasons and has been selected for application in this planning. Unfortunately, the DVRPC mapping of land use is not done by parcel, as is the case here. In addition, DVRPC uses several distinctions such as separation of parking (over 10 spaces) from the related land use which make little or no sense for Radnor Township planning.

Existing land use categories mapped include:

- **Residential**
  - Rural:  $\geq 2$  acre parcel
  - Low Density:  $\frac{1}{2}$  - 2 acre parcel
  - Medium Density:  $\leq \frac{1}{2}$  acre parcel
  - Multifamily: apartments, condominiums
- **Commercial**
  - Office parks
  - Retail, wholesale, service uses
- **Community Services**
  - Hospital, medical facilities
  - Post office
  - Library
  - Fire company
  - Senior center
  - Schools (both public and private)
  - Churches, Cemeteries
- **Institutions**

- Colleges (both public and private)
- Universities (both public and private)
- Academies
- **Utilities**
  - Power and substations
  - Transmission lines
  - Towers (when separate)
  - Water and wastewater
  - Landfills
- **Transportation**
  - Roads, streets (double lane and divided roads)
  - Municipal-owned parking lots
  - Right-of-ways (SEPTA, P&W)
- **Manufacturing**
  - Light or heavy industrial uses were NOT found in the township
- **Recreational**
  - Municipal and community parks
  - Golf courses and country clubs (both public and private)
  - Private recreation (e.g., Chanticleer)
  - Designated or restricted open space provided in developments and subdivisions
- **Military**
  - No military uses could be interpreted from aerials
- **Mining**
  - No mining uses could be interpreted from aerials
- **Agriculture**
  - Cultivated land
  - Land used to support livestock
- **Vacant**
  - All parcels with no interpretable building/structure (thereby “undeveloped”)
  - All parcels with no obvious land use category as listed above
- **Conservation Easement**
  - Ardrossan Farm “mini-estates” with easements held by the Brandywine Conservancy

Land use mapping is based on gross area of parcel or tract, including open spaces provided as part of subdivisions and land developments that have been assigned to a homeowners’ association and are mapped as some other use (presumably Recreation). There are no Wooded

or Water/Wetlands categories in the above land use category scheme. These resources will be mapped, inventoried and analyzed in the Environmental Section, and are not uses per se; tending to defy parcel boundaries.

In terms of the existing land use mapping methodology, consultants first prepared a draft existing land use map, based on DVRPC's most recent (Year 2000) air photos plus the 1995 DVRPC existing land use mapping plus the Radnor Township base map plus miscellaneous other sources. This mapping, based on parcel mapping obtained indirectly from the Delaware County Board of Assessment, is based on the predominant land use of the parcel (i.e., a 10 acre parcel with a home will be categorized as Residential Rural), unless otherwise specified.

## **2. Existing Land Use and Existing Zoning**

Existing Township zoning is shown in Figure 10-3; size and extent of zoning districts appears in Table 10-2. Obviously, the largest portion of the Township is zoned for large-lot (1-acre lot size) residential development, known as R-1. Significantly smaller portions are zoned for the higher density residential categories (a total of 6, 7 including the AC); although only 1.0 percent (66.5 acres) is devoted to PA Planned Apartment, the high maximum allowed densities allow for a considerable number of units to be accommodated and a relatively large number of residents to be housed here in a small area. A large 14.0 percent (1,244 acres) of the Township total is zoned for AC Agricultural Conservation, which is applied largely to the Ardrossan Farms parcels, as well as to the Overbrook Golf Club and Radnor Valley Country Club. PI Planned Institutional is reserved for the large number of institutions in the Township; as such, PI constitutes a surprisingly large proportion of Radnor. PLU Public Land Use is reserved for schools and municipal facilities, including parks and recreation facilities. FC Flood Plain Conservation is an overlay district intended for floodplain management.

There are six commercial zoning districts as well in Radnor. C-O Commercial Office tends to follow smaller office uses along Lancaster Pike, as does C-2 General Commercial. A small amount of C-3 Service Commercial also is tucked into the Lancaster Pike corridor. C-1 Local Commercial is reserved for Garrett Hill and Ithan and West Wayne Avenue businesses and is intended to be neighborhood-serving establishments. At the other extreme are the much large planned commercial establishments in both PB Planned Business and PLO Planned Office-Laboratory, which are largely regional in their scope (e.g., the former Wyeth facility). The need for so many different commercial districts, like the different residential districts, reflects the nature and extent of commercial uses in Radnor and the need for a sophisticated approach to managing this broad array of different types of land uses. Though some suburban municipalities may choose to exist with fewer districts, the increasing complexity of these land uses in Radnor is likely to give rise to more districts, rather than fewer districts, as discussed below, or at least to use of "overlays" on the existing districts.



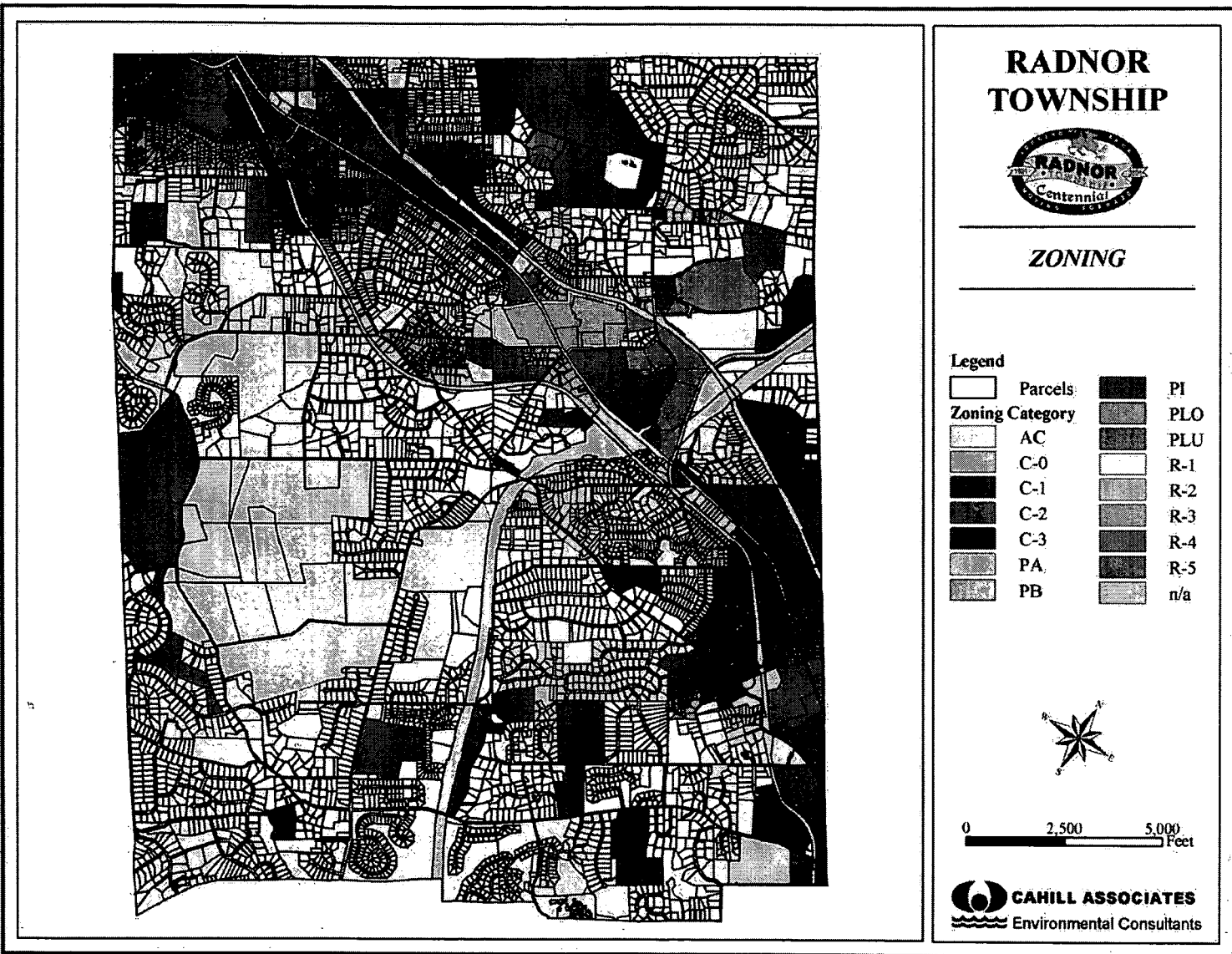


Figure 10-3. Zoning Map for Radnor Township

**Table 10-2. Percentage of Zoning Category within Radnor Township**

Zoning Code	Area, Sq. Mi.	Percentage of Twp
AC	1.94	14%
C-0	0.06	0%
C-1	0.08	1%
C-2	0.13	1%
C-3	0.03	0%
P-I	0.03	0%
PA	0.10	1%
PB	0.12	1%
PI	1.06	8%
PLO	0.20	1%
PLU	0.79	6%
R-1	5.11	37%
R-2	1.31	10%
R-3	0.42	3%
R-4	0.43	3%
R-5	0.41	3%
TRA	1.58	11%

### 3. Development Potential of Radnor Township

Development of the 61 acres of Vacant land, most of which is zoned R-1, is likely to accommodate a maximum of 50 additional homes in Radnor in the future. In fact, given the various constraints on these Vacant parcels, it is unlikely that 50 additional residences will get constructed. Of course, some demolitions and removals of existing structures also will occur on other Township parcels, allowing for some redevelopment (see Housing Section for discussion of “monster homes” redevelopment in Radnor).

The development potential of the AC acreage at Ardrossan Farms, as discussed above, is difficult to assess. Applying a maximum-zoned density calculation would make little or no sense in this case. Assuming continued development of mini-estates lots here plus other uses, a more likely calculation would be 25 to 50 additional residences. In sum, full and complete build out of the Township translates into approximately another 100 homes at the maximum.

Some additional development may also occur on those parcels which are “underdeveloped,” defined as properties that are developed but not at maximum zoned density (e.g., developed R-1 lots of 4 acres where at least 1 or 2 additional residential lots could be subdivided). Although this underdevelopment could apply to both residential and non-residential properties (i.e., there could be commercially zoned properties which could be redeveloped at higher density or intensity), the issue relates primarily to residential lots, specifically to the R-1 zoning category.

Figure 10-4 is a GIS identification of all R-1 parcels having a single residence but also having at least 2.25 acres of land area, where additional subdivision might be possible (though not proven), provided that all other Township requirements were to be satisfied (technically, a lot of 2.0 acres could be subdivided into two 1.0 acre lots; in reality, lot configuration and other constraints almost always require that some excess land area be available). These parcels are not numerous and do not provide substantial growth potential, although certainly modest

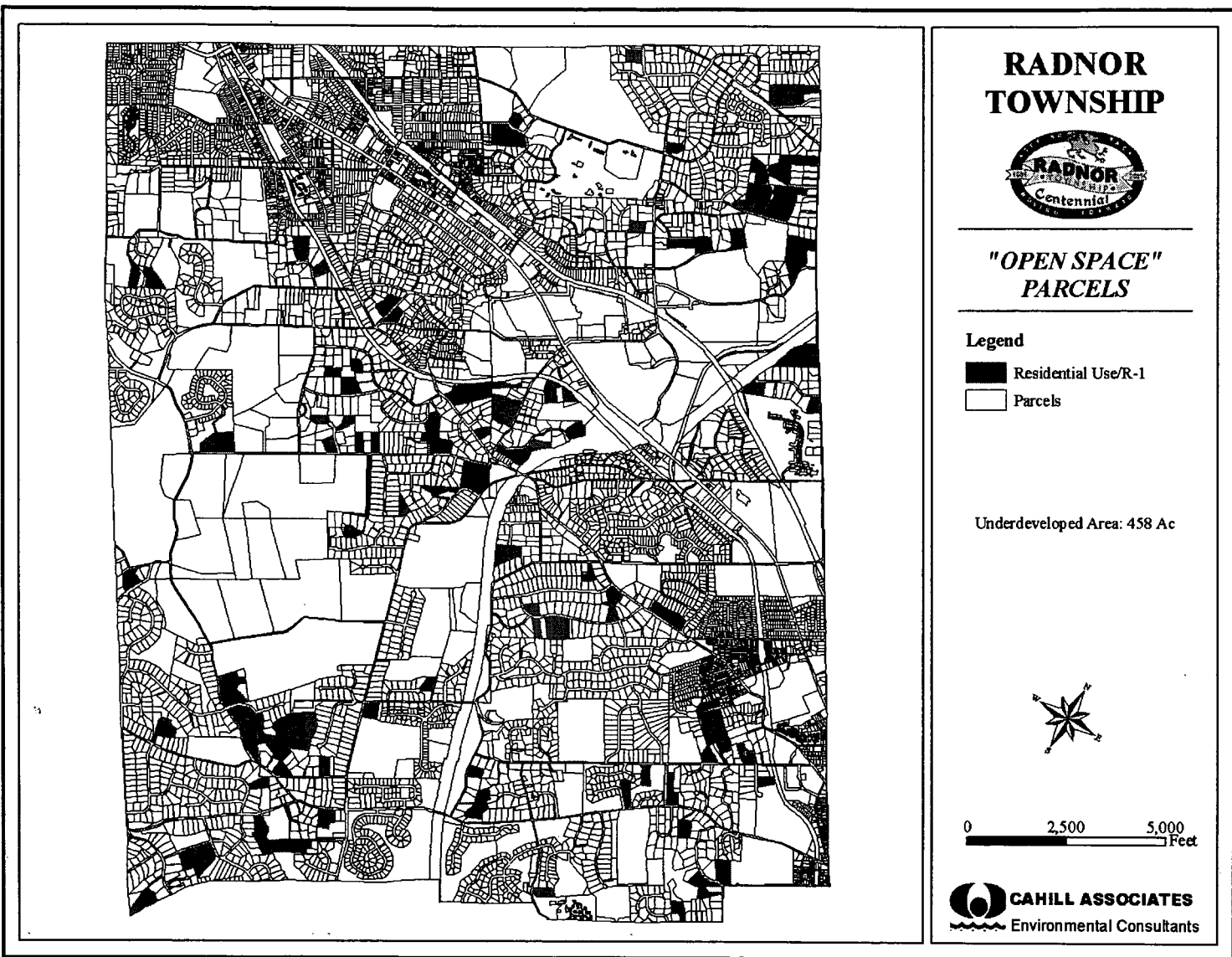


Figure 10-4. Small "Open Space" Parcels with Residential Use and R-1 Zoning

number of lots could be developed, assuming that existing and/or future owners opt to subdivide and intensify development (as stated above, a strong argument could be made in this Township that these larger lots are an excellent investment, commanding premium real estate prices, such that owners will chose to keep them open and enjoy the ever more valuable open space values which they afford).

It is worthy of note that although the larger conservancies and land trusts in the area would not be interested in negotiating conservation easements with owners of these “underdeveloped” properties, development of conservation easements to be undertaken by more local efforts (e.g., a Radnor Township Land Trust) may be quite worthwhile. In fact, many owners may be enjoying an income and tax bracket situation, which would work well with donation of conservation easements. Many owners might appreciate the notion of conserving their properties for environmental and other reasons. Furthermore, the market values of conserved properties in this upscale real estate market could continue to bring a premium, regardless of the “official” appraisal results.

### **C. Land Use and Planning Issues in Adjacent Municipalities**

Radnor Township shares its border with seven municipalities in three counties: Easttown and Tredyffrin Townships in Chester County; Haverford, Marple, and Newtown Townships in Delaware County; and Lower Merion and a very small section of Upper Merion Townships in Montgomery County. Each municipality has its own planning program and schedule for undertaking significant planning efforts, as well an internal process for ordinance review and update. Radnor Township and its neighbors are essentially all well-developed “mature” Townships and are relatively close to being “built out.” The majority of land uses span Township boundaries and indeed blend “into each neighboring municipality such that township borders are largely imperceptible. This blending of land uses holds especially true for residential and commercial land uses. On the other hand, because so many Recreation and Institutional uses are either directly or indirectly a function of their municipality, these uses are typically contained within specific municipalities. Recreational uses including The Willows and Skunk Hollow Park in the western portion of the Township are township-managed and owned, so would obviously not extend into adjacent Newtown Township. In terms of Institutional land use, Villanova University historically has been situated within Radnor Township; Villanova’s property line is aligned with the Township boundary line. In some cases, Institutional land use in Radnor Township abuts Residential land use in Lower Merion Township; nevertheless, these changes in land use do not constitute significant conflicts in existing land use patterns, with a few exceptions (see discussion above in the Institutional Land Use section). In some cases, especially where and when special events such as regionally popular athletic events do occur at the various institutions, conflicts become more apparent and require special planning accommodations.

The Pennsylvania Municipalities Planning Code (MPC) specifies that all municipal comprehensive plans shall include:

*A statement indicating that the existing and proposed development of the municipality is compatible with the existing and proposed development and plans in contiguous*

*municipalities, or a statement indicating measures which have been taken to provide buffers or other transitional devices between disparate uses, and a statement indicating that the existing and proposed development of the municipality is generally consistent with the objectives and plans of the county comprehensive plan. (Article III Comprehensive Plan)*

The comprehensive plans of Radnor's "neighbors" have been consulted and reviewed; the recommendation of this particular section as well as the recommendations appearing throughout this Plan are compatible with plans of neighboring municipalities which have been reviewed, as is the case with planning ongoing by Delaware County. Special attention has been paid to compatibility with PADCNR's recently released Draft River Conservation Plan for the Darby Creek Watershed (also being prepared by consultant, Cahill Associates).

In terms of the MPC, recently added provisions promote "multimunicipal planning" and "joint zoning" with a variety of new provisions requiring "intergovernmental cooperative planning and implementation agreements." All of these more areawide approaches to planning are available to Radnor and its neighbors. These options have not been utilized in this planning process, in many respects because of the size and complexity of the existing municipalities, coupled with the relative maturity of the development patterns which already exist. The fact that three different counties are involved also complicates any "multimunicipal" and/or "joint" planning efforts.

Below is a summary of the status of planning within adjacent municipalities, as well as a brief comparison between existing land uses and future land uses for that area near the Radnor Township borders.

#### Planning Status of Adjacent Municipalities

*\* Indicates no update planned as of October 2002*

**Easttown** Comprehensive Plan, June 2001  
Zoning, 1997 as Amended  
Subdivision and Land Development Ordinance 1998, Updated  
*Existing Land Use:* The land use on the Radnor side of Easttown Township is primarily residential, matching the existing land uses along the Easttown side of the boundary. No conflicts are apparent with existing uses.  
*Comprehensive Plan:* Easttown Township's Future Land Use map shows the entire boundary area with Radnor Township mapped as Low Density Residential. Again, no conflicts exist with the Radnor Township Existing Land Use Map, which also has the shared boundary classified as Residential.

**Tredyffrin** Comprehensive Plan, 1987  
Open Space, Recreation, and Env'r. Resources Plan, Draft 1992  
Zoning, Amended 1979  
Subdivision/Land Development Regulations, Ch. 181, July 1998  
*Existing Land Use:* Tredyffrin Township shares the entire northern boundary with Radnor Township, including an area within the Route 30 commercial district. Uses are

consistent along township lines, with Residential matching Residential, Commercial matching Commercial, and private Recreation matching Private Institution.

*Comprehensive Plan:* Both municipal plans are consistent, with Tredyffrin classifying the Route 30 Devon-Strafford Area as a “Special Development District” whereby special guidelines and procedures are recommended to be developed to enhance the renewal and reuse potential of the area. Generally, this seems to be quite consistent with the Route 30 corridor commercial designations in Radnor, as well as the concept plan for the Wayne Business District as set forth above. Tredyffrin planning is striving to enhance the Lancaster Avenue commercial corridor, consistent with this Plan.

**Haverford** Comprehensive Plan, 1988 (Volume I and II)  
Zoning, Chapter 182, 1974 as Amended to Current  
Subdivision/Land Development, As Amended to Current

*Existing Land Use:* Land uses along the Haverford - Radnor boundaries are similar. Residential use dominates the existing conditions, with Institutional and Residential sometimes falling in adjacent areas. There are no inconsistencies with existing land uses between township lines.

*Comprehensive Plan:* Both Plans are consistent and no major conflicts are evident. The Haverford Future Land Use Plan generally recommends the continuation of existing (1988) uses for those neighborhoods adjacent to the Radnor Township border. It is unknown at time of writing whether Haverford Township intends to update the Comprehensive Plan, but given the age it is likely.

**Marple** Comprehensive Plan, April 1991  
Zoning, Amended May 1998

*Existing Land Use:* The small area that Radnor and Marple Townships share is currently residential use which blends across township lines.

*Comprehensive Plan:* The Future Land Use Plan for Marple Township, at the border with Radnor Township, maintains the existing residential land uses.

**Newtown** Comprehensive Plan, Draft October 2001  
Zoning Ordinance  
Subdivision/Land Development Regulations, 1995

*Existing Land Use:* Newtown Township includes a large portion of Radnor’s western boundary line, and both townships share a large portion of the Darby Creek Watershed. Residential uses coincide along township lines, and as expected, Institutional use in Newtown does not extend into Radnor.

*Comprehensive Plan:* Areas in Newtown that are labeled “Permanent Open Space” coincide with the Radnor Township parks that are Open Space/Recreation Features, specifically the Willows and Skunk Hollow Park. Additional shared land along Township boundaries is represented in both Plans to remain in low density residential use.

**Lower Merion** Comprehensive Plan, 1979 (Volume I and II)\*  
Park and Recreation Plan, 1996  
Zoning Ordinance, Chapter 155, 2000

Subdivision/Land Development, Chapter 135, 1998

*Existing Land Use:* The land use patterns along the Radnor – Lower Merion Township borders are consistent. The majority of the land use is Residential, with the Route 30/Bryn Mawr area in Commercial use, as expected. No major conflicts exist.

*Comprehensive Plan:* The Comprehensive Plan dates from 1979, and no update is scheduled. In addition to the documents listed here, the Township has also produced an Open Space and Environmental Resource Protection Plan, a Scenic Road Corridor and Viewshed Analysis, and a Lower Merion Township Natural Areas Study, which have not been reviewed for this report. The existing Comprehensive Plan is dated and is likely to be superseded by these various other official and unofficial planning documents.

A special comment is in order regarding the rather dramatic master planning currently underway by the Bryn Mawr Hospital in Lower Merion. Given the nature and extent of this facility planning, proposed uses may affect nearby Radnor Township neighborhoods. Consequently, Radnor should contact Lower Merion and amicably request that it have an opportunity to review and comment on this major planning action.

It should be noted that the above comments relating to “multimunicipal planning” notwithstanding, the Radnor’s Lancaster Avenue commercial area to the west of the Wayne Business District (discussed below) could benefit substantially from coordinating efforts with neighboring Tredyffrin which has also indicated an interest in improving the planning in its portion of this commercial strip. Because these commercial areas are indistinguishable in so many ways and function to some extent as a unit and because this planning process has not had the resources to devote to detailed study of the issues surrounding this particular commercial area, joint planning efforts for this specific area would make sense. Although the nature and extent of these joint efforts is not at all clear, effort should be made to initiate dialogue with Tredyffrin and explore potential coordinated planning efforts for this commercial area.

**D. The Radnor Township Land Use Plan: Recommended Actions**

**1. Introduction**

In terms of physical land use and future planning, the discussion thus far indicates that there is little opportunity for land use change, given the paucity of vacant land in the Township. Some re-development may occur, as has been discussed in the Housing Section and other sections, in some cases changing land use or at least intensifying existing land uses. In sum, a case could be made that there is relatively little to say in terms of a conventional Future Land Use Plan.

There are at least two major exceptions to this quick summation—two areas where physical planning is critical for the future of Radnor Township. First, intensive effort has been devoted in this planning process to a physical land use plan on a conceptual level for the Wayne Business District. This Business District planning, discussed below, builds on the Recommended Actions set forth in the Business and Economics Section, as well as recommendations from a variety of other functional areas.

The theme, Making Wayne's Great Business Even Better: Gateways and Greens, Pedestrians and Promenades, Parking and Stormwater Infrastructure, is interdisciplinary in scope, integrating landscape and design, aesthetics and quality of life, economics and business, and a variety of environmental objectives into a set of conceptual recommendations intended to make one of Pennsylvania's wonderful towns increasingly robust and successful. Given the existing success of so much of Wayne, the temptation is to sit back, its problems notwithstanding, and do nothing. This Comprehensive Plan argues for proactive intervention by both public and private sectors to achieve the vision of the best Wayne possible.

The second physical land use imperative to emerge from this comprehensive planning process relates to Radnor's neighborhoods. This element of comprehensive planning is less physically defined than that for the Business District. In fact, the focus during planning has been to take the first step of simply defining the neighborhoods that evoke such positive and passionate reactions. The bulk of these neighborhoods are residential in character, though the commercial enclaves of Garrett Hill and Ithan and elsewhere are critical to neighborhood life in many respects and need to be supported (though at the same time not expanded; a delicate balance). Recreational facilities are critical in many cases; existing institutional uses are critical as well.

In the section below, these neighborhoods are physically sketched and mapped. This mapping is intended to be preliminary in nature and to provide a springboard for broader neighborhood programming in the Township. In some cases, neighborhoods like South Wayne and North Wayne, are already well defined and have well-developed neighborhood organizations representing their interests. In other cases, neighborhoods are much more amorphous and lacking in definition. Other neighborhoods, such as those represented by the newer Bryn Rose Civic Association, fall somewhere in between. Recommended Actions, at least those that are physical in nature, will vary by neighborhood and will evolve over time, especially for those neighborhoods, which are in the early stages of formation. Again, the overall goal is neighborhood conservation.

A sub-text to this theme of neighborhood conservation is working to ensure the continuing vibrancy of the neighborhoods, which comprise Radnor Township. Although the exact mechanisms and planning actions, which may evolve to support this program, both public and private, are not clear and have not been identified in this Comprehensive Plan, additional management actions may be forthcoming in the future. As discussed in the housing section, concern exists that real estate market pressures will increase re-development of existing homes, possibly with much larger homes or even with more houses, all within the existing zoning and other relevant codes. Concern exists that success of commercial uses will lead to expansion of commercial uses, encroaching into immediately adjacent residential neighborhoods. Conservation of neighborhoods means maintaining the sometimes delicate balance between mixes of uses, often in remarkably close proximity. Careful buffering is essential. And although Radnor has already worked to make its codes and ordinances address many of these issues, the challenges remain and are even intensifying. More intensive consideration must be given to these vital neighborhood "compatibility" issues. In both cases, from the Wayne Business District to Radnor neighborhood conservation, the overriding goal is to build on the significant strengths that already define the Radnor community. In so doing, the Comprehensive Plan can and should help to make this great community even better.



## **2. The Vision Plan for the Wayne Business District: Recommended Actions**

A variety of concepts – Vision Plan elements – contribute to the Making Wayne's Great Business Even Better: Gateways and Greens, Pedestrians and Promenades, Parking and Stormwater theme for the Wayne Business District (Figure 10-5). All of these vision elements need to be fleshed out in more detail and evaluated for their feasibility. Some elements may work; some may not. Some may need to be modified. Some may be able to move forward relatively quickly; some may have to be deferred for some time. The objective is to set forth these concepts in the Comprehensive Plan to guide public and private actions in the future. Some actions, such as the School Board's decision on location of the new Middle School and disposition of the existing Middle School, may be major and immediate. Some may be more subtle and long-term.

The Wayne Vision concept features creation of several **Town Commons areas**, a concept which emerged from Focus Group discussions. Town Commons areas are intended to provide community focus, a sense of public space and definition, which for the most part does not exist at the present time. These Town Commons areas would be intended to be high activity meeting areas, focused on "people use," with both considerable landscaping as well as design enhancement features (lighting standards, outdoor furniture, possibly sculpture, etc.). They are intended to be defining meeting locations. Town Commons areas would function to provide aesthetic enhancement through additional landscaping and street trees and other improvements, as well as provide facilities for pedestrians. Finally, Town Commons areas might also be able to incorporate some environmentally-friendly stormwater management opportunities (see below).

This Plan recommends a Town Commons area in the vicinity of the existing Middle School site on South Wayne Avenue; the Commons could "open up" (or daylight) the enclosed and buried Ithan Creek tributary. This Plan also recommends a Town Commons area at the southwest quadrant of the Lancaster Pike and Wayne Avenue intersection, extending from the intersection and westward, unifying the strip of open areas in front of the bank, church, and Old Library facilities. The Plan envisions a smaller Town Commons area to be integrated into the existing North Wayne Avenue parking lot, converting an existing alley just to the south of 121 North Wayne Avenue into a landscaped "mini-Green;" this concept could be integrated with a reduced width parking area just to the south of the Ritz Building, adding another "mini-Green" but holding parking spaces constant. The Town Commons here would be coordinated with other proposed concepts for North Wayne Avenue, including a new mid-block crossing on North Wayne Avenue.

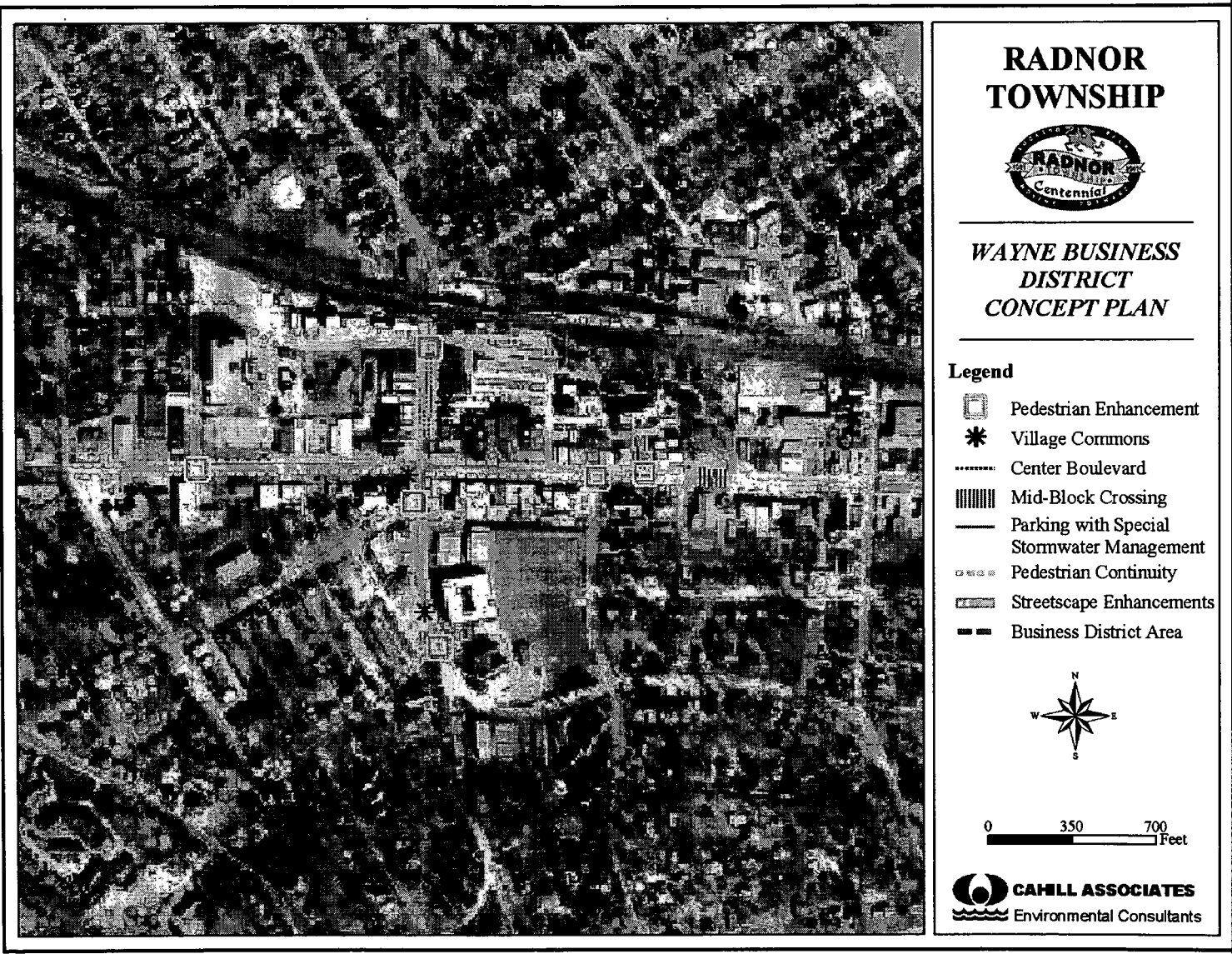


Figure 10-5. Wayne Business District Concept Plan

**Pedestrians:** Wayne Vision Plan elements include eight nodes of Pedestrian Enhancements/Crossings at strategic locations along Lancaster and Wayne Avenues, plus continuous Pedestrian Continuity improvements along Lancaster and Wayne Avenues. Pedestrian Enhancements include a variety of features: bump outs, resurfacing, elevated walkways, signalization, landscaping, special street furniture and signage, special lighting in order to accommodate pedestrian traffic with greater ease and comfort. These are placed at locations of greatest perceived need. This Plan proposes special mid-block crossings of Lancaster Avenue (both West in the area of Anthropologie and East in the area of Wayne Presbyterian Church Lancaster Avenues) in order to get people back and forth across this busy highway safely. In addition, a variety of Pedestrian Continuity improvements are envisioned: reconstruction of sidewalks with consistent surfacing and texturing and landscaping to integrate the walking experience, eliminating the frequent changes in grade and sidewalk widths, and so forth. Town Commons, as described above, will provide focused destination points for pedestrians (i.e., places to sit, gather, socialize, etc.). In general, efforts should be made to further buffer pedestrians from the intense traffic movement along Lancaster Avenue, as well as along the busier roadways such as North and South Wayne Avenues (see Landscape Islands/Aisles and Allee and Promenade below), as has been accomplished along West Lancaster Avenue at the recent AT&T parking lot project with its additional landscape buffer.

**Landscape Islands/Aisles** are proposed for the northwest side of Lancaster Avenue and for the northeast side of Lancaster Avenue (east of the Wayne Hotel), where the existing extra depths will allow parking to be brought out to the street, thereby gaining a strip of about an additional 10 feet between the end of parking and the sidewalk. This additional strip should be planted to further separate and buffer the sidewalk from the Lancaster Avenue traffic. Gaining approval from PennDOT for this proposed change will be challenging but should be feasible; the West Lancaster Avenue section is made especially feasible by the “defense” provided by the long traffic light delays at the Lancaster Avenue and Wayne Avenue intersection, allowing angled parkers along West Lancaster Avenue to exit by backing into Lancaster Avenue safely. These changes can be accommodated without any reduction in existing parking spaces.

Additionally, along the northeastern side of Lancaster Pike, to the west of the Waynewood intersection and in front of the Wayne Hotel is an existing deceleration lane which does not function and which could be integrated into enhanced greenway/pedestrian way/stormwater system, blending into the next block to the west in front of the Wayne Presbyterian Church, with the proposed mid block pedestrian crossing as the defining point. This could be accomplished through addition of a bulb on the northeast corner of Waynewood. Every effort should be made to accomplish traffic calming objectives through landscaping treatments in Wayne, as well as elsewhere in Radnor.

