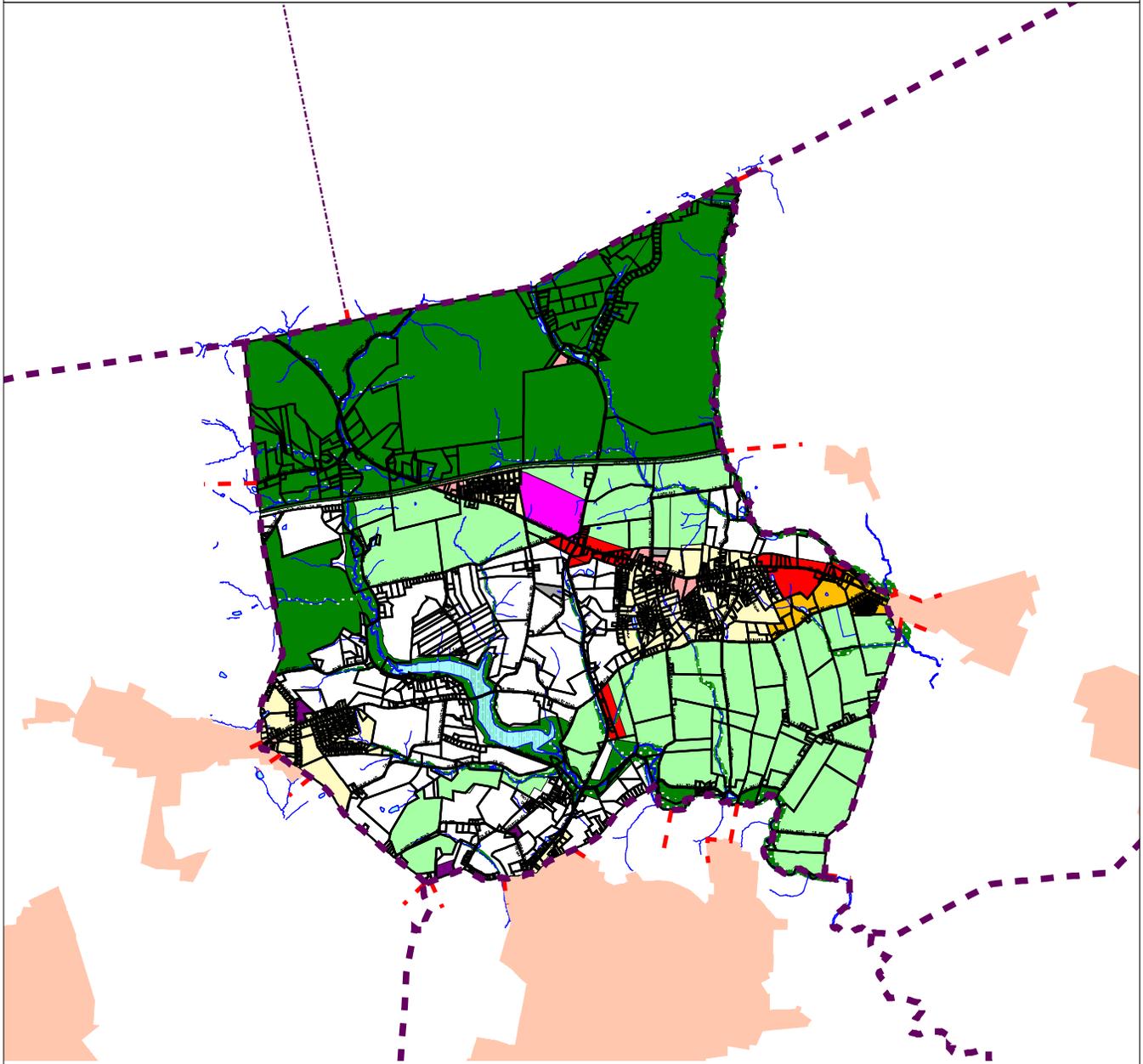


Elizabeth Township Comprehensive Plan



Adoption Date: September 8, 2003

Prepared By:

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COMPREHENSIVE PLAN

ELIZABETH TOWNSHIP LANCASTER COUNTY, PENNSYLVANIA

September 8, 2003

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I. INTRODUCTION

A. PURPOSE OF THE PLAN

Like any business, local governments need to chart future plans so that they can assure the efficient use of resources. Local governments are in the business of assuring public welfare and delivering public services. The preparation of a comprehensive plan provides a deliberate framework of information that can be used to make future decisions regarding local government functions. The comprehensive plan further provides a sound legal basis for specific implementing measures, such as zoning and subdivision regulations, designed to carry out the intent of the comprehensive plan.

One working definition of comprehensive planning is “the allocation of municipal resources towards municipal goals and objectives;” this definition embodies the essence of this study.

This Comprehensive Plan *first* sets forth a set of community planning goals. These goals can include general health and safety-type objectives, like the provision of adequate housing and employment opportunities, or the protection of the environment. More specific objectives can seek to improve the local balance of public services, or can recommend the conservation of prime agricultural land. Finally, problem-solving goals seek to correct existing or foreseeable deficiencies or problems, such as improving the design of a particular road intersection or discouraging strip development patterns.

Next, this study inventories, maps, and describes the Township's resources over several chapters. These resources include, but are not limited to, land, streams, roads, utilities, parks, housing, schools, police and fire service, and businesses.

Third, analyses are performed within each Plan chapter to determine the capabilities of these resources to serve projected future population growth.

Fourth, the community goals and objectives are applied to the analyses of resources, yielding a future land use scheme. In addition, guidelines are offered regarding the future delivery of public services. The time frame for this Comprehensive Plan is to the year 2020; all recommendations made within this Plan are structured around a 20-year time frame. Local officials will need to update this Plan by the year 2020, or sooner if conditions change rapidly.

Finally, implementation strategies are discussed and recommended that will enable the Township to set in motion the results and recommendations presented in the Plan. In the end, any planning process is meaningless unless its recommendations find application as part of the Township's business - the protection of public welfare and the delivery of public services.

B. HOW TO USE THIS PLAN

This Comprehensive Plan has been developed to serve several important purposes. Principally, the Plan is intended to assist the Township in the administration of land use planning programs. In addition to the community planning goals embodied at the outset of the Plan, many action-oriented recommendations have been expressed throughout the Plan text; these recommendations have been *italicized* and printed in **bold letters** for the readers' and decision-makers' convenience. Many of these recommendations tie in to specific implementation strategies discussed in the final Plan chapter.

The several maps within the Plan have been carefully prepared and colored so that the desired information can be easily gleaned from the maps. The many analyses utilized throughout the study were devised to maximize the utility of the findings. Step-by-step descriptions of these methodologies have been furnished to enable the reader to gain a better understanding of the issues and their planning implications. Finally, as seen previously, a detailed table of contents appears at the beginning of the text that provides quick reference to the appropriate sections of the Plan. All of these features will aid local decision-makers in their evaluation of future planning proposals.

A second significant function of this Plan is its collection of important information. The term "Comprehensive Plan" accurately describes the composition of this report; its contents are quite comprehensive. Accordingly, the Plan provides convenient access to a wealth of up-to-date factual information concerning the Township's resources. This information will serve not only local officials, but also service agencies, property owners, residents, business leaders, and prospective developers. The inventories of existing conditions will also provide the groundwork upon which future Plan updates can be more easily accomplished.

Finally, the Plan provides a future land use scheme that can be useful to many landowners. For example, residents can get an idea of the land uses that are projected around their homes. Farmers can continue to farm with relative assurance that their agricultural setting will not be disrupted. Prospective developers can use the Plan to package development proposals that conform to the Township's collective goals, thereby ensuring a smooth development review process. Businesses can glean a sense of secure investment climate from the Township's organized government administration and future land use scheme. In all, the Plan considers many competing interests and devises a strategy to assure their relative harmonious coexistence.

In summary, it is important for all of those persons involved and/or interested in the future of Elizabeth Township to read and understand this entire Plan. Local decision-makers should keep the Plan handy when evaluating future development proposals, service adjustments, or public investments. The Plan's format will provide considerable information, analyses and expertise without requiring its complete rereading. In the end, it is intended that the Plan will be a powerful and practical tool in local decision-making.

C. REGIONAL CONTEXT

Elizabeth Township is located in northern Lancaster County in southeastern Pennsylvania on the southern slopes of the Furnace Hills. The Township is approximately 10 miles north of the City of Lancaster, which serves as the County seat of government. Elizabeth Township contains a total land area of 18.1 square miles, including sizeable areas of public lands and forests. The Township is bounded by Penn Township to the west, Warwick Township to the south, and Clay Township to the east, all in Lancaster County; and Heidelberg and South Lebanon Townships in Lebanon County to the north.

Elizabeth Township has a primary geographic and economic link with the Lancaster urban area, and a secondary link with Lebanon to the north. York, Harrisburg, and Reading are all within an hour's driving time from Elizabeth Township. US 322 and PA 501 are the primary transportation links connecting Elizabeth Township with neighboring areas.

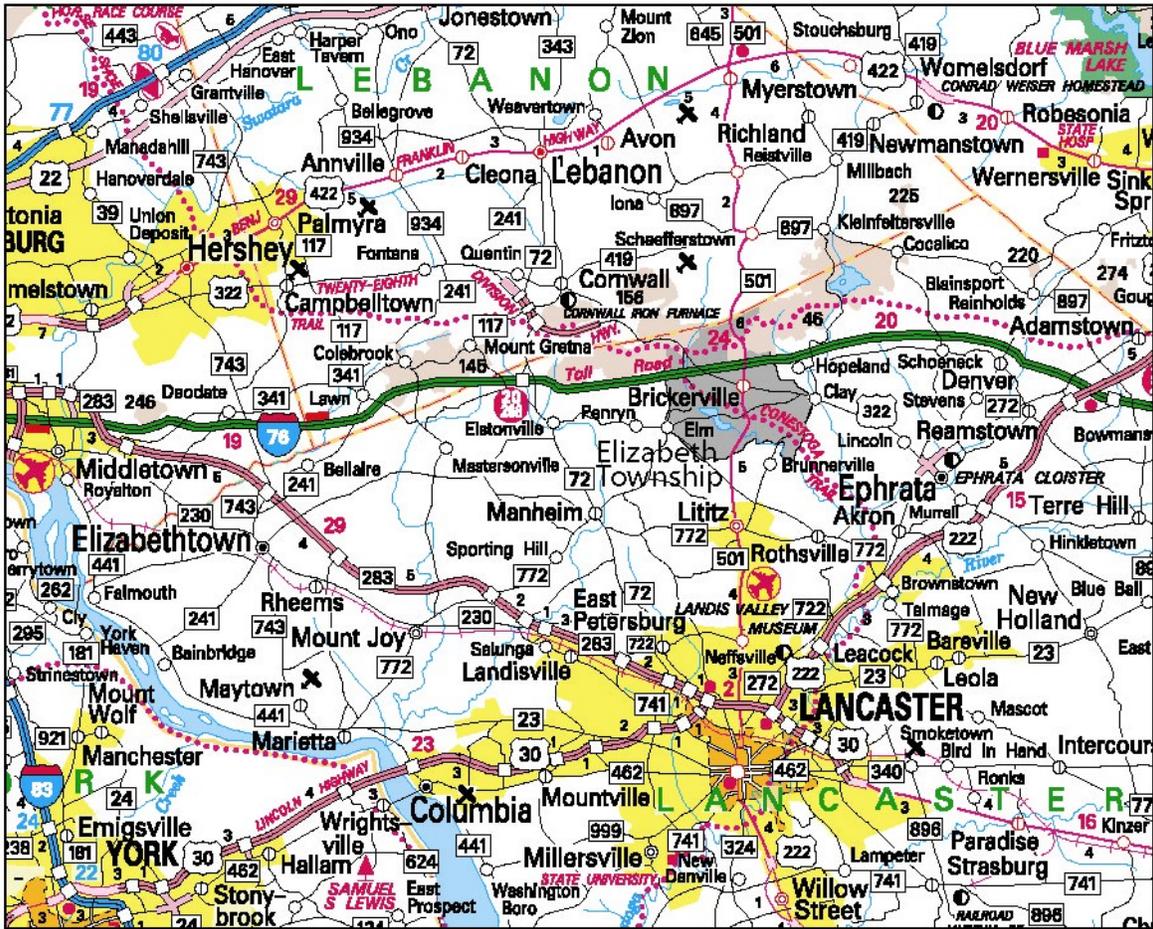
The Regional Location Map located on Page 4 illustrates the location of Elizabeth Township within Lancaster County and the surrounding area.

D. HISTORIC SKETCH

Elizabeth Township possesses a rich historical heritage. Established in 1757 from what was then Warwick Township, it was split in 1853 to create the present Clay Township to the east. The area now comprising Elizabeth Township played an important part in the development of the Country in early colonial days. The village of Brickerville dates from 1741, when the area's first blast furnace was built to make cast iron from ore from the Cornwall mines. Stiegel glass manufacturing, dating from 1757, soon grew into an international export. Iron production grew, reaching its peak around 1780 and continuing until 1856. The supplying of charcoal from area forests to feed the furnaces over this period became an important related industry.

Today, Elizabeth Township is a quiet rural community, devoted largely to agricultural, recreational, and residential uses. The Township's largest village is Brickerville. Other smaller villages include Elm, Poplar Grove, and Lexington.

REGIONAL LOCATION MAP



II. COMMUNITY PLANNING GOALS

Like any effective planning effort, the preparation of the Elizabeth Township Comprehensive Plan must seek to achieve desired goals and objectives of the community. These range from universal human and societal needs to the resolution of particular problems. Essentially, the Township's goals and objectives formulate an agenda or list of priorities that are used to guide the development of the Comprehensive Plan, as well as the allocation of municipal resources.