**Parking:** The extent of parking problem in Wayne is very much a function of how one defines “problem.” To the extent that upscale shoppers expect to locate parking immediately in front of their intended destinations, problems do exist; the general sense is that these problems peak during the business week lunch hour. On the other hand, recent parking studies by McMahon Associates and Pennoni Engineers, though partial in their focus, do not conclude that there are serious existing parking shortages and do not argue for addition of major new parking lots or garages at least in the immediate future.

Clearly, every opportunity to add parking spaces distributed throughout the Wayne business district should be explored and exploited (within reason). Extreme care should be taken in all Wayne planning to maintain the existing inventory of parking spaces maximally distributed east and west, north and south. In fact, a high priority in all planning should be incremental “squeezing” in of additional parking spaces where practicable; preliminary investigations indicate that these opportunities do exist and could provide a short-term solution to parking needs, likely at lesser expense than any parking structure. Furthermore, a key concept here is distribution of spaces throughout the business district, an objective which is very hard to accomplish with a large parking structure located by definition in one location. In addition, a parking opportunity may also exist along School Lane which runs parallel to Lancaster Avenue, just to the south; feasibility of partially decked/structured pull-in parking along School Lane may be a very cost effective way to provide a number of additional parking spaces in this general area, potentially serving both local retail along Lancaster Pike as well as the public and civic uses located in the South Wayne Avenue area.

A certain number of the existing parking spaces in Wayne (either along the street or in the existing parking lots) are occupied by employees of any of the existing public and private uses/business establishments in and around Wayne. A way to increase available parking expressly for shoppers in the highest intensity retail locations experiencing the greatest perceived shortages would be to investigate these parking pattern realities and determine if some sort of centrally located parking facility would be able to siphon off employee cars (offered on a monthly or longer term basis), thereby freeing up existing street spaces for shorter term shoppers. The new multi-story parking garage in West Chester Borough provides a cost effective parking solution in an historically and aesthetically sophisticated manner. In the longer term, this type of facility might be useful in solving the future parking needs of Wayne as well.

**The Allee and Promenade:** Perhaps the most daring element of the Wayne Vision is a concept proposed for North Wayne Avenue, where a European-inspired allee is envisioned for this unusually broad section of roadway, applying traffic calming concepts to the maximum. For the bulk of the road length, North Wayne would become two separated one-way traffic lanes, north and south, with a planted landscaped/tree lined pedestrian strip in the middle (far more than a mere median), possibly including seasonal uses such as kiosks, outdoors cafes, and the like. Parallel parking on both sides of the one-way lanes would be possible (in other words, four lanes of parallel parking) and could be accommodated, given the significant width of the total roadway here. Such a concept would have a dramatic effect on the North Wayne users, both in car and on foot, dramatically improving its quality (and profitability) and giving it a decidedly people orientation. The intent would be to significantly increase pedestrian activity in all but the most inhospitable of days, comparable to European town settings. The roadway would require two southbound lanes as it approached the Lancaster Avenue intersection, for a total of three lane widths. There would also be added a mid block pedestrian crossing along North Wayne, allowing car access into the existing parking lot on the east side of North Wayne; a mini-Town Commons area is also proposed on this east side. The Township should contact PennDOT to discuss the feasibility of this and other proposed pedestrian crossings.

An alternative, easier to implement variation of this concept would be to continue the angled parking on both sides of North Wayne, rather than the parallel parking, with the special uses in the median area. An even less dramatic variation would be eliminating the central alley and locating the landscaped strips along both the east and west sides of the street, between the shops and the parking, still a significant improvement over the existing configuration. The point is that there are many different variations which need to be explored in more detail, virtually all of which would add an exciting new dimension to the Wayne shopping experience. It should be noted that ongoing and committed short-range lighting and traffic lighting projects also should be reviewed as soon as possible to coordinate with this longer-term alley and promenade concept. Financing will be important; creative financing, as has occurred at the existing AT&T parking lot with parking space rental fees being directed into Radnor Community Enhancement Trust Fund for eventual improvements, all need to be explored. In sum, these concepts need to be examined in more detail without delay. North Wayne Avenue offers exciting potential and deserves immediate attention.

**Louella Court and Other Special Uses:** Louella Court is an unrealized retail opportunity. The excessively wide opening onto Lancaster Pike should be redesigned with attractive landscaping and street furniture, constricted and narrowed, extending into the existing median mini-park. Parking should be preserved, with sidewalk areas improved with landscaping and street furniture. A pedestrian crossing to the south side of Lancaster Avenue should be evaluated here, adding to the activity at Louella Court. To the east and west of this Louella Court location, reconfiguration of parking along Lancaster Avenue with the addition of Landscape Islands or Aisles is proposed (see above). Farther to the east on Lancaster Pike is an existing gas station which is a major re-use opportunity given its large size. An appropriate town/village-scale commercial retail use or series of uses should be incorporated consistent with the Wayne vision performance standards, with residential uses on upper floors and parking in the rear.

**Wayne Business District Gateways:** Highlighting the entrance to Wayne on Lancaster Pike, both on the east (Aberdeen) and on the west (Bloomingdale) is critical for a variety of reasons. Such “gateways” must accomplish several objectives, including automatic deceleration and traffic calming, in addition to announcing one’s arrival at a very special shopping experience. How this announcement can most effectively occur is not clear. Perhaps sculpture could be used, or a gateway developed which spans Lancaster Pike. Gateways which are much more conspicuous and visually appealing to both the pedestrian and the auto user must be incorporated into the Wayne plan.

**Stormwater:** Virtually all of these visioning elements have important stormwater elements by design (a further subtext of the visioning might be “...people, plants, and precipitation...”). Separate stormwater studies have been undertaken by Township consultants, Cahill Associates, demonstrating the serious stormwater problems, in terms of both quantity and quality, which exist in the Wayne Business District’s Ithan Creek headwater areas. A severe need has emerged to better manage peak stormwater rates, total volume of stormwater, and stormwater quality in this very highly disturbed and altered landscape where natural hydrology has been dramatically impacted. The worst-case stormwater (and stream) reality is reflected in the

extent of streams which are totally enclosed and buried and desperately need to be “daylighted” in this Wayne area.

To achieve these stormwater objectives, the proposed Town Commons would be designed with subsurface stormwater infiltration systems, “feeding” the new landscaping and overflowing into the groundwater. The Promenade should be similarly designed, as should all of the Landscaped Islands/Aisles along Lancaster Avenue; although stormwater volume reduction would not be great in any one of these locations, the combined volume and peaking effects would have a significant flood reduction impact on the downstream Middle School and other existing flood problem locations. All of these stormwater provisions would serve to reduce nonpoint source pollutant loadings as well.

**General Action Elements:** Finally, some general and specific comments need to be made relating to Wayne visioning. This Plan concludes that the Middle School should remain in Wayne for a number of important Comprehensive Planning reasons. The Middle School is important to the Wayne Business District and broader Wayne community, as are our churches, our Post Office and Fire Department, our Library, and the many special services, facilities, and institutions which define life in this very special town center. The Middle School reinforces residential and commercial vitality which makes Wayne such a special place. The School and Business District complement one another in a variety of mutually supportive ways, with the positive effects of the School extending beyond the Business District itself into the surrounding tightly-knit dense and compact residential neighborhoods. As a catalyst for many of the activities that are so essential for the life of the town, the Middle School complements the Village-like atmosphere and promotes walking through the downtown area where shoppers are served by an ever-widening and diverse group of retailers.

The conclusion reached in the previous paragraph is based solely on comprehensive planning factors. While these comprehensive planning factors should be considered in any decision relating to the relocation of the Middle School, it is not within the scope of this Plan to determine their specific interplay with the equally important educational and site-specific planning factors relating to this decision. However, should the School Board determine that the Middle School is to be relocated, the School site should be used for institutional/community purposes and should not be converted to commercial, office or residential uses, for all of the reasons stated above. The site must continue in some civic-related function.

Additionally, the abandoned gas station on the south side of Lancaster Avenue (across from Anthropologie and the old hardware store) should be razed with the pie-shaped lot used for parking for the adjacent building and the remainder of the site “greened” (a possible stormwater opportunity). Although the existing Wayne post office function should continue, the distribution center function should be relocated, thereby freeing up needed spaces.

Secondly and more generally, mixing uses and promoting residential uses on the upper floors of commercial and retail uses and on other available land in the heart of the business district seems like an excellent way to provide some additional housing which is so desperately needed, as well as support retail and commercial uses even more. More and better street furniture, improved and more attractive lighting, general enhancement of the pedestrian

environment (better surfacing and aesthetic treatment), buffering of sidewalks from street traffic (such as has been accomplished at the recent reconstruction of the AT&T Building parking lot); keeping stores and store windows attractive and protected along the streetscape, and taking advantage of every possible “pocket park” and “pocket parking” opportunity are all part of the planning vision.

Thirdly, although Wayne enjoys wonderful rail system access which should be preserved, at the same time Township representatives have argued against encouraging expansion of commuter parking facilities and the functioning of the Wayne Station as a regional commuter facility, attracting additional non-Radnor commuters. There already exist more parking spaces at this location than anywhere else in Wayne; with the exception of the need for parking adjacent to the Middle School use, parking must be broadly distributed.

Finally, an overlay district should be defined and developed, in order to implement this Wayne Vision. A set of performance standards should be developed as the first step in developing this overlay in the zoning ordinance. These performance standards should be far-reaching, expansive, and complex. They will not be easily established, and agreement will be difficult to achieve. Of special interest is better and more aesthetically pleasing façade lighting, as well as allowance for outdoor seasonal dining, where appropriate. Signage should be used for the utmost beneficial effects aesthetically, helping to unify this Wayne Vision. The most effective mechanism to impose and enforce these standards needs to be evaluated. In all likelihood, the standards should be imposed through an overlay-zoning district. However, all options should be considered.

### **3. Planning for Radnor Township Neighborhood Conservation: Recommended Actions**

As stated above, conservation of Radnor’s neighborhoods is the second physical land use “imperative” to emerge from this comprehensive planning process. This element of comprehensive planning is less physically defined than that for the Wayne Business District, as discussed above. In fact, the focus during this planning process has been to take the first initial step of simply defining the neighborhoods that evoke such positive and passionate reactions in Radnor residents. The bulk of these neighborhoods are residential in character, though the commercial enclaves of Wayne and Garrett Hill and Ithan are critical to neighborhood life in many respects and need to be supported (though once again not expanded). Recreational facilities are critical in many cases to this neighborhood definition; existing institutional uses are critical as well.

In the section below, these neighborhoods are physically sketched and mapped. This mapping is intended to be preliminary in nature and to provide a springboard for broader neighborhood programming in the Township in coming months and years. In some cases, neighborhoods like South Wayne and North Wayne, are already well defined and have well-developed neighborhood organizations representing their interests. In other cases, neighborhoods are much more amorphous and lacking in definition. Recommended Actions, at least those that are physical in nature, will vary by neighborhood and will evolve over time, especially for those neighborhoods which are in the early stages of formation. Again, the goal is neighborhood conservation.

Neighborhoods have been developed here based on analysis conducted during a special Neighborhood Workshop, held at Radnor Township, February 2, 2002. The well-attended event first heard preliminary remarks by the consultants relating to defining neighborhoods; four breakout groups, defined by Township quadrant (roughly, northwest, northeast, southwest, southeast) then were distributed with maps to undertake preliminary neighborhood mapping. Participants were instructed that the goal of this Workshop was to target only those specific neighborhoods with the most distinctly definable physical characteristics, again in anticipation of developing ways to better manage these physical features through comprehensive planning and zoning and other forms of municipal management. The point was stressed that many other neighborhoods, many wonderful and worthwhile neighborhoods, certainly might exist in Radnor and should not feel slighted if they have not been identified during the course of the Workshop. Notes of these sessions are included in Appendix A; these notes include a considerable amount of valuable information relating to neighborhood definition and should be valuable in the identification of those next steps to be taken to better manage neighborhood values in Radnor.

#### **Methodology for Neighborhood Identification**

Participants were given an overall structure to be addressed in the neighborhood identification process:

1. **Name the Neighborhood:** List first choice and second choice names
2. **Locate the Neighborhood(s):** Using the detailed 2000 photomaps and markers provided, pencil neighborhood limits in first. Use streets and whatever other boundaries you feel are appropriate. If there is disagreement, try to come to consensus; otherwise, show alternative lines if necessary. After completing Task 3, you will come back to this and confirm.
3. **Describe the Neighborhood:** How is this Neighborhood defined physically? This is the most ambitious task. We are setting out “measures” below to get you started. But you may have other measures that you feel are important. If you all draw a blank and nothing comes to mind as you move down the list, move on. The point is to get you neighborhood experts to move through the list and decide what is important/what isn’t, what means something here, and what doesn’t. Admittedly, some of this may be frustratingly “approximate.” But do your best. We’re shooting for a “typical.”
4. **Quantitative Indicators:** Try to answer the following:
  - Average (typical) lot size?
  - Average building coverage?
  - Average impervious/paved coverage?
  - Average height/number of stories?
  - Upper story setbacks?
  - Total mass or volume or floor area?
  - Yard setbacks?
  - Front, Side, and Rear?



- Out buildings or garages (Extant? Location? Size? Configuration? Treatment?)
- Neighborhood Consistency or Regularity?
- Age or history?

**5. Qualitative Indicators:** Try to answer the following:

- Definable Architectural Style or Design?
- Coloring?
- Textures, Surfacing, Building Materials?
- Roofline and Eaves (Style, Slope, Other Characteristics)?
- Special Features: Towers, Turrets, Gables, Shutters, Other?
- Windows (Size, Configuration, Shape, etc.)
- Porches, Entry (Scale, Style, Configuration, etc.)?
- Landscaping Elements?

**6. Review/Confirm Neighborhood Location:** Based on neighborhood definition work, go back to the location boundaries and make sure you are comfortable with your neighborhood location line.

The Township was split into four quadrants according to geography. The following Radnor Township neighborhoods have emerged (Figure 10-6), listed below by Township quad:

**1. Southwest Area**

- Ithan Creek Valley Neighborhood
- Darby Creek Valley Neighborhood

**2. Northwest Area**

- West Wayne
- Ithan

**3. Northeast Area**

- North Wayne Village
- South Wayne Village
- Additional Northeast Neighborhoods to be Added

**4. Southeast Area**

- Aldwyn Lane
- Ashwood Manor
- Conestoga Village/Black Friar/Oak Terrace
- Garrett Hill
- Glenbrook

What has emerged with great clarity as the result of this planning process and planning workshop activity is that neighborhoods are extremely important to Radnor residents. Although there may be some dispute in terms of exactly where to draw the boundary lines and where one neighborhood stops and another starts, Radnor residents feel very strongly about where they live. Protecting and conserving these neighborhood values, whatever they might be and however they might be defined, therefore should be taken quite seriously by planners.

As stated earlier, this is the first step in neighborhood planning. Figure 10-6 should be viewed as a draft map. The Township should consider sponsoring a follow-up neighborhood workshop to accomplish several important objectives:

- Confirmation of Neighborhood Values
- Identification of Neighborhood Threats
- Public and Private Neighborhood Conservation Opportunities

Based on this refinement and expansion, meaningful planning steps can then be developed.

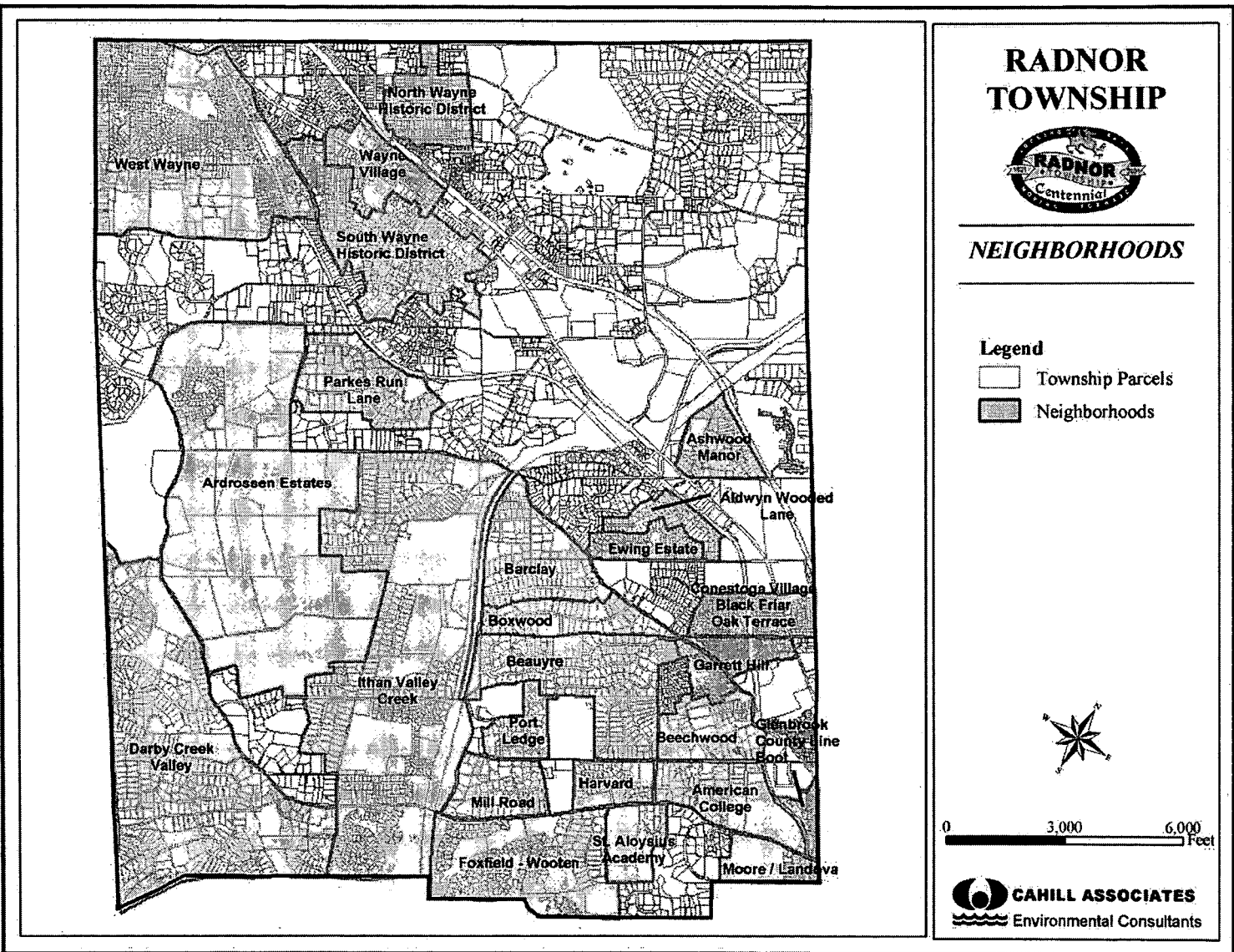


Figure 10-6. Neighborhoods located within Radnor Township (DRAFT)

#### **4. Recommended Actions**

This final section on land use is treated and formatted in a somewhat different manner than the other sections of the Plan. The overarching Goal is repeated below, together with Objectives. Two major Recommended Actions are listed as the major implementing actions for land use. These Recommended Actions are described in much greater detail in the text sections above, both in terms of the plan concepts for the Wayne Business District as well as an expanded action program for conservation of Radnor's neighborhoods. These text sections should be consulted for those interested in additional detail.

#### **Goal**

***Mission of the Comprehensive Plan: To maintain the excellent quality of life in Radnor Township, preserving the community and its character even as essential changes are accommodated.***

#### **Objectives**

***General Planning Goals** (Note: Specific functional area Goals are addressed in their respective sections in this DCP and are not repeated here).*

- 1. Accommodate reasonable growth, using innovative growth management techniques such as transit oriented development, traditional neighborhood design, and other flexible design techniques that harmonize with and enhance the existing community.*
- 2. Maintain and protect the many small residential neighborhoods that make the Township such a unique community, with attention toward special re-use and re-development strategies.*
- 3. Reinforce the excellent overall business climate within the Township, with special emphasis on strategies to enrich the Wayne Business District.*
- 4. In all of its planning, protect existing aesthetic values and restore areas where aesthetics have been degraded through use of appropriate planning techniques and rigorous performance standards.*
- 5. Work to preserve as many remaining open spaces in the Township as possible through a full range of direct and indirect open space protection strategies.*
- 6. Work carefully to preserve the balance of land uses and ensure adequate buffering in the many critical interfaces between commercial, residential, and other different land uses.*

#### **Recommended Actions**

- **Multiple planning concepts have been recommended for conservation and enhancement of the Wayne Business District. These recommendations are conceptual in nature and need to be evaluated**

**in the immediate future. To this end, preparation of a Wayne Business District “master plan” should be discussed, evaluated, and undertaken, if recommended.**

- **Neighborhoods have been designated by preliminary mapping which needs to be reviewed and confirmed. Next critical steps include development of neighborhood plans and programs designed to provide the conservation that has been identified as so important to Radnor community life.**
- **Specifically, maintain as much open space “green” area at the intersection of the Blue Route and Lancaster Avenue, particularly between the P&W railroad bridge and Radnor-Chester Road, to enhance the sense of “gateway,” minimize traffic problems, and achieve other planning objectives, including the rigorous implementation existing commercial zoning specifications; avoid commercial expansion in any way.**
- **Transitional land use zones such as the area along Lancaster Avenue from Aberdeen to Chamounix need special care, as land uses blend from commercial to residential. Retention of the many older residential structures is desirable. Existing policy of using the special exception process to conserve these structures should be continued, possibly even expanded. In other comparable situations, explore ways to use the special exception process to maximize conservation of older existing structures, in preference to new development.**
- **Further study of the Lancaster Avenue commercial corridor west of Bloomingdale Avenue to Old Eagle School Road including abutting residential uses should be undertaken, ideally in conjunction with Tredyffrin Township; special attention should be paid to residential areas behind the Wawa and Minellas Diner and any other residential areas specifically impacted by activity in the corridor.**
- **Rather dramatic master planning is currently underway by the Bryn Mawr Hospital in adjacent Lower Merion Township. Given the nature and extent of this facility planning, proposed uses may affect nearby Radnor Township neighborhoods. Consequently, Radnor should contact Lower Merion and amicably request that it have an opportunity to review and comment on this major planning action.**

## **SECTION 11**

### **IMPLEMENTATION OF RECOMMENDED ACTIONS**

#### **A. General Mechanisms for Comprehensive Plan Implementation: Specific Municipalities Planning Code Provisions**

Historically, the primary tools for implementation of the municipal comprehensive plan have been the municipal zoning ordinance and map and municipal subdivision/land development ordinance (SLDO) with the Official Map and Capital Improvement Program also high on the list. These tools are important for implementation of this Draft Comprehensive Plan and are referred to, both directly and indirectly, in the Recommended Actions matrix that appears below. Additionally, however, a variety of additional implementation tools and techniques will be important for making the Recommended Actions a reality, in part a reflection of the maturity of the Township as well as the complexity and sophistication of its municipal systems. For example, from retrofitting of existing stormwater management system elements to integration of traffic calming techniques into the appropriate settings to overlaying additional management measures to better protect and conserve the Township's rich historical resources to making the Plan for Wayne a successful reality, implementation will require careful and thoughtful initiatives. The technical details of most of these initiatives are not fleshed out in the Draft Comprehensive Plan; the DCP is a conceptual blueprint. In the days and weeks and months and years ahead, the Township will undertake this detailed planning, issue by issue, area by area, in order to make this critical Implementation dimension a success.

#### **B. Formation of Planning Commission Sub-Committee for Plan: Implementation Progress Monitoring**

The single most important outcome emerging from this planning process is the recommendation that a specific mechanism needs to be developed and institutionalized which has as its primary mission the implementation of the Radnor Township Comprehensive Plan, perhaps designated the Comprehensive Plan Implementation Task Force.

##### **1. Comprehensive Plan Implementation Task Force**

Although, according to the Pennsylvania Municipalities Planning Code, implementation of the comprehensive plan typically falls to the respective municipal planning commissions and other related township bodies, in truth the Radnor Township Planning Commission, as is the case with many local planning commissions, suffers consistently from an agenda which is crowded with specific development-related applications, controversies, and a variety of issues which fully occupy meeting agendas. Little if any time and energy is available for the "discretionary" tasks of Comprehensive Plan implementation, where no immediate review period deadline must be satisfied. In fact, although many of the excellent recommendations of the 1988 Comprehensive Plan ultimately have come to be implemented, many have not. Many participants in this current planning process believe that a major reason for this lack of action, at least in terms of some of the recommendations, has been a lack of time and resources available to the Planning

Commission. As currently structured, there simply are not adequate incentives, either positive or negative, in place to guarantee that the Comprehensive Plan be implemented.

We want to point out here that the Radnor experience is absolutely typical. When the Chester County Planning Commission embarked on its national award winning *Landscapes* planning process, they learned early on that so many of their 73 municipalities had produced comprehensive plans which said and did the right things. The problem was a lack of implementation, a lack of follow through in the zoning and subdivision/land development ordinances, and in other implementation tools. As a consequence, that county has institutionalized a remarkably generous program of grants, the Vision Partnership program, to help municipalities in this implementation process. Unfortunately, Delaware County has no comparable Vision Partnership program. Radnor must make it happen by itself.

In short, a mechanism needs to be created whose essential mission is Comprehensive Plan implementation, whose sole task is careful detailing and prioritizing of the Recommended Action Plan, the “communication” of these implementation tasks to specific groups/actors in the Township, and then a year by year evaluation of progress achieved to date, a Plan “report card,” if you will. We would imagine the Task force work program to be as follows:

#### **Work Scope for the Proposed Comprehensive Plan Implementation Task Force**

1. Annual Refinement, Detailing, Prioritizing of Plan Recommended Actions
  - a. Short-Term and Long-Term Recommended Actions
    - 1) Development of selection criteria for Recommended Actions programming
    - 2) Sorting out of Recommended Actions; applying selection criteria
    - 3) Development of Recommended Actions Annual (Short-Term) Program using selected selection criteria
      - a. Report Output to Planning Commission; Planning Commission Review and Approval
      - b. Report Output to Board of Commissioners, Review and Approval
    - 4) Annual Sharing/Distribution of Tasks with Township Actors/Stakeholders
      - a. Via Written Form
      - b. Via Attendance at Meetings
    - 5) Annual Progress Report Preparation by Task Force
      - a. To Planning Commission
      - b. To Board of Commissioners

Although the Task Force can be expected to include members of existing Township groups such as the Planning Commission and other boards and agencies, the Task Force may also include other specially designated representatives, depending upon the needs and issue at hand. In most cases, these additional representatives will be designated by the Township, both the Planning Commission and Board of Commissioners. In all cases, the work of the Task Force is to be overseen by the Planning Commission and ultimately by the Board of Commissioners. The Task Force would have no direct line of authority or power per se, however, if functioning properly should be able to exert considerable influence indirectly, given its authorization by both the

Planning Commission and the Board of Commissioners. Any necessary budgetary support to assist the Task Force in its work (not anticipated to be significant; this is not to be confused with actual work on Recommended Action implementation) would require authorization from the Board.

The very first task of the Task Force will be to take the long array of Recommended Actions appearing in the section below, sort out and further detail these tasks, and then prioritize these tasks, short-term (defined as coming year) versus long-term. This process will require development of selection criteria, based on realities of the recommended Actions as well as realities of Radnor Township life. These criteria will be applied to develop a short-term coming year Work Program.

After application of the selection criteria, the Work Program will include specific assignments to be made in terms of implementation responsibility, all of which will be drafted as a Recommended Action Plan. This Draft Recommended Action Plan will be submitted annually to the Planning Commission for their review and approval, for ultimate review and approval by the Board of Commissioners.

Secondly, the Task Force will communicate Recommended Action Plan "assignments" to Township boards, groups, actors, first in writing, and then directly in person, at meetings and at other appropriate venues. "Communicate" understates the case. Clearly, this task is a process which can be expected to require considerable marketing skill and attention. The respective boards, groups, actors will receive their respective lists of Recommended Actions with already well-filled agendas. The challenge for the Task Force will be to convince each group to embrace what is being requested with resolve. In some cases, funding may be involved. From the Shade Tree Commission to the Environmental Advisory Council to any of the individual Township departments, the Recommended Action Plan will have to be "sold."

It should be noted that in most cases, the actual work of implementing Recommended Actions will be designated to different groups, different actors in the Township and will not be the responsibility of the Task Force itself. This is because Radnor already has established an impressive array of planning and management groups which should be utilized to perfect and make its systems better. In some special cases, such as preparation of overarching ordinances or ordinance language, the Task Force itself may elect to develop draft ordinances to be considered.

Finally, the Task Force will compile an annual progress report on Comprehensive Plan implementation and will submit this report to both the Planning Commission and the Board of Commissioners. This "report card" becomes critical for the Task Force itself and ultimately alerts all Township actors how implementation of the Comprehensive Plan is faring. This progress report can be accomplished so as to coincide with the distribution of the Recommended Action Plan for the coming year.

In summary, the list of Recommended Actions is long and challenging, as can be easily seen. Although creation of the Implementation Task Force comes with no guarantee and can be expected to be confronted with challenging problems, the mechanism of the Task Force should



advance Plan Implementation far more than has been the case in years past and be a giant step forward in accomplishing the Goals and Objectives of the new Comprehensive Plan.

**C. Goals, Objectives, and Recommended Actions**

Each section of the Draft Comprehensive Plan includes a Goal or Goals. In most cases, more specific Objectives quantifying these goals are also included. Each section concludes with more specific implementing Recommended Actions, designed to achieve the respective Objectives and Goals which have been set forth as the framework for the Comprehensive Plan. There are selected maps, such as the Plan for Wayne and Radnor Neighborhoods, which have special three-dimensional and geographic planning significance. But in the balance, this Comprehensive Plan is relatively unconventional in its de-emphasis of the conventional physical land use planning dimension. Radnor is at a stage of maturity and relatively full development; the sub-text here has been to conserve the many values and resources of the community and make the Township even better. Making a Great Community Even Better. Consequently, there are no dramatic land use planning changes to be declared. This array of Goals and Objectives and Recommended Actions takes on added importance. This is the heart of the Plan.

## **ENVIRONMENTAL & NATURAL RESOURCES**

### **Goal**

*Protect the Township's vital environmental values, including water resources, wetlands, floodplains and riparian areas, woodlands and important habitat areas, balancing the needs of development with environmental values.*

### **Objectives**

1. *Direct development to areas of minimum environmental sensitivity; prohibit development in areas of heightened sensitivity and value, such as wetlands, floodplains, riparian zones, and steep slopes.*
  - **Tighten existing natural resource regulations.**
  - **Evaluate existing natural resource regulations in the Township for rigor; compare with regulatory programs being recommended by the Brandywine Conservancy, the Green Valleys Association, and other environmental organizations for a "tough but fair" test (e.g., carefully scrutinize exactly what is allowed to happen in the floodplain, look at what is happening under current regulations). A sub-committee of the PC, buttressed with volunteers, could do this and report back to the PC.**
  - **Promote use of private tools such as conservation easements to permanently protect sensitive areas. Radnor could continue to rely on the Brandywine and other conservancies, but if other municipalities can support their own local land trusts, should Radnor start its own land trust as well?**
2. *Manage water resources, both water quality and water quantity, especially through a program of improved stormwater management.*
  - **Modify the existing stormwater regulations to require comprehensive (peak rate, total, volume, water quality) management, encouraging low impact development/conservation design applications where feasible.**
  - **Pursue comprehensive stormwater management at all Township projects; promote this approach at all School District and other public sites. This recommendation includes Meadow Management/Reforestation Pilot Projects, undertaken by the Township on Township-controlled parcels (e.g., The Willows) where water quality is so critical.**
  - **Undertake special retrofit stormwater studies to solve high priority problem areas (already ongoing at Rosemont Business Campus and Strafford Office Complex); implement "greening" projects in the Wayne Business District.**

- **Develop Backyard Rain Garden model concept for voluntary application by homeowners, demonstrating how walkways, patios, other landscaping can be made to provide important water quantity and water quality functions; pursue funding for developing owner matching grant program to incentivize program in the highest priority areas (e.g., Ithan sub-basin drainage immediately upstream of existing Middle School site in Wayne).**
  - **Education:** Using the EAC, the League of Women Voters and other resources, promote educational venues on all levels that communicate the importance of stormwater management and other essential elements of the water cycle and overall water resources management (e.g., a stormwater workshop is already being planned).
3. *Implement watershed-wide planning principles as developed by the Darby Creek River Conservation Plan and other appropriate watershed planning processes.*
- **Enact Riparian Buffer regulations! This is the most critical single recommendation of the Darby Creek RCP. Radnor needs to be a leader riparian buffer management effort; reasonable distances must be determined!**
  - **Develop Riparian Buffer Restoration/Reforestation programs through the work of the EAC and other Township groups (various grant programs are available).**
  - **Promote stormwater as above, natural resource management as above, open space conservation as below. Place the highest priority on daylighting of enclosed streams and naturalizing of channelized streams; consider undertaking a Township-wide study of the streams to prioritize those stream segments most in need of restoration; then pursue restoration projects.**
4. *Work to preserve the natural woodlands which remain in the Township through minimum disturbance/minimum maintenance land development techniques, site conservation, and other practices; reinforce tree protection requirements and promote re-vegetation and re-forestation strategies with native species, compatible with sound landscape ecology principles.*
- **Better tree/woodlands protection, management, and regulation. Incorporate optimal tree protection regulations in Township regulations, including rigorous tree removal standards and rigorous tree replacement requirements. Provide incentives, positive and negative, in the subdivision/land development regulations for a minimum disturbance/minimum maintenance approach to site development.**

- **With EAC and other assistance, evaluate additional management actions (regulations?) which might be taken for those priority woodland masses and linking corridors identified in the Comprehensive Plan; also consider further evaluation of these priority Radnor township woodlands.**
  - **Establish pilot projects of reforestation on Township-controlled parcels, building onto existing forested masses with highest priority.**
  - **With EAC and other assistance, develop private-owner-oriented woodland programs of reforestation.**
5. *Work to preserve those open spaces remaining in the Township, using all direct means such as acquisition, as well as less direct regulatory programs; prioritize those open spaces, taking into account factors such as proximity to wildlife habitat and forage areas, aesthetic values, water resource values, and other factors relating to landscape ecology management.*
- **Continue to implement the recommendations from the Township's existing Park and Recreation Plan, as updated and revised.**
  - **Consider formation of a Radnor Township land trust which would intensify private-owner oriented efforts for open space conservation and land stewardship; also reinforce linkages with existing land trusts such as the Brandywine Conservancy.**
  - **Develop an intensified program of Land Stewardship owner interaction, identifying and prioritizing all those property owners with conservation potential; outreach efforts that communicate the benefits of conservation techniques such as donation, bargain sale, and so forth should be developed (materials are readily available, such as from Chester County Planning Commission, the Brandywine Conservancy, elsewhere).**
6. *Integrate management of noise, artificial light, and odor into the Township's planning and management program.*
- **Adopt Better Regulations!**
  - **Adopt Better Buffering Regulations!**
7. *Work to protect air quality through mobile source emission strategies developed in the transportation-planning element of the comprehensive plan and through integrating transit oriented development and other auto trip reduction strategies into overall planning.*
- **Traffic mobility/traffic calming as elsewhere**
  - **Screening/landscaping/woodland protection as above**

## **HOUSING**

### **Goals**

*Conserve and maintain Radnor's existing housing stock and residential neighborhoods.*

*Provide housing opportunities for a diverse population, including low- and moderate-income residents and senior citizens.*

*Maintain a supply of affordable and market rate housing that meets Radnor's share of regional housing needs.*

*Promote conservation development strategies for new development on large parcels.*

### **Objectives**

1. *Promote the rehabilitation of deteriorating or substandard residential properties.*
  - **Continue the Township's property maintenance, inspection, and enforcement program.**
2. *Ensure that redevelopment within established neighborhoods is compatible in scale and character.*
  - **Enact regulations to manage and control monsterization.**
3. *Discourage demolition and promote the preservation of residential structures of historic significance.*
  - **Enact historic preservation overlay(s) and other development regulations that encourage rehabilitation of historic residential buildings.**
4. *Support housing that incorporates facilities and services to meet the health care, transit, or social service needs of seniors.*
  - **Protect and preserve the ample supply of rental units/complexes in the Township.**
  - **Develop and implement strategies for the careful senior housing re-use of those institutional parcels which become available in the future, provided that the other goals of the Comprehensive Plan are being respected.**

- **Develop and implement strategies for the careful senior housing re-use of those “underdeveloped” parcels, provided that the other goals of the Comprehensive Plan are being respected.**
5. *Encourage and foster diverse housing opportunities for low- and moderate-income families.*
- **Protect and preserve the ample supply of rental units/complexes in the Township.**
6. *Undertake a variety of strategies to preserve and/or increase housing density and diversity in appropriate locations.*
- **Allow for increased housing density immediately surrounding commercial areas and particularly near transit centers.**
  - **Consider enacting minimum density requirements in the higher density residential districts.**
  - **Amend zoning regulations to permit smaller residential lots where smaller lots would be compatible with the surrounding neighborhood.**
7. *Encourage mixed-use districts as a means of increasing the housing supply while promoting diversity and neighborhood vitality.*
- **Use area plans and/or other tools to develop regulations that support the development of housing above and among commercial uses in the Wayne area and other appropriate locations.**
8. *Discourage the conversion of lands designated as residential to nonresidential uses.*
9. *Investigate use of additional tools such as maximum lot size overlays with related restrictions and community land trusts.*
10. *Consider a variety of strategies that will promote cluster or conservation design in new land development.*
- **Investigate use of transfer of development rights.**
  - **Amend zoning to include a conservation design option.**

## **BUSINESS AND ECONOMIC DEVELOPMENT**

### **Goals**

*Protect and enhance the character and mix of uses in Wayne as a special town center.*

*Protect and enhance the smaller commercial districts in the Township, including Garrett Hill and other neighborhood districts along Conestoga Road.*

*Restrict expansion of commercial zoning in areas near the I-476 interchange to reduce congestion and increase safety in the area.*

*Maintain the Township's commercial tax base to provide a balanced contribution for the finance of local public service needs.*

### **Objectives**

1. *Provide adequate public parking in the Wayne business district to serve businesses, other visitors, and commuters.*

#### **Recommended Actions: Parking**

- Consider recommendations from the 2001 Wayne parking study.
- Promote the use of parking cross-easements between businesses.
- Create an on-street parking plan for the Business District.
- Encourage a consistent orientation of on-street parking along Lancaster Avenue.
- Upgrade parking directional signage.
- Better manage restaurant zoning densities in order to distribute parking-intensive restaurants.
- Create a parking coordination/management entity.
- Study needs and costs for structured parking.