To derive these goals and objectives, local officials were asked to complete a 35-question survey that helped to identify important planning issues. These issues were then discussed at a meeting of the Comprehensive Plan study group. In addition, a town meeting was held to solicit public input into the planning process to determine issues of public concern. Finally, twelve County-wide Policy Goals articulated in the Policy Plan component of the Lancaster County Comprehensive Plan were incorporated into the goal formulation process and are reflected in the many goals and objectives listed below.

In the course of the succeeding Plan chapters, more-detailed policy recommendations are made which are based on specific analyses within those chapters. It is these more detailed policy recommendations concerning the location, character, and timing of future development in combination with the goals and objectives set forth below which serve as the Township's Statement of Community Development Objectives as provided for in the Pennsylvania Municipalities Planning Code. These policy recommendations are in **BOLD** print. They reflect Township policy and are the specific bases for the recommended implementing measures identified in the Plan's final chapter, Implementation.

A. NATURAL AND CULTURAL FEATURES

Goal: To encourage agricultural uses and to protect sensitive environmental and cultural resources from degradation.

Objectives:

1. Focus development away from the agricultural-zoned areas of the Township;
2. Protect agricultural zoned areas from incompatible adjacent uses;
3. Permit farm occupations and farm-based businesses to supplement farm income;
4. Promote enrollment of farms in Agricultural Security Areas and in the Clean and Green tax deferral program as ways to provide benefits to farmers;
5. Acknowledge the abundance of high-quality natural resources and waters that characterize the Township;

6. Protect sensitive environmental resources, including but not limited to floodplains, wetlands, woodlands, steep slopes, and wildlife habitats from indiscriminate development;
7. Discourage development in the vicinity of State Game Lands, Speedwell Forge, Segloch Run, Horseshoe Trail, and the new County Park;
8. Ascertain long-range plans for State Game Lands within the Township and encourage their preservation; and
9. Encourage the preservation of the Township's historic and archaeological resources.

B. HOUSING AND THE ECONOMY

Goal: To provide for the housing, commercial service, and employment needs of the Township.

Objectives:

1. Continue to maintain the Township's historical development trend;
2. Provide for a range of housing types and densities to meet projected needs to the year 2010/2020;
3. Revise current development regulations to accommodate planned growth and ensure that they are achieving intended purposes;
4. Discourage poor lot and access design;
5. Discourage strip development patterns;
6. Provide future development that offers a variety of community and commercial services;
7. Promote use of open space designs for rural residential development;
8. Encourage aesthetically pleasing commercial and industrial uses in the Brickerville area, which are physically separated from residential areas;
9. Acknowledge the importance of agriculture to the economy of the Township, and promote ways to encourage continued agricultural production;
10. Revise Township Zoning Ordinance to permit home occupations in all zones subject to specific review standards;

11. Provide for small-scale, locally-oriented commercial retail and office space in a village setting within Brickerville; and
12. Develop a proper site-planning process and utilize incentives to promote better-sited and designed development.

C. PUBLIC FACILITIES AND SERVICES

Goal: To provide for needed public facilities and services.

Objectives:

1. Encourage cooperation and coordination among providers of public facilities and services;
2. Assure adequate future police, fire, and ambulance service at all times;
3. Plan for the future need for improved police protection;
4. Continue to rely on volunteer staffing for local fire and ambulance service by actively recruiting volunteers;
5. Provide for improved recreational opportunities, including:
 - a. Developer-provided parks;
 - b. Possible Township acquisition of land for a community park in Brickerville;
 - c. Possible creation of a linear park along Hammer Creek; and
 - d. Apply for grants for acquisition and improvements of parks.
6. Locate public and institutional facilities in Brickerville;
7. Improve access to health and human services; and
8. Assure the general welfare of all residents, employees, and properties located within the Township.

D. UTILITIES

Goal: To provide for the sewer, water, and solid waste disposal needs of the Township.

Objectives:

1. Maintain the utilization of on-lot water supply and on-lot sewage disposal systems throughout the Township;
2. Educate the Township residents on the proper care and maintenance of individual on-lot sewage treatment systems; and
3. Promote local utilization of the available recycling and household hazardous waste management programs.

E. TRANSPORTATION

Goal: To coordinate land use and transportation planning for the safe, efficient, and convenient movement of people and goods.

Objectives:

1. Coordinate future land use and roadway functions to maximize efficient use of the region's existing major roads;
2. Coordinate existing roadway functions with appropriate design standards;
3. Coordinate future road improvements with projected roadway functions and adjoining planned land uses;
4. Assure that future developments provide for proper access designs and locations that minimize traffic congestion and safety problems;
5. Identify State and Township roads requiring horizontal and vertical realignment and intersections which could be improved in the Township;
6. Review and, if necessary, adjust road design or use to minimize traffic congestion and improve safety; and
7. Promote alternative modes of transportation, including carpooling, biking, and walking, to reduce traffic congestion, conserve energy, and encourage a sense of community.

F. FUTURE LAND USE

Goal: To provide adequate and appropriately located areas to meet future land use needs to the year 2020.

Objectives:

1. Promote citizen participation in the planning process;
2. Promote a vision for the future by directing growth away from sensitive environmental resources;
3. Accommodate future growth, with particular emphasis on reviewing and upgrading existing public services and providing additional public services;
4. Provide incentives for the creation of livable communities via the implementation of a village development district; and
5. Assure that future land uses are compatible with neighboring uses in adjacent municipalities.

III. NATURAL AND CULTURAL FEATURES

This chapter will inventory, describe, and map the Township's land use resources. This information will be extremely useful in allocating future land uses within the Township. Additionally, natural resource information will be instrumental in the formulation of land development policies that protect the natural environment.

A. SOILS ANALYSIS

A soils analysis is an important basis for planning future land uses. Soils information may be used to identify lands with severe development constraints as well as to locate lands that are particularly well-suited to particular land uses. Specific land uses are best located on soils that are suitable and have complementary characteristics for those land uses. For example, agricultural land uses are usually found where soils are level, well-drained, and fertile. Residential land uses can be suitably located where soils are sufficiently above bedrock and water table. Using suitable land significantly reduces the costs associated with excavating a foundation, as well as locating and designing an on-lot sewage disposal system. Finally, industrial uses favor soils that are relatively flat and sturdy so as to withstand the heavy weights associated with the operation of large plants. This section provides an analysis of the Township's soils and their characteristics with relation to their general suitability for various land use activities.

SOIL ASSOCIATIONS

Because of Lancaster County's leading position as an agriculturally productive region, the United States Department of Agriculture's (USDA), Soil Conservation Service, has recently completed its second soil survey of the County. This soil survey was completed in 1985 and utilizes the best soil-classifying and mapping technologies available at that time. Consequently, some soil names and their locations are likely to differ from those compiled in the County's former soil survey, which was issued in 1959. Obviously, these changes do not mean that the soils have changed, but that the methods of soil identification and classification have been refined.

The *Soil Survey of Lancaster County (1985)* depicts Elizabeth Township as including three of Lancaster County's six general soil associations. A soil association is a grouping of one or more major and some minor soils which exhibit a distinctive pattern of soils, relief, and drainage. Soil associations are a result of a combination of several geologic formations and their physical and chemical weathering over time.

The ***Ungers-Bucks-Lansdale Association*** is comprised of nearly level to very steep, well-drained soils on ridges, side slopes, and foot slopes. This association was formed in residuum from Triassic siltstone, conglomerate, shale, and sandstone. It is located in the northern one-third of the Township and includes the State Game Lands within the Township.

The **Bedington Association** is characterized by nearly level to moderately steep, well-drained soils on dissected ridgetops and side slopes. This association was formed in residuum from acid shale. It is present in the central and southwestern portions of the Township.

The **Duffield-Hagerstown Association** is comprised of nearly level to steep, well-drained soils in undulating broad valleys. This association was formed in residuum from limestone. It occupies the southeastern portion of the Township.

The following table summarizes the approximate area in square miles of the various soil associations within the Township:

Soil Associations	Square Miles
Ungers-Bucks-Lansdale	7.0
Bedington	7.4
Duffield-Hagerstown	3.2
Total	17.6

The following table lists the individual soils found within the Township:

SOIL TYPES IN ELIZABETH TOWNSHIP			
Soil Symbol	Soil Name	Slope Percentage	Agricultural Rating
AbB	Abbottstown silt loam	3–8	IIIw
BdA	Bedington silt loam	0–3	I
BdB	Bedington silt loam	3–8	Ile
BdC	Bedington silt loam	8–15	IIIe
BeD	Bedington channery silt loam	15–25	IVe
Bm	Blairton silt loam	3–10	IIIw
Bo	Bowmansville silt loam	0–3	IIIw
BuB	Bucks silt loam	3–8	Ile
BuC	Bucks silt loam	8–15	IIIe
BuD	Bucks silt loam	15–25	Ive
BxC	Bucks very stony silt loam	8–25	Ivs
CkA	Clarksville silt loam	0–5	Iiw

SOIL TYPES IN ELIZABETH TOWNSHIP (CONTINUED)			
DbA	Duffield silt loam	0-3	I
DbB	Duffield silt loam	3-8	lie
HaA	Hagerstown silt loam	0-3	I
HaB	Hagerstown silt loam	3-8	lie
HbC	Hagerstown silty clay loam	8-15	IIle
Hbd	Hagerstown silty clay loam	15-30	Ive
Hg	Holly silt loam	0-3	IIIw
LaB	Lansdale loam	3-8	lie
LaC	Lansdale loam	8-15	IIle
LaD	Lansdale loam	15-25	Ive
Ln	Lindside silt loam	0-3	liw
MdB	Mount Lucas silt loam	3-8	lie
MeB	Mount Lucas very stony silt loam	3-12	Vis
Nc	Newark silt loam	0-3	liw
RaB	Readington silt loam	3-10	lie
RbB	Readington extremely stony silt loam	3-8	VIIIs
Rd	Rowland silt loam	0-3	liw
UaB	Ungers loam	3-8	lie
UaC	Ungers loam	8-15	IIle
UaD	Ungers loam	15-25	Ive
UbB	Ungers extremely stony loam	3-8	VIIIs
UbD	Ungers extremely stony loam	8-25	VIIIs
UbE	Ungers extremely stony loam	25-50	VIIIs

PRIME FARMLAND

One primary consideration of soils mapping is the identification of prime farmlands. The United States Department of Agriculture (USDA) describes prime farmland as the land that is best suited for producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and water supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment. Prime farmland is characterized by good permeability to air and water, few or no rocks, resistance to erosion, and relatively flat topography. The USDA encourages all levels of government and private individuals to effectively use these valuable resources to meet the nation's short- and long-range food and fiber needs.

About 55% of the soils within Lancaster County are considered prime farmlands. These soils have enabled the County and its farmers to attain State and national distinction as one of the most productive sources of agricultural products.

Prime farmland soils are those soils with an agricultural rating of Class I or II. In addition, the USDA considers Class III soils to be of Statewide Importance to agriculture. The Soils Map shows all Class I and II soils in Elizabeth Township as green and Class III soils as gold. Other soils (Class IV-VII), some of which may be used for agricultural purposes, are left white. The Township's Class I, II, and III soils are located primarily to the southeast in a contiguous mass made up of the Duffield-Hagerstown unit, as well as interspersed with other soils throughout the southern two-thirds of the Township. It is estimated that approximately one-half of the Township is comprised of Class I, II, and III soils.

The Township should continue to protect its Class I, II, and III soils for agricultural uses both by restricting the conversion of these soils to other uses, and by discouraging the location of incompatible uses in close proximity to agricultural areas.

DEVELOPMENT CONSTRAINTS

Another important soils consideration relates to those soils that have constraints for building development. Such constraints can include a wide range of soil characteristics, including steep slopes, wetness, depth to bedrock, frost action, low strength, and flooding. A separate set of soils constraints becomes important where on-site sewage disposal methods are contemplated. These constraints include steep slopes, wetness, flooding, and slow percolation rates. It is important to identify and locate those soils that possess these building development and on-site sewage disposal constraints so that projected land uses can be kept away from these environmentally-sensitive areas.

The following table lists those soils which, according to the USDA, possess "severe" on-lot sewage disposal constraints, as well as "severe" building development constraints for one or more specified development activities, including shallow excavations, dwellings without basements, and dwellings with basements.

SOILS WITH SEVERE DEVELOPMENT CONSTRAINTS			
Soil Symbol	Soil Name	Severe Building Development Constraints	Severe On-Lot Sewage Disposal Constraints
AbB	Abbottstown silt loam	wetness	wetness & percs slowly
BeD	Bedington channery silt loam	slope	slope
Bm	Blairton silt loam	wetness	wetness, percs slowly, & depth to rock
Bo	Bowmansville silt loam	wetness, flooding, & outbanks cave	wetness, percs slowly, & flooding
BuB	Bucks silt loam	—	percs slowly
BuC	Bucks silt loam	—	percs slowly
BuD	Bucks silt loam	slope	percs slowly & slope
BxC	Bucks very stony silt loam	—	percs slowly & slope
CkA	Clarksburg silt loam	wetness	wetness & percs slowly
HbD	Hagerstown silty clay loam	slope	slope
Hg	Holly silt loam	wetness, flooding, & outbanks cave	wetness, percs slowly, & flooding
LaD	Lansdale loam	slope	slope
Ln	Lindside silt loam	wetness & flooding	wetness & flooding
MdB	Mount Lucas silt loam	wetness	wetness & percs slowly
MeB	Mount Lucas very stony silt loam	—	wetness & percs slowly
Nc	Newark silt loam	wetness & flooding	wetness & flooding
RaB	Readington silt loam	wetness	wetness & percs slowly
RbB	Readington extremely stony silty loam	wetness	wetness & percs slowly
Rd	Rowland silt loam	wetness, flooding, & outbanks cave	wetness, percs slowly, & flooding
UaD	Ungers loam	slope	slope
UbD	Ungers extremely stony loam	slope	slope
UbE	Ungers extremely stony loam	slope	slope

Approximately two-thirds of the total land area within the Township is characterized by soils with severe physical constraints either for development or on-lot sewage disposal. ***Future development should avoid soils with severe development or on-lot sewage disposal constraints to minimize environmental degradation and the threat to public health, safety, and welfare.***

B. GEOLOGY/GROUNDWATER

The geology of an area plays an important role in determining the surficial shape of the environment. Throughout the ages, underlying rock is subjected to natural weathering forces that chemically and physically erode its original shape. These weathered materials then form soils that remain on site or migrate to other areas. These soils possess distinct characteristics that often dictate which land uses can be accommodated.