2. *Improve the pedestrian environment in the Wayne Business District to make the area more attractive for shoppers.*

#### **Recommended Actions: Pedestrian Environment**

- Use parking, plantings, landscape aisles, and other streetscape amenities to protect pedestrians from traffic, vehicular noise and fumes.
  - Improve the sidewalk network in the Wayne Business District through more consistent design.
  - Explore the feasibility of a signalized pedestrian crossing along Lancaster between Aberdeen Avenue and Louella Court, as well as other mid-block crossings.
3. *Maintain and improve the mix of stores in the District to assure that the area remains a restaurant center, that it continues to provide needed basic services for Township residents, and that it expands the range of apparel and other shopping goods available.*

**Recommended Actions: Retail Mix**

- Monitor the availability of basic services and encourage landlords to maintain space for convenience and service businesses.
  - Employ a “Main Street” manager to coordinate Business District activities and provide an information clearinghouse on available properties.
  - Support additional retail development by upgrading retail uses on Louella Court and other off-Lancaster locations.
  - Encourage conversion of ground floor office uses on prime blocks of Lancaster Avenue and Wayne to retail.
  - Promote a variety of retail uses along North Wayne Avenue to strengthen the link between the train station and Wayne center.
  - Improve the identity of the Wayne as a shopping destination by:
    - creating a stronger visual symbol at the intersection of Lancaster and Wayne;
    - strengthening the district gateways along Lancaster Avenue at Bloomingdale and Louella Court.
4. *Expand and enhance public spaces and cultural activities available in the Wayne Business District.*

**Recommended Actions: Town Commons and Promenade**

- Create “town commons” at the existing parking lot on North Wayne Avenue, along the southwest quadrant of the intersection of Lancaster and Wayne Avenues, and possibly at the current Middle School site along South Wayne Avenue



- **Develop a “promenade” vision for North Wayne Avenue.**

5. *Assure that upper floor spaces in the Wayne Business District are reserved for residential use.*

**Recommended Actions: Residential Uses**

- **Adjust zoning to eliminate parking requirements for upper floor residential uses in downtown Wayne.**

6. *Strengthen the Garrett Hill district as a pedestrian-oriented neighborhood convenience district.*

**Recommended Actions: Garrett Hill**

- **Rezone to prohibit gas stations and other auto-related businesses.**
- **Promote multi-story mixed-use buildings by adjusting zoning to eliminate parking requirements for upper floor residential uses.**
- **Encourage zero-front setbacks in any new development.**
- **Provide a community/shopper parking lot.**
- **At the auto repair site, develop a multi-story mixed use building with retail, condos, and parking in the rear.**

7. *Restrict expansion of commercial zoning in areas near the I-476 interchange to reduce congestion and increase safety in the area.*

8. *Assure that payments or services in lieu of taxes are provided by institutions utilizing their facilities for unrelated revenue generating purposes to compensate for the use of community transportation facilities and other infrastructure.*

## **TRANSPORTATION AND CIRCULATION PLAN**

**Goals** *(No objectives were developed for this section)*

*Develop a transportation capital improvement plan with recommendations for safety and capacity-related traffic improvements to accommodate future traffic demands.*

*Implement traffic improvements for key roads and intersections to improve traffic flow and encourage traffic to remain on the major routes.*

*Develop traffic calming strategies for implementation, as appropriate to help preserve the neighborhoods and communities.*

*Use landscaping, gateways, and street furniture, etc. to integrate the road system and traffic within the communities to preserve the character of the area.*

*Preserve the rural and scenic character of the streets, without sacrificing safety.*

*Improve pedestrian circulation by implementation of pedestrian facilities, as well as planned trail and bicycle facilities.*

*Encourage increased use of public transit.*

*Encourage opportunities for transit-oriented development and limit intensive uses to areas close to public transit where such uses are compatible with adjacent uses and would cause no adverse impact on the residential neighborhoods.*

*Enhance regional rail use through accommodation of commuter parking needs in a manner consistent with the Comprehensive Plan.*

*Promote ride sharing or carpooling, as well as other trip reduction strategies to reduce single occupant, private vehicle commuting by employees of major businesses.*

*Support a coordinated/planned private transit service through a cooperative partnership between the major employers, institutions and the Township.*

**Recommended Actions:**

**Existing Road Network**

- Reclassify several roadways within the Township to reflect current traffic conditions and future needs. Refer to Table 1 for potential reclassification of roadways.
- Continue to monitor future traffic conditions to determine if reclassification is necessary.
- Upgrade roadways to satisfy the design criteria of newly reclassified roadways.
- Future development should be monitored and regulated so that subsequent traffic generation does not alter the designated function of individual roads unless the design can be upgraded and is consistent with both the future land use and circulation plans. Developments should not cause restrictions on the ease of entering or exiting a roadway from adjacent properties, or increase traffic to encroach upon or exceed the capacity of a road.

**Existing Traffic Volumes and Capacities**

- The potential short-term intersection improvements contained in Table 6 should be further evaluated and considered by the Township.
- Traffic signal equipment (i.e., controllers, loop detectors, etc.) and programming (i.e., timings, phasing, offset timings, clocks, etc.) should be properly maintained to ensure proper operations.
- Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the Penn DOT *Twelve Year Transportation Improvement Plan*).
- Improve interface between automobile traffic and pedestrian movement.

**Future Traffic Volumes and Capacities**

- The potential long-term intersection improvements contained in Table 7 should be further evaluated and considered by the Township.
- As long-term improvements are selected for implementation by the Township, the Township should then pursue their selection by Penn DOT, Delaware County, and DVRPC for their respective transportation improvement plans, as appropriate.

- Plan for the potential long-term improvements by acquiring the necessary right-of-way for geometric road configuration improvements, as necessary and when available.
- Pursue funding opportunities for identified roadway and intersection improvements (i.e., DVRPC *Transportation Improvement Program* and the Penn DOT *Twelve Year Transportation Improvement Plan*).
- In all of its roadway and intersection improvements, make sure that pedestrian movement is given a high priority.

**Deficient Roadway Conditions**

- The Township should periodically review accident reports to identify accident trends and safety issues.
- Solutions to the most prevalent roadway deficiencies should be examined and implemented to reduce the potential for accidents.
- Re-evaluate the merit of the Penn DOT 12-Year TIP improvement involving aligning of Goshen Road in the vicinity of Darby-Paoli Road, given the overall rural road context and neighborhood concerns.

**Regional Framework**

- Radnor Township should continue to proactively plan for its future transportation network, including all modes of transportation, in a coordinated effort with surrounding municipalities, the Delaware County Planning Commission, the Delaware Valley Regional Planning Commission, and the Pennsylvania Department of Transportation.

**Future Transit Services**

- As the most popular and utilized form of public transportation, the R-5 regional rail service will continue to serve the majority of public transportation users. Accordingly, the Township should coordinate with the SEPTA and the adjacent municipalities to ensure that the best service possible is provided to its riders, which would include convenient train schedules, express service, etc.
- Major expansion or improvements to the R-5 regional rail service within Radnor is currently limited by the ability to expand parking. Therefore, the Township should support and encourage initiatives by SEPTA to provide adequate parking in the future, if done properly. Any major improvements to transit service or increased parking initiatives implemented by SEPTA and/or the Township should first be available to residents of Radnor, before providing additional regional transportation service to non-Radnor residents.

- Due to the limitations of parking at regional rail stations within Radnor, the proximity of the stations to residential neighborhoods, and the traffic problems generated at peak hour in-bound commuting periods, expansion of service at regional rail stations must be carefully considered, especially at the Wayne, Radnor, and Villanova stations. For example, rail station-related actions in and around the Wayne station must be consistent with the plan for Wayne, as set forth herein. Priority should be given to AM arrivals at Radnor stations, possibly adding shuttles to major Township destinations.
- Given the concentration of jobs and people in Radnor, potential for a connection to the proposed Schuylkill Valley Metro should be investigated (e.g., Township Commissioners could request that project sponsors evaluate this issue).
- Support and expand shuttle bus service during peak hours (including lunch time) from the major office parks and employment centers, to the Wayne Business District and rail station.

#### **Pedestrian Facilities**

- The Township should complete a full inventory of its sidewalk facilities to determine the adequacy of the current sidewalk network.
- The Township should ensure to the extent feasible that all sidewalk facilities are ADA compliant, provide an adequate buffer area between pedestrians and vehicular traffic, and are continuous to promote safe pedestrian travel.
- The sidewalk network within the Wayne Business District should be improved to provide a consistent design of sidewalks, which will help to encourage pedestrian traffic within the District, and should be considered in the implementation/adoption of any roadway/intersection improvements, streetscape enhancements, access management initiatives, and redevelopment applications.
- Explore the feasibility of providing a signalized pedestrian crossing along Lancaster Avenue between Aberdeen Avenue and Louella Avenue due to the heavy pedestrian and vehicular traffic levels and the lack of traffic signals to accommodate crossing of Lancaster Avenue; and/or provide pedestrian facilities (i.e., crosswalks and pedestrian signal phases) at the Lancaster Avenue/Louella Avenue intersection.
- Ensure adequate sidewalks are available along the roadways surrounding public transportation facilities (i.e., train stations and bus stops) to encourage residents to walk to these facilities, which in turn would reduce the number

of vehicle trips on the roadway network and reduce the parking demand in the area of these facilities.

**Bicycle Facilities**

- The Township should pursue providing on-road bicycle facilities on some of its collector and local roads to enhance bicycle mobility throughout the Township and provide links between other bicycle facilities and desirable destinations (i.e., recreational facilities, transit facilities, schools, businesses, etc.).
- The Township should create an Official Trail Map to establish current and future bicycle, pedestrian, and multi-use trails.

**Scenic Roads**

- The Township should utilize conservation easements as well as special ordinance provisions as methods of protecting the scenic quality and openness of the landscape, minimizing the disruption of areas of high visual quality and maintaining the character along scenic roads.
- Preserve the rural and scenic quality of streets without compromising safety, and when possible, roadway capacity.
- The Township should review its current Scenic Roadways designations for adequacy.

**Wayne Business District Parking Study**

- The recommendations contained in the Parking Study, Wayne Business District, January 2001 report should be considered by the Township.
- The Township should encourage the use of parking cross-easements between businesses located in Wayne and along Lancaster Avenue.
- A detailed on-street parking plan for the Wayne Business District, and specifically along Lancaster Avenue and North Wayne Avenue should be developed in conjunction with the creation of any streetscape plans for the District.
- A consistent design of on-street parking along Lancaster Avenue in the Wayne Business District should be encouraged to the extent feasible.
- Coordinate with PennDOT for their final approval to the on-street parking along State Highways, specifically North Wayne Avenue and Lancaster Avenue.

**Access Management Program**

- The Township should encourage such access management methods along U.S. Route 30 like *side access, one-way access patterns, combination/relocation of access points*, and provide *access easements* through adjoining parcels. The Township should require these techniques for re-developing land uses along Lancaster Avenue and possibly along other roadways within the Township.
- To the extent feasible, any streetscape initiative planned for the Wayne Business District should address access management issues along Lancaster Avenue and other roadways within the District.
- The Township should proactively work to promote and facilitate use of access management measures between adjacent but separately-owned parcels. The Township should be more proactive in its review of commercial developments, encouraging practical access management measures.

#### **Traffic Calming**

- Radnor should increase attention to traffic calming solutions and should create a well-defined traffic calming master plan policy, educational campaign, and approval process to evaluate when and where traffic calming is appropriate, to avoid sporadic and ineffective traffic calming usage, and to provide the Township with standardized and consistent criteria for traffic calming decision making. Many municipalities have implemented a three-step process, as outlined below, which Radnor should consider as part of this traffic calming program:
  - Educating the public regarding the traffic problem (i.e., speeding through neighborhoods, etc.),
  - Enforcing speed limits
  - Engineering traffic calming solutions (study and design aspects)
- Any streetscape initiative planned for the Wayne Business District should address traffic calming issues along North Wayne Avenue, South Wayne Avenue, Lancaster Avenue, and other roadways within the area. Specifically, these traffic calming measures within the district may include the following:
  - *Landscaped Median* – along North Wayne Avenue between Lancaster Avenue and Station Avenue, which will be designed to accommodate the necessary turning lanes at intersections, a pedestrian crossing(s), and turning movements to/from the municipal parking lot.
  - *Raised Pedestrian Crosswalks* – along roadways within the district may promote driver awareness of pedestrians, reduce vehicle speeds, and provide aesthetic benefits as well.

- **Public involvement throughout the process is recommended, as the implementation of traffic calming measures may be controversial.**
- **As with any improvement to a State roadway, PennDOT approval will be required for the implementation of traffic calming measures on any State roadways; therefore, the Township should work closely with the Department through the planning and design process.**



## **OPEN SPACE AND RECREATION**

### **Goals**

*Provide for the recreational needs of all Township residents through a balanced mix of active and passive recreational facilities and programs.*

*Protect and enhance the character of the Township through the acquisition and protection of open space.*

### **Objectives**

1. *Continue to improve the high quality of existing Township open space and recreational facilities.*
2. *Continue to acquire, protect, and preserve open space in the Township. Coordinate these efforts with protection and enhancement of natural resources. Assess various methods for acquiring land or interests in land for the purpose of conserving open space.*
3. *Document all open space in the Township, including all conservation easements in favor of the Township, the Radnor Conservancy or another nature conservancy or other public body, and any open space created as a result of the use of density modification in the development of residential tracts.*
4. *Continue to improve management of the use of Township recreational facilities in order to maximize the utilization and enjoyment of these facilities.*
5. *Continue to expand and/or modify Township recreational programming to fill gaps in services from existing recreation services providers.*
6. *Create non-motorized linkages between recreation and open space facilities and Township residences, businesses and schools and between the facilities themselves. Create linkages to regional trail systems.*
7. *Study need for and feasibility of developing an indoor recreational facility in Radnor Township.*
8. *Explore the issuance of a new bond issue to help attain Open Space and Recreation Objectives.*
9. *Continue to expand and improve communications to Township residents about recreational opportunities and programs offered by both the Township and other area recreational service providers.*

**Recommended Actions:**

- **Promote the acquisition of open space; inventory and identify key vacant and underutilized parcels (or portions of parcels) for acquisition as Township open space.**
  1. **Develop strategies for acquisition and/or protection of these parcels. Consider outright transfer or restricted transfer. Proactively initiate informal discussions with property owners of key parcels concerning protection of these important lands. Explore funding options for the acquisition of open space, including grants and government funding opportunities.**
  2. **Evaluate without delay the feasibility and desirability of establishing a second municipal bond fund, patterned after Radnor's successful initial bond fund, intended to support additional open space acquisition by the Township.**
  3. **Continue to earmark an allocated portion of the Township transfer tax for the purchase of open space and other park improvements.**
  4. **Develop strategies such as conservation easements for permanent protection of open space lands now only temporarily protected. Proactively seek out these arrangements. Consider the formation of a land conservancy.**
  5. **Develop a plan to inventory all open space in Radnor Township in order to identify potential future purchases of land for conservation purposes.**
  6. **Develop an information packet for landowners regarding conservational alternatives and benefits. Develop and implement a campaign to educate residents about conservational alternatives and the need for land conservation. Work with the Radnor Conservancy and other land conservancies to pursue landowners potentially interested in conservation alternatives.**
- **Develop plans and recommendations for a pedestrian and bicycle trail network to provide linkages between parks, neighborhoods, and public facilities as well as create a recreational resource for all users.**
  1. **Using the 1991 Parks, Recreation and Open Space Plan as a starting point, create a master plan for implementing a combination on-road and off-road non-motorized trail and greenway system for pedestrians and bicyclists. Create a funding strategy that will promote construction of this transportation system.**
  2. **Plan for and fund the construction of new sidewalks in neighborhoods lacking these important infrastructure elements.**

- 3. Seek to acquire easements across privately-held lands in order to connect public open spaces.**
  - 4. Embark on a comprehensive educational campaign regarding the community benefits of such a trail/greenway system to overcome misconceptions and fears regarding trails and greenways. Sponsor recreational events and trips to existing trail/greenways in the region.**
  - 5. Dovetail greenway/trail development efforts with stormwater management and riparian buffer reestablishment in the Township.**
  - 6. Collaborate with adjacent municipalities to coordinate and cooperate on trail and greenway efforts.**
  - 7. Create a Township-wide trail marking or “wayfinding” system for trail and pedestrian transportation facilities.**
  - 8. Create ADA-accessible paths in existing parks as linkages to trail system.**
  - 9. Consider extending the Radnor Multi-Purpose Trail from its terminus at Radnor-Chester Road to Martha Brown’s Woods.**
- **Determine the need for and feasibility of a Township indoor recreation facility.**
    - 1. Conduct a market feasibility study for such a facility. Examine existing gaps in the recreation provider market. Examine other similar area facilities. Establish a program for this facility and determine projected use and costs if the decision is made to construct an indoor recreational facility.**
    - 2. If possible, locate the Township indoor recreation facility in a location served by mass transit and/or near the P&W trail.**
    - 3. Consider combining the indoor recreation facility with parking, retail or other types of development. Consider the local economic affect of visitation to and from this facility.**
    - 4. Consider inclusion of facilities specifically designed to serve both teens and seniors.**
  - **Create greenway linkages and new open space opportunities throughout the Township in conjunction with improved stormwater management measures and the reestablishment of former riparian buffers and forested areas.**

- 1. Some greenway linkages should provide for trail access. Others that do not should function as wildlife corridors and visual amenities as well as meeting functional stormwater best management functions.**
  - 2. Provide Township technical and funding assistance to property owners who establish and maintain these greenway linkages in exchange for permanent conservation easements on these areas.**
  - 3. Promote reforestation of turf covered corporate, private, or other sites as the establishment of “water gardens” – areas that capture and return precious groundwater to local water tables. Assist private property owners to fund these efforts in return for public passive open space access or easements on the reforested areas.**
- **Update the 1991 Parks, Recreation and Open Space Plan in order to meet identified open space and recreation needs.**
    - 1. Consider a Joint Municipal Open Space and Recreation Plan with one or more of the seven adjacent municipalities. The goals of this collaborative effort will be to identify opportunities for sharing facilities, services, or programs that may result in cost savings and/or more efficient facility utilization.**
    - 2. Examine Radnor Township and School District active sports fields to determine if there are opportunities for facility improvements that will result in greater and more efficient facility utilization.**
    - 3. Continue a comprehensive 5-year maintenance plan for all Township parks. Examine methods for improved maintenance, cost savings, and increased efficiency in the maintenance of all parks.**
  - **Improve communications about Township and School District recreation and open space facilities and programs to Township residents and the general public.**
    - 1. Update the Township website on a more frequent basis. Seek to establish additional links to the Township web pages from related sites.**
    - 2. Plan and establish a specific public relations and educational campaign to inform the general public about the benefits of greenway and trails networks. Plan this program over a two to three year period.**
    - 3. Develop a public relations campaign on Township success stories in recreation and open space and environmental resources planning.**

- 4. Initiate regular, scheduled meetings and information sharing with adjacent municipalities regarding open space and recreation. Sharing resources, ideas, and concerns may lead to new solutions or efficiencies.**
  - 5. Consider retaining outside professional assistance to seek funding at the state and federal levels for Township environmental resources and recreation improvements and programs.**
- **Support the Radnor Township Conservancy, generally and specifically, in all ways which are feasible for the Township.**

## **HISTORICAL AND ARCHAEOLOGICAL RESOURCES**

### **Goal**

*Protect and conserve historic and cultural assets*

#### **Recommended Actions (1988 Comprehensive Plan)**

- “Draft and adopt a Historic Preservation Ordinance and/or an Historic Overlay District Zoning Ordinance and designate historic resources on the Zoning Map.
- Adopt Technical Appendix C as the official Radnor Historic Property Inventory (until the programmed historic resources inventory is completed).
- Amend the Subdivision Ordinance to require the identification of any property that is listed in the Radnor Historic Property Inventory that is within the land being developed or within 500 feet of the development.
- Establish an Historical Commission.
- Review the Zoning and Subdivision Ordinances to evaluate whether the present ordinances adequately encourage the preservation of estate properties and create incentives which will permit appropriate reuse of such property.”

#### **Recommended Actions:**

- Implement all of the recommendations of the 1988 Comprehensive Plan relating to historical and archaeological resource protection and conservation.
- Consider establishing an Historical Architectural Review Board(s) as needed.
- Implement PHMC Work Program recommendations without delay. Because timing is critical, a special sub-group or sub-committee for historical resources and archaeological resources planning and programming should be formed to assist in the implementation of these recommendations, targeting both short terms actions as well as longer term actions. Make sure that important resources such as Banjo Town are included in the expanded resource inventory being undertaken as part of this effort.
- Consider unifying the entire historical and archaeological work program into a local preservation plan, or Historic Resources Protection Plan, integrating all of the elements discussed here.
- Review the Delaware County Archaeological Resources Inventory and Management Plan and data available that relates specifically to Radnor; evaluate the significance of this data; and consider ways to integrate this information into future subdivision and land development review processes and other elements of Township planning work.

## **INSTITUTIONAL USE**

### **Goals**

*Encourage sound planning of institutional property, congruent with Township-wide principles, while preserving the existing character of the institutional properties.*

*Work to harmonize Radnor's existing institutions with adjacent land uses, promoting physical buffering, better programs of communication, and the like.*

*Integrate institutional traffic issues with the transportation planning element of the Comprehensive Plan.*

*Improve communication from the Township to the institutions and vice-versa, especially in areas of potential concern such as student housing, traffic, and other major issues.*

*Ensure compliance with Township revenue-producing code, especially that dealing with non-student revenue producing events.*

*All institutional use code requirements should be reviewed; in the event that existing institutional uses cease in their present form, ensure that any re-development that results is compatible with the total Goals, Objectives, and Recommended Actions of this Comprehensive Plan.*

### **Recommended Actions:**

- As stated in the 1988 Plan, limit expansion of institutional uses to areas within the present limits of campus areas which are zoned as Institutional Districts.
- Require that the long range land use plan, a condition of approval for any new construction or use change at institutions, be updated every 2 years.
- As stated in the 1988 Plan, modify the Zoning Ordinance for Institutional Districts so that if institutional use ceases, the area affected should be rezoned for residential use in accordance with the Goals, Objectives, and Recommended Actions of this Comprehensive Plan; special attention should be given to provision of assisted living and other senior-related housing.
- Refine as necessary the existing zoning ordinances for institutional districts so that different setback requirements for the various uses allowed within institutional districts are provided. Uses which are less compatible with adjacent zoning districts should be set back farther than more compatible uses. The setbacks may be different depending upon the adjacent zoning.

- **Radnor Township staff should host an annual planning information exchange with these institutions during which all relevant planning issues, including problems of community relations and traffic/transportation, should be identified and discussed. This meeting should also feature updates of the respective institutions' long-range plans, highlighting any major changes to these plans.**
- **Radnor Township publishes a periodic newsletter which could reserve space for institutional notes; Radnor also has a website which could devote space to institutional notes.**



## **COMMUNITY SERVICES AND FACILITIES**

### **Goals**

*Provide a full range of public facilities which are convenient and accessible to all residents.*

*Maintain the high level of services offered to Township Residents.*

*Anticipate and plan for future public facility needs.*

### **Recommended Actions:**

- The Township should support the volunteer-based Radnor, Bryn Mawr, and Broomall Fire Companies and the emergency medical services as appropriate.
- The Township should support all of its local government departments as appropriate.
- The Township should continue to support the existing Library facility in Wayne, including any expansion that may be necessary.
- The distribution center function of the Wayne Post Office should be relocated, thereby freeing up needed space at the Wayne location for other uses.
- This Plan concludes that the Middle School should remain in Wayne for a number of important Comprehensive Planning reasons. The Middle School is important to the Wayne Business District and broader Wayne community, as are our churches, our Post Office and Fire Department, our Library, and the many special services, facilities, and institutions which define life in this very special town center. The Middle School reinforces residential and commercial vitality which makes Wayne such a special place. The School and Business District complement one another in a variety of mutually supportive ways, with the positive effects of the School extending beyond the Business District itself into the surrounding tightly-knit dense and compact residential neighborhoods. As a catalyst for many of the activities that are so essential for the life of the town, the Middle School complements the Village-like atmosphere which promotes walking through the downtown area where shoppers are served by an ever-widening and diverse group of retailers. This conclusion is based solely on comprehensive planning factors. While these comprehensive planning factors should be considered in any decision relating to the relocation of the Middle School, it is not within the scope of this Plan to determine their specific interplay with the equally important educational and site-specific planning factors relating to this decision. However, should the School Board determine that the Middle School is to be relocated, the School

**site should be used for institutional/community purposes and should not be converted to commercial, office or residential uses, for all of the reasons stated above. The site must continue in some civic-related function.**

- **Effort should be made on an ongoing basis to better integrate the School District's planning process more directly with Township comprehensive planning and vice-versa.**
- **The Wayne Senior Center should remain in the center of Wayne.**
- **The expansion program at the Wayne Art Center should minimize the impact to neighboring land uses and special care should be taken to address any concerns with future development.**

## **EXISTING LAND USE AND LAND USE PLAN**

### **Goal**

*Mission of the Comprehensive Plan: To maintain the excellent quality of life in Radnor Township, preserving the community and its character even as essential changes are accommodated.*

### **Objectives**

**General Planning Goals** (Note: Specific functional area Goals are addressed in their respective sections in this Plan and are not repeated here).

1. *Accommodate reasonable growth, using innovative growth management techniques such as transit oriented development, traditional neighborhood design, and other flexible design techniques that harmonize with and enhance the existing community.*
2. *Maintain and protect the many small residential neighborhoods that make the Township such a unique community, with attention toward special re-use and re-development strategies.*
3. *Reinforce the excellent overall business climate within the Township, with special emphasis on strategies to enrich the Wayne Business District.*
4. *In all of its planning, protect existing aesthetic values and restore areas where aesthetics have been degraded through use of appropriate planning techniques and rigorous performance standards.*
5. *Work to preserve as many remaining open spaces in the Township as possible through a full range of direct and indirect open space protection strategies.*
6. *Work carefully to preserve the balance of land uses and ensure adequate buffering in the many critical interfaces between commercial, residential, and other different land uses.*

### **Recommended Actions:**

- **Multiple planning concepts have been recommended for conservation and enhancement of the Wayne Business District. These recommendations are conceptual in nature and need to be evaluated in the immediate future. To this end, preparation of a Wayne Business District “master plan” should be discussed, evaluated, and undertaken, if recommended.**
- **Neighborhoods have been designated by preliminary mapping which needs to be reviewed and confirmed. Next critical steps include development of neighborhood plans and programs designed to provide**

**the conservation that has been identified as so important to Radnor community life.**

- **Specifically, maintain as much open space “green” area at the intersection of the Blue Route and Lancaster Avenue, particularly between the P&W railroad bridge and Radnor-Chester Road, to enhance the sense of “gateway,” minimize traffic problems, and achieve other planning objectives, including the rigorous implementation existing commercial zoning specifications; avoid commercial expansion in any way.**
- **Transitional land use zones such as the area along Lancaster Avenue from Aberdeen to Chamounix need special care, as land uses blend from commercial to residential. Retention of the many older residential structures is desirable. Existing policy of using the special exception process to conserve these structures should be continued, possibly even expanded. In other comparable situations, explore ways to use the special exception process to maximize conservation of older existing structures, in preference to new development.**
- **Further study of the Lancaster Avenue commercial corridor west of Bloomingdale Avenue to Old Eagle School Road including abutting residential uses should be undertaken - ideally in conjunction with Tredyffrin Township; special attention should be paid to residential areas behind the Wawa and Minellas Diner and any other residential areas specifically impacted by activity in the corridor.**
- **Rather dramatic master planning is currently underway by the Bryn Mawr Hospital in adjacent Lower Merion Township. Given the nature and extent of this facility planning, proposed uses may affect nearby Radnor Township neighborhoods. Consequently, Radnor should contact Lower Merion and amicably request that it have an opportunity to review and comment on this major planning action.**

## Appendix A-1 Water Resources – Quantity

### A. The Water Cycle

Understanding the water cycle and how human development actions have affected this cycle is especially important in order to understand the natural resources of Radnor Township. Figure 1 illustrates the essential dynamics of the water cycle (or hydrologic cycle, a term which can be used interchangeably). The water cycle arrows make the point of continuous movement of water. Of all the aspects of the water cycle which must be emphasized, its dynamic quality--the never-ending cycling from atmosphere to the land and then to surface and groundwater pathways and back to the atmosphere--is most critical to appreciate. The often-heard observation that we drink the same water today that Native Americans drank hundreds, thousands of years ago is a function of this continuous cycling and recycling.

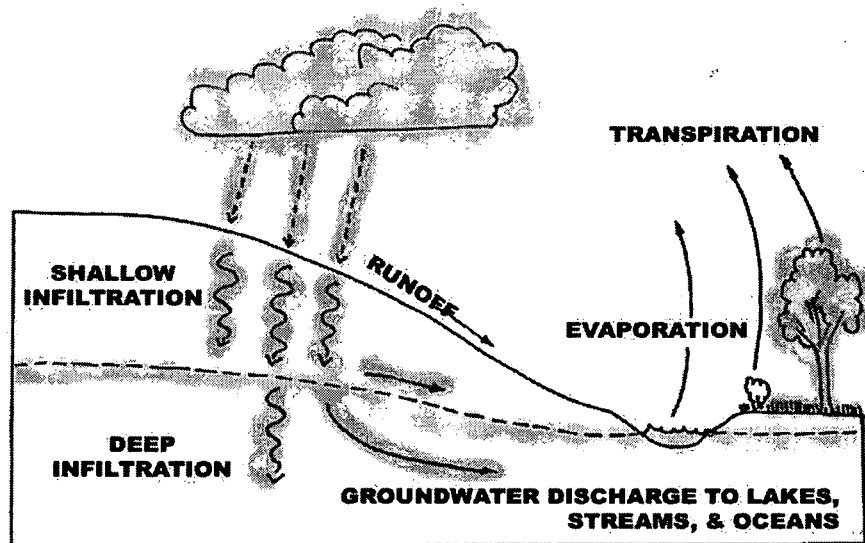
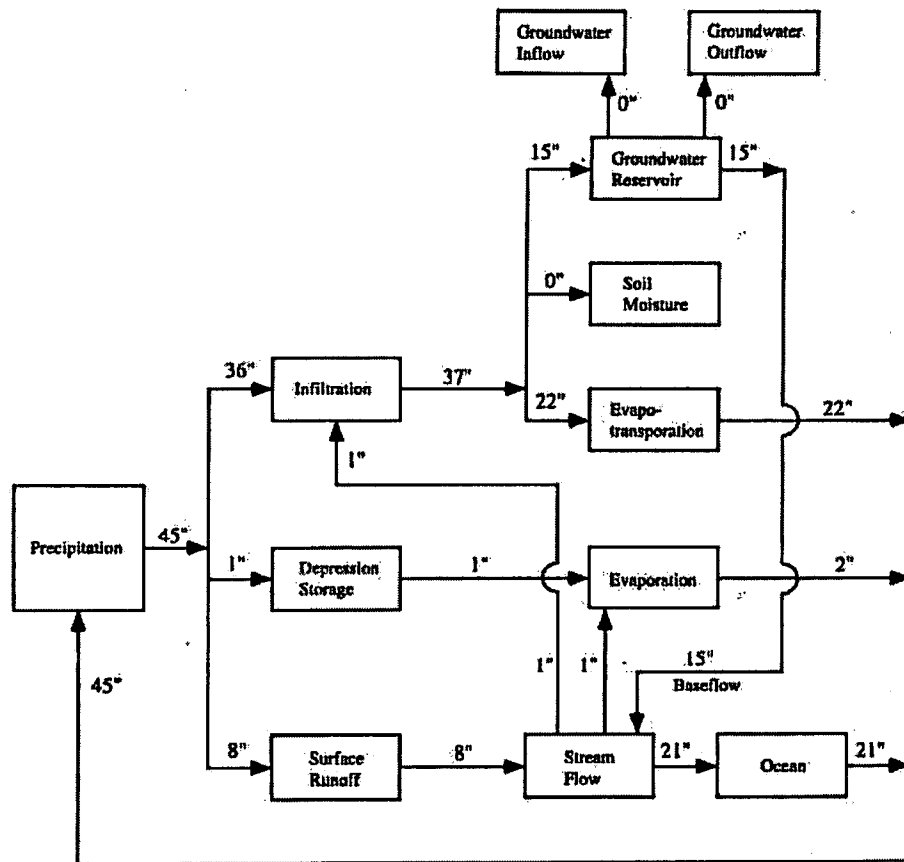


Figure 1 The Natural Hydrologic Cycle

The water cycle includes components, which can be displayed in the form of a system flow chart for an average year, shown in Figure 2. Precipitation data is based on precipitation gages both in Delaware County and in the region and includes data recorded over many years at many different stations (the closest official US National Oceanic Atmospheric Administration rain gage is located at the Philadelphia International Airport). Although rains may vary considerably from gage to gage for specific storms, there is an averaging of precipitation records over the longer run. Average precipitation really is quite comparable for Delaware County or Chester County or Montgomery County or Bucks County. Total stream flow data, similarly is based on stream gage data, which is typically recorded by the US Geological Survey, over as many years as possible. Special baseflow separation procedures are applied to separate out stormwater runoff from stream baseflow occurring during non-storm periods or dry weather. Different watersheds with different land covers and different geologies and aquifer characteristics, will demonstrate

some variation in stormwater runoff and stream baseflow in average years, although the general relationships are remarkably consistent in this Piedmont region. It should be noted that data in Figure 2 assume a certain level of development and watershed alteration extant at that particular time. If we had data for watersheds in their purely natural state, as of 1600 AD for example, we would undoubtedly discover that Infiltration would be greater, Surface Runoff would be reduced, Evapotranspiration would be somewhat greater, and the Groundwater Reservoir component would be considerably larger. Real world experiences reinforced by partial data records have been documenting these water cycle changes over recent years in most watersheds.



**Figure 2 The Hydrologic Cycle Quantified for a Typical Piedmont Region (Cahill Associates 2001, based on various Southeastern Pennsylvania Watersheds)**

It is important here to appreciate that the water cycle system itself is a closed loop. What goes in must come out. Impacts on one part of the cycle by definition create comparable impacts elsewhere in the cycle. If inputs to Infiltration are reduced by 10 inches somehow, then inputs to Surface Runoff (or Depression Storage which is highly unlikely) must be comparably increased by 10 inches. Furthermore, Infiltration outputs will have to be reduced by this same 10 inches as the water cycle system continues (i.e., the Groundwater Reservoir, Evapotranspiration and Soil

Moisture components together). Groundwater Reservoir reductions will further be reflected in Stream Baseflow reductions. Impacting one part of the system invariably results in impacts throughout the water cycle system. This action/reaction system sensitivity has important ramifications for any attempt to manipulate and manage components within the water cycle. Management programs which focus on one aspect of the water cycle – for example, managing only for peak rates of stormwater runoff as we have done so often in Radnor and other municipalities, without paying attention to all of the water cycle component impacts – produces all sorts of "surprises" and typically is doomed to failure.

Land development typically means a significant change in the natural landscape, including creation of impervious surfaces (roads, parking, roofs, other). When we pave over and make impervious surfaces, we increase surface runoff. Figure 3 demonstrates the impact. The arrows in the illustration are drawn to suggest size or extent of impact (in this case, total quantities of water involved year after year). Note that when we move from the pre-development to post-development site, the three medium-sized arrows become one increased surface runoff arrow with both evapotranspiration and infiltration substantially decreased in size. Figure 4 carries the comparison several steps further, contrasting a Natural Ground Cover scenario with 10-20 percent impervious, 35-50 percent impervious, and 75-100 percent impervious scenarios. Again, the point to be made is that increasing surface runoff total volumes translates into significantly reduced total volumes of infiltration, with significant consequences later in the water cycle. This issue is of paramount importance given the tremendous amount of development which already has occurred in Radnor Township.

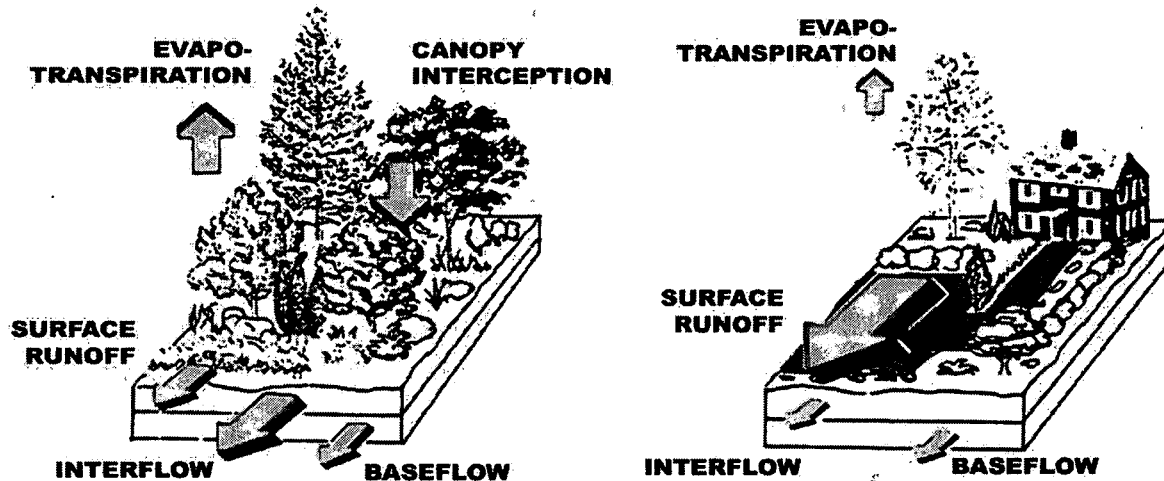


Figure 3 The Effects of Development on the Hydrologic Cycle

In the recent past most municipal stormwater management programs, including Radnor's, have focused on peak rate management. In fact, in many areas of Radnor, much of the existing development occurred prior to any stormwater management regulations. In these areas, like much of Wayne, the only stormwater management in place is a stormwater collection system, which directs stormwater runoff into the nearest stream without any type of peak rate control, volume

control, or water quality control. More recently, detention basins have been engineered for land development projects to satisfy Radnor's regulations which have focused on the specific stormwater management need for peak rate control in order to prevent flooding on adjacent parcels downstream. To satisfy these regulations, peak rates of runoff at a site, pre- to post-development, must be held constant usually through use of a detention basin, although large increases in total runoff volumes are still allowed to be generated. As these increased volumes combine downstream, downstream flooding typically gets worse, detention basins notwithstanding. Because such peak rate control management efforts are so partial in concept, and because this approach to stormwater management fails to acknowledge and plan for critical system-wide water cycle impacts (and the critical issue of lost recharge and runoff as an essential watershed resource has not even been mentioned as yet!), the existing stormwater management system itself has become a problem, rather than a solution.

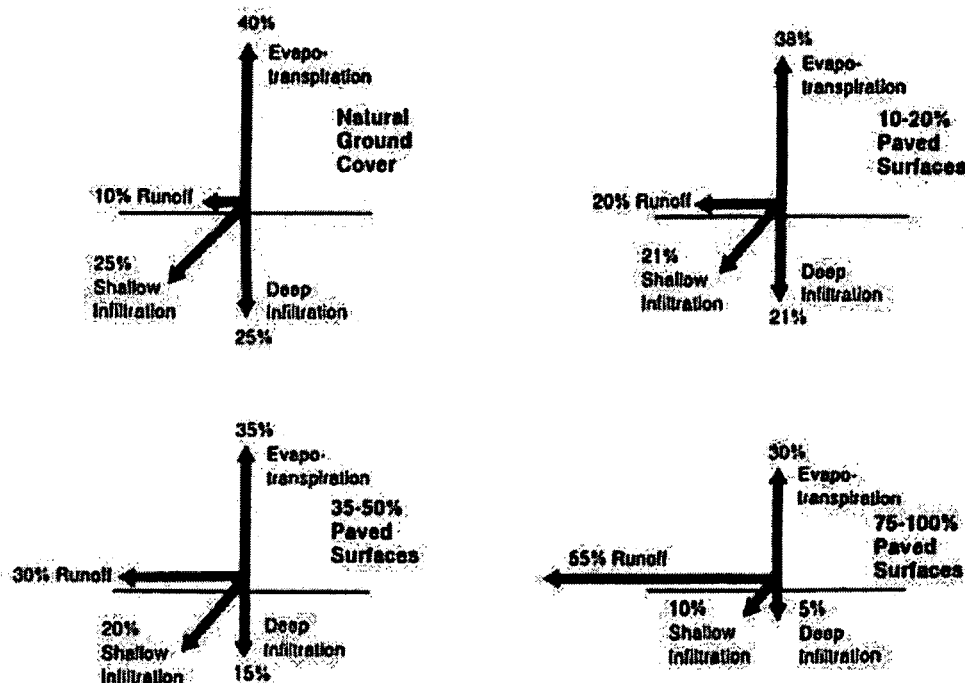


Figure 4 Typical changes in runoff resulting from impervious surfaces

**Precipitation:** Precipitation is fundamental to the water cycle. In southeastern Pennsylvania, average annual precipitation does vary to some extent from location to location, but long-term rain gage data generally indicate average annual precipitation to be about 45 inches--in other words, a relatively humid climate pattern, recent droughts notwithstanding. Overall, this water cycle is distinguished by substantial precipitation, which tends to be distributed throughout the year in frequent events of modest size. The long-term charting of precipitation month-by-month confirms this relatively even distribution of rainfall/precipitation events. No one specific month or season tends to be excessively wet or dry, though certainly times of precipitation extremes have occurred (especially hurricanes).



Also important is the distribution of rainfall by size of event. Data records indicate that precipitation occurs mostly during relatively small storms. Based on previous analyses of southeastern Pennsylvania data for various rain gages, over 95 percent of the total number of precipitation events occurring during the last several decades was classified in the "less than 2 inches in 24-hours" (approximately the 1-year storm) category. Even more important from a water cycle perspective, over 95 percent of the average annual rainfall **total volume** occurred in storms or "events" of less than 3 inches (less than the 2-year storm); 85 percent of the average annual rainfall **volume** occurred in storms or "events" of less than 2 inches. Over half of the total volume of the average annual precipitation occurs in "less than 1-inch" precipitation events. In short, the vast bulk of precipitation occurs in the smaller and more frequent storm events. Water management, especially stormwater and flooding management programs, have historically dwelled on only the largest catastrophic events, such as the 100-year storm, but these smaller storms are actually more critical when most water cycle questions are being asked (and answered). If the concern is keeping the water cycle in balance, storm size distribution data suggests that using the 1- or 2-year storm as the basis of design for stormwater management Best Management Practices, rather than the larger 100-year storm, will serve to capture the vast bulk of stormwater runoff and provide adequate water cycle balance.

Precipitation events have been classified in storm events as below:

1-year storm	2.4 inches in 24 hours
2-year storm	3.2 inches
10-year storm	5.6 inches
100-year storm	7.2 inches

Note that these events are to be understood as statistical probabilities. The 1-year storm has a 100 percent chance of occurring during any one year. A 2-year storm has a 50 percent chance of occurring in any one year, and so forth. The largest storms, certainly the 100-year storm (1 percent chance per year), tend to be hurricane-related events. Also, it should be noted that our very recent experience of frequent and extremely large storms seems to be calling some of these statistical calculations into question.

**Stormwater and the Groundwater Reservoir/Stream Baseflow:** Precipitation can take several routes after reaching the land surface. One possibility, Depression Storage, consists of small quantities of precipitation, which are intercepted and temporarily ponded or pooled on the land surface, later to be evaporated. Depression Storage tends to be relatively insignificant and not subject to significant change, pre-to post-development.

Really, the focus of interest for stormwater and overall water resources management is both Infiltration and Surface Runoff. As discussed above, increased Surface Runoff by definition means decreased Infiltration. Land development creates both impervious surfaces and pervious surfaces such as lawns, often further compacted during the construction process, both of which result in reduced quantities of infiltration when compared with the pre-development natural condition. Important here is the pre-development vegetative cover condition of the site; existing

stands of forest or meadow or even scrub vegetation allow for considerably more Infiltration than will occur with a post-development lawn on a disturbed and at least partially compacted soil base.

A critical water cycle impact here focuses on the Groundwater Reservoir component, also commonly referred to as groundwater or aquifer recharge. Decreases in Infiltration mean decreases in the Groundwater Reservoir. As these reductions continue acre-by-acre, development-by-development, their cumulative effect grows larger. As the effects accumulate, Groundwater Reservoir depletion grows more serious, and the water table, the uppermost surface of this groundwater reservoir, declines as well. Figure 5 illustrates a simplified pre-development situation in cross-section, where normal Precipitation patterns combine with natural vegetation to produce a particular Groundwater Reservoir or aquifer condition.

In post-development conditions shown in Figure 6, well development and impervious surfaces have been added, resulting in reduced inputs to the Groundwater Reservoir. The water table declines. If we add in the effect of drought further reducing Groundwater Reservoir inputs and further lowering the water table, the cumulative effects of development and drought become quite significant. Springs and streams--especially first order headwater streams--are jeopardized and may even cease flowing. Wells, especially older shallow wells, may fail, and wetlands, typically fed by groundwater discharge, will be adversely impacted.

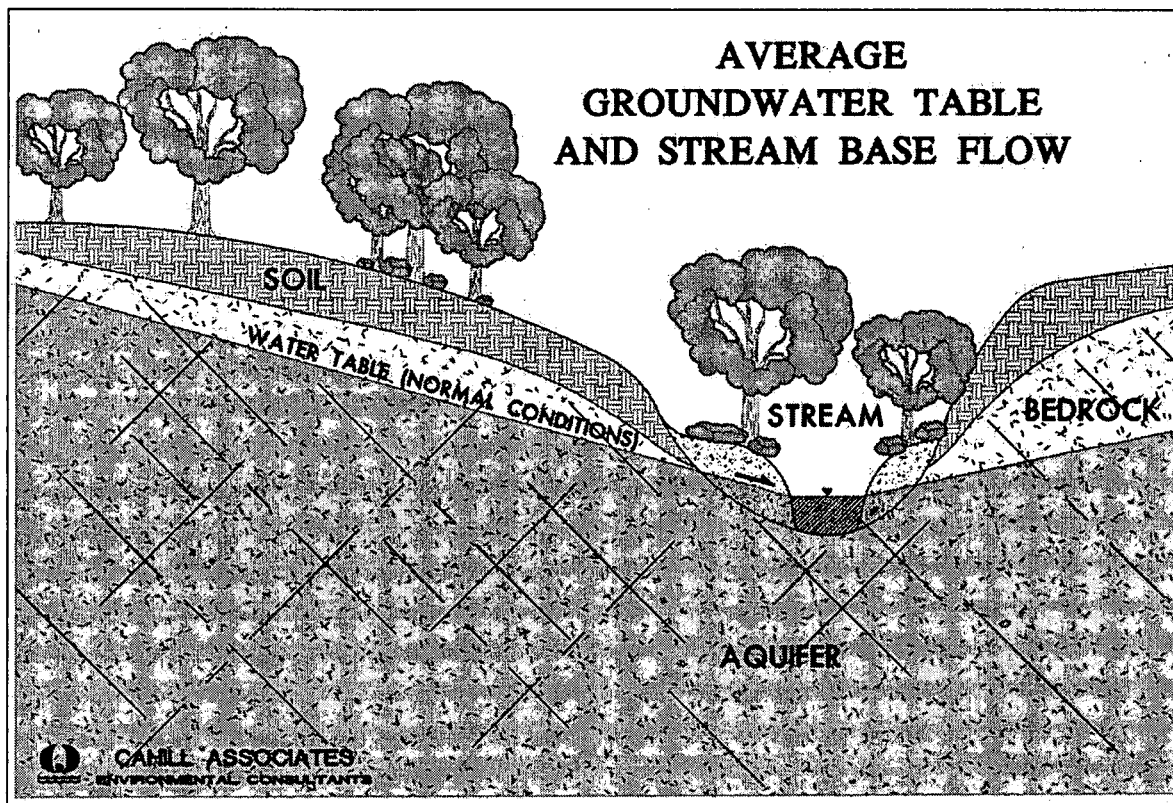


Figure 5 Groundwater and stream base flow (pre-development)

Most wells can be re-drilled at greater depths, though at considerable expense. Not so, for headwater streams and springs--the lifeblood of the stream system. The illustrations in Figures 5 and 6, though simplified, clearly establish the dynamic and critical relationship between the Groundwater Reservoir and Stream Baseflow. If the water table declines, Stream Baseflow declines by definition. The Groundwater Reservoir might be thought of as a saturated sponge where Precipitation inputs are added from time to time on the surface. In the consolidated aquifers of the Piedmont, groundwater then moves gradually through a myriad of pathways down and through the nooks and crannies of the sponge, ultimately flowing gradually out at the bottom in the form of Stream Baseflow. However slow the movement and indirect the pathways might be for this continuous flow, however distant the point of stream discharge might be, the point here is that **when subtractions are made from this Groundwater Reservoir flow, at some point the impact will be seen in the form of a lowered water table and reduced Stream Baseflow discharge.**

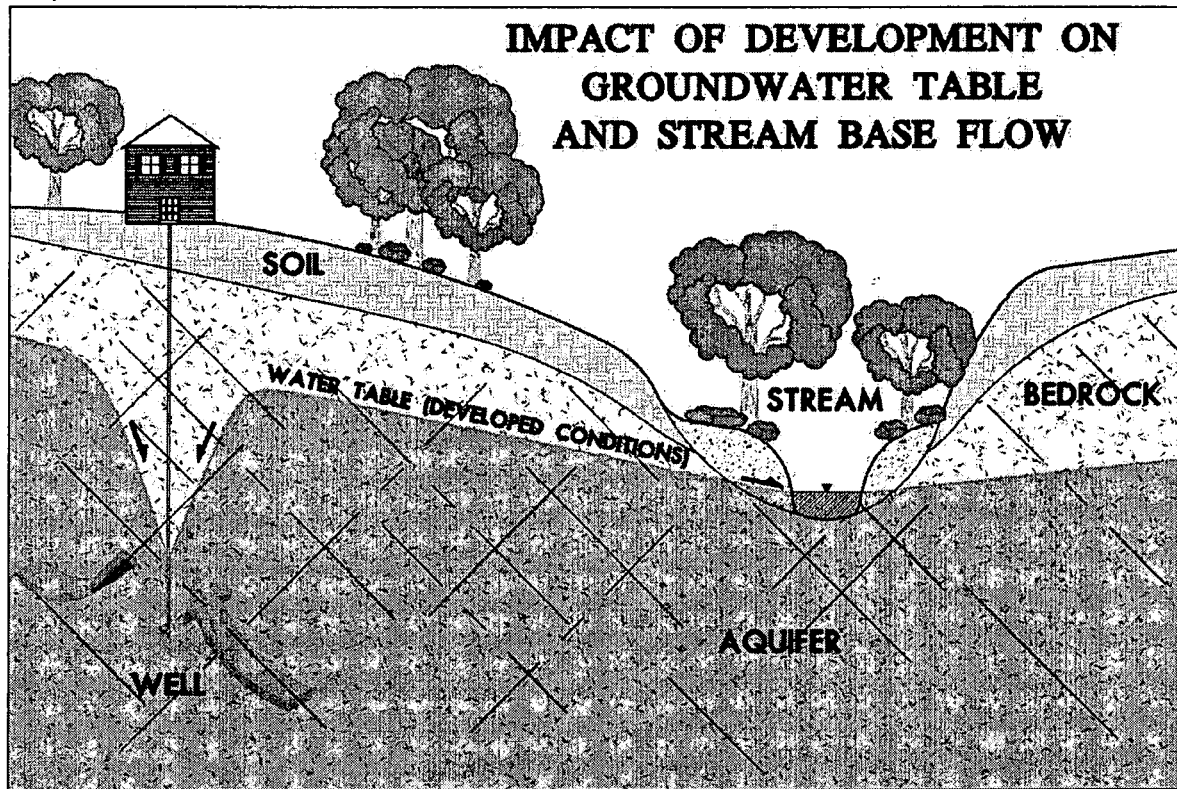


Figure 6 Impact of development on groundwater table and stream base flow

In Piedmont physiography like Radnor, **Surface Runoff** comprises Stream Flow a relatively small fraction of the time, perhaps less than 20 percent of the time in first order headwaters streams. The vast bulk of the time, Stream Flow in Radnor consists of Stream Baseflow discharged from the

**Groundwater Reservoir.** This Stream Baseflow discharge occurs continuously, a reflection of the continuous movement occurring within the groundwater, which is such a distinguishing characteristic of the water cycle.

It should be noted that this presentation of the water cycle and the groundwater phase of this cycle has been highly simplified for this discussion. In fact, the hydrogeological context can be quite complex. Rock types may vary from high capacity carbonate formations to tighter and less water-yielding rock. These variations and complexities notwithstanding, the basic dynamics of the simplified hydrogeological model used here remain valid.

Of course, during dry periods, both the water table and Stream Baseflow also decline, even under natural conditions. When the effects of drought and development are combined, the Groundwater Reservoir and water table may be so reduced that Baseflow ultimately is virtually eliminated from the stream, and the stream dries up with catastrophic ecological consequences. Even if Stream Baseflow is not entirely eliminated, significant reductions in flow occur which also adversely stress the aquatic community in a variety of ways, well before total dry up results.

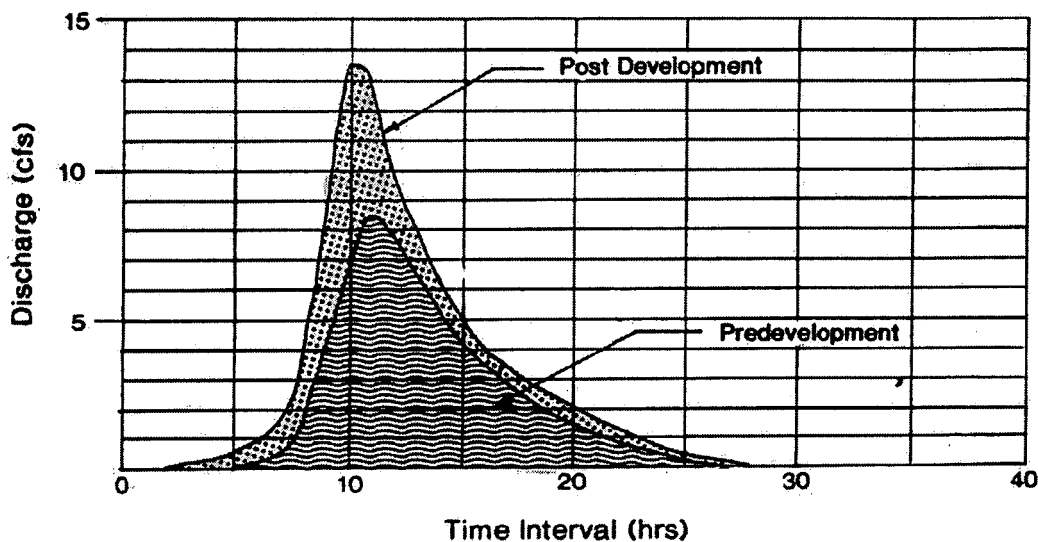
Adding to the seriousness of the problem is the fact that these stormwater-related impacts are magnified in the smallest streams--the headwaters zones--of the total stream system. Headwaters are defined here as 1st-order perennial streams, where the stream system with its aquatic community literally begins. In headwaters, Stream Baseflow by definition is modest even in pre-development and non-drought conditions. Therefore, any subtraction from flows in these small streams proportionally has greatest adverse impact. The potential for actual dry up is greatest in this most vulnerable, most sensitive headwaters zone. Furthermore, headwaters zones comprise the largest percentage of the total stream system on a lineal percentage basis. Headwaters are the locations of critical ecological functioning where exchange of energy from land to water occurs most directly and is most ecologically vital. Headwaters zones therefore are both most sensitive and of special value.

In some cases, the Groundwater Reservoir does not discharge to a stream, but rather to a wetland. Frequently, wetlands are zones of groundwater discharge and are in fact "fed" and kept alive by the Groundwater Reservoir. In these instances, reduced Infiltration and a lowered water table ultimately translate into loss of wetlands themselves, reduced wetland extent, reduced wetland vibrancy and richness, and other wetland functional losses. In sum, the impacts resulting from stormwater-related reduced inputs to the Groundwater Reservoir and Stream Baseflow can have serious and far-reaching consequences. Because the balance has already been so impacted and so tipped by so much existing development done the wrong way, it is especially critical that new development projects not make the problems even worse.

**Stormwater and Surface Runoff:** Because land development alters the water cycle by increasing Stormwater Runoff, the management concern historically has focused on how to handle excess water, how to prevent flooding. In fact, flood prevention continues to be the focus of most conventional stormwater management programs; flood prevention, of course, is a critical issue.

Understanding stormwater runoff means understanding the concept of a hydrograph, a graphical comparison of runoff being discharged from any particular site (measured in cubic feet per second)

on the vertical axis, versus time (measured as time into the storm event such as Hour 1, 2, 3, and so forth) on the horizontal axis. Hydrographs can be developed for sites of any size—one acre or 100 acres or 1,000 acres—and for all different size storm events. Hydrographs can actually be measured in the field (no simple matter) or can be estimated through a variety of mathematical modeling methodologies (the most typical approach). Figure 7 presents a hydrograph for a typical site in Radnor before development has occurred (not many of these left; note that the actual discharge values, site sizes, etc. are largely irrelevant for sake of the comparison developed here). A storm – hypothetically, the 100-year storm – begins. As can be seen from the Pre-Development hydrograph, surface runoff from the site does not begin for a while, until hour 2 or so, at which point the site soil becomes saturated (when the rate of Precipitation exceeds the rate of permeability of the soils). At this time, the rate of precipitation is assumed to increase, similar to hurricane-type events, such that the rate of runoff increases rapidly as well. In time, precipitation rates decline, and surface runoff rates decline as well.



**Figure 7 Stormwater hydrographs for Pre-development conditions and Post Development Uncontrolled conditions**

Note that the hydrograph is a graph of the rate of stormwater runoff. Rate must be carefully distinguished from volume of runoff. The area beneath the hydrograph curve constitutes the total volume of runoff discharged from the site. A second point to be stressed is that the pattern of runoff even in the pre-development or natural site condition is very much dictated by the assumed precipitation rates defining the storm event. If these assumed rates of precipitation were to be modified, then runoff rates would be modified as well. Lastly, note that there is runoff occurring even in pre-development conditions for the largest storm events. Because the rate of precipitation increases so dramatically in the 100-year storm event assumed here, maximum Infiltration rates are exceeded even without development. Even in forests, runoff results during the 100-year storm, given the assumed storm distribution.

Figure 7 also includes a hypothetical development at the hypothetical site and presents a post-development hydrograph without any stormwater management controls in place (Post-Development Uncontrolled). Several observations relating to the two hydrographs can be made. First, the Post-Development Uncontrolled hydrograph rises or increases earlier in time when compared with Pre-Development. Runoff starts occurring earlier after development because portions of the site have been made impervious and immediately start to discharge as rain begins to occur. More importantly, Post-Development Uncontrolled runoff rapidly increases and peaks out at a runoff rate level which is considerably higher than the peak rate of runoff for Pre-Development. The extent of this peak rate increase is very much linked to the amount of impervious surface and other land cover changes involved in the development process. If only 10 percent or so of the site were to be made impervious, then increase in peak rate would not be so great. If 50 percent of the site were made impervious, extent of increase in peak rate would be dramatic.

Introducing stormwater management, Figure 8 adds a Post-Development Controlled hydrograph to the comparison, where “Controlled” is here defined as a detention basin which functions to hold constant the pre-development rate of Surface Runoff by engineering design via a notched weir or perforated riser or some other technique to regulate the site discharge rate (this would be a detention basin sized without regard to a release rate percentage factor). However, the detention basin simply collects and detains the added runoff, discharging this increased runoff volume at the maximum pre-development rate over an extended period of time. Total volume of stormwater being discharged with Post-Development Controlled in Figure 2-8 is significantly increased. By design, detention facilities control runoff rates, but do not reduce increased post-development runoff volumes.

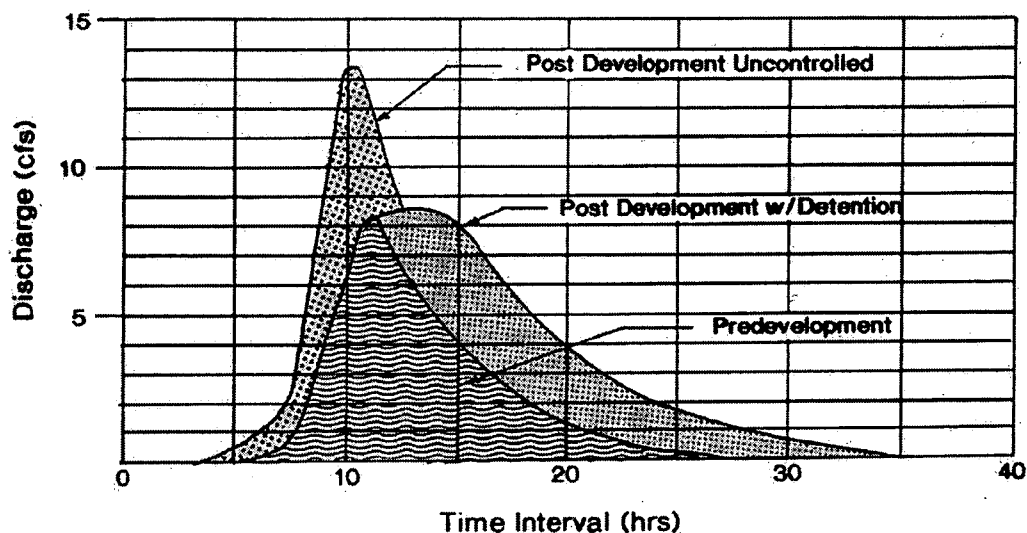
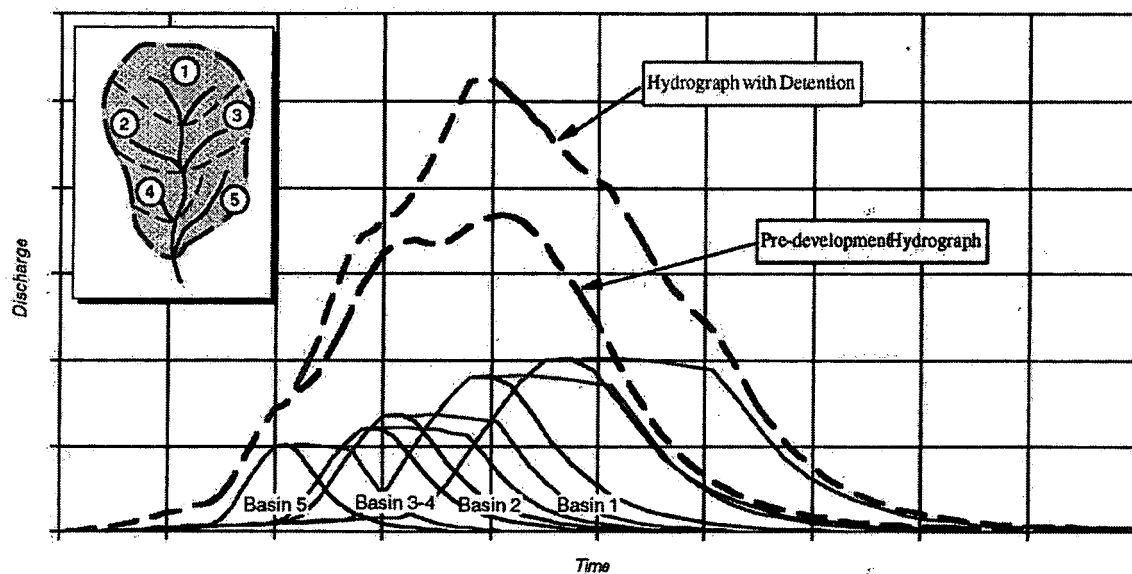


Figure 8 Comparison of pre- and post-development stormwater hydrographs

Peak rate control is a stormwater management strategy in large part designed to protect the adjacent downstream property from worsened flooding. That objective usually is achieved. However, if the perspective is extended to the broader sub-watershed or watershed zone, what is the effect of this increased volume of Runoff being discharged? What happens when many different sites throughout the watershed are developed with many different detention facilities discharging these increased volumes site-by-site? What is the cumulative watershed impact? These questions are reinforced by real world experiences where whole watersheds or sub-watersheds have been developed with reliance on a "no increase in peak rate/detention basin" philosophy and where flooding downstream has worsened nonetheless.

Figure 9 illustrates these cumulative downstream flooding impacts which can result when stormwater management is based upon peak rate control watershed-wide. Assumed here is a hypothetical Watershed "A" comprised of five hypothetical development sites (numbered 1 through 5 in the inset), each of which relies on a peak rate control/detention basin stormwater management approach.



**Figure 9 Effects of stormwater detention in a hypothetical watershed**

The figure shows the Pre-Development hydrographs – colored blue – for each Basin site 1 through 5. These 5 separate hydrographs when combined, create a Resultant Pre-Development hydrograph for the entire Watershed (dashed blue line). The Post-Development hydrograph – shown in red – assumes that all five developments utilize detention basins for stormwater management. The five hydrographs are modified as showing the Pre-Development peak rates not being exceeded, but being extended. The impact at the base of the Watershed is detrimental. As these extended peak rates are summed, the resultant Hydrograph grows taller (dashed red line). Not surprisingly, this resultant Hydrograph with Detention for the entire watershed not only exceeds the Pre-Development Hydrograph in terms of total area under the respective curves. In addition, the

combined peak rate of runoff for watershed A with Detention increases considerably because of the way in which these increased volumes are directed down the watershed system.

In short, flooding worsens considerably downstream, even though elaborate and costly detention facilities have been installed at each individual development. The floodplain by definition will be expanded. Property loss, possible loss of life and limb – all the costs associated with flooding – can be expected to worsen. The simple “peak rate control with detention basin” approach to stormwater management frequently does not even solve the problem of flooding.

Additionally, note that based on Figures 7, 8 and 9, the duration of flood flows – though not necessarily the absolute peak flooding rates – also increases and continues for longer durations, with potential adverse impacts:

- Significant stream bank erosion
- Bank undercutting
- Elimination of meanders
- Changes in the morphology of the stream, including channel widening and straightening
- Increased sedimentation and deposition
- Elimination of pools and riffles
- Reduced stream ecological value

Looking at the Pre-Development hydrograph, the peak runoff rate may occur for an hour or so. Moving to Post-Development with Detention and with release rate reduction factors applied, that peak rate or “release rate reduced” peak rate may extend for 11 or 12 hours. Over time, these impacts can transform the stream from a high quality if not pristine water, with excellent species diversity and richness, literally to functional storm sewers, devoid of biota.