Geology is also a primary determinant of groundwater quality and quantity. Certain rock types and structures convey water better and yield more abundant well supplies. For example, limestone areas are characterized by solution channels that readily allow the passage of water, whereas other local metamorphic rocks have very low, secondary porosity. Rock type and structure can affect the degree of filtration that takes place within the groundwater, and the chemical composition of the rock can also contribute to the chemical properties of the groundwater.

Finally, the physical properties of underlying rock determine its strength and suitability to support development. These properties determine the ease of excavation and ability to support the foundations of various structural types.

TOPOGRAPHY

The topography of Elizabeth Township is largely a reflection of the underlying geology. Lancaster County lies within the Piedmont physiographic province, which is divided into three sections, two of which are represented in Elizabeth Township. The Triassic Lowlands section occupies the northern half of the Township. The northernmost portion of this section consists of the Furnace Hills area, characterized by steep slopes, high relief, and rugged, forested topography. In the north-central part of the Township, at the base of these slopes are found gently rolling plains, broad shallow valleys, and low, flat-topped ridges. The Conestoga Valley section occupies the southern half of the Township. Rolling hills and valleys comprise the majority of this area. To the southeast is an area of fertile farmland characterized by rolling valleys of low relief.

GEOLOGIC FORMATIONS

The Geology Map illustrates Elizabeth Township's geologic formations. Area geology conforms closely to both topography and soil associations. The Township's geologic formations were formed during two major periods of geologic history. About 500 million years ago, during the Paleozoic Era, Lancaster County was submerged beneath a shallow sea and a sequence of sediments was deposited that included limestones, sandstones, and shales. During the close of this Era, tectonic forces accompanied by high temperatures and pressures subjected these deposits to folding, faulting, metamorphism, uplift, and erosion, creating the geology and topography in the southern half of the Township as we know it today. The ***Cocalico Formation***, characterized by shale and sandstone geology, was the first-evolving geologic formation and is dominant in this area of rolling hills and valleys. The primary soil association in this area is the Bedington unit.

Also evolving in this time period was the limestone-rich **Epler Formation**, which underlies an area in the southeastern portion of the Township. Occupying very small areas in this vicinity also are the dolomite-laden **Ontelaunee Formation** and the limestone-rich **Annvile, Hershey, and Myerstown Formations**. Taken together, these formations are known as the Beekmantown Group. Soils in the Duffield-Hagerstown unit are dominant in these areas. The weathering of the underlying limestone makes this region the lowest point in the Township, containing fertile, well-drained soils produced through the erosion of the limestone.

During the following Mesozoic Era, a sequence of pebble conglomerates, sandstones and shales accumulated in small lakes and stream valleys, and were subsequently intruded by molten igneous material, forming **Diabase** dikes. The pebble conglomerates and **Diabase** dikes act as wedges to uphold the prominent ridges found in the northern portion of Elizabeth Township. Geologic formations evolving during the Triassic period of this Era include the **Hammer Creek** and **Hammer Creek Conglomerate Formations** in the northernmost part of the Township. These formations occupy areas of high relief with steep slopes and consist of quartz-pebble conglomerate with sandstone and shale. The high resistance of conglomerate to weathering accounts for the prominent profile of this landscape. Soils in the Ungers-Bucks-Lansdale unit are dominant in these areas.

Also evolving in this time period were the **New Oxford** and **New Oxford Conglomerate Formations**, located just south of and at the base of the **Hammer Creek Formations**, in an area of gently rolling plains and broad valleys. They are comprised of sandstone and quartz-pebble conglomerate. Soils in the Ungers-Bucks-Lansdale unit are dominant in these areas.

UNSTABLE GEOLOGY

The highly erosive nature of limestone holds distinct implications for land use planning. As groundwater passes the highly permeable limestone, it creates subsurface solution channels (underground tunnels conveying groundwater). These solution channels continually become larger, thereby increasing their capacity to carry additional groundwater. This condition provides a ready source of water for wells that are drilled into the solution channels. On the other hand, the formation of large solution channels and caverns can create sinkhole problems that pose obvious and significant safety hazards for land uses located on the surface.

Future development in those areas underlain by significant amounts of limestone should be cautious of the unstable nature of limestone and potential for development of sinkholes.

CHARACTERISTICS OF GEOLOGIC FORMATIONS

A table has been constructed on the following pages showing the relationship between the geologic conditions of the Township and such land use characteristics as porosity and permeability, ease of excavation, foundation stability, and quantity of groundwater. These four characteristics are important to consider when allocating and planning land use activities. This table is intended for reference use only and should be utilized to determine general characteristics of the formation types.

The **porosity** and **permeability** of a geologic formation refers to how quickly and easily water, air, and other substances pass through the rock. A classification of low permeability means that the rock is essentially impermeable. A classification of moderate refers to a permeability of about 14 feet per day. A high permeability means that substances may pass through the rock at a rate somewhere between 14 and 847 feet per day.¹

The **ease of excavation** refers to how pliable the rock is when moving it or drilling it. The classifications range as follows:

Easy - Can be excavated by hand tools or lightweight power equipment.

Moderately Easy - Rippable by heavyweight power equipment at least to weathered-rock/fresh rock interface and locally to greater depths.

Intermediate - Rippable by heavyweight power equipment to depths chiefly limited by the maneuverability of the equipment. Hard rock layers or zones of hard rock may require drilling or blasting.

Moderately Difficult - Requires drilling and blasting for most deep excavations, but locally may be ripped to depths of several feet due to closely spaced joints, bedding, or weathered rock.

Difficult - Requires drilling and blasting in most excavations, except where extensively fractured or weathered.²

Foundation stability can be classified as good, fair, or poor. Good foundation stability means that the bearing capacity of the rock is sufficient for the heaviest classes of construction, except where located on intensely fractured zones or solution openings. Fair foundation stability is determined by the presence of the water table, the type of rock composition, and weathering depth. Poor foundation stability means that foundations must be artificially stabilized to allow sufficient bearing capacity for light or moderate construction.

¹Alan R. Geyer and J. Peter Wilshusen, *Engineering Characteristics of the Rocks of Pennsylvania* (Harrisburg, PA: Pennsylvania Geologic Survey, 1982), p. 14.

²*ibid.*, p. 14.

GEOLOGIC FORMATION CHARACTERISTICS

Formation Name (Composition)	Symbol	Porosity & Permeability	Groundwater	Ease of Excavation	Foundation Stability
<p>ANNVILLE FORMATION (Light-gray high calcium limestone mottled at base; maximum thickness is about 250 feet.)</p>	Oan	Joint- and solution openings provide a secondary porosity of moderate to high magnitude; low permeability.	Industrial and public ground-water supplies are available; wells have encountered solution openings for very large yields; usually of excellent quality for most uses; water may be relatively hard.	Difficult; bedrock pinnacles are a special problem; moderate drilling rate.	Good; a thorough investigation should be made for possible collapse areas.
<p>COCALICO FORMATION (Shale member - dark-gray shale; highly phyllitic; includes some interbedded green and purple shale; entire formation is approximately 1,000 feet thick.)</p> <p>(Sandstone member - yellowish-brown argillaceous and quartzose sandstone; entire formation is approximately 1,000 feet thick.)</p>	Oco	<p>Joint-, fault, and bedding-plane openings provide a secondary porosity of low magnitude; low permeability.</p> <p>Joint- and bedding-plane openings provide a secondary porosity of moderate magnitude; low permeability.</p>	<p>Yields of 10 to 50 gal/min are obtained from most wells; most favorable location for obtaining high yielding well is upland stream valley.</p> <p>Yields of 10 to 15 gal/min are obtained from most wells.</p>	<p>Moderately easy; slight rebound may be a special problem; fast drilling rate; thin sandstone interbeds slow the drilling rate.</p> <p>Moderately easy; moderate to slow drilling rate.</p>	<p>Good; should be excavated to sound material.</p> <p>Good; should be excavated to sound material.</p>
<p>EPLER FORMATION (Very finely crystalline, medium-gray limestone interbedded with gray dolomite; coarsely crystalline limestone lenses are present; approximately 1,000 feet thick.)</p>	Oe	Joint- and solution-channel openings provide a secondary porosity of low to medium magnitude; low permeability.	A fair source for public supply and industrial use (51% of wells studied have yields greater than 25 gal/min).	Difficult; bedrock pinnacles are a special problem; fast drilling rate.	Good; should be excavated to sound bedrock and thoroughly investigated for cavernous areas.
<p>HAMMER CREEK FORMATION (Reddish-brown, coarse-grained sandstone having interbeds of red shale and quartz-pebble conglomerate; measured thickness at type section is 9,360 feet.)</p>	Trh	Low primary porosity; moderate secondary porosity from joint- and bedding-plane openings; moderate to low permeability.	Median yield is 66 gal/min; hardness and total dissolved solids are frequently high.	Difficult; slow drilling rate due to quartz-pebble conglomerate and in areas where rock is adjacent to diabase.	Good; should be excavated to sound material.
<p>HAMMER CREEK FORMATION CONGLOMERATE (Very coarse quartz conglomerate; abundant pebbles and cobbles of gray quartzite; minor interbeds of coarse red sandstone; measured thickness is 2,580 feet.)</p>	Trhc	Low primary porosity; low secondary porosity from joint- and bedding-plane openings; low permeability.	Conglomerate beds are too discontinuous and interbedded with coarse red sandstone to be evaluated as a separate aquifer.	Difficult; slow drilling rate due to quartz-pebble conglomerate.	Good; should be excavated to sound material.

GEOLOGIC FORMATION CHARACTERISTICS					
Formation Name (Composition)	Symbol	Porosity & Permeability	Groundwater	Ease of Excavation	Foundation Stability
HERSHEY FORMATION (Dark-gray to black, argillaceous limestone, weathers medium gray to light brown; finely crystalline; basal conglomerate contains angular boulders of dolomite; maximum thickness may reach 1,000 feet.)	Oha	Joint- and solution openings provide a secondary porosity of low magnitude; low permeability.	Median yield is 25 gal/min; low median yield shows that solution openings are not common.	Moderately easy; difficult at depth where rock is unweathered; fast drilling rate.	Good; should be excavated to sound material; should be investigated thoroughly for solution openings.
MYERSTOWN FORMATION (Medium to dark gray, medium-crystalline limestone; dark-gray to black carbonaceous limestone at base; coarse calcareous beds are common; average thickness is about 220 feet.)	Ohm	Joint- and solution openings provide a secondary porosity of low magnitude; low to moderate permeability.	Median yield is 25 gal/min; wells have encountered solution openings for very large yields; water can be relatively hard.	Moderately easy; difficult at depth where rock is unweathered moderate drilling rate.	Good; should be investigated thoroughly for solution openings.
NEW OXFORD FORMATION, SHALE AND SANDSTONE (Light-colored sandstone, arkosic sandstone and conglomeratic sandstone; includes red to purplish-red sandstone, shale, and mudstone; total thickness is approximately 4,000 feet.)	Trn	Primary porosity occurs in weathered portion; joint- and bedding-plane openings provide a secondary porosity in unweathered rock; high to moderate total effective porosity; moderate permeability.	Median yield is 66 gal/min; hardness and total dissolved solids are frequently high.	Moderately easy; relatively fast drilling rate may be expected.	Good; should be excavated to sound material; under-drainage may possibly be required.
NEW OXFORD FORMATION CONGLOMERATE (Coarse conglomerate, consisting chiefly of quartz and quartzite pebbles, cobbles, and boulders in a poorly-sorted, red-brown sand matrix; conglomerates are most numerous near the base of the formation; the lower half of the formation is approximately 3,000 feet thick.)	Trnc	Low to moderate primary porosity, especially in weathered zone; joint- and bedding-plane openings provide a secondary porosity; low permeability.	Average yield is about 14 gal/min.	Difficult; relatively slow drilling rate may be expected.	Good; should be excavated to sound material.
ONTELAUNEE FORMATION (Light to dark gray, very fine to medium-crystalline dolomite; interbedded and nodular dark-gray chert at base; average thickness is about 750 feet.)	Oo	Joint- and solution channel openings provide a secondary porosity of moderate to high magnitude; generally highly permeable.	Wells in excess of 200 to 500 gal/min are common; industrial and public supplies of groundwater are available; water is relatively hard.	Difficult; bedrock pinnacles are a special problem; fast drilling rate; chert beds and lenses slow the drilling rate.	Good; should be investigated thoroughly for solution cavities.

GROUNDWATER

Another important environmental factor to consider in the future development of Elizabeth Township is the direct relationship between land use characteristics and groundwater. An understanding of local groundwater conditions is important in properly allocating future land uses in order to 1) protect important groundwater recharge areas, 2) assure adequate quality and quantity for well water for rural areas, and 3) plan for future sewage facilities.

The foregoing Geologic Formation Characteristics table describes the median groundwater yields for each geologic formation. These descriptions are based upon general observations and by no means dictate the actual groundwater yields within any given locale in the Township. A more detailed discussion concerning groundwater follows. The geologic conditions underlying the Township affect both groundwater supply and groundwater quality.