## Appendix A-2 Water Resources – Quality

### A. General Water Quality Issues

#### 1. Physical Types of Pollutants: Soluble vs. Particulate

The physical form of the pollutant has major bearing on all aspects of water quality management. One very important way of differentiating pollutants is the extent to which pollutants are particulate vs. soluble in nature. Good examples of this comparison are the nutrients phosphorus and nitrogen. Phosphorus typically occurs in particulate form, often bound to soil particles. Because of this physical form, stormwater management practices which rely on physical filtering and/or settling out can be largely successful for phosphorus removal. In stark contrast is nitrogen, which tends to exist in highly soluble forms where any sort of attempt at physical filtering has little if any effect. As a consequence, management approaches for nitrogen must be quite different in approach (wetlands/wet ponds and other approaches where anaerobic conditions are promoted and where denitrification can occur are preferable).

#### 2. Natural Mechanisms for Stormwater Pollutant Reduction/Mitigation

Although stormwater-related pollution often can be reduced if not eliminated through preventive Best Management Practices (BMPs) driven by quantity reduction objectives, not all stormwater pollution can be avoided. In such cases, an array of natural pollutant removal processes are available for use and should be exploited to the maximum. Because these processes tend to be associated with, even reliant upon both the vegetation and soil realms, they can be readily incorporated into many BMPs. Such natural pollutant removal processes include:

**Settling:** as discussed above, the kinetic energy of stormwater washes all types of matter; particulate form and other, from land cover surfaces. Particles remain suspended in stormwater flows as long as the energy level is maintained. Larger particles require more kinetic energy in order to remain in suspension. As the energy level declines--as the storm flow slows, these suspended particles begin to settle out by gravity, with larger, heavier particles settling out most quickly and the smallest colloidal particles requiring considerably more time for settling. To the extent that time can be maximized, more settling can be expected to occur, holding all other factors constant. Therefore, approaches which delay stormwater movement or approaches that reduce kinetic energy in some manner (e.g., energy dissipaters) serve to maximize settling and deposition.

**Filtering:** another natural process is physical filtration. As pollutants pass through the surface vegetative layer and then down through the soil, larger particles are literally physically filtered from stormwater. Vegetation on the surface ranging from grass blades to underbrush removes larger pollutant particles. Stormwater sheet flow through a relatively narrow natural riparian buffer of trees and understory herbaceous growth has been demonstrated to physically filter surprisingly large proportions of larger particulate-form stormwater pollutants from stormwater flows. Both filter strip and grassed swale BMPs rely very much on this filtration process. Filtration may also occur in stormwater which is infiltrated and then gradually moves downward through the various soil layers, although once this

infiltration process begins, a variety of other pollutant removal processes (see below) are set into motion as well.

**Biological Transformation and Uptake/Utilization:** though grouped as one type, this category includes a complex array of different processes that reflect the remarkable complexity of different vegetative types, their varying root systems, and their different needs and rates of uptake of different "pollutants" (in this case, clearly "resources out of place"). An equally vast and complex community of microorganisms exists within the soil mantle, and though more micro in scale, the myriad of natural processes occurring within this realm is just as remarkable. Certainly both nutrients phosphorus and nitrogen are essential to plant growth and therefore are taken up typically through the root systems of the various vegetative types, from grass to trees. Nitrogen processing is quite complex, a function of nitrate/nitrite and ammonia/ammonium forms. The important process of denitrification occurs through the action of widely present facultative heterotrophs, which function to facilitate the exchange of ions in the absence of oxygen and ultimately convert nitrates for release in gaseous form. These processes ultimately become chemical in nature, as discussed in the next section). As wetland species are introduced, all of this processing becomes more chemically complex.

**Chemical Processes:** For that stormwater which has infiltrated into the soil mantle and then moves vertically toward groundwater aquifers, various chemical processes also occur within the soil. Important processes occurring include adsorption through ion exchange and chemical precipitation. Cation Exchange Capacity (CEC) is a rating given to soil which relates to a particular soil's ability to remove pollutants as stormwater infiltrates through the soil mantle (i.e., through the process of adsorption). Adsorption will increase as the total surface area of soil particles increases; this surface area increases as soil particles become smaller, as soil becomes tighter and denser (in other words, large particle sandy soils end up having considerably lower total surface areas per unit volume measure than a heavy clayey soil. CEC values typically range from 2 to 60 milliequivalents (meq) per 100 grams of soil. Coarse sandy soils have low CEC values and therefore are not especially good stormwater pollutant removers (a value of 10 meq is often considered to be the minimum necessary to accomplish a reasonable degree of adsorption-related pollutant removal). Conversely, "tighter" soils such as clayey types have much higher CEC values.

Through reliance on these processes, management practices can be applied which substantially increase pollutant removal potential above and beyond any mitigation being provided by the detention basins currently utilized at most sites. Through a combination of vegetative-linked removal combined with a host of processes occurring within the soil mantle, pollutants entrained in stormwater runoff can be removed and even eliminated.

### 3. Water Quality Sampling

Water quality in the Township's streams is not as well documented as we might like, especially in the northern Gulph Creek portion of the Township. There have been a variety of special

studies conducted during recent years, which have increased our understanding of the water quality in the Darby Creek system.

The most interesting and reliable water quality data undoubtedly has been developed recently by the Philadelphia Water Department; this data fortunately extends to both the Cobbs Creek and non-Cobbs Creek portions of the Darby Creek system. In 1999, the PWD undertook special water quality sampling, which included both actual sampling and computer model simulations of water quality. Ten additional sampling stations were selected, five in the Cobbs Creek and five in the remainder of the Darby Creek system, based on varying rationales. Sampling generally was performed weekly during the late Spring and early Summer, 1999, with 4 of the 10 samples occurring during what considered to be "wet weather." Parameters include Statewide Specific Criteria as well as a variety of basic water quality parameters to be later used by the PWD in its analysis of water quality problems and their respective sources (see Technical Memorandum No. 2, November 30, 1999).

Results indicate a remarkable degree of PADEP standards violations for fecal coliform (standard at 200/100 ml); exceedances were greatest in the Cobbs but were also remarkably high on the Stony and the Muckinipattis and were quite high farther up the Darby mainstem (peaking at 6,000/100 ml at Station 5 with the wet weather average at 1,473 and the dry weather average at 771; Station 5 was located at Darby Creek at Marple Road next to Haverford State Hospital in Haverford Township; because of its downstream proximity to Radnor, Station 5 should give a reasonable reading of water quality flowing from Radnor; it should be noted that in other sampling such as the 1995 PADEP biological investigations at Station 3 in Radnor on the Darby above the confluence with Foxes Run the fecal coliform count in dry weather was 1200/100 ml, again comparably high). Exceedances of the fecal coliform standard were much higher during the wet weather samples, yet were definitely present during dry weather flows, suggesting that fecal coliform to some extent are being discharged on an ongoing basis, possibly from leaking sewer interceptors, from individual onsite septic systems, possibly from geese. Other parameters of interest such as dissolved oxygen and metals toxicity do not appear to be a significant problem, although again the sampling record is not extensive.

## **Appendix A-3**

### **Air Quality**

The air we breathe is a blend of various gases and substances. Like a giant stew, the ingredients are eaten, digested, altered, and replaced. Animals infuse oxygen into their blood and exhale carbon dioxide; plants take in the carbon dioxide and respire oxygen. Volcanoes erupt and emit sulfur into the mixture, lightening strikes fixing nitrogen into the ground, bacteria composts nutrients, releasing methane into the air. Coal fired power plants produce electricity, sulfur and nitrogen oxides. Cars, trucks, planes, trains and buses in their travels leave unburnt hydrocarbons and particulate matter in the air. In short, the air we breathe is a mix of nitrogen, oxygen and carbon dioxide, with a complex, of other ingredients; just as good food promotes good health, clean, or reasonably pure, air facilitates healthy life.

Polluted air causes cancer, birth defects, brain damage, respiratory complications, problems with eyes and noses, and can even be fatal. Damage extends to trees, lakes, streams and animals, all of which we depend on for our own survival. Air pollution affects buildings, homes and cars, as pollutants dissolve and corrode. Airborne pollutants which are ultimately deposited on the land surface are now recognized as major nonpoint source water quality factors as well.

#### **1. Sources of Air Pollution**

Several general categories exist for classifying air pollution: point sources, nonpoint mobile sources, biogenic sources, and area sources. Point sources are those inputs that are stationary and directly measurable, such as smoke stacks or vents. Nonpoint sources are mobile and not directly measurable, such as automobiles and airplanes. Biogenic sources include trees, bacteria, vegetation and other natural sources of gases and particles. Area sources are stationary sources such as chemical producers and dry cleaners, that are too small to monitor individually, but are often grouped together to determine emissions. Although the pollutants produced by each source may vary in composition and concentration, all sources are all combined on a regional scale to produce an areas ambient air quality. Weather and wind patterns obviously are important in understanding air quality at any one location.

Although Radnor is substantially developed, Radnor is substantially developed with low density residential uses which support considerable vegetation and "green areas." The vegetation is beneficial from an air quality perspective. Furthermore, Radnor has few if any point sources of air pollution. On the other hand, Radnor is bisected by massive regional highways, with comparably massive traffic flows occurring daily on the Blue Route and Lancaster Avenue. Significant daily problems of congestion translate into comparably significant mobile source emissions along these major regional corridors, as well as local roads such as Conestoga and which carry increasing traffic loads and experience back ups (queuing with the resultant acceleration is a notorious mobile source emission problem). As the entire road-system carries more traffic and experiences more congestion, mobile source emissions increase, unless it is assumed that each vehicle is polluting less. Air quality in Radnor therefore may be deteriorating, although the actual air quality sampling undertaken is extremely sparse (see discussion below).

## 2. The Air Quality Regulatory Framework

The Federal government, through the US Environmental Protection Agency (USEPA), controls air quality under the Clean Air Act, originally passed in 1970 and amended in 1990. Although the Clean Air Act includes the entire nation, it is largely administered and implemented by the individual states. The main responsibilities of USEPA are to set standards for pollutant levels and to ensure that these air quality standards are met.

USEPA has outlined six criteria pollutants, called National Ambient Air Quality Standards (NAAQS), to monitor and regulate: carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>) and lead (Pb). Table 1 lists the standards established for the NAAQS.

**Table 1 National Ambient Air Quality Standards (NAAQS;**  
<http://www.dep.state.pa.us/dep/deputate/airwaste/aq/standards/standards.htm>)

Pollutant	Average	Concentration
Carbon Monoxide	8-Hour	9 ppm
	1-Hour	35 ppm
Lead	Max Quarterly	1.5 ug/m3
Nitrogen Dioxide	Annual	0.053 ppm
Ozone	Max Daily 1-Hour	0.125 ppm
	Max Daily 8-Hour	0.085 ppm
Particulate Matter ≤ 10 microns	Annual	50 ug/m3
	24-Hour	150 ug/m3
Particulate Matter ≤ 2.5microns	Annual	15 ug/m3
	24-Hour	65 ug/m3
Sulfur Dioxide	Annual	0.03 ppm
	24-hour	0.14 ppm

At the state level, PADEP has a constitutional obligation to protect Pennsylvanian's right to clean air. Furthermore, PADEP has been delegated multiple authorities and responsibilities under the Federal Clean Air Act. PADEP's Bureau of Air Quality regulates emissions from thousands of point sources statewide and works with companies to ensure compliance, while enforcing penalties against those in violation. In addition, PADEP monitors ambient air quality to determine regional compliance, to gather data and trends and to provide information to the public. PADEP also works jointly with the Pennsylvania Department of Transportation in management of transportation-related mobile source emissions. PADEP publishes annual reports summarizing ambient air quality; the 2000 report is available on line at <http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/aqreport.htm>

## 3. NAAQS: Air Pollution Sources and Health Effects

**Carbon Monoxide (CO):** Carbon monoxide is a by-product of burning gasoline, natural gas, coal, oil and wood. Automobiles are a major source of CO. CO enters the bloodstream through

the lungs and decreases the amount of oxygen delivered to the body. Low levels of CO are a threat to people with cardiovascular disease. In healthy people, higher levels of CO cause visual impairment, reduced work capacity, reduced dexterity, and reduced brain function

**Ozone:** Ozone is derived from chemical reactions of pollutants, volatile organic compounds (VOC), and oxides of nitrogen (NO<sub>x</sub>). Ozone is the principle component of smog. Exposures (1-3 hours) to ozone are linked to increased respiratory cases in hospitals. Repeated exposures increase the likelihood of respiratory infection, lung inflammation, decrease lung function and aggravate asthma.

**Nitrogen Dioxide:** Nitrogen dioxide is derived from burning gasoline, natural gas, coal, oil, and wood. Cars are a major source of NO<sub>2</sub>. Exposure to NO<sub>2</sub> causes lung damage and respiratory infections. In addition, NO<sub>2</sub> leads to ozone and acid rain problems.

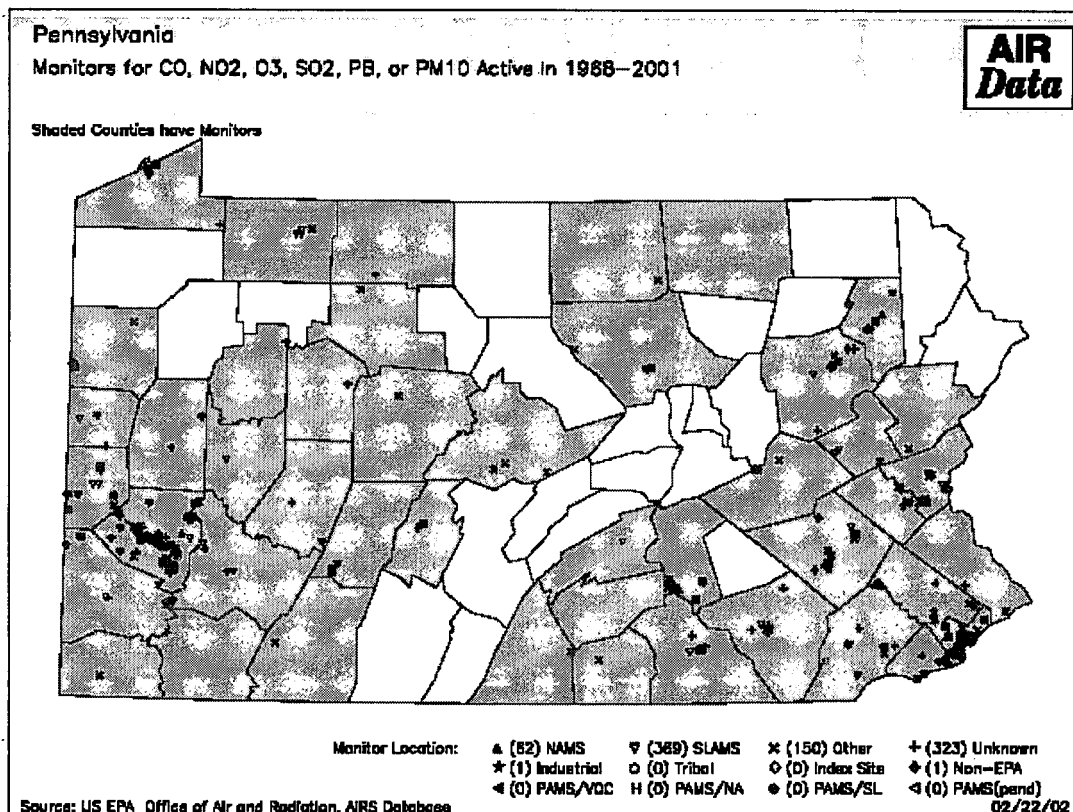
**Particulate Matter:** Particulate matter (PM) is derived from burning wood, diesel, gasoline, industrial plants, agriculture, construction and unpaved roads. PM can cause respiratory infections and diseases, decreased lung function and premature death. The elderly and those with cardiopulmonary disease are particularly susceptible. PM also causes reduced visibility and upon settling it damages materials. A controversy continues regarding the size of particles that should be regulated, with recent research suggesting that USEPA standards are not sufficiently “fine grained” (literally).

**Sulfur Dioxide:** Sulfur dioxide is derived from industrial processing of paper and metals, burning coal and oil, especially high-sulfur coal typically in the eastern United States. The health effects include respiratory problems and infections, cardiovascular problems; permanently damage to lungs may result.

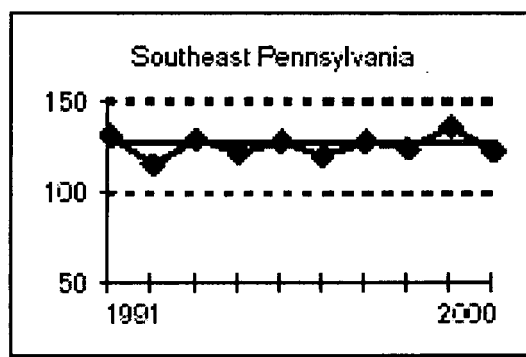
**Lead:** Lead is derived from leaded gasoline, paints, smelters, and manufacturing of lead batteries. Lead enters the body through inhalation and ingestion of food, water, soil or dust particles. Once in the body, lead tends to be accumulated and not readily excreted. Health effects of lead exposure include problems with the kidneys, liver, nervous system, seizures, mental retardation, and/or behavioral disorders. Even at low doses, children and fetuses suffer central nervous system damage. Lead is also linked to high blood pressure and heart disease.

#### 4. Air Quality in the Region

What can we say about air quality in and near Radnor Township? Unfortunately, air quality sampling is costly and complex, and therefore is undertaken in relatively few locations. The air quality for southeastern Pennsylvania is monitored from several locations in Montgomery, Bucks, Chester, Delaware and Philadelphia Counties. There are several point sources that are directly measured, and also several ambient monitoring stations. Station locations are presented in Figure 1. Southeast Pennsylvania is in attainment for all the air quality standards, except for the ozone standards (see Figures 2 and 3). Over the past 10 years, levels of CO, NO<sub>2</sub>, Pb and PM have decreased on average, and SO<sub>2</sub> has remained roughly steady.

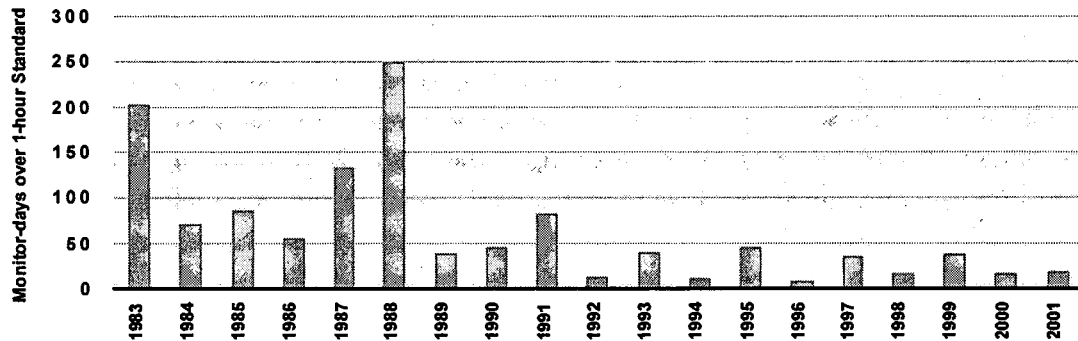


**Figure 1 Locations of Air Quality Monitoring Sites in Pennsylvania**



**Figure 2 Ozone Trends 1991 to 2000 Second Daily Maximum 1-hour (parts per billion)**  
(taken from PA DEP 2000 Ambient Air Quality Monitoring Report)

## **Philadelphia Ozone Non-attainment Area Air Quality Trend**



**Figure 3 Ozone Trends in the Philadelphia Region**

Figures 4 and 5 describe the air quality conditions throughout Pennsylvania. In addition, PADEP posts a daily air quality index, which describes the current air conditions for a given area and assigns a qualitative value, such as good, moderate, hazardous, and so forth (<http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/aqi.htm>).

### **5. Additional Resources**

The monitoring network for air quality is rather limited and highly generalized. Measurements from a small number of sites are used to judge the air quality of a large area. There is a need for more data (and for less pollution). Local municipalities have little authority over regional air quality, but there are still ways that municipalities can positively affect the air quality situation. USEPA has a variety of programs aimed at improving air quality. For instance USEPA offers grants for cleaner transportation and air quality programs (<http://yosemite.epa.gov/aa/grants.nsf>). They provide assistance for small businesses to lower emissions; they provide consumer information rating emission efficiency for automobiles. On a smaller scale, the Plants for Clean Air Council, provides information on maintaining and improving air quality with the aid of plants (<http://www.plants4cleanair.org/>).



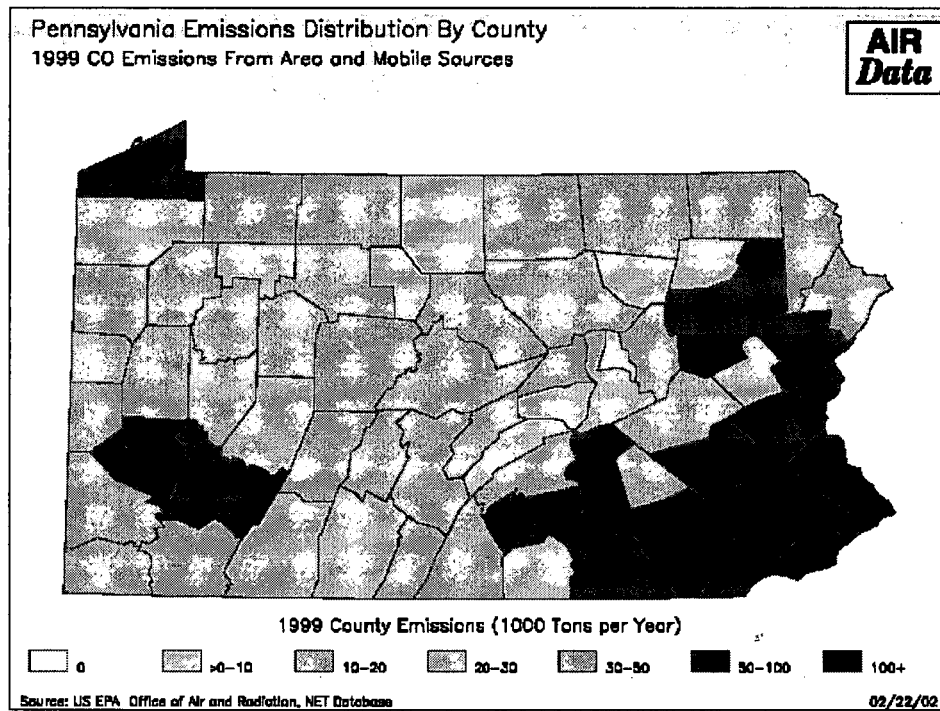


Figure 4 Carbon Monoxide Emissions by County

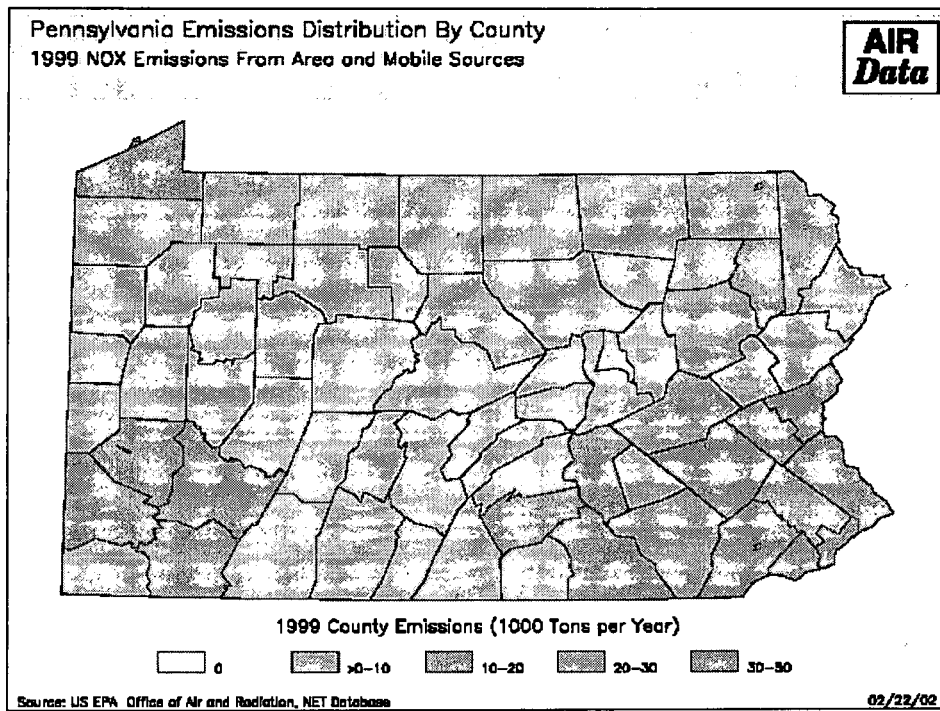


Figure 5 Nitrogen Oxide Emissions by County

## **Appendix D-1**

### **Detailed Site Descriptions**

#### **KEY**

DCHSI -- DELAWARE COUNTY HISTORIC SITES INVENTORY  
DCPC -- DELAWARE COUNTY PLANNING COMMISSION  
DVPC -- DELAWARE VALLEY PLANNING COMMISSION  
DVRPC-- DELAWARE VALLEY REGIONAL PLANNING COMMISSION  
DVRPCI -- DELAWARE VALLEY REGIONAL PLANNING COMMISSION INVENTORY  
HDC -- HISTORIC DELAWARE COUNTY  
NRHP -- NATIONAL REGISTER OF HISTORIC PLACES  
PHMC -- PENNSYLVANIA HISTORICAL & MUSEUMS COMMISSION  
PHRS BHP -- PENNSYLVANIA HISTORIC RESOURCE SURVEY, BUREAU FOR  
HISTORIC PRESERVATION  
PI -- PENNSYLVANIA INVENTORY

1) RADNOR FRIENDS MEETING HOUSE - Sproul & Conestoga Roads. Built 1717-18, probably the oldest building in Radnor Township. Small stone structure with steep-pitched gable roof, round arches over windows and doors. Addition built 1722, eastern section. Except for about 60 years in 19th century, in continuous use for religious purposes. (1972 - NRHP; PHMC List; P1; PEMC Marker) (See Appendix D-II, Radnor Friends Area]

2) OLD COUNTRY STORE - 601 Conestoga Road. Built Ca. 1808, with several later periods of construction. Two-story stone cemented over. Probable site of earlier dwelling occupied by original Welsh settler John Jerman. From late 1700's through much of 19th century served as a store; Ithan Post Office established there 1889. (DVRPC; DCPC)

3) SCHOOL HOUSE - 610 Newtown Road. Built 1856, on site of school established by Friends before 1800. Extensive interior and exterior alteration of original building. (DCPC)

4) THE PEAK - Corner of Newtown, Conestoga and Radnor-Chester Roads. Georgian Revival mansion house built in 1903 for Barklie Henry. (DCPC; HDC)

5) SCHOOL HOUSE LOT - 583 Conestoga Road. Two and a half story stucco-over-stone house. Portion of existing structure may be original, dating from 1769. No evidence of building having been used as a school. (DCPC; 1972 PHMC List)

6) GREEN HEDGES - 581 Conestoga Road. Earlier two-story brick house built in two sections in Ca. 1800 and 1843. Land purchased from Lewis Jerman by Margaret Dickenson in 1769. (P1; DVRPC; DCPC)

7) WAYSIDE - 569 Conestoga Road. Two-story stucco-over-stone house, built Ca. 1830. Land was part of the 3 acres acquired by Margaret Dickenson from Lewis Jerman in 1769. A well-preserved stone and farm barn stands on the property. (DCPC; HDC)

\* 8) ATTERBURY HOUSE - 615 Newtown Road. Two and a half story stone house built in several sections beginning before 1800. Jacob Maule ran his Quaker Boarding School here shortly after 1800. House and nearby carriage house (1890) have had substantial alterations. (DCPC; HDC)

\* 9) TODD HOUSE - 230 Sproul Road. Large stone house with stone barn and springhouse. Original 18th century two-story stone farmhouse has had substantial alterations. Site of one of first settlements of the Jerman family in the 1680's. Large (17th century?) sycamore stands by springhouse. (DCPC)

\* 10) JOSEPH HARDING HOUSE - 620 Lancaster Avenue, Radnor. Large two and half story stucco-over-stone house, built 1834-1839. Original stone barn behind house built at same time. Built by Joseph Harding, owned by Martha Brown subsequently, and became part of the Chew estate. (P1; DCPC; HDC)

11) FENDALL HOUSE - 734 Lancaster Avenue, Radnor. Built 1798. Original two-story stone and frame house is largely intact except for asbestos siding covering front exterior. Oldest house on Lancaster Pike in Radnor Township. Built by William Penn's great grandson, Peter Gaskell, first occupied by Thomas D. Fendall, probably a worker employed by him. A particularly well-preserved example of the typical average working family's house in the area. (P1; DCPC; HDC)

\* 12) BELORME - County Line & Matsonford Roads, Radnor. Two stories Fieldstone, gable roofed house. Built in 1806 with additions in 1815. (P1; DVRPC; DCPC)

13) ASHWOOD MANOR - 208 Ashwood Road, Villanova. Two and a half story stone house with long shed dormer, built in early 1800's with several additions. Property owned by Peter Penn-Gaskell, descendant of William Penn in 1796. He lived there in rebuilt home until 1831. (P1; DVRPC; DCPC)

14) GATEHOUSE ASHWOOD MANOR - 801 Lancaster Avenue, Villanova. Stone Gothic cottage with numerous gables, tower and diamond shaped windowpanes. Built in 1892 and retains original condition. (P1; DVRPC; DCPC)

15) ODDFELLOWS HALL - 64 1-3 Conestoga Road, Radnor. Stone building, three stories in height. Marker on front reads "I.O. of O.F. Radnor Hall built 1851" (International Order of Odd Fellows). (DCPC; HDC)

16) DAVID LEEDOM HOUSE - 634 Conestoga Road, Radnor Square stone house, the rear wing built 1830 by Lydia and Mary Davis. Large square front addition built 1855 by Sarah Leedom. (P1; DCPC; HDC)

17) NATHAN MATLACK HOUSE - Darby-Paoli Road. Two story stone house. Built between 1762 & 1783, westerly portion is the older. Stone exterior now covered with plaster. Terraced barn foundation and small springhouse remain. (A Rare Pleasing Thing: Radnor, K. Hewitt Cummin)

\* 18) SPRINGHOUSE - South Ithan Avenue (Booth School Property). 1730 Stone house, spring in living room. On the site of one of the earliest settlements in Radnor Township. (DCPC)

19) SPRING VALLEY - Darby & Sproul Roads, Bryn Mawr Avenue (Ellis Estate) (now Fox Fields Road). Tenant house and barn owned by Jones A. Moore, first cousin once removed of Isaac Cornog, in 1870. (DCPC)

20) ROBERT E. STRAWBRIDGE HOUSE - Mill Road south of Bryn Mawr Avenue. Large brick, timber, and stucco building built in style of medieval English Manor House. Land is part of Stephan Evans 97 acres surveyed in 1705 owned by Jesse Brock in 1870 and John K. Valentine in 1892. (P1; DVRPC; DCPC)

21) BOLINGBROKE - King of Prussia Road. Stone house built in stages between 1700 and 1792 (date stone). Additions have transformed it into a three-story mansion with gabled roof. (Historic American Buildings Survey #PA1000: 1958; DVRPCI: 1969)

22) CHUCKSWOOD - 101 South Spring Mill Road. Large Brick two and a half story house with a gabled roof. 1801 datestone in eaves. Through 1841 the only brick house in Radnor Township. Outstanding interior details. (Historic American Buildings Survey #PA195:1958; DVRPCI: 1969)

23) FINLEY HOUSE - 113 West Beechtree Lane, Wayne. Stone House covered with plaster. Built between 1838-1841. Some portions older (1789). Once the property of John Pugh III. Doubled in size in 1885. Home to Radnor Historical Society. (PHMC: 1972)

\* 24) HILLSIDE - 512 King of Prussia Road, Radnor. Farmhouse of stone, stucco and clapboard -two stories and gabled roof. Built prior to 1816. Typical of early Pennsylvania farmhouses. (Listed as most important on 1972 PHMC List; DVRPCI: 1969)

\* 25) LAUNFAL - Sproul Road, Villanova. Stone mansion constructed for Lincoln Godfrey Ca. 1895 from plans of T.P. Chandler. House later rebuilt for Clarence Geist by Architect Paul Cret. Formal gardens planned by Jacques Greber, designer of the Parkway in Philadelphia. (Listed as most important on PHMC List: 1972)

26) WAYNE CRICKET CLUBHOUSE -West Beechtree Lane. Two story wood frame house built 1889. One portion remains standing as a private residence.

27) SORREL HORSE INN -Agnes Irwin School - Ithan & Conestoga Roads. Built 1764. Two-story stone structure built as an inn originally called the Horse & Groom. After 1794 inn operation ceased. Property has also been called Kirkdale, Highland Farm, Barclay Farm (in 1892 when it was "renovated" by G.W. & W.D. Hewitt architects). Renamed Sorrel Horse in 1950 's by Charles B. Grace of Bethlehem Steel Company. (PHMC: 1972)

28) WOODSTOCK - 158 Vassar Circle. Fieldstone and stucco with pebbledash and whitewash masonry Two and a half-story house. South section built 1776. North section built 1800. Additions built in 1931. Built by James Hunter who served with the army during the

Revolutionary War. Charles Thomson, first secretary of the Continental Congress was often a visitor at "Woodstock". (PHMC: 1972; DVRPCI: 1969)

29) WOODSTOCK BARN - Vassar Circle. See above. Three-story fieldstone, board and batten barn converted into dwelling/studio in 1926 by Thornton Oakley. In peak of gable at south end is date stone "JH 1804". (PHMC: 1972; DVRPCI: 1969)

\* 30) WOOTTON - St. Aloysius Academy. Mansion designed for George W. Childs, who named it "Wootton", by John McArthur, architect of Philadelphia's City Hall. Mansion built 1876. Gatehouse 1880. Beautiful interior. (PHMC: 1972; DVRPCI: 1969)

\* 31) HOLLY TREE HOUSE - Darby-Paoli Road east of Newtown Road. Small two-story stone house built Ca. 1720 by Thomas Thomas. (PHMC: 1972)

\* 32) BROOKE FARM HOUSE & BARNS - Brooke & Church Roads, St. David's. Built 1771 by Samuel Brooke. Beautiful setting exemplifying rural Radnor. (PHMC: 1972; Historic Wayne — Bicentennial Issue: DCHSI: 1973)

33) NORTH WAYNE HISTORIC DISTRICT - North Wayne Avenue to Eagle Road (east) North Woodland Court east on Eagle to south on Radnor Street Road to Poplar west to North Wayne. One of the earliest planned communities connected to the railroad. (NRHP)

\* 34) SPRINGHOUSE - Godfrey Road. Said to have 1684 datestone (unfound) on site of one of the earliest settlements. Stone additions 1805-1823. Poor condition. Original owner Samuel Miles. (DCHSI: 1973)

\* 35) 812 MAPLEWOOD ROAD - Stone and frame. Part built 1794-98 by David Morgan. (DCHSI: 1973)

\* 36) 300 LANDOVER ROAD - Stone house. Original part built 1722. Late 18th century and later additions. Stone barn built 1791 by William and Mary Sheaff. Springhouse also remains. (DCHSI: 1973)

\* 37) 1000 SPROUL ROAD - Rear wing is 18th century. Stone front additions bear datestones 1834 and 1885. Built first by Thomas Read. Rural setting with barn and outbuildings (springhouse, barn and carriage house). (DCHSI: 1973)

38) 500 CONESTOGA ROAD, VILLANOVA - Section built in 1780 by Adam Siter. Was eviscerated by Okie and transformed to a servants wing. Large R. Bragnard Okie addition 1924. (DCHSI: 1973)

\* 39) CORNOG HOUSE - Church Road, Wayne on Ardrossan Property. Two-story stone house invisible from the road. Built by David Cornog. Datestone says 1790. Little restoration. Setting is rural with beautiful view. (DVRPCI: 1973)

40) SIMON MATLACK HOUSE - Newtown & Darby-Paoli Roads. Two-story house built 1798 or earlier. Built probably by Simon Matlack. It has been enlarged since then and a massive stone barn built. 1858 datestone R and MP for Robert Paiste and wife. Beautiful view from property and to the south Inverary Development ruins total setting. (DVRPCI: 1973; A Rare and Pleasing Thing: Radnor, K. Hewitt Cummin)

41) 700 SPROUL ROAD - Many stone additions to small 18<sup>th</sup> century house. Springhouse and barn stand. Formerly home of B.F. Clyde. Built first by Nathan Evans. Stone barn part from 1814 still stands. (DVRPCI: 1973; A Rare and Pleasing Thing: Radnor, K. Hewitt Cummin)

\* 42) ABRAHAM'S LANE HOUSE - Abraham's Lane. Eighteenth century house stone with later additions. Barn and outbuildings stand. Former Abraham house. Setting is rural and evokes 18th century atmosphere of Radnor. (DVRPCI: 1973; A Rare and Pleasing Thing: Radnor, K. Hewitt Cummin)

43) HOUSE -BRYN MAWR AVENUE - Near to and southwest of Castlefinn Lane (314-322 Bryn Mawr Avenue). Two-story stone farmhouse built 1822 by Jonathan Miller. Barn nearby is now a dwelling. Former Castlefinn estate later joined to the Morris estate. (DVRPCI: 1973)

\* 44) TOLSTOI HOUSE - HUNT ROAD - (visible from Malin Road) Two-story stone house part built in 1767, part built in 1801 by Henry Lewis, and part in 1842 by George Owen Mans. Has old springhouse. Countess Tolstoi lived here while writing biography of her father. (DVRPCI: 1973; A Rare and Pleasing Thing: Radnor, K. Hewitt Cummin)

45) "KINTERRA" - 676 Church Road. Two-story stone house built 1808-1814 by John Hampton. A fine example of early 19th century construction. (DVRPCI: 1973; A Rare and Pleasing Thing: Radnor, K. Hewitt Cummin)

46) 221 ATLEE ROAD, WAYNE - Impressive stone house, part built 1802-1805 by William Siter. Was named Ford Hook in 1870 by then-owner Dr. Atlee. (DVRPCI: 1973)

47) 765 CONESTOGA ROAD, ROSEMONT - Two-story stone house part built 1804 by John Gyger, a weaver. (DVRPCI: 1973)

48) HOUSE - COOPERTOWN ROAD - two-story stone house built by Philip Sheaff, part possibly before 1800 (owned by L. Biddle). (DVRPCI: 1973; A Rare and Pleasing Thing: Radnor, K. Hewitt Cummin) (Unconfirmed)

\* 49) HOUSE - EARLES LANE & SAWMILL ROADS - Two-and-one-half-story stone house painted white, probably built ca.1842. Used as mill master's house. This house retains its charm in part because of its setting which abuts township-owned open space. Built first floor well above ground level because of flooding by Darby Creek. (DVRPCI: 1973)

50) CONESTOGA MILL RESTAURANT - Conestoga & Haverford Roads. Large stone building erected Ca. 1832 by Henry Lawrence. Used as railroad freight station, warehouse & store but never as a mill. (DVRPCI: 1973)

\* 51) HICKORY HALL - Darby-Paoli Road. Large federal style stone house built Ca. 1840 by Levi Lewis II. Situated on the hill northwest of Holly Tree House and on Ardrossan. This house also exemplifies rural Radnor and is part of and commands a beautiful view. (DVRPCI: 1973)

\* 52) THE GRANGE - Newtown Road, Villanova. Large stone house situated on Ardrossan Farm erected ca. 1840 by Levi Lewis II. This house overlooks fields and meadows of the farm. (DVRPCI: 1973)

53) BAPTIST SCHOOL HOUSE AND CEMETERY - West Wayne Avenue near Conestoga Road. Built 1841 by the Radnor Baptists as a school. Now it is a dwelling. Datestone Ca. 1766 was added erroneously in 1953. The building has been refurbished. (DVRPCI: 1973)

54) 751 CONESTOGA ROAD, ROSEMONT - Stone house built 1823-1843 by Abraham Carear. Contains large fireplace (now hidden) and thick stonewalls and recent additions. Thirteenth milestone remains to the east of the house. Stone barn has been converted into a house. (DVRPCI: 1973; A Rare and Pleasing Thing: Radnor, K. Hewitt Cummin)

55) ST. RITA'S HALL - Villanova University. 1848. Oldest College building on the Villanova University campus, once the estate Belle-Aire of John Rudolph. Only the Friends Meeting, Radnor Methodist Church, and Radnor Baptist Church and descendants of the Morgan Family have owned their current land in Radnor longer than Villanova. (DVRPCI: 1973; A Rare and Pleasant Thing: Radnor, K. Hewitt Cummin)

56) LOUELLA MANSION - Louella Court, Wayne. Built Ca. 1865. This stone building was the home of J. Henry Askin, early developer of Wayne. When in failing health Ca. 1880, he sold it to Anthony J. Drexel and George W. Childs who were also developers of Wayne. The building has been a school and hotel and apartments (current use). (DVRPCI: 1973; A Rare and Pleasant Thing: Radnor, K. Hewitt Cummin)

57) COLONIAL BUILDING - Corner of East Lancaster and North Wayne Avenues. Built as the Lyceum Hall by James Henry Askin and designed by David S. Glendale Ca. 1870. It was dedicated 10/24/1871. It was later called the Opera House. It was home of the first local newspaper, "The Wayne Gazette". 12/30/14 fire destroyed interior rebuilt 1915 without mansard roof. Remodeled 1950—1951. (DVRPCI: 1973; Historic Wayne Bicentennial Issue)

58) SATURDAY CLUB OF WAYNE - 117 West Wayne Avenue, Wayne. Built 1898 by Jonathan D. Lengel from plans of David Knickerbacker Boyd. It is home of one of the first Women's clubs in the country. (NRHP: 4-14-78)

\* 59) SCHOOL HOUSE - Darby-Paoli Road. Built Ca. 1856. Stone building built as a school house. (DVRPCI: 1973)

60) BORST HOUSE and BLOOMINGDALE AVENUE - Built Ca. 1870 by James Henry Askin. It is the oldest developed street in Wayne. Houses have Mansard roofs. First occupied 1872. (DVRPCI: 1973 \*Most Important; Historic Wayne Bicentennial Issue)

61) GLENAYS - Landover Road. Built Ca. 1860 for W. Montgomery. Was also called Leighton House. (NRHP; DVRPCI: 1973)

\* 62) MONTGOMERY APARTMENTS –

\* A. Godfrey Road: dates wildly conflicting Ca. 1860/ or 1689-1742. Workers stone apartments with large 18th century barn.

\* B. Newtown Road: same as above, workers stone apartments.

\* C. Riding stables and house: (Clock tower building) stone built 1901 for W. Montgomery. These buildings (A. and C.) share rustic setting evocative of rural life in 19th century. (DVRPCI: 1973)

\* 63) RADNOR HUNT - Roberts & Darby-Paoli Roads. Home of the Radnor Hunt. Late 19th century additions by Hunt Club to early stone house. A springhouse of quoted 1798 dimensions complete with chimney still stands. (DVRPCI: 1973; A Rare and Pleasant thing: Radnor, K. Hewitt Cummin)

\* 64) POPLAR HOUSE - 752 Brooke Road. Built by Daniel Moreau Barringer Ca. 1908. Stucco. Large beautiful settings with stonewall along one side of property. (DVRPCI: 1973)

65) CAMPWOODS - 745 Newtown Road. Large house named for the Revolutionary War outpost which occupied this sight. Elliot Roosevelt (son of FDR) married Elizabeth Donner here in 1932. The view is of Ardrossan farm. Surrounded by substantial houses now. (NRHD: 9/1/83)

\* 66) ARDROSSAN - Newtown Road. Large 20th century home of R.L. Montgomery. Springhouse bears a plaque declaring that on this property was born Elizabeth Iddings, mother of Anthony Wayne. (DVRPCI: 1973; DCPD)

\* 67) HARFORD - Hares Lane. Built 1885 by Furness & Evans for Judge Hare. Now owned by Radnor Township. (DVRPCI: 1973)

68) BEAUPRE - Rosemont. Built 1902 for Robert Kelso Cassatt in the French Manor Style of reinforced concrete, an early use of this technique. Now Presbyterian Children's Village. (DVRPCI: 1973)

69) WOODCREST - Eagle & King of Prussia Roads, Radnor. Designed by Horace Trumbauer for James Paul ca. 1900. Half-timber construction, English late medieval design. Cabrini College Property. (DVRPCI: 1973; PHMC List)

\* 70) WALMARTHAN - present name Walton Hall, Eastern College, Fairview Drive, St. David's. Built 1912-13. Designed by D. Knickerbacker Boyd. Built by Jonathan D. Lengel. Forty-room mansion in stucco Spanish Mission Style. House, lakes, outbuildings, path, drives and woods present handsome composition. (DVRPCI: 1973; PHMC List)



71) WAYNE NURSING HOME - West Wayne Avenue, Wayne. Built Ca. 1910 for the Wood family this stone mansion was designed by Hazelhurst and Huckel. They called it Woodlea. It became the Caley Nursing Home. It was burned and rebuilt. (DVRPCI: 1973)

\* 72) LAURIER - Bryn Mawr Avenue. Stone mansion and outbuildings owned by the Colkett family. It remains an estate. (DVRPCI: 1973)

73) TOLL HOUSE - Lancaster Avenue near Airedale Road, Rosemont. Frame house said to have been moved here Ca. 1860. (DVRPCI: 1973)

74) WAYNE HOTEL - Lancaster Avenue. Built 1906. Four and a half story stone building.

75) RAVENSCLIFF - Darby-Paoli Road. Twentieth century stone mansion. (DVRPCI: 1973)

\* 76) THE WILLOWS - Darby-Paoli Road. Designed by Charles Barton Keen and built by John Sinnot Ca. 1910, it was named Rose Garland. Renamed Maral Brook by the Zantzinger family. Purchased along with 47 acres in 1973 by Radnor Township. Renamed "The Willows". Large mansion stone and stucco painted white. (DVRPCI: 1973)

\* 77) MILL DAM CLUB - Maplewood Avenue, South Wayne. Site of sawmill built in 1799 by William Siter and operated during 19th century.

\* 78) CHANTICLEER - 747-753 Brooke Road, Wayne. Mansion with outbuildings and beautiful gardens. Rosengarten estate. (NRHP: 7-24-84; PHMC List)

\* 79) GLENCOE - Roberts Road. Large turn-of-the Century mansion and stables with tower and rounded, buttressed wall. Brick with red tile roofs.

\* 80) FAUNAMEDE - Darby-Paoli Road at Colony Road. Two story stone farmhouse. Refurbished or built ca. 1814 by George Brooke. (DVRPCI: 1973 listed as important)

81) DOWNTOWN WAYNE - Southeast side of Lancaster and South Wayne Avenues. The center of Wayne dates from 1864, when developer J. Henry Askin purchased acreage formerly owned by Thomas Maule. He added additional former Maule property and also acreage purchased from Abraham family heirs, so that by 1870 his estate, Louella, covered the center of current Wayne. Askin developed a residential community around his estate. By 1870, the railroad stop had changed names from "Cleaver's Landing" to "Wayne", in honor of General Anthony Wayne. The easy rail access to Philadelphia made the Wayne railroad stop a summer resort. Development of Wayne as a commercial center proceeded rapidly during the 1880's and 1890's.

82) CONESTOGA ROAD - Existed as far back as 1693 only as far as Friends Meeting. Extended in 1741 following an Indian trail west to the Susquehanna River. The road was improved in 1769. Conestoga wagons carrying goods and travelers followed this route to and from Philadelphia. The 16th milestone still stands in Wayne.

\* 83) DARBY-PAOLI ROAD - Like Conestoga Road, one of the oldest roads in the township. Laid out in 1710. For much of its length in Radnor it follows Little Darby Creek which served as a millstream during the 18th and part of the 19th centuries. Since portions of the stream valley have remained relatively untouched the view from Darby-Paoli Road is for some stretches much the same as it appeared nearly two centuries ago.

84) HORACE TRUMBAUER HOUSE - Louella Avenue. Built 1891-2 for John H. Watt from plans of Horace Trumbauer. Two and a half story stone.

85) BALLYSHANNON - 325 Bryn Mawr Avenue, Bryn Mawr. Large flagstone mansion with outbuilding built 1907-8. Formal gardens.

86) BLABON MANSION - 821 Mill Road, Bryn Mawr. Fine Tudor Revival mansion designed by Duhring, Okie & Ziegler of Philadelphia. Built in 1909 of limestone and mica schist first floor, oak and plaster second story and red tile roof. Terraces and ornamental landscaping surround it. (PHRSBHP; PHMC List)

87) BLOOMFIELD - 200 South Ithan Avenue, Villanova. Designed by Horace Trumbauer. Built in 1922 by J.S. Cornell & Sons for George McFadden. In the form of a French countryseat, of stucco with limestone highlights. It is a shining example of Trumbauer's work. (Recommended for NRHP; PHMC List; PHRSBHP)

88) PENNSYLVANIA & WESTERN SUBSTATION #1 - 501 Conestoga Road, Wayne. Currently the studio of Edward Fenno III, sculptor. Built ca. 1900. Noted for architectural interest, in style of architect Seeler, known for industrial design. (PHMC List)

89) WAYNE TRAIN STATION - Present building built in 1888, the fourth station house since Wayne had become a stop as Cleaver's Landing. (Historic Wayne - Bicentennial Issue)

90) WAYNE PRESBYTERIAN CHURCH - Lancaster Avenue. James Askin donated the land and \$25,000 for the erection of the church. Dedicated in 1870; it is now the chapel. (Historic Wayne - Bicentennial Issue; DVRPCI: 1973)

91) RADNOR METHODIST CHURCH - Conestoga Road, Rosemont. Stone church built 1833. Property includes old cemetery where the first burial was made in 1791. (DVRPCI: 1973; A Rare and Pleasant Thing: Radnor, K. Hewitt Cummin)

92) ST. MARY'S EPISCOPAL CHURCH - Louella & Lancaster Avenues, Wayne. Stone. Built Ca. 1889. Wilson Brothers & Company designed the church. The interior was renovated and church rebuilt after a serious fire in 1969. (DVRPCI: 1973; Historic Wayne - Bicentennial Issue)

93) CENTRAL BAPTIST CHURCH - Lancaster Avenue. Stone church. Built Ca. 1898. First services held 4/3/1898. Designed by David Knickbacker Boyd and built by Jonathan Lengel. (DVRPCI: 1973; Historic Wayne - Bicentennial Issue)

94) ST. THOMAS OF VILLANOVA - Villanova University Campus. Stone church built 1895 (DVRPCI: 1973)

95) ST. JOHN'S A.M.E. CHURCH - West Wayne Avenue. Buck and frame church built 1889. (DVRPCI: 1973)

96) SECOND BAPTIST CHURCH - Highland Avenue. Ca. 1920. Offshoot of Central Baptist Church began as a mission before 1900. (DVRPCI: 1973)

97) ST. MARTIN'S EPISCOPAL CHURCH - King of Prussia Road, Radnor. Stone Church designed by T.P. Chandler. Built Ca. 1890. (PHMC List: 1972; A Rare And Pleasant Thing: Radnor, K. Hewitt Cummin)

98) CHRIST CHURCH ITHAN - Conestoga Road, Rosemont. Stone church designed by T.P. Chandler Ca. 1890. (DCPC; PHMC List: 1972; HDC)

99) SARAH SITERS HOUSE - Lancaster Avenue & Sugartown Roads. Built 1798. Two and a half story stone house. Oldest house in Radnor Township on Lancaster Avenue. (Historic Wayne -Bicentennial Issue)

100) LANCASTER AVENUE - Built 1792-94 connecting Philadelphia with Lancaster. Called the Philadelphia and Lancaster Turnpike. The 13th milestone (to the Schuylkill River) of which remains on the Northwest corner of Wayne and Lancaster Avenues. (Historic Wayne-Bicentennial Issue)

101) SPROUL ROAD - Route 320. Formerly called Radnor-Chester road for obvious reasons. It existed as a road prior to 1693. (A Rare and Pleasant Thing: Radnor, K. Hewitt Cummin)

102) HOUSE - 752 BROOKE ROAD - Only this house and Fendall house retain original size. 27 X 27 foot stone house painted white. Built Ca. 1790 into the hillside as a farmhouse. Frame stable built Ca. 1823 remains. Beautiful rustic setting. (A Rare and Pleasant Thing: Radnor, K. Hewitt Cummin)

\*As stated in the 1988 Comprehensive Plan, "...A large number of the buildings have significance not simply because of the historic importance of the structures but because the open space surrounding the structure has remained undeveloped. In several cases the estate or a substantial portion of its land has remained intact, lending immeasurably to the overall value of the site as an historic viewshed. Those items marked with an asterisk are particularly fine examples."

## **Appendix D-2**

### **Radnor Friends Area Description**

#### **RADNOR FRIENDS AREA**

According to the Radnor Historical Society in "Historic Sites in the Area of the (Blue Route) Project's Potential Impact", the following summarizes the historic significance of the Radnor Friends Area:

"The area has significance for seventeenth, eighteenth, nineteenth, and twentieth-century history in the following categories: architecture, communications, education, landscape architecture, military, political, religious, transportation, and social/humanitarian. It was part of the Welsh tract, some 40,000 acres which were sold to Welsh Quakers by William Penn.

Radnor was one of the three townships which Penn directed be laid out contiguously, as one "barony" (Browning, 1912). It was apparently the intention of the Welsh settlers to conduct their own affairs independently of the rest of the colony. Whether the political and economic governance of the Tract should be regulated by the Welsh themselves as a separate entity, by Chester County or by Philadelphia County was a subject of much dispute in the 1680's and 1690's. Eventually the Chester-Philadelphia County line mandated by Penn divided the Welsh Tract in two. Colonization of the Tract was opened to others and the dream of a separate barony with a dominant Welsh language, culture, and political control ended.

Most of the land near the Meeting remained in the possession of the Jerman family (original Welsh settlers) through most of the eighteenth century. In the late eighteenth and early nineteenth centuries another family - that of John Siter - gained control of most of the land. While the Jerman holdings had been predominantly agricultural, enthusiasm for small-scale industry and commerce as well as farming characterized the Siter's dominance in the 1800's (Activities, 1974).

Virtually all roads laid out in the first 70 years of European settlement in Radnor terminated near the Meeting House. The Conestoga Road also ran past the Meeting. A lively crossroads community developed early and remained the religious, social, and economic center of township activity for a century and a half.

By the end of the eighteenth century or early in the nineteenth, the district boasted a Meeting House, a school (supported by the Meeting), a store, a library, and the services of a joiner, a cordwainer, a tailor, and a wheelwright. Not a great distance east of the crossroads on Conestoga Road was the Sorrell House Tavern (now part of a private school). The spider web formation of township roads - with Radnorville (Ithan) at its center - is still evident and the crossroads village continues to serve as a small market area for local travelers. In the middle of the nineteenth century with the opening of the Columbia Railroad (later the Pennsylvania Railroad's Main Line), Radnor began to change from a farming area to a suburb of summer residences for wealthy Philadelphians (Massey, 1963). By the end of the century, the township had become the year-round residence for many members of this class. The Atterbury House and The Peak typify

this change in the area's social and economic composition. Recent attempts to zone The Peak for high-rise apartment construction illustrate the current trend of the break-up and subdivision of the estates created by railroad-related wealth in the late 1800's."

Below are the physical and historical significance descriptions of the individual structures within the Radnor Friends Area, as included in the report.

A) RADNOR FRIENDS MEETING HOUSE was built of stone in two sections, in 1717-1718 and 1722. The larger, western section - probably the older of the two - has a steeper pitched roof and doors in the southern and western walls (Plates 3 and 4). The eastern section has doors in the southern and northern walls (front and back) in the manner typical of American meeting houses. The round stone-arched windows and doors, the front porch, and the shutters are also common to American meetinghouses. The inside dimensions of the meetinghouse are 32' x 27' (eastern section) and 34' x 27' (western section). The square-edged paneled partition - which is in an excellent state of preservation, was recently restored to its original place at the line of the common wall under the direction of Paul M. Cope, Architect. It had previously been moved approximately seven feet into the western section. The facing seats are parallel to the long side of the meetinghouse.

The small stone building facing the southern facade of the meetinghouse was used to keep cadavers during the winter for burial in the spring. The cemetery and unmarked headstones, southwest of the meetinghouse, are intact.

The Meeting was organized in 1684 and held its early meetings in John Jerman's home. The Meeting House was built in two sections, the higher (western one Ca. 1717) and the eastern addition in 1722. This stone structure replaced an earlier log building. In 1735, the Jerman family formally transferred the land on which the Meeting House was built to the Society of Friends. In 1778, the building was used as a hospital and officers' headquarters building in Radnor Township, the center of Township activity through the eighteenth century and well into the nineteenth. It was closed in 1882, but reactivated in 1937 and to this day is used for Quaker meetings.

B) OLD COUNTRY STORE (Ca. 1808, 1843) is a stucco-over-stone office building built in several sections: the kitchen, which is a two-story addition measuring approximately 15' x 15' (adjacent to the Gulf Station in Plate 6); the original 2-1/2-story section; which measures approximately 15' x 30'; the 2-1/2-story corner section, which measures approximately 20' x 30'; and a recent addition in the rear. Earlier views show that, well into the twentieth century, there was a one-story pillared porch along the Conestoga Road frontage.

The building, situated on its original site, is in good-to-excellent condition. Only minor alterations have taken place: some of the random-width floor boards have been covered with linoleum and work, the ceilings in the corner section have been covered with tin drop-ceilings (Ca. 1920), and the walls in several rooms have recently been paneled. Most of the original floors, woodwork, walls and windows are intact. Fireplaces and marble mantels in upstairs and downstairs rooms are well preserved. Both 2-1/2-story sections are of two-over-two design: parts of partition walls have been removed.

Part of the kitchen wing was originally used as an icehouse. A stone water well was recently discovered beneath the kitchen floor.

The original section of this building is, by tradition, regarded as the house of John Jerman, the most prominent of the original Welsh settlers. Jerman bought the land in 1688, four years after his arrival, and may have resided on this site in an earlier structure.

During much of the nineteenth century - and perhaps as early as the 1770's or earlier - the site was used as a store. John Siter owned the place and ran the store in the early nineteenth century. The Ithan Post Office was established here in 1889. It may also have been a tavern at one time. After William H. Cornog purchased the property in the late 1800's, the crossroads became known as "Cornog's Corner" (Cummin: 1967-1973).

In the 1930's and 1940's, the wealthy and socially prominent residents of Ithan organized a "cooperative" to purchase the declining enterprise and continue to operate it as a store. Many notable surnames of American capitalism appeared on the list of shareholders: Atterbury, Chew, Pennington, Pugh, and others (Philadelphia: 1950). Eventually, the store/post office was converted to an office building - without loss of the older appointments.

C) SCHOOL HOUSE (1856) in the small triangle bounded by Newtown, Conestoga, and Radnor-Chester Roads (the original site) was recently enlarged and extensively altered. The original stone walls of the 1-1/2-story building are visible only in the store room of the dress shop. The exterior is now stucco and wood. The lean-to facing Newtown Road is a late addition (Plate 8). Structurally, the building is in excellent condition.

The present building was erected in 1658 by the Radnor School District, which had acquired the property in the 1830's. The site had been sold to the Society of Friends in 1794 for the erection of a schoolhouse and there may have been such a building prior to the 1856 structure.

D) THE PEAK (1930) is a lavishly appointed mansion of the Georgian revival in the Radnor Friends area. The estate was acquired in 1906 by Arthur I. Meigs, a noted local architect. Meigs, who was a partner in the important Philadelphia architectural firm of Mellor, Meigs, and Howe, contributed substantial design modifications to The Peak during a period of several decades (Massey, 1963)

The estate is in fair-to-good condition on its original site, but in the past several years, it has begun to deteriorate.

The main section of the 2-1/2-story mansion is rectangular with hipped roof and generally symmetrical appointments. The leaves are detailed as classical cornices. There are nine windows and three dormers on each of the long facades (front and back).

The chimneys are placed symmetrically, one in each corner of the house. The windows are rectangular with double-hung sash. The main doorway is sheltered by a small porch without columns or pilasters. The porch has a rounded pediment. Metal work on balconies and on the imaginative screen door of the "Garden Room" (Plate 10, foreground) was done by Samuel

Yellin, a noted Philadelphia metal worker. The screen door, which has a "spider web" design, has been damaged by vandals.

At the end of a stonewall which leads from house to boxwood garden is the "Sunset Tower" (Plate 11), a gazebo built of wood and stone. The "Tower" is in excellent condition. Several frame and stone outbuildings are likewise well preserved. The 1-1/2-story frame stable is one example.

The mansion was built by Barklie Henry in an era (1903) when architect-designed houses were appearing all along the Main Line - a symbol of the wealth brought to these farming communities by the expansion of the railroads and of American industrial capitalism. Three years later Henry sold it to Dr. Arthur V. Meigs, a wealthy physician. Meigs's son, Arthur I. Meigs, a partner in the important Philadelphia architectural firm of Mellor, Meigs, and Howe, altered the house in many ways over a period of years (Massey, 1963).

The Meigs family, like the Jerman family in the eighteenth century and the Sifers in the nineteenth, acquired much of the land surrounding the Meeting House (Plate 9). The wealth of the family has dissipated and its acquisitions outside of the estate proper have been sold to various individuals. The Mansion and estate designed by Meigs have also passed out of the heirs' possession and have been the subject of various zoning contests.

E) SCHOOL HOUSE LOT (pre-1811?) is a 2-1/2-story stucco-over-stone house which is in good-to-excellent condition. The building is on its original site in the Radnor Friends area and has been subjected to very few alterations.

The front of the house, the part which faces Conestoga Road is the older section and was probably built between 1798 and 1811. It measures approximately 18' x 20'. The main door (preserved) is adorned by a rectangular window with three mullions and plain pediment. The rear section, with a single-slope roof as a lean-to, was probably built in the middle of the nineteenth century. Along the western facade of the house is a one-story addition (ca. 1960) which replaces and earlier lean-to.

This land has been called "school house lot" since 1769, but there is no evidence of its having been used for school purposes. John Jerman, Jr. sold the property to Mordecai Morgan in 1758. It passed to John Sifer in the early 1800's. A building (original section of the present structure?) was recorded on the property as early as 1808. The house is shown as the "butler's Cottage" on the 1921 Plan of The Peak.

F) GREEN HEDGES (Ca. 1839?) is a rectangular two-story brick dwelling with a two-story brick addition in the Radnor Friends area. The building is on its original site, but has been much altered inside and out. The house, which may at one time have been two houses, has had windows and doors added, removed, and enlarged. The original section measures approximately 40' x 16'. The 1920's kitchen wing, part of the major alteration designed by Arthur Meigs, measures approximately 18' x 15'. The earlier porch on the front of the house has been removed and a porch and door added to the eastern facade.

This house is unusual in that it is an early brick building in Radnor Township: few brick structures were built in the township until quite late in its history (Cummin, 1967). Green Hedges, so named in 1962 by the present owner's father, may not have existed in the eighteenth century. It was built in two sections - perhaps as two houses - one as early as 1800 (but more likely in the 1820's), the other in the 1840's. Lewis Jerman had sold the ground to Margaret Dickenson in 1769. Early in the twentieth century, the property was owned by the Meigs family. It housed their farmer and his family. The noted architect Arthur Meigs totally re-designed the house in the 1920's.

G) **WAYSIDE** (Ca. 1830) is a 2-1/2-story stucco-over-stone dwelling with a two-story frame addition in the Radnor Friends area. The five dormers in the steep ridged roof have gables with overhang. The main entrance has a broken pediment and fanlight (Plate 18). The original front porch has been removed.

The house is on the original site and is in an excellent state of preservation. Few alterations have occurred. The paneled doorway, which leads into a center hall, is intact. Two rooms are found on either side of the hall. Original fireplaces, mantels, and large kitchen fireplace, and much of the original floor and woodwork are preserved. Elements of the later "Stick Style" are evident in the gable ends of the roof. The Barn is stone and frame and is also well preserved.

The land on which this house stands was also part of the three acres which Lewis Jerman sold to Margaret Dickenson in 1769 (Cummin:1967). The property was assessed for two small houses in 1798, but the present structure was probably built about 1830 for Ann Siter, wife of John Siter. Siter had been reared in Germantown (Philadelphia) and was most likely of German ancestry. His Radnor spouse was probably of Welsh lineage. His clan's proliferation in Radnor was considerable and was identified more readily with its local Welsh origins than with the Germans.

H) **ATTERBURY HOUSE** is a 2-1/2-story stone dwelling built in several sections in the eighteenth, nineteenth, and twentieth centuries in the Radnor Friends area. Nearby is a frame (yellow pine) carriage house, built in 1890. Residence and carriage house, both on the original sites, have been altered considerably and "restored" over the years.

Originally one of the largest farmhouses in Radnor, this building was used as a boarding school for girls by Jacob Maule, who was its owner in 1798. Maule built an addition (for the boarding school?) about 1813. About the beginning of the twentieth century, William W. Atterbury developed his estate, which included this house, on some 42 acres acquired from Alexander Cassatt. Atterbury had succeeded Cassatt as President of the Pennsylvania Railroad (1925-1935). Atterbury was alleged to have successfully conspired with Col. Robert Montgomery to purchase workers' homes in nearby "Banjotown" (Wolfson:1963).

Banjotown was a racially integrated community which had been developed by Sarah Jane Matlack, a descendant of John Siter. Montgomery's and Atterbury's purpose - achieved in 1917 - was to put an end to the continued presence of a "shantytown" in such close and visible proximity to their mansions. William Atterbury's residence remains in the Atterbury family's possession to the present.



**Appendix D- 3**  
**Delaware County Planning Department**  
**Preservation Toolbox Synopsis**

**1. Survey/Inventory of Cultural Resources**

Identifying historic resources in the municipality is a key first step in order to know what is valuable to protect, and what actually contributes to the historic/visual identity of a community. This can vary from a windshield list and map of key resources to a comprehensive full survey of as many resources as documented thus far. Defining the criteria for what becomes part of the survey is essential, as the survey can become the rationale for future preservation regulations.

**2. The Preservation Plan**

A plan requires an assessment of the present status of the community's historic resources, knowledge of past preservation efforts and goals to be attained for the future. It also includes a survey, and can include a section on how preservation can affect the economic vitality of a community. It should also include the history of the municipality and key themes and features exemplify this heritage. Key players in how future preservation goals will be achieved and a timetable are also ingredients.

**3. National Register of Historic Places**

See text.

**4. Act 167 Districts**

See text.

**5. Historic Ordinances**

Municipalities can regulate historic resources or regulate development in the vicinity of historic resources by local municipal ordinances. Most historic ordinances are either a zoning overlay, a part of the existing zoning ordinance or a stand alone historic ordinance that may also include a demolition ordinance. Each municipality must decide where they want to locate their historic regulation; if they want to impose regulations and/or offer special incentives to historic property owners; which properties to regulate, and what their ordinance will include. These ordinances work best for district-wide areas or municipal-wide protection of resources. Some ordinance establish historic commissions, control demolition, require certain mitigation for new development surrounding historic resources, and even include some design review of additions/partial demolitions to historic resources. Some add design guidelines for compatible new development that involves subdivision/zoning issues like set back, height, massing, etc.

**6. Local Landmark Designation**

This designation is best for isolated historic landmarks that a community wants to acknowledge. The designation should include reason of significance and the regulations to be made concerning the resource. This can be useful legislation if the resource is not National Register eligible but the municipality wants to give it some status or exert some control.

**7. Land Development and Subdivision Regulations**

This can include an array of incentives like density and parking bonuses, conditional uses for historic buildings and lot averaging. Many different provisions may be dealt with and included here.

#### **8. Building Code Exceptions**

Code enforcers can make exceptions for rehabbing historic structures, according to BOCA. This allows local code enforcers/building inspectors ability to be more lenient within the regulations for historic resources.

#### **9. Façade Easements**

Façade easements are treated similarly to conservation easements. Like conservation easements, a façade easement legally restricts changes which may occur to the exterior of the structure, without necessarily affecting its use. They may be donated or purchased.

#### **10. Tax Incentives**

Local municipalities can offer local property tax incentives for rehabbing historic resources, as well as the federal income tax program in place.

#### **11. Grants**

See text.

#### **12. Certified Local Government Program**

Funds are available to communities which are eligible for preservation funding. SHPO has details.

#### **13. "Main Street" type of commercial revitalization activities.**

#### **14. DCED has many community development programs that can include pro-preservation projects. Contact Governor's Center for Local Government Services at 888-2CENTER.**

#### **15. Suggested design guidelines or other technical assistance info available at township level that encourages the appropriate design solutions for historic buildings and places.**

The above is a list of direct preservation actions. Other tools like education and different techniques for advocacy should be considered. There are also many "smart growth" tools that actually benefit preservation goals as well.