GROUNDWATER YIELDS

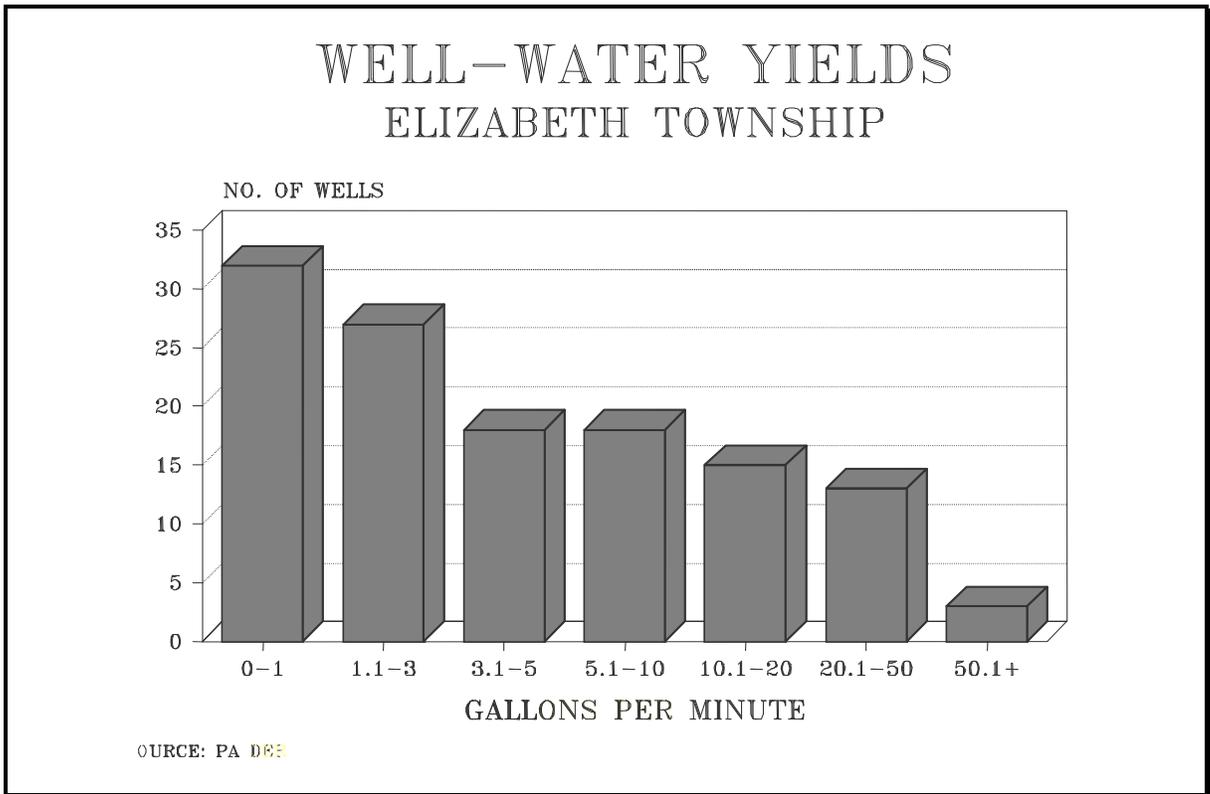
Two areas within Elizabeth Township provide recharge to area groundwater aquifers, according to the 1992 draft *Elizabeth Township Act 537 Sewage Facilities Plan*. The State Game Land Forests in the northern portion of the Township provide constant recharge to the entire Township. Also, Brubaker Valley, consisting mainly of farms, provides recharge to the underlying aquifers in the southeastern part of the Township.

Based on the study entitled *Summary Groundwater Resources of Lancaster County, Pennsylvania (1977)*, a table has been constructed describing the groundwater yields of the Township's respective geologic formations, based on reported yields of tested wells:

Map Symbol	Formation Name	Yield Range (gpm)	Median Yield (gpm)	Water Quality
Oan	Annville	1 to 600	30	very hard
Oco	Cocalico	1 to 100	20	moderately hard
Oe	Epler	1 to 600	30	very hard
Trh	Hammer Creek	5 to 94	16	generally soft
Trhc	Hammer Creek Conglomerate	5 to 94	16	generally soft
Oha	Hershey	1 to 600	30	very hard
Ohm	Myerstown	1 to 600	30	very hard
Trn	New Oxford	1 to 450	12	generally soft to moderately hard
Trnc	New Oxford Conglomerate	1 to 450	12	generally soft to moderately hard
Oo	Ontelaunee	1 to 600	30	very hard

Additionally, more recent and more local information was obtained from the Pennsylvania Department of Environmental Protection's Bureau of Topographic and Geologic Survey. The *Summary Groundwater Resources of Lancaster County, Pennsylvania (1977)* reports on the various yields from selected wells located in Elizabeth Township. The location of tested wells with regard to geologic formation was not reported.

Of the 128 wells inventoried in Elizabeth Township, reported yields range from .5 to 60 gallons per minute. The average yield is 9.6 gal/min, while the median yield is 4.5 gal/min. The following graph illustrates the distribution of the wells regarding their yields.



According to the United States Geological Survey, a typical household with three family members would require an average of 0.2 - 0.4 gallons per minute. Peak rates of use would range between 3 and 5 gallons-per-minute for the same household. The *Lancaster County Sewer and Water Resources Study (1987)* defines low well yields as those producing less than 5 gallons-per-minute. Actual well yields needed to supply demand depend on the amount of storage capacity in the household system.

60% of all wells tested showed yields of 5 gal/min or less, indicating generally low groundwater yields in a majority of the developed portion of the Township. This raises a concern regarding the potential availability of groundwater for future uses, and should be an important consideration in determining areas appropriate for future development. Low groundwater yields should also be the basis for encouraging proper storage capacity to overcome peak water shortages.

With regard to the capability of providing adequate groundwater for public supplies, it appears that the Hammer Creek Formation in the north and the Ontelaunee Formation to the southeast offer the best potential for significant, sustained, high-quality yields. Detailed groundwater studies and analyses would be necessary prior to any eventual operation of public groundwater wells.

SPRINGS

The Natural Features Map identifies 11 springs within Elizabeth Township, most located on either side of the ridge underlying PA 322. The majority of these springs constitute the headwaters for a number of local streams.

GROUNDWATER QUALITY

Groundwater quality is an important factor in determining the suitability of local water supplies as well as the need for public water in some areas. On-lot sewage disposal fields rely upon subsurface soil and rock particles to filter impurities from the effluent entering the groundwater. In the limestone formations, the presence of solution channels can intercept effluent containing nitrates before the soil has had the chance to purify it. The polluted groundwater can then travel through the solution channels to degrade the water in the aquifer. This water is then used by local residents in wells and springs. In addition, malfunctioning on-lot disposal systems can contribute to high nitrate levels in the groundwater. The historic record of reported on-lot disposal system repairs between 1976 and 1991 is 73 or 5.0%, with most of these located in the more developed parts of the Township.

In the same way, non-point source pollutants such as agricultural pesticides, fertilizer, manure, and urban runoff can make their way into aquifers, polluting the groundwater. There are no known point sources of groundwater pollution within the Township other than individual on-lot sewage disposal systems, two community on-lot systems, and three private non-industrial dischargers into local streams, according to the 1992 draft *Elizabeth Township Act 537 Sewage Facilities Plan*.

A preliminary hydrogeological analysis of groundwater involving the sampling of 25% of Township wells provides valuable information on area groundwater quality. Testing reveals that 20.6% of tested wells have nitrogen nitrate levels above 10 milligrams per liter, which is the upper limit of acceptable water quality. In addition, 10.3% of wells have fecal coliform or total coliform levels above zero. Elevated levels of nitrogen nitrates are found in the Elm area and in the southeastern agricultural portion of the Township.

Future development in areas underlain by limestone geology that is reliant upon on-lot sewage disposal and on-lot water should be limited because of the ease of transmission of groundwater contaminants in these areas. Any drilling of domestic or public water supplies within these areas of the Township should be thoroughly and routinely tested for contamination. Potential major point sources of groundwater contamination in any location should be regulated by the Township.

C. SURFACE WATERS

DRAINAGE BASINS

The way in which water moves through our environment has definite land use implications. First, streams and their floodplains present hazards to development. Second, streams and streambank vegetation offer high-quality habitat, conservation, scenic, and recreational values. Third, the particular characteristics of watersheds, or drainage basins, can be used to help site public wells as well as delineate wellhead protection areas. Finally, the watershed is a basic geographic unit used to plan and design sanitary and storm sewer systems. Systems that can make use of gravity-fed lines can reduce the initial capital cost and long-range operation and maintenance costs of these utilities.

The flow of surface water through Elizabeth Township occurs almost completely within one major drainage basin, the Cocalico Creek Basin. Very small areas along the western and southern flanks of the Township lie within the Chickies Creek and Conestoga River drainage basins. The Township's drainage basins are shown on the Natural Features Map.

Cocalico Creek Drainage Basin

The Cocalico Creek Drainage Basin covers a multi-municipality area in the northern part of the County, draining the southern slope of South Mountain and most of the Furnace Hills. The Cocalico Creek is a tributary of the Conestoga River, which in turn flows into the Susquehanna River. While the Cocalico Creek itself does not flow through Elizabeth Township, several of its tributaries do. These tributaries have their origins in the Furnace Hills.

There are two minor drainage basins within Elizabeth Township which contribute to the flow of the Cocalico Creek. **Hammer Creek** and its tributaries drain the western and southern two-thirds of the Township. **Middle Creek** and its tributaries drain the northeastern one-third of the Township.

Subminor drainage basins exist for **Kettle Run** and **Walnut Run**, as well as several unnamed tributaries, which flow into Hammer Creek, and **Segloch Run** and **Furnace Run**, as well as an unnamed tributary, which flow into Middle Creek.

Chickies Creek Drainage Basin

The Chickies Creek Drainage Basin drains the far western reaches of the Furnace Hills to the west of Elizabeth Township. However, a small area of approximately 125 acres along the western boundary of the Township near Elm also lies within this drainage basin. Surface water from this area flows west and south into three unnamed tributaries of Chickies Creek.

Conestoga River Drainage Basin

The Conestoga River Drainage Basin drains a small, approximately 300-acre area along the southern boundary of the Township near Halfville. Surface water from this area flows south into an unnamed tributary of the Santo Domingo Creek, from whence it flows into the Lititz Run and finally the Conestoga River.

WATER BODIES

Speedwell Forge is a manmade lake created in the mid-1960s by the Pennsylvania Fish Commission through the impoundment of Hammer Creek. It covers 106 acres and is used for public recreation. A reduced flow of water is released back into Hammer Creek below the impoundment.

Spring Lake is located in the northern portion of the Township and is used for fishing, picnics, and general recreation.

HIGH QUALITY WATER

The Federal Water Pollution Control Act of 1972 was passed to “restore and maintain the chemical, physical and biological integrity of the Nation's waters.”³ To implement this Federal mandate, the Pennsylvania Department of Environmental Protection (DEP) established water quality standards (Chapter 93 of DEP's Rules and Regulations). As part of these standards, the State has designated some 12,500 miles of rivers and streams as “special protection waters.” These special protection waters are divided into the following two categories:

“High Quality Waters - A stream or watershed which has excellent quality waters and environmental or other features that require special water quality protection.”

“Exceptional Value Waters - A stream or watershed which constitutes an outstanding national; state, regional, or local resource, such as waters of national, state or county parks or forests; waters which are used or projected for use as a source of water supply; waters of wildlife refuges of state game lands; waters which have been characterized by the Pennsylvania Fish Commission as wilderness trout streams and other waters of substantial recreational or ecological significance.”⁴

³Pennsylvania Code, Title 25, Water Quality Standards. Current through 31 Pa.B. 396 (January 13, 2001)

⁴Ibid., p. 2.

These designations impose considerable protection from land uses and other projects or activities that could result in surface water degradation.

“High Quality Waters are to be protected as they exist. Water quality can only be lowered if a discharge is a result of necessary social and economic development and all existing uses of the stream are protected.”⁵

“Exceptional Value Waters are to be protected at their existing quality because they have outstanding ecological and/or recreational values. The social and economic justification procedures do not apply. Water quality in Exceptional Value Waters simply cannot be degraded.”⁶

High quality and exceptional value waters are reflected on the Natural Features Map.

The Pennsylvania DEP has designated two streams and their associated drainage basins within the Township as High Quality Waters. These include **Furnace Run** and its unnamed tributaries, and **Hammer Creek** to Speedwell Forge Dam. **Segloch Run**, formerly a High Quality stream, has recently been upgraded to an Exceptional Value stream because of its excellent water quality and environmental significance.

DEP has further classified High Quality Waters as warm-water fisheries, cold-water fisheries, or trout stocking fisheries. High Quality cold-water fisheries are those waterways which possess concentrations of dissolved oxygen of not below 7.0 milligrams per liter, or concentrations of ammonia nitrogen not to exceed 0.5 milligrams per liter. Within Elizabeth Township, **Hammer Creek** to Speedwell Forge meets these standards and is designated a High Quality Cold-Water Fishery.

High Quality trout-stocking fisheries are those waterways which possess concentrations of dissolved oxygen of not below 5.0 milligrams per liter, or concentrations of ammonia nitrogen not to exceed 0.5 milligrams per liter. Within Elizabeth Township, **Furnace Run** meets these standards and is designated a High Quality Trout-Stocking Fishery.

Together, these High Quality streams and their associated drainage basins occupy a little over half of the land area within Elizabeth Township. The Pennsylvania DEP is responsible for administering and enforcing the Pennsylvania Clean Streams Law. The Department protects the water of High Quality streams by regulating the discharge of wastewater, and through other legislated programs. Most of these

⁵Pennsylvania Department of Environmental Resources, *Local Protection of High Quality Streams* (Harrisburg, PA: June, 1981), p. 3.