## Appendix E Business Inventory

### Radnor Township Business Inventory

Retail Category	Downtown Wayne*	Other Lancaster Ave.	Neighborhood districts**	Total Radnor Township
<b>CONVENIENCE GOODS</b>				
Supermarket, Grocery Stores		2		2
Convenience Stores	2	3	2	7
Meat Stores				0
Fish Stores		1	1	2
Fruit & Vegetables		2		2
Bakeries	3	1		4
Candy & Nuts				0
Other Specialty Foods	4	2		6
Liquor & Beer Distributors	1	2		3
Drug Stores/Pharmacies	2	5		7
Cosmetics & Beauty Supplies				0
Health Food Supplements				0
Other Health & Personal Care				0
Full-Service Restaurants	11	10	4	25
Limited-Service Restaurants	12	7	5	24
Bars & Lounges	1	1	2	4
<b>SHOPPING GOODS</b>				
Full-Service Department Stores				0
Discount Department Stores				0
Warehouse Clubs				0
Other General Merchandise				0
Men's Clothing	1			1
Women's Clothing	2	5		7
Children's Clothing	3	1		4
Family Clothing	3			3
Clothing Accessories				0
Other Clothing	4	2	1	7
Shoe Stores	1	2		3
Jewelry Stores	4	2		6
Luggage & Leatherwork		1		1
Furniture				0
Floor Coverings	3	3		6
Window Treatments				0
Other Home Furnishings	4	7		11
Household Appliances				0
Radio/TV/Electronics	1	2		3
Computer & Software Stores		1		1
Camera, Photo Supply	2	1		3
Optical Stores	1	3		4

Radnor Township Comprehensive Plan Update  
Appendix E – Business Inventory

General-Line Sporting Goods	1			1
Specialty Sporting Goods	2			2
Toys & Hobbies	3	1		4
Sewing, Needlework				0
Music Stores	1			1
Book Stores	2			2
Newsstands				0
Record/CD/Tape Stores	1			1
Video Stores	1			1
Office Supply/Stationers	1	1		2
Gift, Novelty, Souvenir Stores	7	3		10
<b>OTHER RETAIL STORES</b>				
Home Centers		1		1
Paint & Wallpaper Stores	1	3		4
Hardware Stores	1	1		2
Retail Lumber Yards				0
Nursery & Garden Centers			1	1
Auto Parts & Accessories Stores				0
Florists	2	3		5
Antique Stores	3	1		4
Other Used Merchandise	3	1		4
Pet Supply Stores		1		1
Art Dealers	2	1		3
Tobacco Stores				0
Collectors' Items & Supplies				0
Other Miscellaneous Retail Stores	2	3	2	7
<b>SERVICES</b>				
Hair/Nail Salons	10	7	1	18
Laundries; Dry Cleaning	6	6	4	16

\* Downtown Wayne defined as Lancaster Avenue between Bloomingdale and Aberdeen avenues, North and South Wayne avenues, and adjacent streets

\*\* Includes Garrett Hill and districts along Conestoga Road (West Wayne Avenue, Ithan, Bryn Mawr)

# RADNOR TOWNSHIP



## *SURFICIAL GEOLOGY*

### Legend

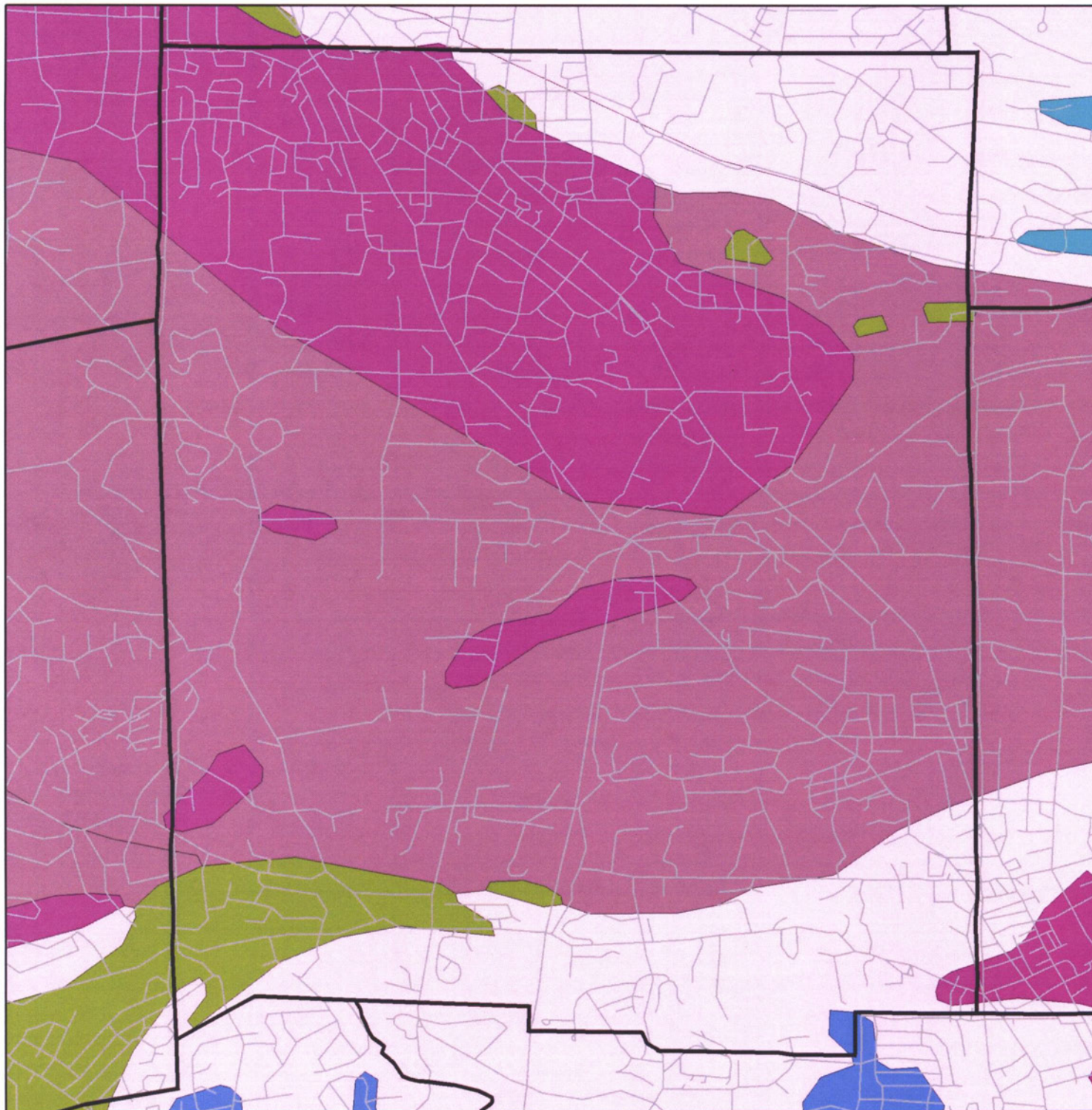
 Municipal Boundary

### Geologic Formations

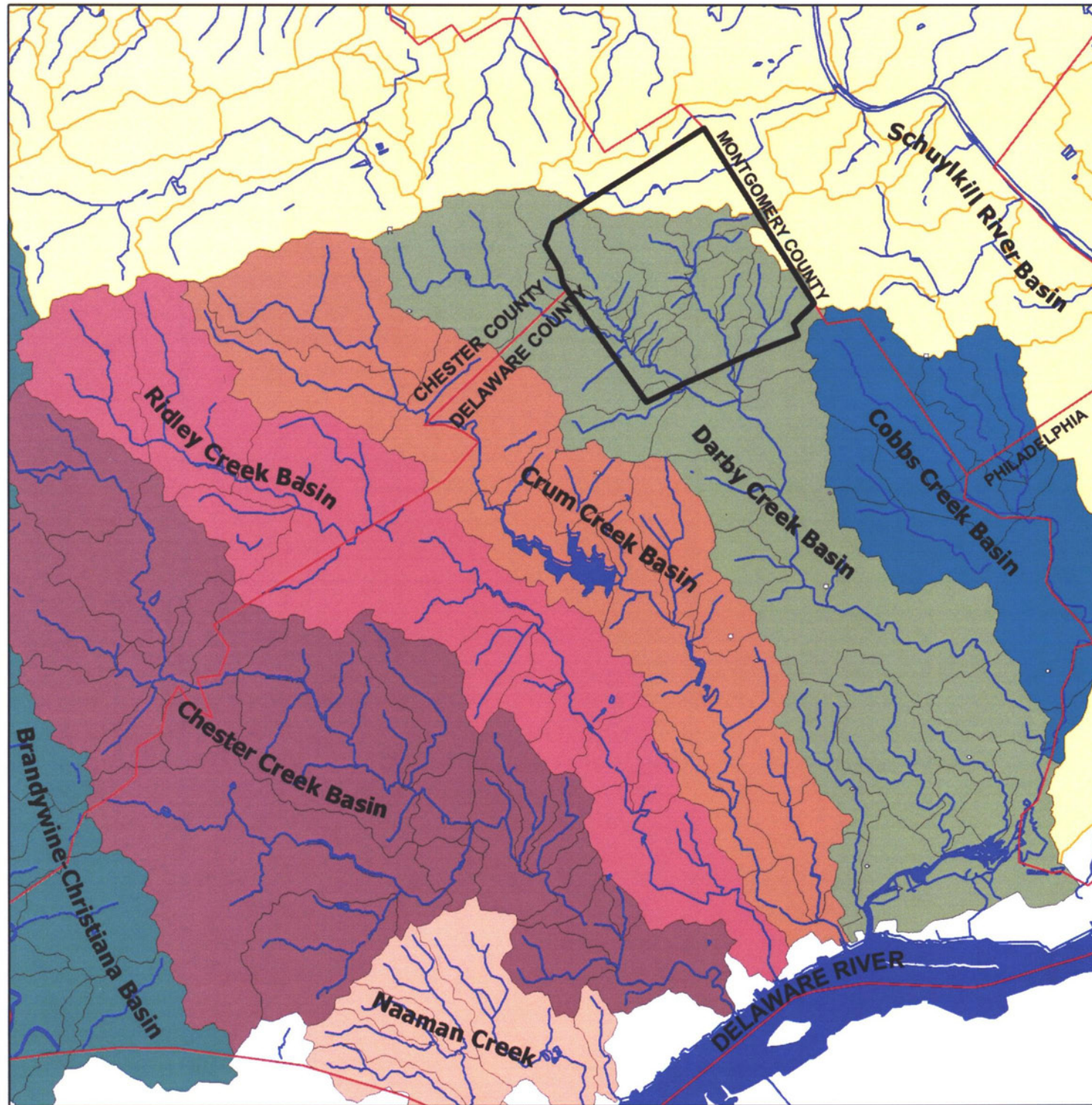
-  Felsic Gneiss
-  Mafic Gneiss
-  Serpentine
-  Wissahickon Fm
-  Bryn Mawr Fm
-  Conestoga Fm



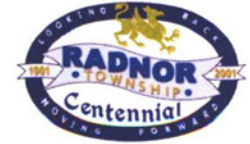
0 2,000 4,000 Feet







# RADNOR TOWNSHIP



## REGIONAL WATERSHEDS

### Legend

- Streams/Rivers
- River/Lake
- County Boundary
- Radnor Township

### Sub-Basins

- Schuylkill River
- Cobbs Creek
- Darby Creek
- Crum Creek
- Ridley Creek
- Chester Creek
- Naaman Creek



0 10,000 20,000 Feet



# RADNOR TOWNSHIP



## SOIL SERIES

### LEGEND

Soil Series

Alluvial Land	Made Land
Beltsville	Marsh
Brandywine	Melvin
Brecknock	Neshaminy
Butlertown	Othello
Chester	Quarries
Chewacla	Rowland
Chicone	Sassafras
Chrome	Urban Land
Codorus	Urbana
Congaree	Wehadkee
Glenelg	Wheaton
Glenville	Woodstown
Hatboro	Worsham
Manor	



**CAHILL ASSOCIATES**  
Environmental Engineers & Planners



# RADNOR TOWNSHIP



## HYDROLOGIC SOIL GROUPS

### Legend

- Municipal Boundaries
- Urban Soils/Made Land
- Water

### Hydrologic Soil Groups

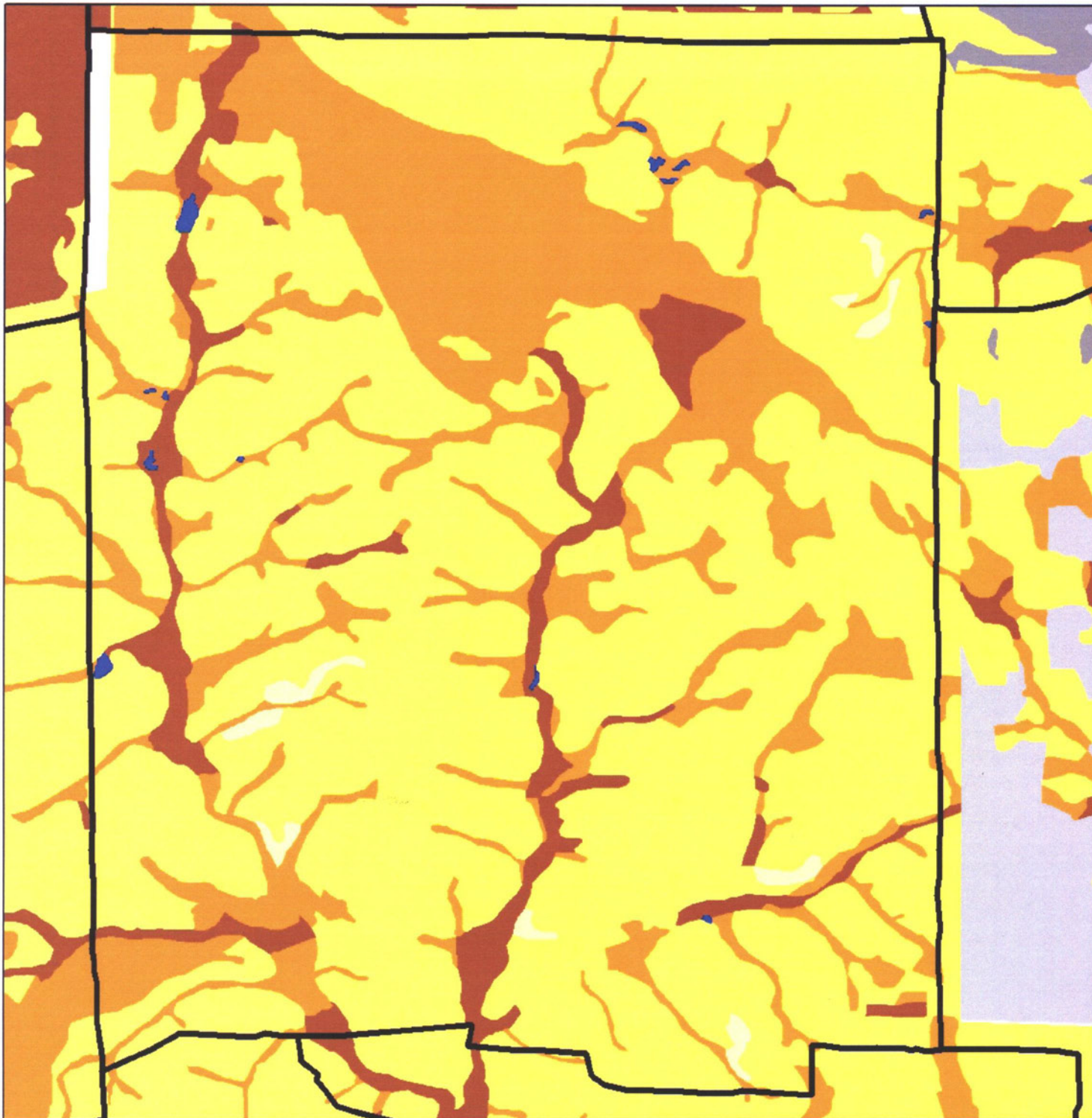
- A
- B
- C
- D



0 2,500 5,000 Feet

A horizontal scale bar with markings at 0, 2,500, and 5,000 feet.

**CAHILL ASSOCIATES**  
Environmental Consultants





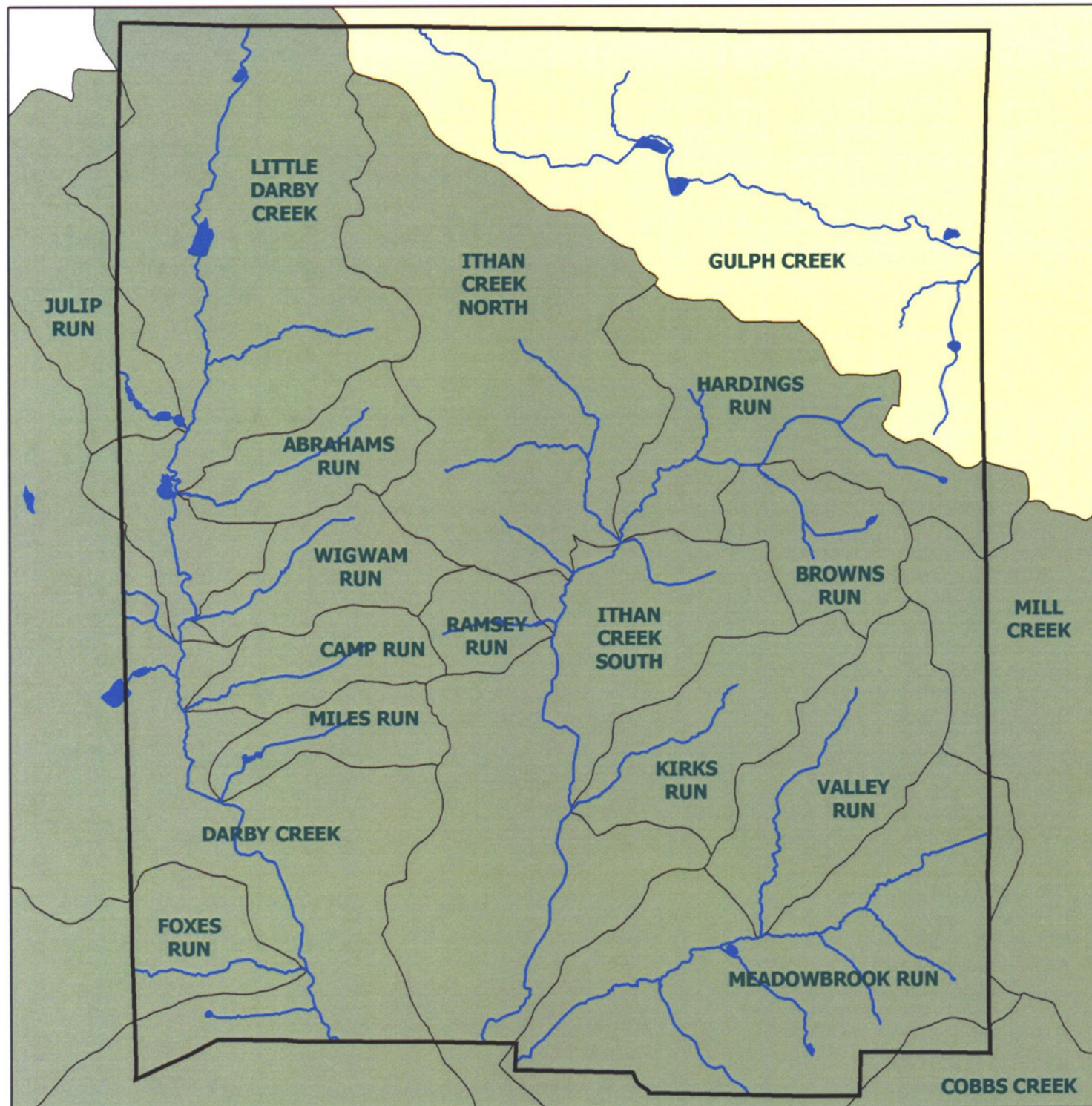
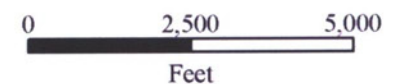
# RADNOR TOWNSHIP



## *SURFACE WATER & WATERSHEDS*

### Legend

- Streams & Creeks
- Lakes & Ponds
- Municipal Boundary
- Darby Creek Sub Basins
- Gulph Creek Sub Basins







# RADNOR TOWNSHIP





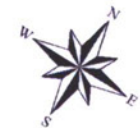
## *HISTORIC STREAMS (1870)*

### Legend

-  1870 Stream Network
-  Municipal Boundary

### Watersheds

-  Darby Creek
-  Schuylkill River



0 2,500 5,000 Feet



# RADNOR TOWNSHIP



## FIRST ORDER STREAMS

### Legend

- Non-First Order Streams
- First Order Streams
- ▭ Township Boundary
- ▭ Lakes & Ponds
- ▭ Watersheds



0 2,500 5,000 Feet






# RADNOR TOWNSHIP



## FLOODPLAINS

### Legend

-  Municipal Boundary
-  100-Year Floodplain
-  Watersheds



0 2,000 4,000 Feet



# RADNOR TOWNSHIP



## 75' RIPARIAN BUFFER

### Legend

— Streams and Creeks

■ Lakes & Ponds

### Land Use Classification

■ Agriculture

■ Commercial

■ Community Service

■ Conservation Easement

■ Institution

■ Recreation

■ Residential - Rural

■ Residential - Low Density

■ Residential - Med Density

■ Residential - Multifamily

■ Transportation

■ Utility

■ Vacant



0 3,000 6,000  
Feet



# RADNOR TOWNSHIP



## NWI WETLANDS

### Legend


 Municipal Boundary

### Wetland System

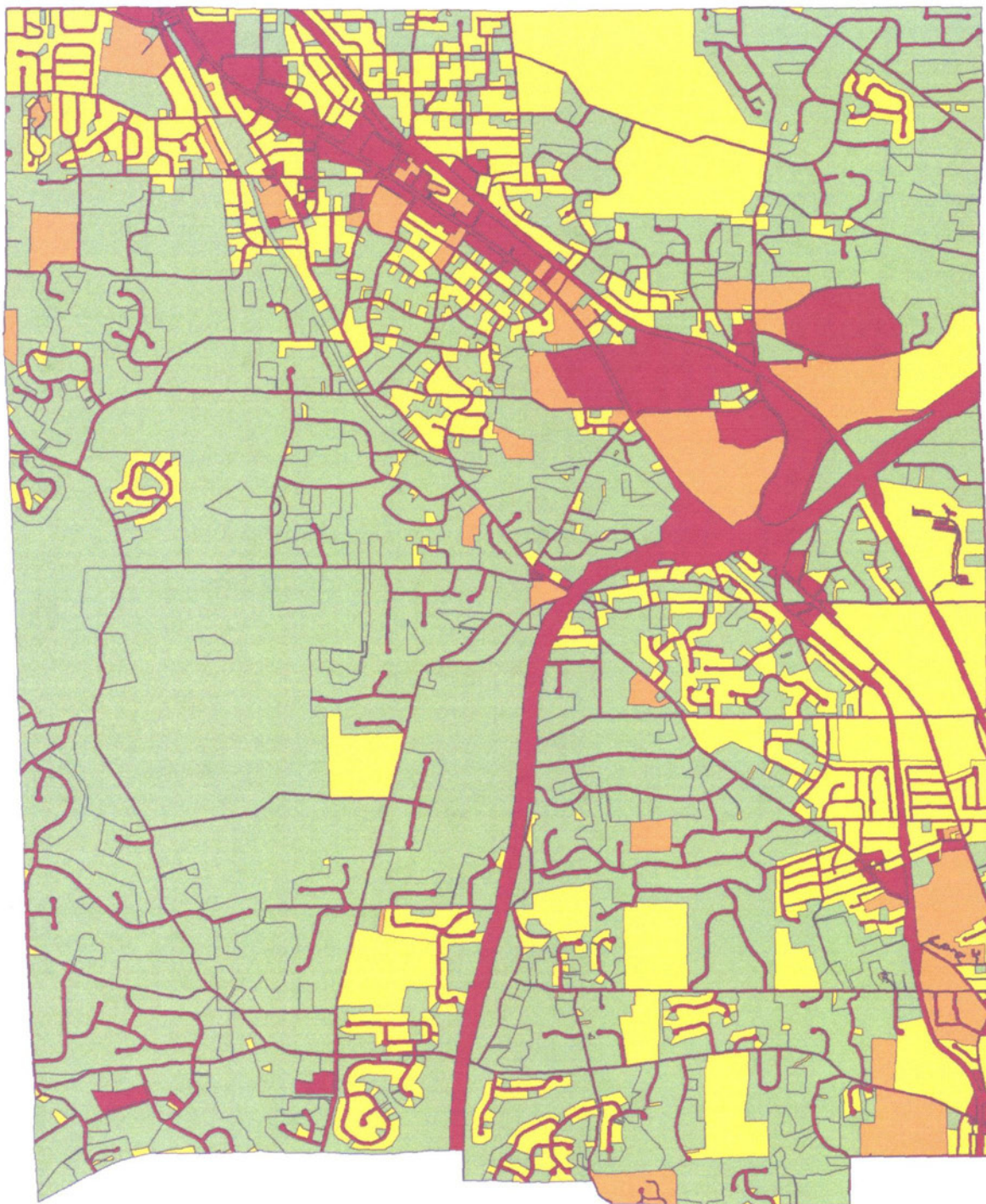
 Palustrine

 Upland



0 2,000 4,000 Feet  






# RADNOR TOWNSHIP



## *PERCENT IMPERVIOUS*

### Legend

Percent Impervious - Land Use

- 1 - 10
- 11 - 25
- 26 - 50
- 51 - 100



0 3,000 6,000 Feet









# RADNOR TOWNSHIP



## DESIGNATED USES

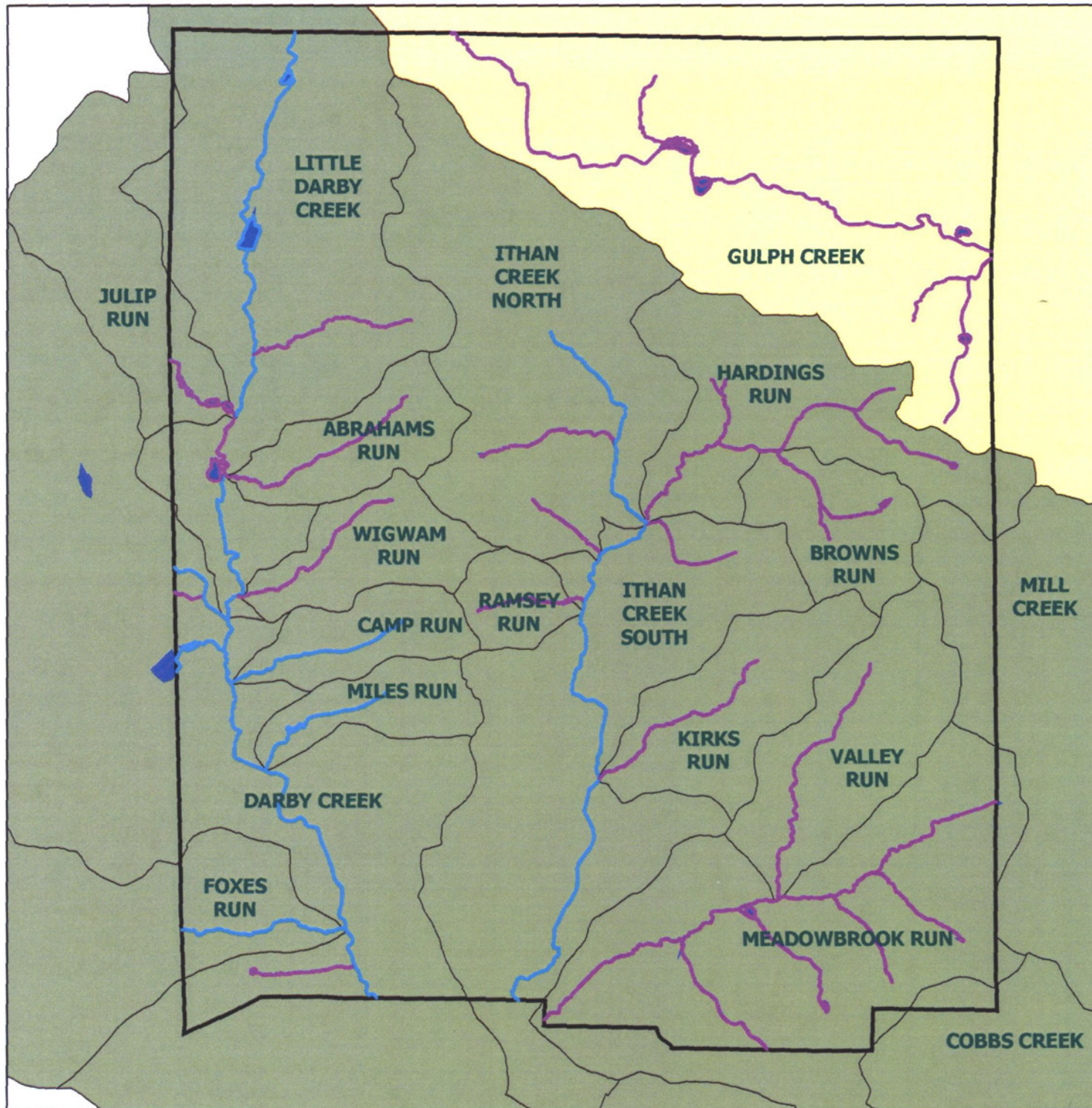
### Legend

Chapter 93 Use

-  Cold Water Fishery
-  Warm Water Fishery
-  Lakes & Ponds
-  Municipal Boundary
-  Darby Creek Watershed
-  Gulph Creek Watershed



0 2,500 5,000 Feet









# RADNOR TOWNSHIP



## 303d STREAM CLASSIFICATION 2002

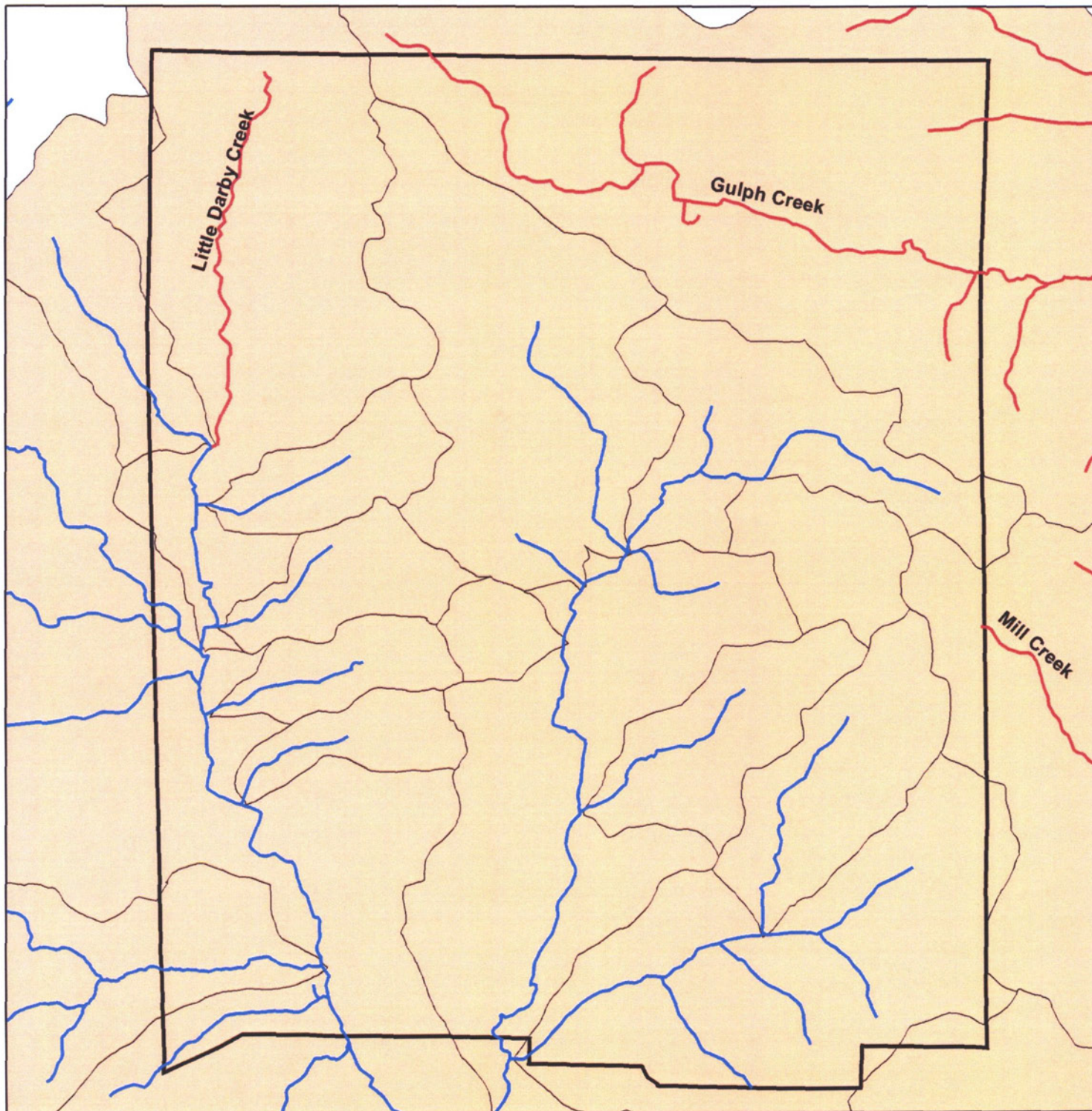
### Legend

#### 303d Classification

-  Nonattaining (Impaired)
-  Attaining (Nonimpaired)
-  Township Boundary
-  Watersheds