⁶*Ibid.*, p. 3.

programs address discharges from point sources of pollution. Nonpoint sources of pollution such as agricultural and urban runoff can also degrade water quality.

To help avoid degradation of the Township's High Quality waters and to effectively address non-point sources of pollution, questions of land use need to be addressed. Impacts from current and future land uses can result in the degradation of streams. Under Pennsylvania law, the regulation of land uses is left mostly to local municipalities. Therefore, the Township plays an important role in the protection of its High Quality streams.

In addition, Lancaster County can play an important role in the protection of these areas. The County's 1992 *Regional Open Space Plan* recommends that the County preserve Segloch Run and the Speedwell Forge Wetlands as independent Natural Heritage Preserves. It also recommends that an inter-municipal greenway be created from the Horseshoe Trail along Segloch Run to Furnace Run and Middle Creek (to Akron Borough), and that a regional greenway be created to run along the entire length of Hammer Creek from the Horseshoe Trail to the southeastern corner of the Township (to Lancaster City). The County has recently purchased 238 acres of land just north of Speedwell Forge and along Hammer Creek, for a County park, and is actively pursuing the further purchase of lands adjacent to it. These efforts together with municipal and private efforts could go a long way toward the protection of the Township's High Quality and Exceptional Quality Waters.

The Township should make every attempt to preserve the quality of its High Quality and Exceptional Value Streams by prohibiting any intensive development and limiting rural development within its drainage basins, and by routinely monitoring runoff levels from farms and roadways for the detection of harmful pollutants that could infiltrate these waterways. Continued cooperation with PA DEP is also essential for the long-term preservation of the water quality of these streams.

In addition, the Township should work together with the County and others toward the permanent preservation of high priority sites.

FLOODPLAIN PROTECTION

Flooding can result in the loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, impairment of the tax base, and other adverse impacts on the public health, safety, and general welfare. In the interest of public health, safety, and welfare, it is necessary to delineate the Township's floodplains so that appropriate measures and regulations can be applied to those areas.

Floodplains are typically defined as those areas that are subject to periodic inundation by floodwaters. The floodplain consists of the floodway and the floodway

fringe. The floodway is the stream channel plus an additional area that must be kept free of encroachment to avoid an increase in flood heights. The floodway fringe is the remaining portion of the floodplain within which encroachments must be limited.

Federal Emergency Management Agency (FEMA) Flood Hazard Boundary Maps (1980) were used to delineate identified floodplains on the Natural Features Map. The 100-year flood is used as the base flood for purposes of floodplain management measures by FEMA. As mapped for Elizabeth Township, it includes the undifferentiated floodway and floodway fringe. Middle Creek and Furnace Run were studied using detailed methods, while all other streams were studied using approximate methods. The 500-year floodplain, which would indicate additional areas of flood risk in the community, was not mapped by FEMA.

Elizabeth Township is a participant in the Federal Flood Insurance Program. The Township has an adopted Floodplain Zone which utilizes the 100-year floodplain boundary as identified by FEMA as well as alluvial soils as described in the *Soil Survey of Lancaster County*.

Elizabeth Township is fortunate in that flooding is not a widespread problem. This is attributable both to the physical features of the drainage basins and stream channels as well as to the fact that little development has occurred in the floodplains. In addition, good farming methods, such as contour plowing, are effective factors in alleviating flooding, as agricultural lands comprise a significant percentage of the Township. Road flooding along Furnace Run, Middle Creek, and Hammer Creek is caused primarily by inadequate drainage. At some locations, flood levels are increased due to the obstruction of streams by trees, trash, and other debris during storm events.

To provide protection against future flooding, proposed development should be directed away from the Township's identified floodplain areas.

STORM WATER MANAGEMENT

One of the most frequently occurring planning problems is the impact from storm water runoff. As an area develops, the patterns, volumes, and velocities of storm water runoff are likely to change. These changes are created by increasing amounts of impervious cover in the form of buildings, roads, parking lots, and driveways, which collect rather than absorb runoff, and the clearing of trees and vegetation, particularly on slopes, which greatly decreases the ability of soils to absorb rainfall. Increased storm water runoff can create severe impacts on downstream properties that are rarely anticipated by area residents. These can include ponding, leakage into basements, and damage to foundations due to wetness, and even flash floods.

Storm water runoff can be effectively managed on site. Effective storm water management means limiting storm water runoff to no greater than pre-development conditions. This management can involve complicated engineering studies and

analysis that may result in costly structural improvements, or simpler nonstructural solutions. Nonstructural solutions frequently involve the use of vegetative ground cover, trees, and swales and have the added advantage of helping to maintain surface and groundwater quality by promoting the infiltration of water into the soil where impurities can be filtered out.

It is difficult, however, if not impossible to manage the incremental adverse impacts on downstream properties of a lack of storm water management at upstream locations. For this reason, Elizabeth Township has adopted a Storm Water Management Ordinance that applies to local subdivision and development activities. The County's recently updated Subdivision and Land Development Ordinance details storm water management requirements in sections 607.01 through 607.05. In addition, Elizabeth Township has its own Storm Water Management Ordinance that applies to local development activities not involving County review.

The Township should continue to implement its storm water management provisions to require development to limit storm water runoff to no greater than pre-development conditions.

D. WETLANDS AND NATURAL HABITATS

Much recent attention has been focused upon the importance of wetlands. Wetlands include swamps, marshes, bogs, and similar areas. Wetlands provide food and habitat for an abundance of animal life; are breeding, spawning, feeding, cover, and nursery areas for fish; and are important nesting, migrating, and wintering areas for waterfowl. Wetlands also provide other important benefits. They act as natural water storage areas during floods and storms by retaining high waters and gradually releasing them. Wetlands are often groundwater recharge areas and sources of local drinking water. Finally, wetlands purify water by filtering, assimilating, and recycling pollutants.

The *National Wetlands Inventory* as well as the Lancaster County Natural Heritage Foundation *Natural Areas Study* were used to identify the Township's major wetlands, which are delineated on the Natural Features Map. For lands to qualify as wetlands they must possess three components, which include hydric soils, the presence of wetland vegetation, and hydrology. The wetland system in Elizabeth Township is strongly related to the streams and tributaries flowing within the Township, and particularly Hammer Creek and Segloch Run.

Many of these Township's identified wetlands are effectively protected from development and encroachment through the provisions of the Township's Floodplain Zone. In addition, some wetlands receive protection through their location within State Game Lands or State Fish Commission property at Speedwell

Forge. There are, however, some wetlands located outside these areas which deserve protection from encroachment. These include a portion of the Speedwell Forge wetlands, a high-priority area planned for protection under the *Lancaster County Regional Open Space Plan (1992)* (see also discussion under Important Wildlife Habitat). A measure of protection for wetlands in these areas is afforded by the *Lancaster County Subdivision and Land Development Ordinance (1991)*, which states that:

“No subdivision or land development shall involve uses, activities or improvements which would entail encroachment into, the regrading of, or the placement of fill in wetlands in violation of state or Federal wetland protection regulations.”⁷

Proposed encroachments which are not part of a subdivision or land development plan, such as activities on a farm or on an already existing lot, must also obtain the proper state or Federal permits prior to any encroachment.

Because of the important environmental benefits provided by wetlands, it is recommended that additional wetland protection measures be considered to protect and direct development away from these areas.

IMPORTANT PLANT AND WILDLIFE HABITAT

As an area is converted from its natural to a manmade state, the delicate balance of the local ecosystem is often disrupted. This imbalance impairs the environment's ability to support varied forms of plant and animal species. In turn, local species become threatened or endangered.

State and Federal agencies have become increasingly concerned over the protection of local natural habitats as a means of protecting wildlife diversity. The protection of these habitats can also serve other equally important functions like the control of erosion, the recharge of groundwater, the attenuation of pollutants, the abatement of noise, dust, and glare, and the provision of valuable passive recreation opportunities. For these reasons, all levels of government and other conservation-oriented groups have become involved in the protection of these habitats. Like these groups, Elizabeth Township should also be committed to ensuring the integrity of these important areas.

The State Game Lands provide important wildlife habitat for an abundance of animal species, including deer and waterfowl. These lands are managed to protect these species and their habitats.

Information for this section was obtained from the Lancaster County Natural Heritage Project *Natural Areas Inventory* prepared for the Lancaster County

⁷Lancaster County Board of Commissioners, *Lancaster County Subdivision and Land Development Ordinance*, Section 607.07., Wetlands, (Lancaster, PA: 1991), p. 103

Planning Commission by the Pennsylvania Science Office of the Nature Conservancy in June of 1990, and updated in 1992. Part of this information was derived from the Pennsylvania Natural Diversity Inventory (PNDI). PNDI continually updates and refines data regarding the status of rare, endangered, or otherwise significant natural features. This inventory uses some 800 sources of information to map, describe, and disseminate facts about important natural features. The Natural Areas Inventory utilized PNDI information as well as other pertinent information to identify and map exemplary natural areas, locations of species of special concern, and other important natural areas within the County.

It is the policy of PNDI not to release detailed site-specific information about significant natural features to the public. This protects the features from persons who might attempt to locate and collect or destroy such features. Instead, PNDI will provide generalized locations of known or historic natural features occurrences.

PNDI records show no locations of exemplary natural areas or species of special concern within Elizabeth Township. However, the Natural Areas Inventory identifies other important natural areas within the Township. Furnace Hills, including **Segloch Run** and **Dogtown Seep**, is noted to be a natural area of statewide importance for the preservation of biological diversity in the Lancaster County. Furnace Hills comprises the largest tract of forested land in the County, and is the headwaters for many County creeks.

Segloch Run is a scenic ravine with a fairly high diversity of plant life in a mesic woodland. The protection of this site would serve several purposes: 1) help protect the "Exceptional Value" water quality in the run flowing through the ravine; 2) protect a segment of the Horseshoe Trail; 3) add significantly to the open space already provided in this area of the Furnace Hills by the State Game Lands; and 4) help to maintain the rural nature of the area in the vicinity of J. Edward Mack Boy Scout Camp. Dogtown Seep is a large seepage wetland unmapped by the National Wetlands Inventory. Although the site is disturbed and mostly in Lebanon County, this wetland is probably crucial to water quality in Segloch Run. The wetland appears valuable for migratory waterfowl and other wildlife.

The Natural Areas Inventory also identifies one natural area of local significance, the **Speedwell Forge wetlands**. Speedwell Forge is a Pennsylvania Fish Commission lake that has developed a deltaic marsh at its northern end where Hammer Creek enters. The marsh and the floodplain wetlands of Hammer Creek create a wetland complex that is used by waterfowl, wading birds, and other wildlife. Protection should include encouraging a wooded buffer between the wetland and the adjacent road and keeping housing to a minimum in the watershed.

As noted in the foregoing section on High Quality Waters, Lancaster County's 1992 *Regional Open Space Plan* recommends the preservation of Segloch Run and the Speedwell Forge wetlands as independent County Natural Heritage Preserves. It also recommends the establishment of greenways that could help preserve the high water quality of these areas as well as adjacent stream corridor habitats. The recent

County acquisition of land immediately north of the Speedwell Forge Wetlands for a park should help preserve this site as well.

Elizabeth Township's identified important natural areas consist primarily of water areas that have significant impacts on area water quality, wildlife, recreational, and scenic values. It is recommended that development be directed away from these areas and that greenways or streamside and wetland buffers be utilized to protect these important water areas.

WOODLANDS

Extensive stands of woodlands cover the northern portion of Elizabeth Township in the Furnace Hills area. Most of this land lies in State Game Lands No. 156 and the J. Edward Mack Boy Scout Reservation. The area just northwest of Speedwell Forge also has extensive tree cover. Areas of significant woodland cover have been plotted on the Existing Land Use Map.

Woodlands serve multiple uses. First, they help reduce the level of air pollution by absorbing airborne pollutants and, in turn, produce beneficial carbon dioxide. Second, woodlands slow erosion by stabilizing steep slopes through extensive root systems. Third, woodlands aid in purifying groundwater by filtering runoff and reducing sediment load caused by erosion. Fourth, woodlands can provide important wildlife habitat. Fifth, woodland areas offer superb passive recreation opportunities, such as hiking, horseback riding, photography, hunting, and camping. And finally, the woodland resource may be harvested.

According to the State Forestry Office, there is a heavy demand for timber sales in the region, with cutting likely to be occurring on any given day. Most sales occur on wood lots between 2 and 20 acres. Both selective and clear cutting methods are used, depending upon the species. Most of the harvested timber is mixed oaks, tulip poplar, and black birch, with some red maple. There is an occasional problem with erosion in areas where erosion and sedimentation control plans are not filed or followed. Such plans are required to be submitted to the Soil Conservation Service (SCS) under Chapter 102, Department of Environmental Protection's Clean Stream Requirements.

Recent amendments to the Pennsylvania Municipalities Planning Code specifically enable local governments to protect significant woodland areas by preventing extensive development and/or using development review procedures intended to conserve these important areas for multiple uses. It is recommended that the Township enact such provisions to protect its woodland resources.

E. OUTSTANDING SCENIC GEOLOGIC FEATURES

As described in a previous section of this chapter, the geology of an area is largely responsible for its natural landscape. Unique geologic features and formations can produce scenic vistas and places of special interest. Similarly, underground caves and unique mineral deposits also provide recreational, scientific, and educational opportunities that deserve special consideration and protection. Based on research regarding these special types of natural features, several were determined to be located in Elizabeth Township. The following discussion identifies these sites and explains their importance. The locations of these sites are illustrated on the Natural Features Map.

According to the publication *Outstanding Scenic Geologic Features of Pennsylvania (1979)*, an outstanding scenic geologic feature has been identified for Elizabeth Township. Eagle Rock is an outcrop of quartz conglomerate of the Hammer Creek Formation that has weathered unevenly and resembles the shape of an eagle. The site is located just northwest of Brickerville along the Horseshoe Trail.

No caves or important mineral sites were located within the Township.

F. HISTORIC SITES

Elizabeth Township, like much of southeastern Pennsylvania, is fortunate to possess a rich cultural heritage. Today, this heritage is evident in the older buildings, structures, and related settlements within the Township. The conservation and rehabilitation as well as restoration or adaptive reuse of these historic structures is a means of providing a glimpse into the Township's past. Additionally, historic preservation can provide educational opportunities regarding historic lifestyles and architectural styles. Well-maintained historic structures can create a sense of unique identity that stimulates civic pride and economic vitality.

The early history of Elizabeth Township after settlers arrived was strongly associated with iron production and, to a lesser extent, glass manufacture. The supplying of charcoal to feed the furnaces became an important related industry. Speedwell Forge is named for one of the early forges and Hammer Creek for the many trip hammers used in the forges along its banks.

To identify the locations and significance of the historic resources within Elizabeth Township, the Historic Preservation Trust of Lancaster County was consulted. This nonprofit historic preservation agency has surveyed much of Lancaster County in an effort to locate all possible historically and architecturally significant resources. This information was then reviewed and those sites meeting specific criteria for evaluation were then listed on the Lancaster County Historic Sites Register. Those historic sites on the Register that lie within Elizabeth Township are listed within this section and are also identified on the Cultural Resources Map.

To qualify for listing on the Lancaster County Historic Sites Register, buildings, structures, sites, districts, or objects should be demonstrated to be associated with significant historical events or persons, or have architectural significance. Properties should retain their physical integrity. Four levels of significance corresponding to the overall importance of the site are used to rank qualifying sites. These significance rankings are in some cases tentative and may be subject to further evaluation at a later date. The following is a brief description of each level of significance:

Level 1: Exceptional - Examples of the highest quality architectural design and/or historical importance. Of countywide, regional, state, or national significance. To be preserved and protected at all costs.

Level 2: Significant - Examples of high style regional architecture and/or structures of particular historical importance to Lancaster County. Of principally local, countywide, or regional significance. To be preserved and protected.

Level 3: Contributory - Sites of good architectural quality, vernacular structures, or those of less sophistication than "Significant." Preservation of these structures is encouraged.

Level 4: Altered - Sites whose historical or architectural value has been comprised by later, non-historic alterations. Restoration to original or historic appearance is encouraged.

The following table lists all of the sites identified by the Historic Preservation Trust of Lancaster County within Elizabeth Township. Each site is listed by its survey number, and includes a brief description of the site, the date of construction, and level of significance.

ELIZABETH TOWNSHIP HISTORIC SITES		
Survey #	Brief Description	Significance
1	Farm. Not named. Late 18th century.	1
2	Hopewell Forge Mansion. c. 1745.	1
3	Suss House. 1747.	1
4	School. Not named. c. 1870.	2
5	Coleman Memorial Chapel. 1872–1873.	1
6	Stiegel-Coleman House. c. 1743.	1
7	Store. Not named. 1813.	1
8	Bricker Tavern. Mid 18th century.	2
9	Bakeoven. Not named. [GONE].	2
10	Checkerboard House. Mid 18th century.	1

ELIZABETH TOWNSHIP HISTORIC SITES (Continued)		
11	Emanuel Evangelical Lutheran Church. 1806–1807.	2
12	Molly Plasterer's Tavern. Mid 19th century.	2
13	Speedwell Forge Mansion. c. 1765.	1
14	Farm. Not named. c. 1800.	2
15	Old Zion Reformed Church. c. 1813.	1
16	Farm. Not named. c. 1800.	2
17	Farm. Not named. Mid 18th century.	2
18	Farm. Not named. c. 1795.	2
19	Farm. Not named. c. 1800.	2
20	Christian Eby House. 1754.	1
21	House. Not named. Late 19th century.	1
22	Speedwell Stock Farm Mare Barn. c. 1875.	1
23	Martin Brubaker Farmstead. Late 18th century.	2
24	Farm. Not named. c. 1870.	2
25	Farm. Not named. c. 1870.	3
26	House. Not named. c. 1850.	4
27	Farm. Not named. c. 1800.	3
28	Farm. Not named. c. 1860.	3
29	Farm. Not named. c. 1860.	3
30	Farm. Not named. c. 1860.	4
31	Farm. Not named. c. 1800.	3
32	Martin and Eliza Grube Mill. 1855.	2
33	Eby Cemetery. 18th and 19th centuries.	2
34	Farm. Not named. c. 1870.	4
35	Farm. Not named. c. 1870.	3
36	Farm. Not named. c. 1800.	3
37	Farm. Not named. c. 1870.	3
38	Farm. Not named. c. 1870.	3
39	House. Not named. c. 1890.	4
40	House. Not named. c. 1890.	4
41	Brubaker Farm. 1770, 1816.	2
42	Cemetery. Not named. 19th century.	2
43	House. Not named. c. 1800.	4
44	House. Not named. c. 1870.	4
45	Farm. Not named. c. 1890.	4
46	Farm. Not named. c. 1880.	4
47	Farm. Not named. c. 1850.	2
48	Farm. Not named. c. 1800.	3

ELIZABETH TOWNSHIP HISTORIC SITES (Continued)		
49	Steinmetz Cemetery. 19th century.	2
50	Farm. Not named. c. 1850.	4
51	House. Not named. c. 1860.	4
52	Farm. Not named. c. 1890.	4
53	Webster School. c. 1890.	4
54.1	Zartman Mill.	-
54.2	Brubaker/Stauffer Mills. c. 1800.	3
55	House. Not named. c. 1890.	4
56	House. Not named. c. 1860.	3
57	Farm. Not named. c. 1890.	4
58	Farm. Not named. c. 1850.	4
59	Farm. Not named. c. 1850.	4
60	St. John's Church. c. 1900.	3
61	Farm. Not named. c. 1800.	4
62	Farm. Not named. c. 1880.	3
63	Farm. Not named. c. 1900.	3
64	House. Not named. c. 1860.	4
65	Church School. c. 1900.	4
66	House. Not named. c. 1890.	4
67	Farm. Not named. c. 1860.	4
68	Farm. Not named. c. 1860.	4
69	House. Not named. c. 1900.	3
70	House. Not named. c. 1900.	3
71	Farm. Not named. c. 1860.	3
72	House. Not named. c. 1890.	3
73	Farm. Not named. c. 1880.	3
74	House. Not named. c. 1820.	3
75	Farm. Not named. c. 1860.	4
76	Bridge. Not named. 1917.	3
77	Farm. Not named. c. 1870.	4
78	Farm. Not named. c. 1870.	4
79	House. Not named. c. 1900.	3
80	Farm. Not named. 1840.	3
81	House. Not named. c. 1860.	4
82	House. Not named. c. 1900.	3
83	Hammer Creek Cemetery. 19th century.	2
84	Farm. Not named. c. 1860.	3
85.1	Farm. Not named. c. 1870.	3

ELIZABETH TOWNSHIP HISTORIC SITES (Continued)		
85.2	Farm. Not named. c. 1830.	3
86	Henry S. and Eliza Brubaker Farm. 1858.	3
87	Farm. Not named. c. 1870.	4
88	House. Not named. c. 1900.	4
89	Farm. Not named. c. 1900.	4
90	House. Not named. c. 1790.	3
91	House. Not named. 1911.	3
92	Farm. Not named. c. 1900.	3
93	House. Not named. c. 1870.	4
94	House. Not named. c. 1900.	4
95	House. Not named. c. 1900.	4
96	Farm. Not named. c. 1890.	3
97	Farm. Not named. c. 1860	3
98	Farm. Not named. c. 1860.	4
99	Farm. Not named. c. 1890.	3
100	Farm. Not named. c. 1880.	4
101	Farm. Not named. c. 1830.	2
102	Farm. Not named. c. 1900.	3
103	Farm. Not named. c. 1900.	4
104	Farm. Not named. c. 1900.	4
105	Farm. Not named. c. 1900.	4
106	Cemetery. Not named. 19th century.	3
107	House. Not named. c. 1890.	3
108	Farm. Not named. c. 1900.	3
109	Farm. Not named. c. 1880.	3
110	House. Not named. c. 1860.	4
111	Farm. Not named. c. 1890.	4
112	Farm. Not named. c. 1850.	3
113	Farm. Not named. c. 1850.	4
114	Farm. Not named. c. 1850.	4
115	Farm. Not named. c. 1890.	4
116	House. Not named. c. 1800.	3
117	Barns. Not named. c. 1900.	3
118	Farm. Not named. c. 1870.	3
119	Farm. Not named. c. 1935.	3
120	House. Not named. c. 1900.	4
121	Farm. Not named. c. 1900.	4
122	House. Not named. c. 1900.	4

ELIZABETH TOWNSHIP HISTORIC SITES (Continued)		
123	Farm. Not named. c. 1850.	3
124	Farm. Not named. c. 1870.	3
125	House. Not named. c. 1870.	2
126	Farm. Not named. c. 1890.	3
127	Farm. Not named. c. 1890.	4
128	Farm. Not named. c. 1890.	3
129	Farm. Not named. c. 1860.	3
130	Farm. Not named. c. 1890.	3
131.1	Farm. Not named. c. 1860.	3
131.2	Farm. Not named. c. 1860.	3
132	House. Not named. c. 1860.	4
133	Farm. Not named. c. 1890.	3
134	House. Not named. c. 1860.	3
135	Weaver's Dry Goods. c. 1900.	4
136	House. Not named. c. 1890.	4
137	House. Not named. c. 1920.	4
138	Farm. Not named. c. 1860.	2
139	Farm. Not named. c. 1880.	4
140	Farm. Not named. c. 1890.	3
142	House. Not named. 1934.	3
143	Peter Grubb Upper Hopewell Iron Forge Site. 1742.	2
144	Church. Not named. c. 1940.	4
145.1	Speedwell Stock Farm, Barn. c. 1890.	2
145.2	Speedwell Stock Farm, Farmhouse. c. 1890.	4
146	Farm. Not named. c. 1800.	3
147.1	Farm. Not named. c. 1890.	4
147.2	Farm. Not named. c. 1890.	4
148	School. Not named. c. 1890.	3
149	House. Not named. c. 1900.	4
150	House. Not named. c. 1900.	4
151	House. Not named. c. 1900.	4
152	Farm. Not named. c. 1870.	3
153	House. Not named. c. 1900.	4
154	Farm. Not named. c. 1870.	4
154	Farm. Not named. c. 1870.	3
155	House. Not named. c. 1750.	3
156	House. Not named. c. 1890.	4
157	Moses Miller. Early 19th century.	3

Just one of the above sites, the Stiegel-Coleman House (#6), is listed on the National Register of Historic Places, a separate program maintained by the United States Department of the Interior. However, judging by the significance ratings, a number of additional sites are probably eligible for National Register listing. National Register listing provides important recognition, tax benefits, review standards for exterior alterations of structures, and exemption from certain building code requirements. Listing on Lancaster County's Register is intended to minimize the complexity, cost, and time involved in the National Register nomination process for those interested in National listing. The documentation required for listing on the Lancaster County Historic Sites Register is intended to be sufficient to obtain a preliminary opinion of eligibility for the National Register.

At the present time, Elizabeth Township does not have any protective measures for its historic resources. Recent amendments to the Pennsylvania Municipalities Planning Code have enabled local governments to plan and zone for the protection of historic resources. ***It is recommended that Elizabeth Township adopt local provisions for this purpose, including provisions to regulate the demolition, removal, or major exterior alteration of historic structures. Provisions should also require developers to design and construct future buildings that are congruous with adjacent historic resources.***

G. ARCHAEOLOGICAL RESOURCES

Like historic sites, archaeological resources provide a glimpse into an area's distant past. In the case of archaeology, this past refers to times before local historic records were kept, or prehistoric times. Archaeological resources can provide valuable artifacts and remains, or simply information that can assist in the identification, dating, and understanding of prehistoric cultures. Many times archaeological sites are surveyed merely to verify the presence of a prehistoric culture at that location. To identify important archaeological resources, information was obtained from the Pennsylvania Historical and Museum Commission (PHMC), Division of Archaeology and Protection.

The following is a general description provided by the staff at the State Division of Archaeology and Protection, of the methodology and findings concerning archaeological research within Elizabeth Township.

"The determination of areas of high probability for the presence of prehistoric archaeological sites in Elizabeth Township was based on a comparison of the topographic setting of the recorded archaeological sites to the general topography of the Township. Extensive research has shown that the location of prehistoric sites is closely related to a number of environmental variables. Relatively flat ground, converging streams, springheads, saddles, floodplains, swamps, and water in general (including streams that are extinct today) are the most important factors. U.S.G.S. 7.5" topographic maps were used in developing these maps."

"Elizabeth Township has not been systematically surveyed for the presence of archaeological sites. Expectations as to the presence of sites have been based on other portions of Lancaster County that exhibit similar topographic features. The Township is characterized by the steep slopes and gently rolling topography of the Triassic Lowlands and Conestoga Valley sections of the Piedmont Physiographic Province."

"Paleoindian sites are the rarest type known in Pennsylvania, numbering only around 230 for the entire state. Many of these sites consist of isolated surface finds of distinctive fluted projectile points that characterize paleoindian populations. Twelve of these sites have been found in Lancaster County. They represent the evidence of the first human inhabitants of the area and date before 8000 B.C."

"The Archaic period, lasting in this area from about 8000 B.C. to 1000 B.C., is a period of population increase and diversification in response to changing environmental conditions. The knowledge of the distribution and form of Archaic sites in this heavily populated area is very important to an understanding of changing adaptations."