0 2,500 5,000 Feet







# RADNOR TOWNSHIP



## 1995 DVRPC WOODED LANDUSE

### Legend

-  Streams & Creeks
-  Lakes & Ponds
-  Radnor Township
-  1995 DVRPC Wooded



0 2,600 5,200 Feet



# RADNOR TOWNSHIP



## IMPORTANT NATURAL AREAS

### Legend

- Municipal Boundary
- 1992 PNDI Areas



0 2 4 Miles

Radnor Woods

Skunk Hollow

Ithan Creek Wetlands





# RADNOR TOWNSHIP



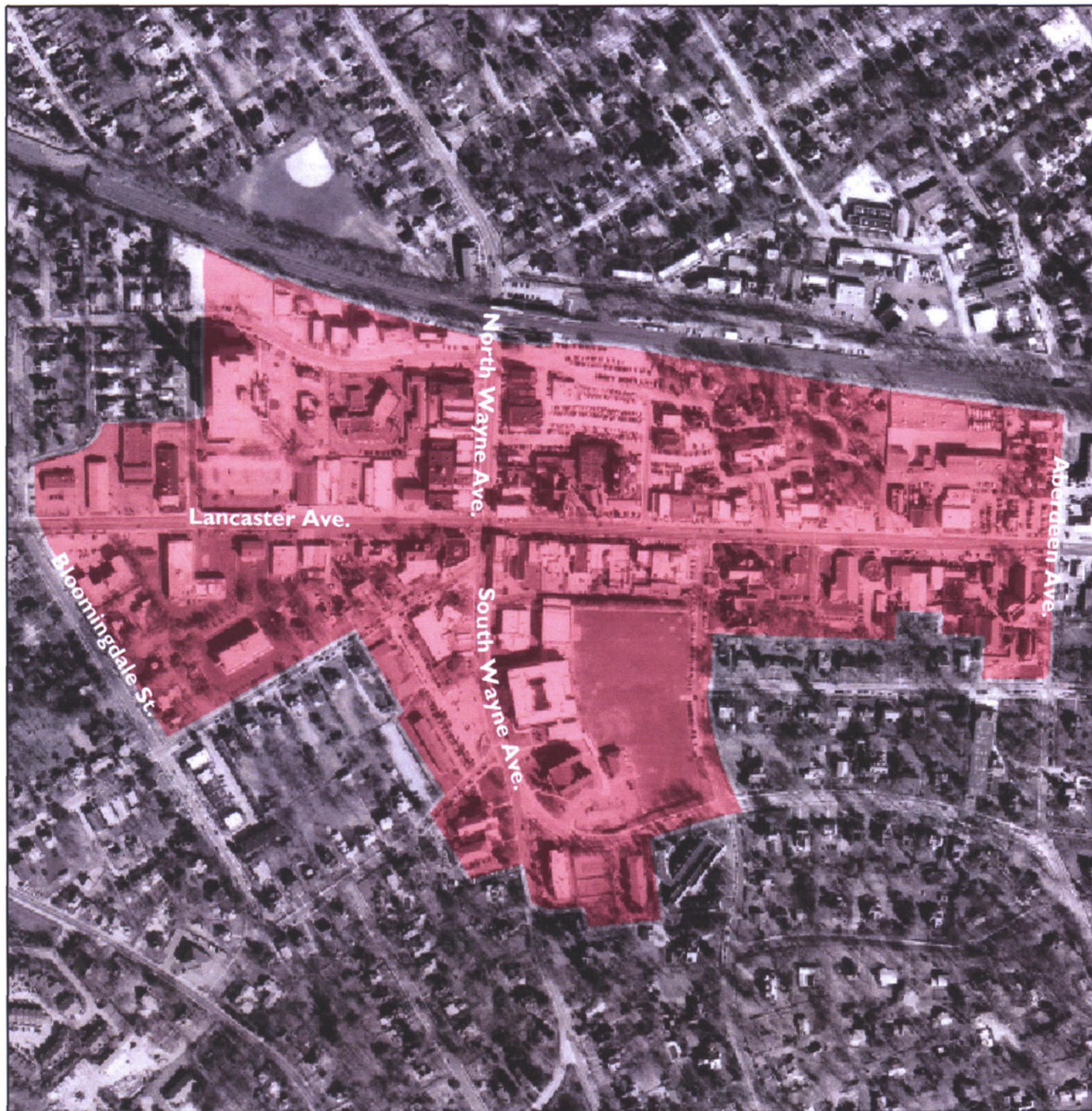
## **DRAFT** *CORE WOODED RESERVES*

### Legend

-  Radnor Township
-  Forested Islands







# RADNOR TOWNSHIP



## *WAYNE BUSINESS DISTRICT*

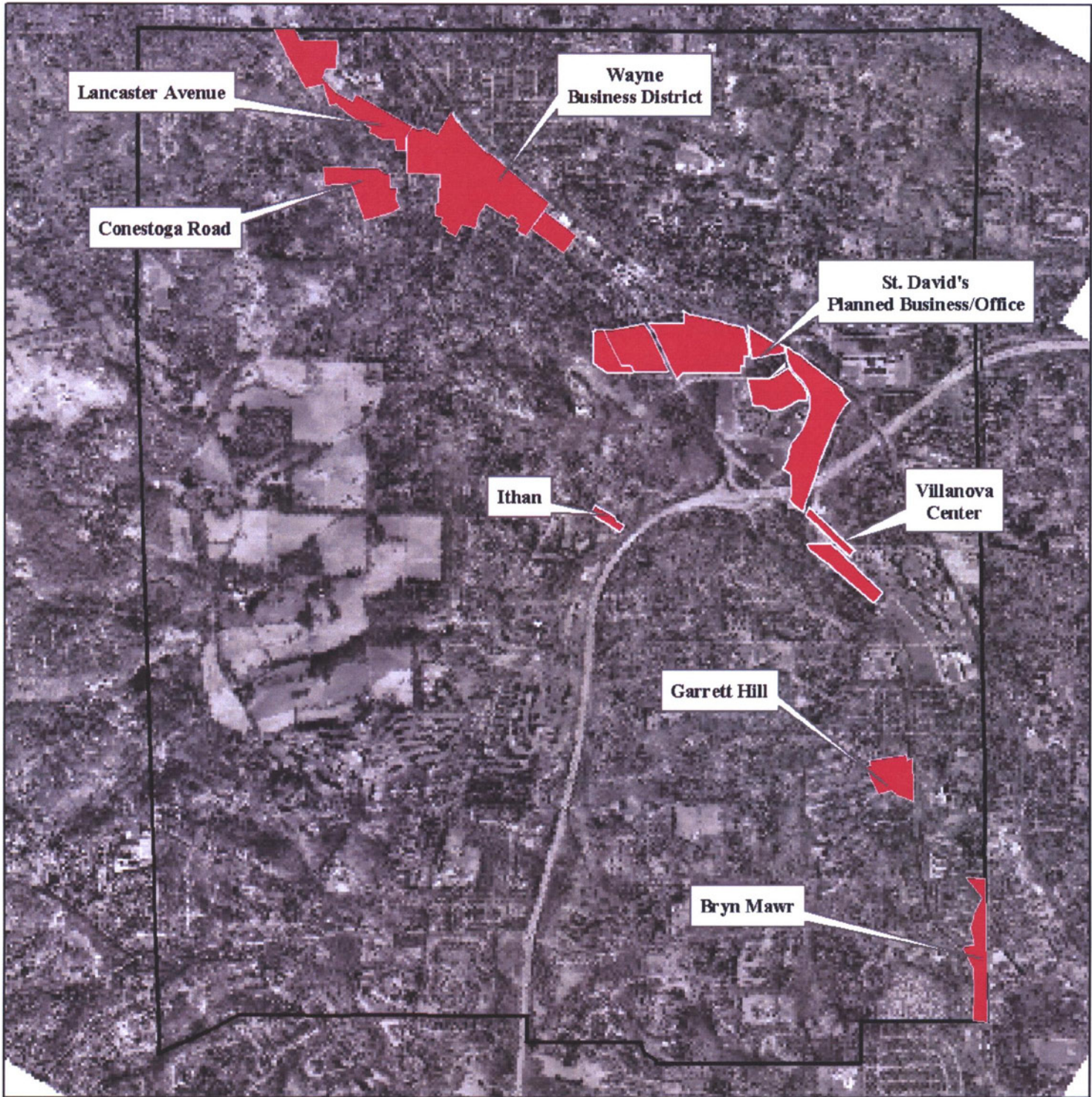
### Legend

 Wayne Business District



0 250 500  
Feet





# RADNOR TOWNSHIP



## COMMERCIAL AREAS

### Legend

-  Radnor Township
-  Commercial Areas





# RADNOR TOWNSHIP

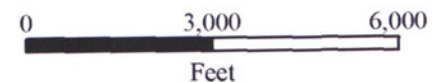


## SCENIC ROADS

### Legend

- Scenic Roads
- Parcels

*Scenic Roads were identified  
in the 1988 Comprehensive Plan*





# RADNOR TOWNSHIP

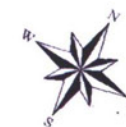


## HISTORIC RESOURCES

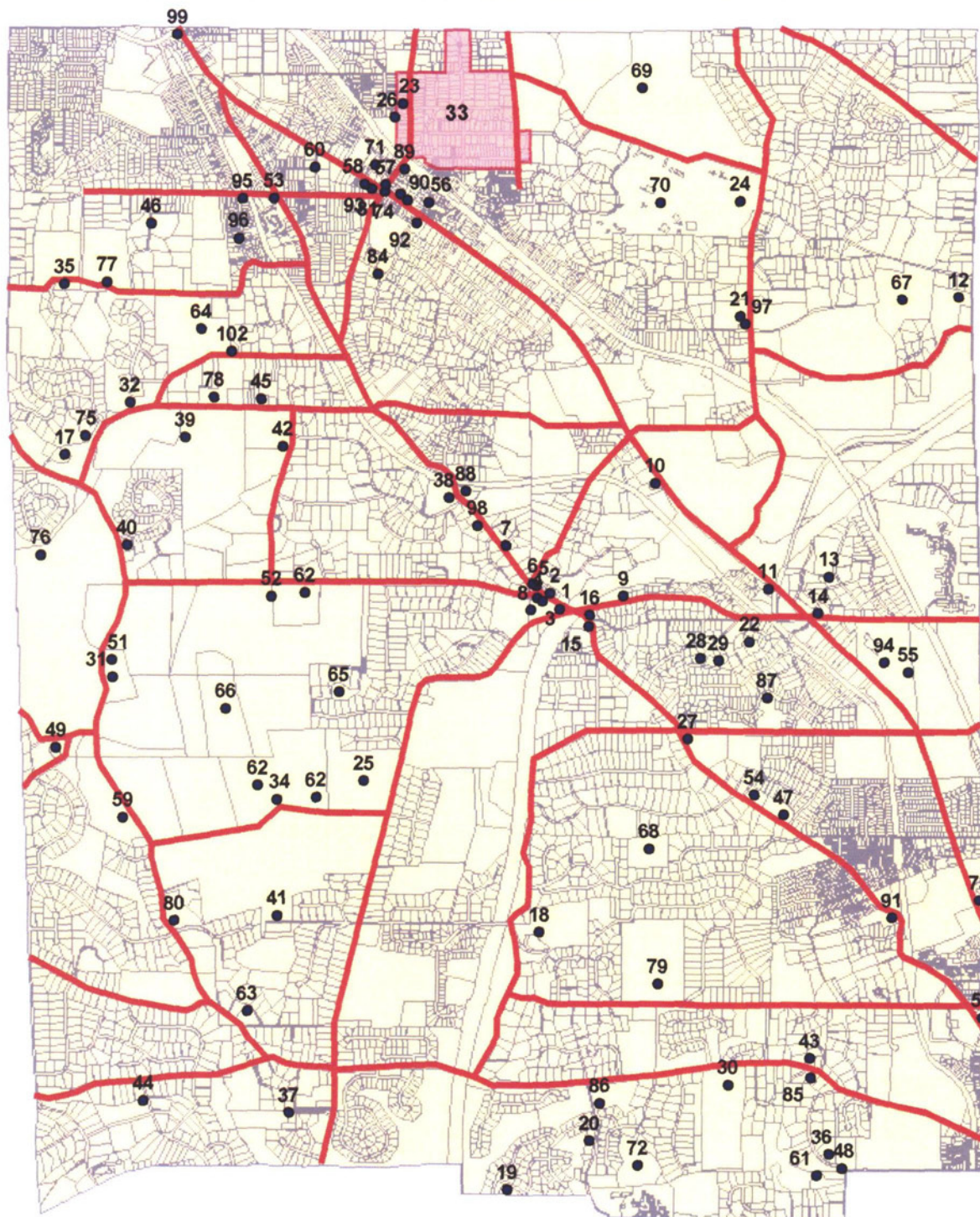
### Legend

- Historic Sites
- Historic Roads
- Historic District
- Parcels

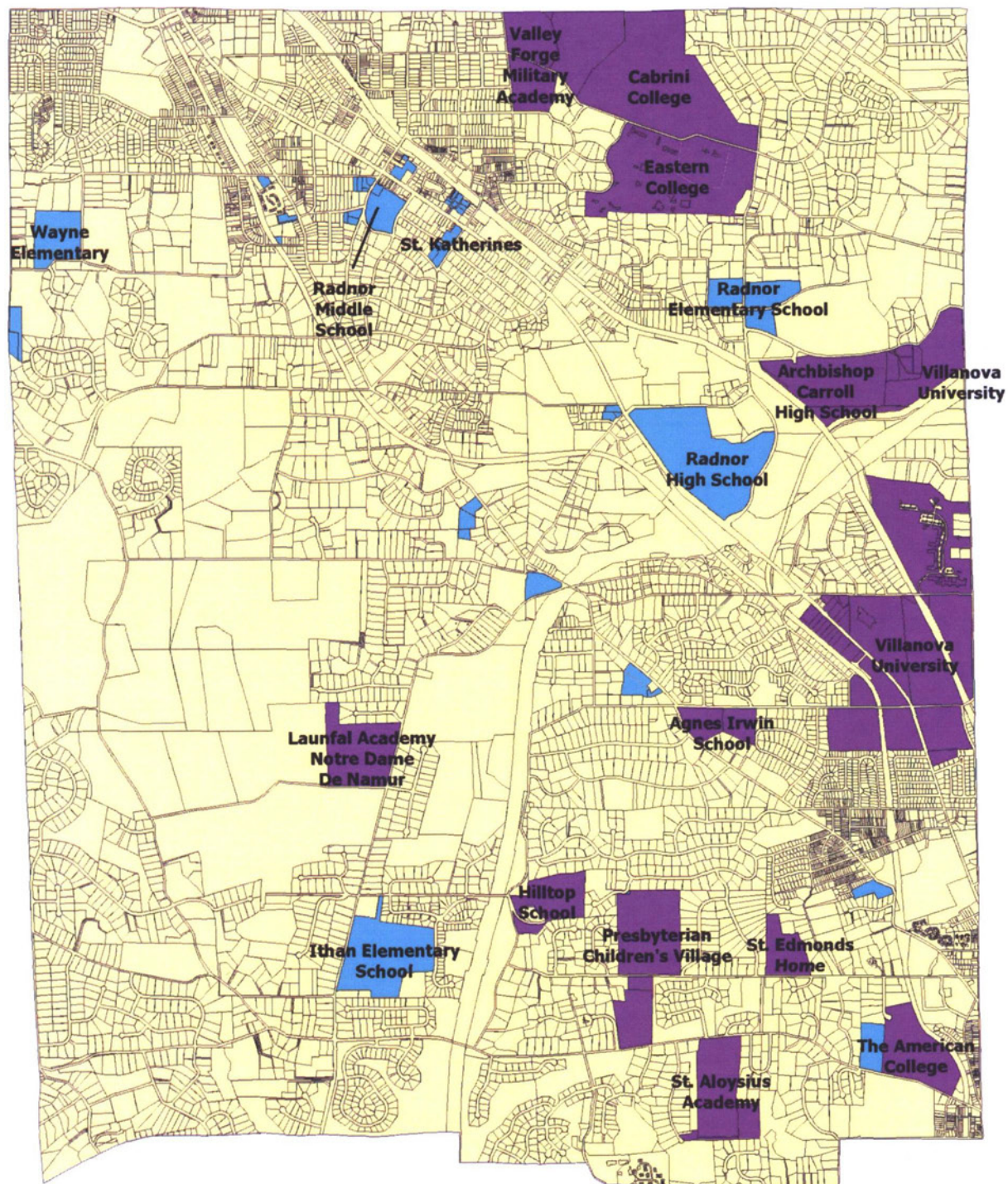
Historic resource data taken from  
1988 Historic Resource Inventory  
of the Comprehensive Plan



0 2,500 5,000  
Feet







# RADNOR TOWNSHIP



## INSTITUTIONS & COMMUNITY SERVICES

### Legend

- Parcels
- Institutions
- Community Services  
(incl. Public Schools)



0 3,000 6,000 Feet



# RADNOR TOWNSHIP

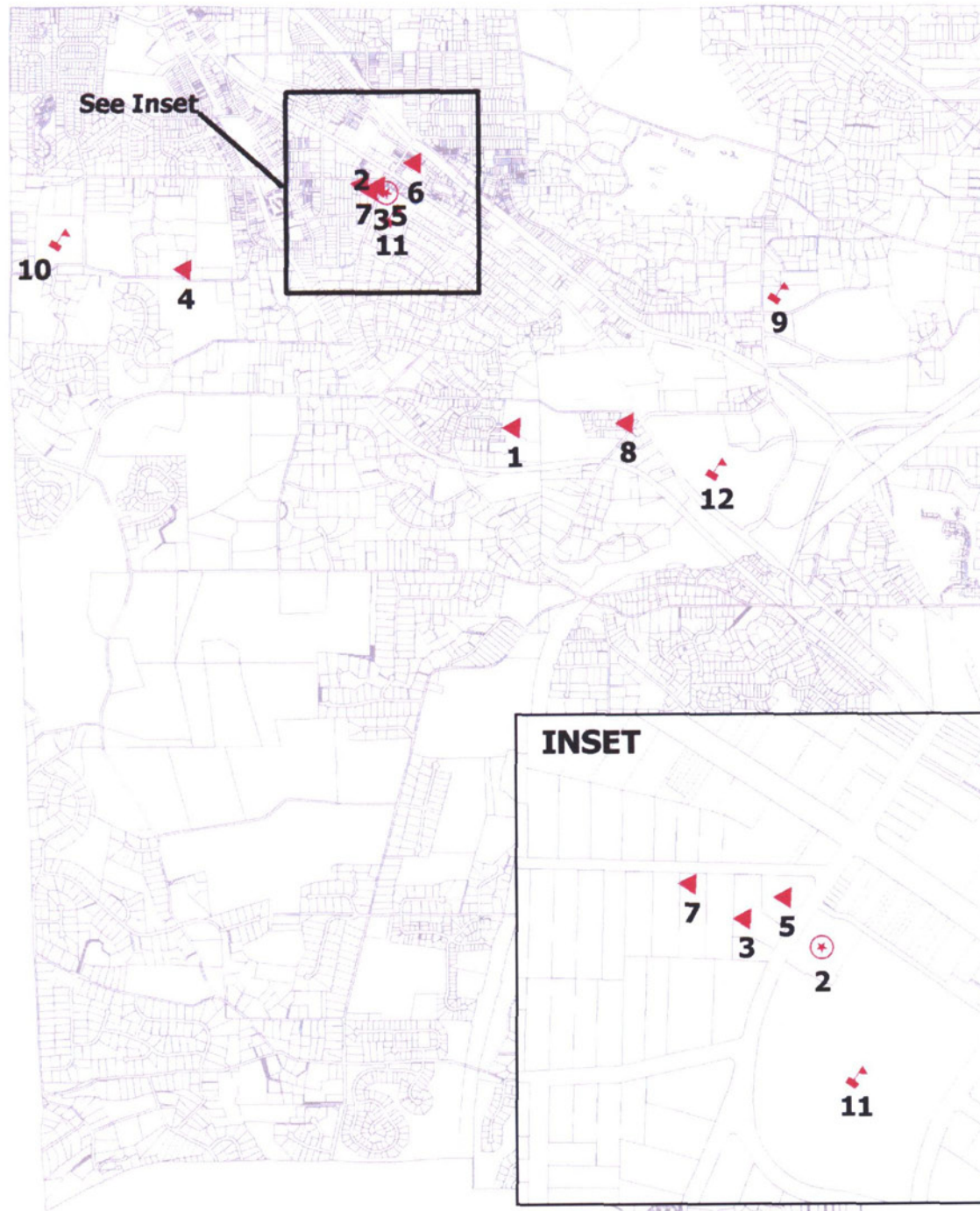


## COMMUNITY SERVICES & FACILITIES

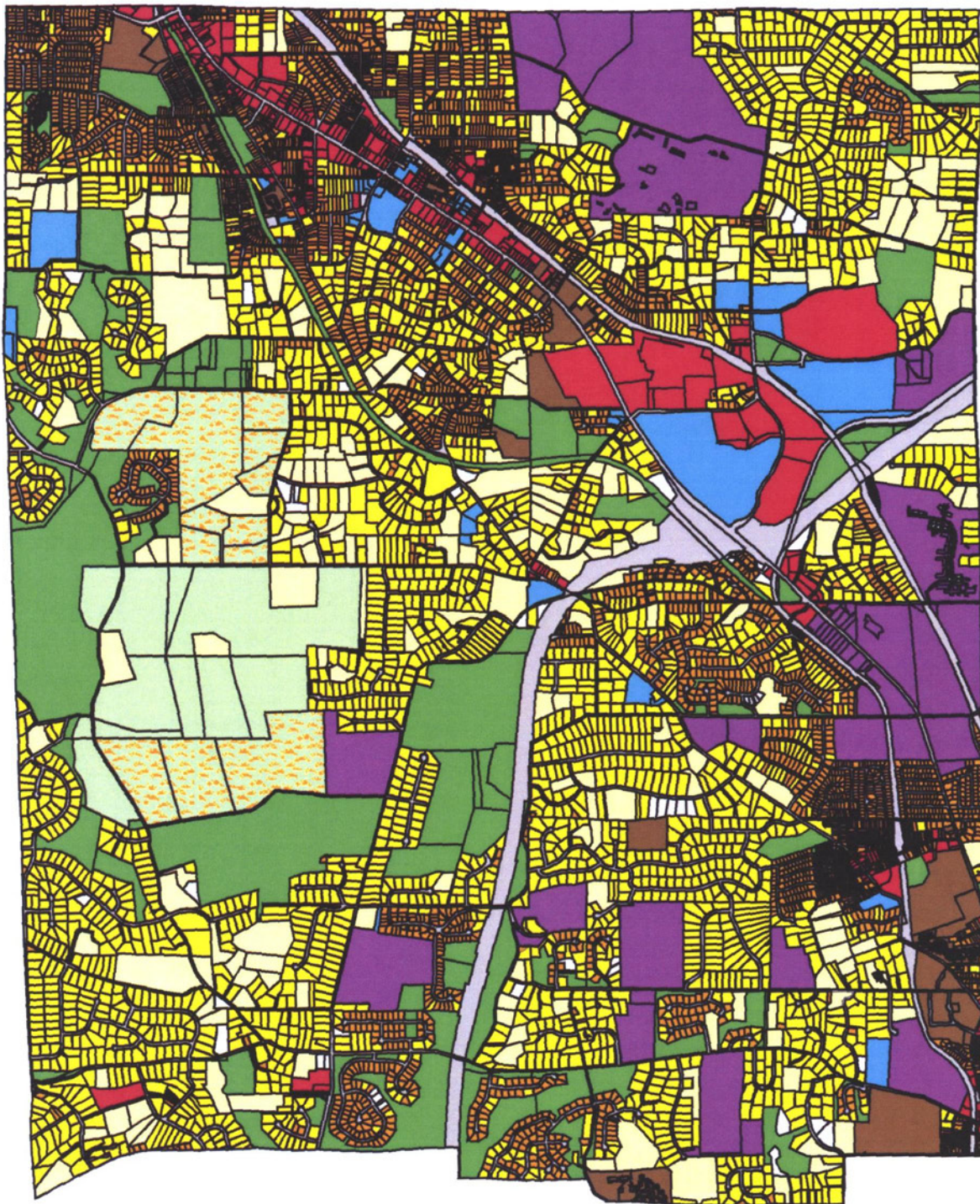
- ▲ 1. Municipal Building
- ⊙ 2. Radnor Fire Co.
- ▲ 3. Memorial Library
- ▲ 4. Wayne Art Center
- ▲ 5. Wayne Post Office
- ▲ 6. Wayne Senior Center
- ▲ 7. Women's Resource Center
- ▲ 8. Villanova Post Office
- ▲ 9. Radnor Elementary Sch.
- ▲ 10. Wayne Elementary Sch.
- ▲ 11. Radnor Middle Sch.
- ▲ 12. Radnor High Sch.



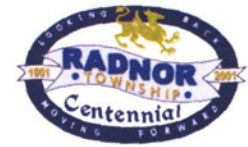
0 3,000 6,000 Feet







# RADNOR TOWNSHIP












## EXISTING LAND USE-2002

### Legend

 Parcels

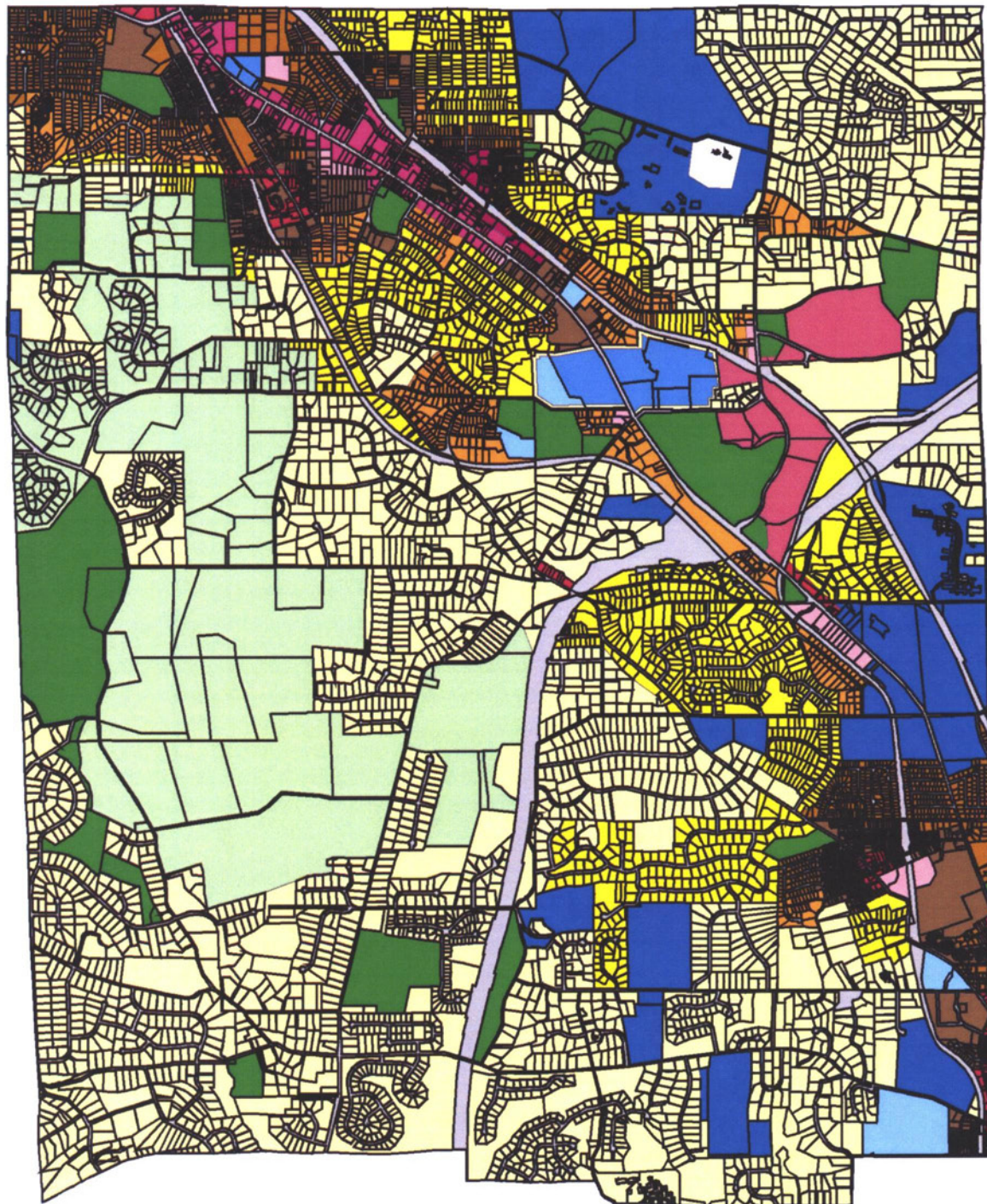
### Classification

-  Agriculture
-  Commercial
-  Community Service
-  Conservation Easement
-  Institution
-  Recreation
-  Residential - Rural
-  Residential - Low Density
-  Residential - Med Density
-  Residential - Multifamily
-  Transportation
-  Utility
-  Vacant

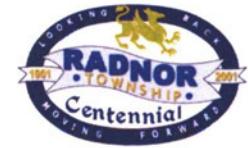


0 2,500 5,000 Feet





















# RADNOR TOWNSHIP



## ZONING

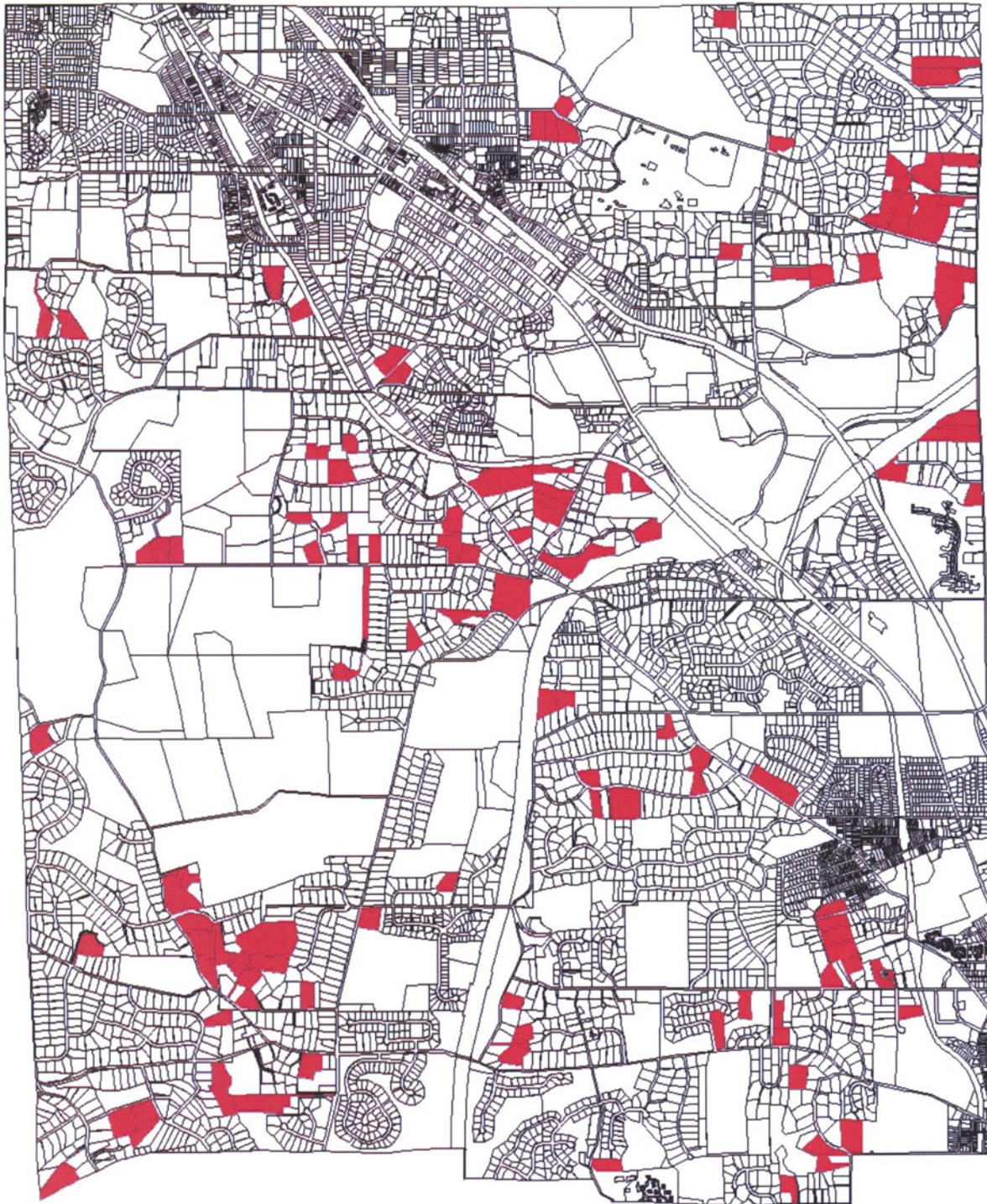
### Legend

	Parcels		PI
	AC		PLO
	C-0		PLU
	C-1		R-1
	C-2		R-2
	C-3		R-3
	PA		R-4
	PB		R-5
			n/a



0 2,500 5,000 Feet







# RADNOR TOWNSHIP



## "OPEN SPACE" PARCELS

### Legend

-  Residential Use/R-1
-  Parcels

Underdeveloped Area: 458 Ac



0 2,500 5,000  
Feet





# RADNOR TOWNSHIP



## WAYNE BUSINESS DISTRICT CONCEPT PLAN

### Legend

-  Pedestrian Enhancement
-  Village Commons
-  Center Boulevard
-  Mid-Block Crossing
-  Parking with Special Stormwater Management
-  Pedestrian Continuity
-  Streetscape Enhancements
-  Business District Area



0 350 700 Feet



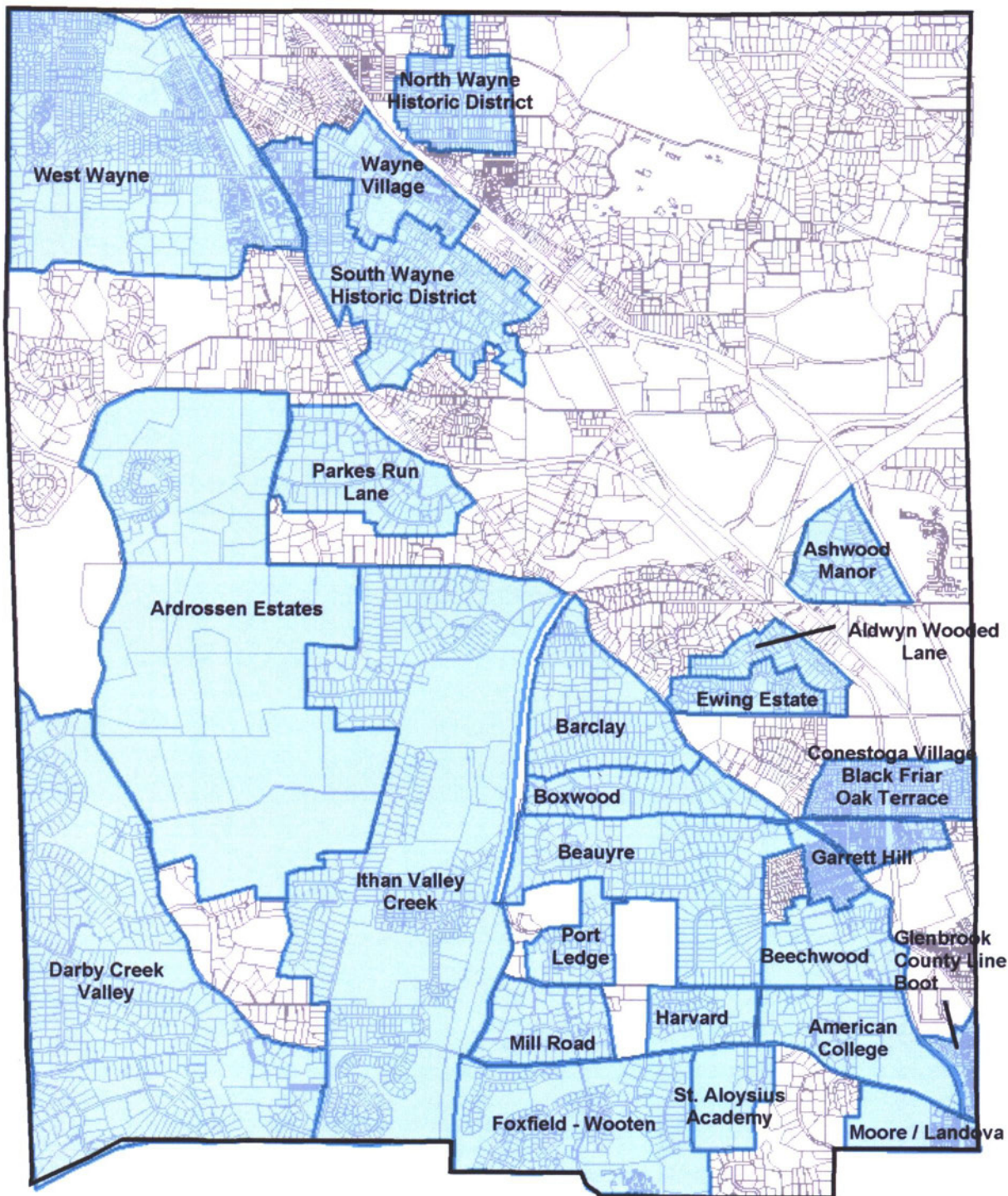
# RADNOR TOWNSHIP



## NEIGHBORHOODS

### Legend

-  Township Parcels
-  Neighborhoods



0 3,000 6,000 Feet