"Sites from the following Woodland periods (1000 B.C. - A.D. 1550) are likely to occur within this Township. These sites are more often confined to settings that provide more open ground, such as floodplains and some hilltops. They represent the development of settled village life. Several phases of socio-political development can be documented at various sites in Lancaster County. These sites contain a wide variety of archaeological remains and are the most useful types of sites for examining prehistoric social organization. For this reason, they are usually determined eligible to the National Register of Historic Places."

"Historic archaeological sites area also likely in the Township, particularly in conjunction with the area's several forges and furnaces, and should be considered in development planning."

To date, there are three archaeological sites recorded within Elizabeth Township. The table below lists these sites by their survey number and provides a brief description of their significance:

Survey No.	Site Type and Significance
36 MI 309	Archaic, several Indian arrowheads
36 MI 376	Archaic-Shook Kill points, Poplar Island points, Brewerton points, Steubenville points
36 MI 247	Shenks Ferry-aged artifacts found

It is highly probable that other, yet unrecorded, prehistoric sites are present along the Township's many streams and tributaries.

The Cultural Resources Map, which follows the Soils, Geology, and Natural Features Maps on the next pages, depicts those areas of known or potential archaeological significance. ***These are areas for which local subdivision regulations should require the completion of a Phase One Survey for proposed major developments, to verify the possible presence of prehistoric artifacts and remains.***

Map 2
Soils Map
Elizabeth Township, Lancaster County

Legend

CLASS I, II, AND III SOILS

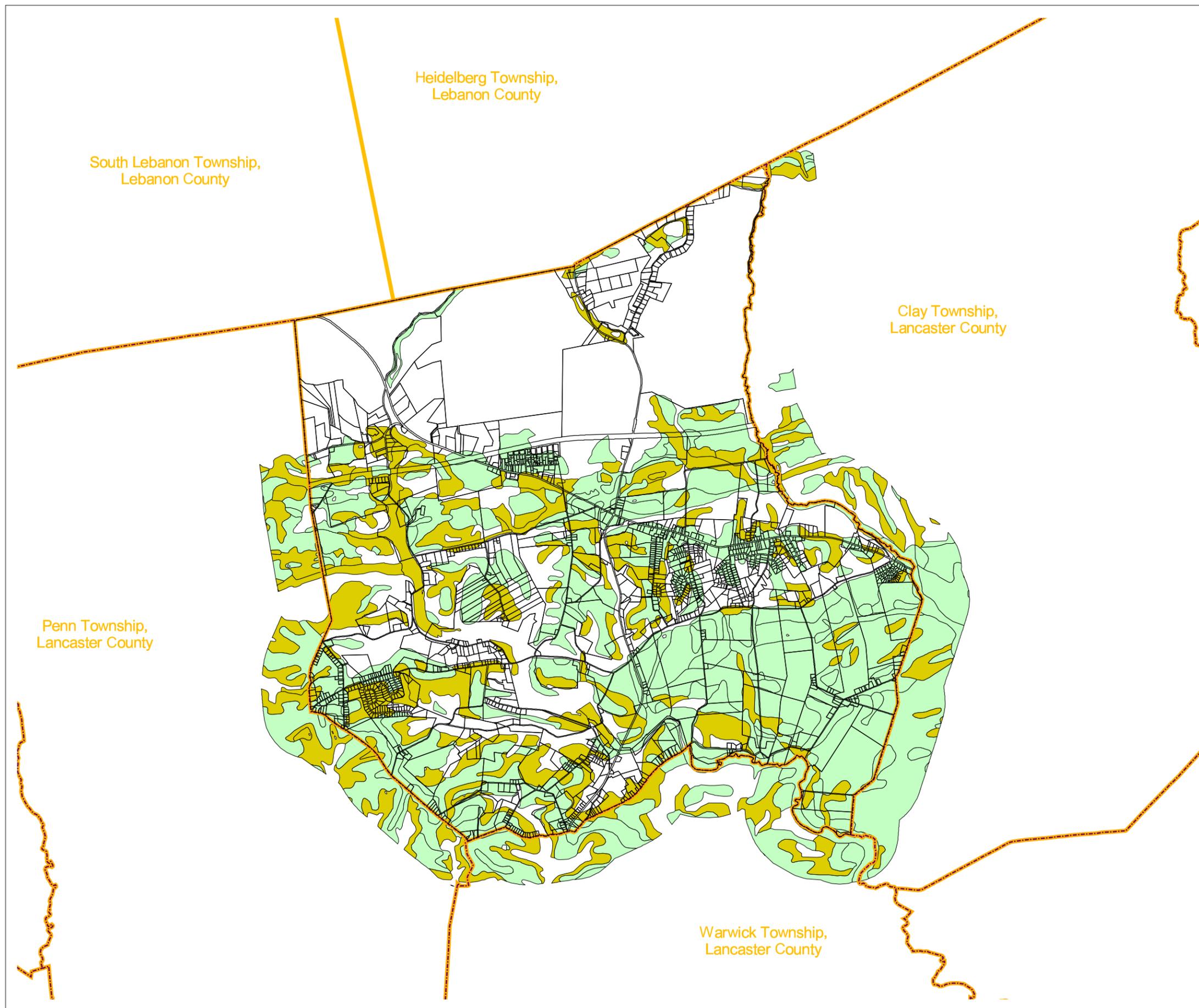
- Class I and II Soils
- Class III Soils



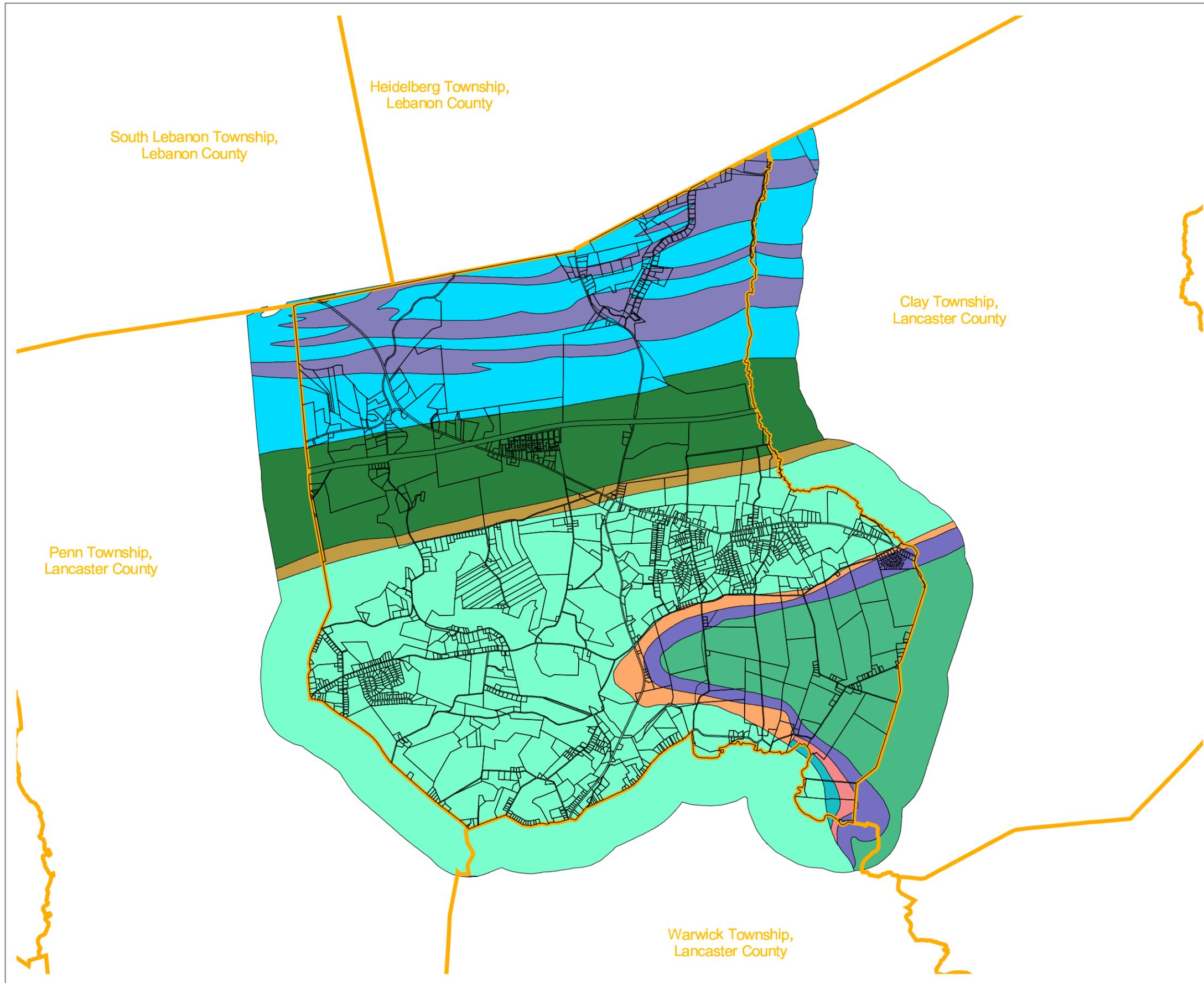
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Base Map: Lancaster County GIS Department Landbase
Projection: Pennsylvania State South, NAD 83, U.S. Feet
Adopted: September 8, 2003
Plot Date: September 26, 2003

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Map 3
 Geology Map
 Elizabeth Township, Lancaster County



Legend

- GEOLOGY
- ANNVILLE
 - COCALICO
 - EPLER
 - HAMMER CREEK
 - HAMMER CREEK CONGLOMERATE
 - HERSHEY
 - HERSHEY-MYERSTOWN
 - NEW OXFORD
 - NEW OXFORD CONGLOMERATE
 - ONTELAUNEE

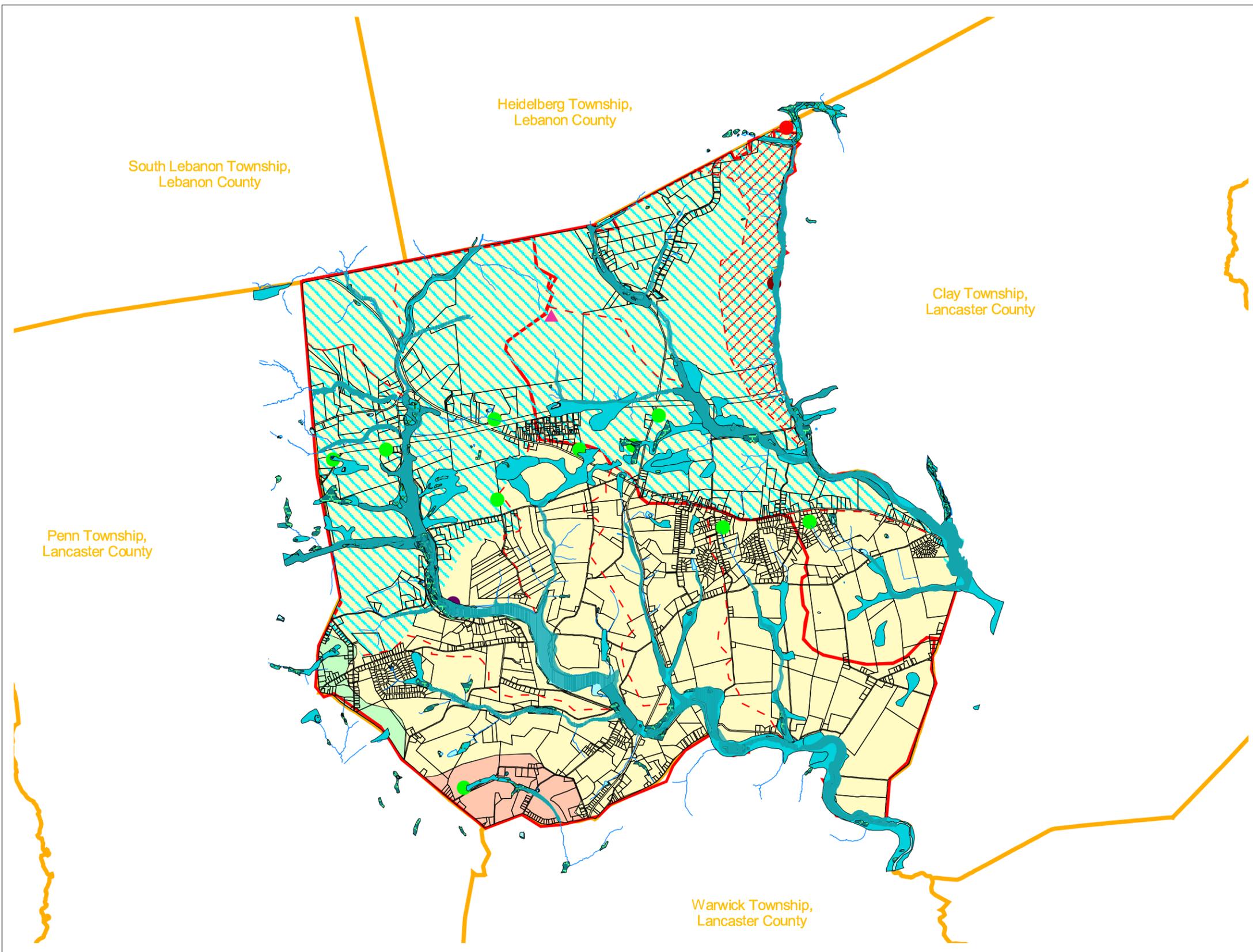


Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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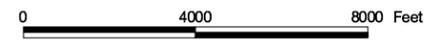


Map 4
 Natural Features Map
 Elizabeth Township, Lancaster County



Legend

- FEMA Zone**
 - 100 Year
 - 500 Year
- Wetlands**
 - Forested Wetland
 - Non-Forested Wetlands
- Hydric Soils**
 - Hydric Soils
 - Soils with Hydric Inclusions
 - Water
- Outstanding Scenic Geological Feature
- Natural Heritage Sites**
 - Dogtown Seep
 - Segloch Run
 - Speedwell Forge Wetlands
- Exceptional Value Waters
- High Quality Waters
- Major Drainage Divide**
 - Chickies Creek Basin
 - Cocalico Creek Basin
 - Conestoga River Basin
- Minor Drainage Divide**
 - Hammer Creek
 - Middle Creek
 - Sub-Minor Drainage Divide

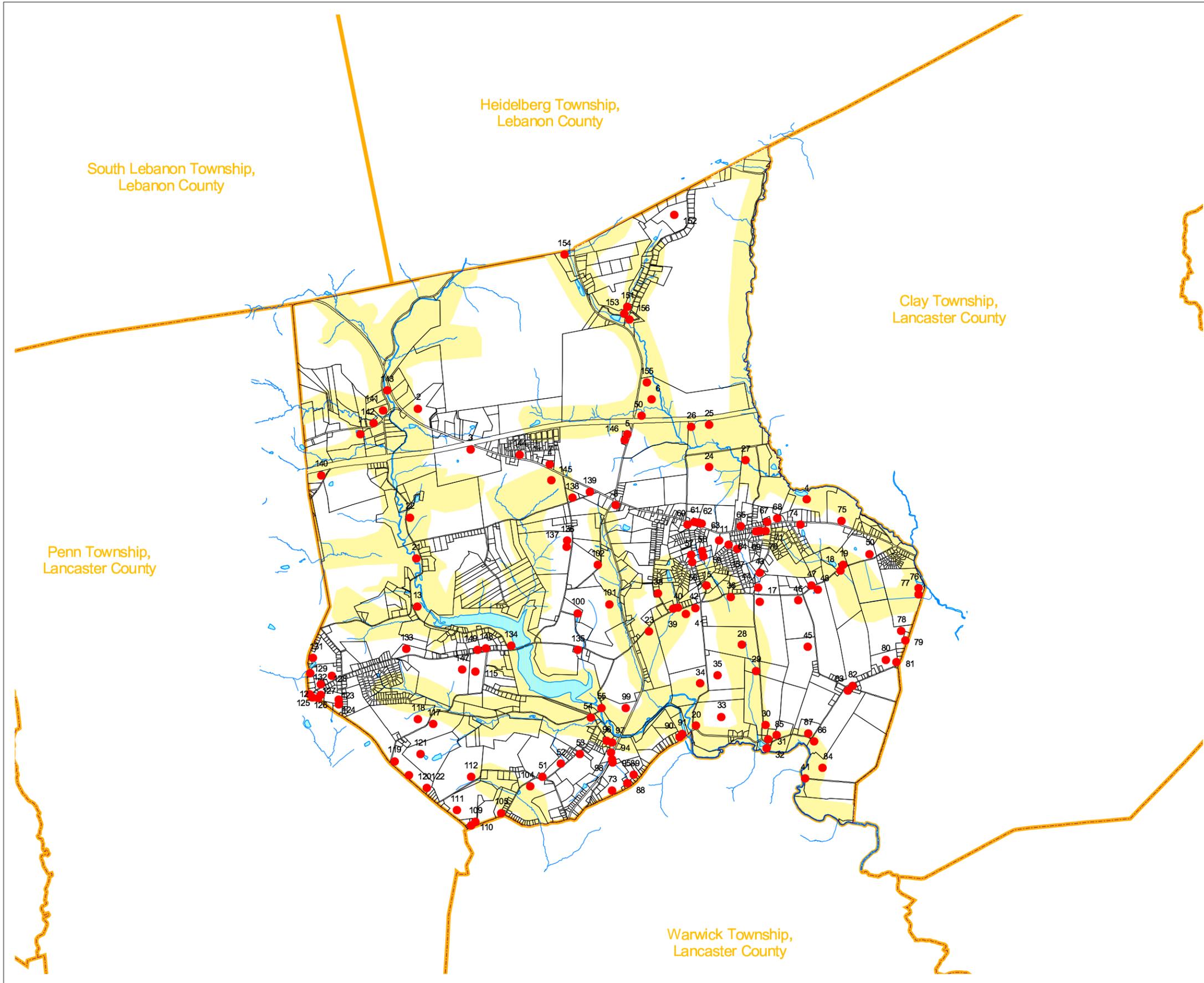


Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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Map 5
 Cultural Resources Map
 Elizabeth Township, Lancaster County



Legend

- Historic Sites
- Areas of Potential Archaeological Significance
- ~ Stream
- Lake, Pond



Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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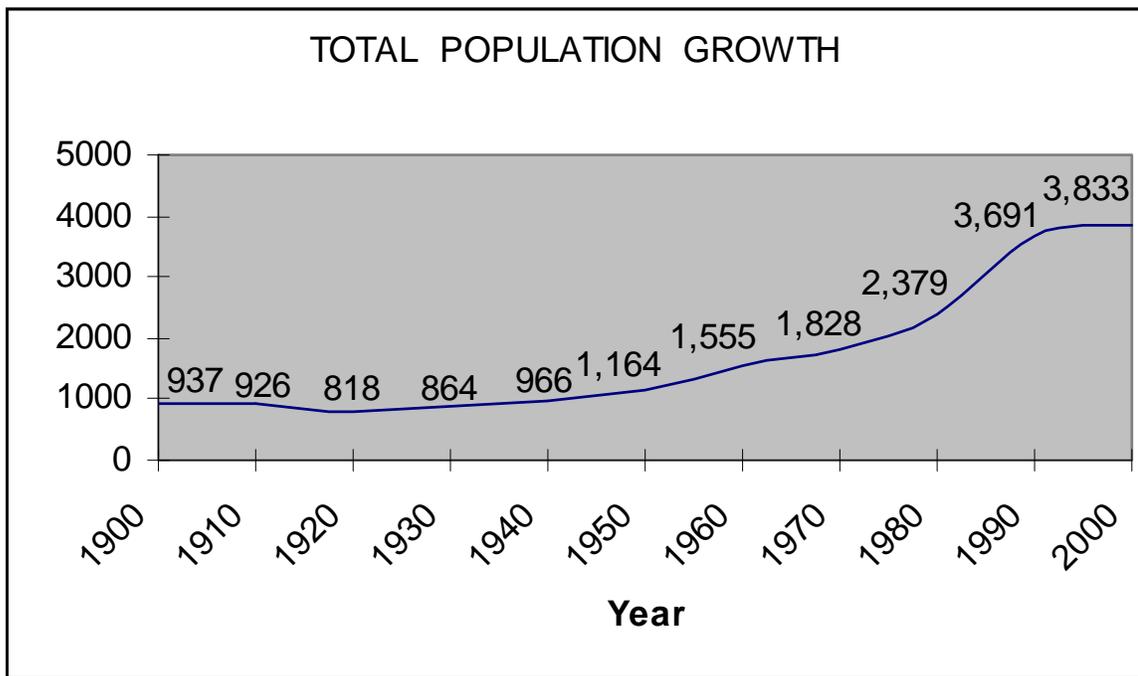


IV. DEMOGRAPHIC, HOUSING, AND ECONOMIC STUDIES

The allocation of municipal resources must consider the population to be served. Obviously, the overall size of a population is related to the amount of services or lands that must be provided. In addition, particular groups within the population have different service needs. This chapter will present past, current, and expected population statistics. In addition, a description of family, housing, and socioeconomic characteristics will be presented.

A. HISTORIC POPULATION GROWTH

The historical growth patterns of a municipality can provide insight to the growth that might be expected in the future. The following graph and table illustrate the amount of population growth that has occurred since 1900 in Elizabeth Township.



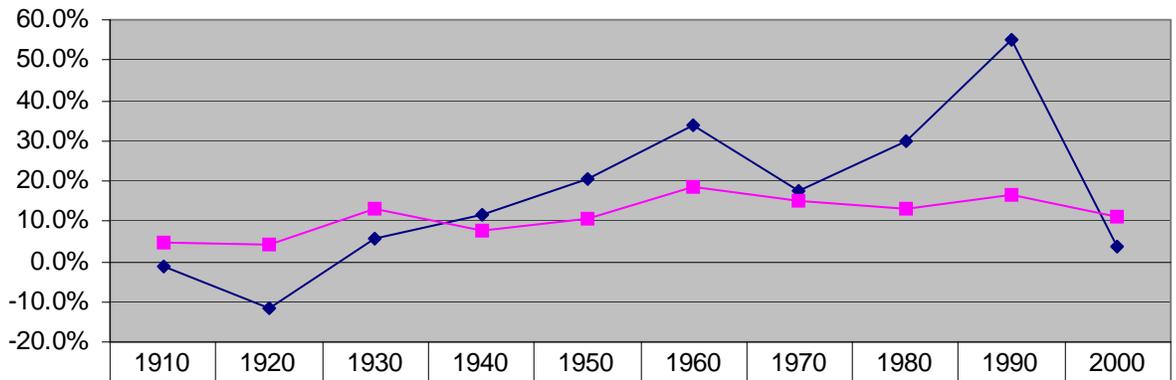
TOTAL POPULATION GROWTH			
Year	Total Population	Net Change	Percent Change
1900	937		
1910	926	-11	-1.2%
1920	818	-108	-11.7%
1930	864	+46	+5.6%
1940	966	+102	+11.8%
1950	1,164	+198	+20.5%
1960	1,555	+391	+33.6%
1970	1,828	+273	+17.6%
1980	2,379	+551	+30.1%
1990	3,691	+1,312	+55.2%
2000	3,833	+142	+3.8%

The total change in the population of any place is due to a combination of natural increase (or decrease) and net migration. Elizabeth Township experienced only minor fluctuations in population levels, including some losses, between 1900 and 1940, indicating some net out-migration during this period. Beginning in 1940, the rate of population growth in the Township began to accelerate, with a slight dip in the growth rate in the 1960s. The previously high growth rate resumed during the 1970s only to rise dramatically in the 1980s and 1990s. The growth over this twenty-year period in the Township is attributable mainly to a high net in-migration rate. Since 1990, the Township appears to have leveled off and has only experience a modest 3.8% growth factor.

A comparison of the Township's and County's population growth rates during the same period provides insight into the regional factors affecting local growth. The following graph illustrates the population percentage fluctuations by decade for Elizabeth Township and Lancaster County.

While Lancaster County maintained a positive rate of growth averaging 7.4% per decade between 1900 and 1930, Elizabeth Township experienced a decline averaging -7.3% per decade in this time period. Beginning in the 1930s, the Township's growth rate surged ahead of the County's, peaking in the 1950s, but falling off in the 1960s. Since 1970, the County's growth rate has averaged a steady 15%, while the Township's growth rate soared to more than 55% by 1990.

COMPARABLE GROWTH ELIZABETH TOWNSHIP & LANCASTER COUNTY

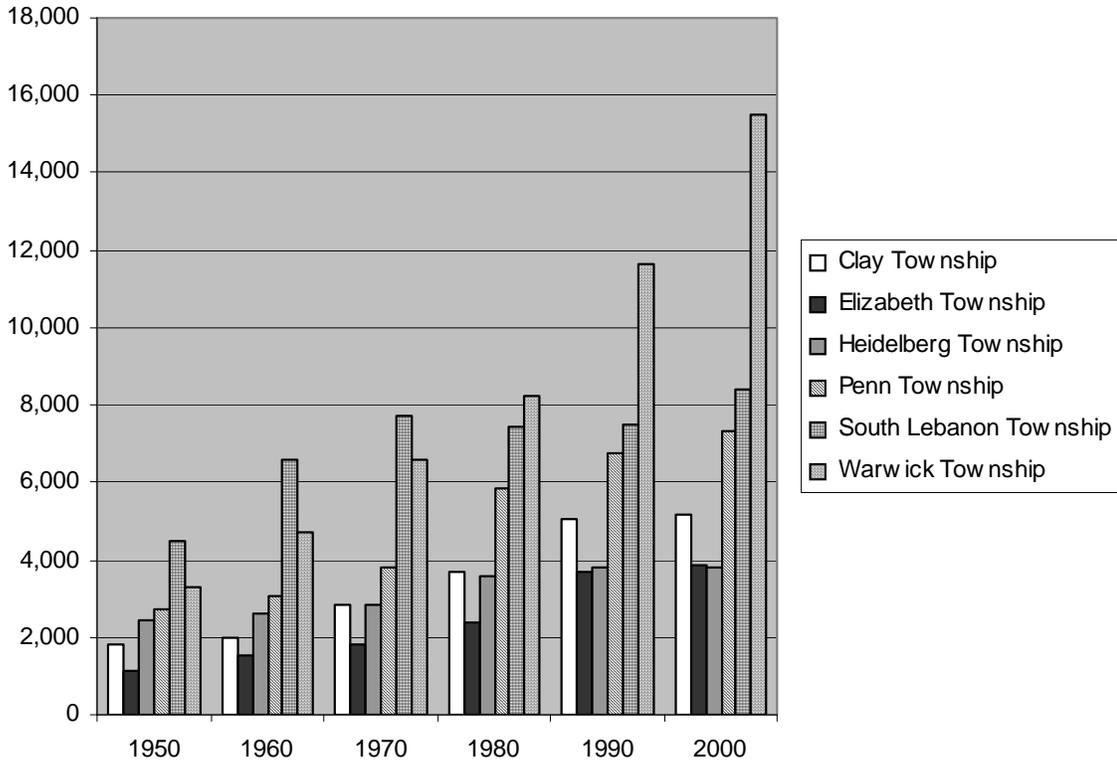


—◆— Elizabeth Township	-1.2%	-11.7%	5.6%	11.8%	20.5%	33.6%	17.6%	30.1%	55.2%	3.8%
—■— Lancaster County	4.9%	4.1%	13.3%	7.9%	10.5%	18.6%	15.0%	13.2%	16.7%	11.3%

A comparison of growth in Elizabeth Township with that in adjacent municipalities can also provide insight into regional development influences. Elizabeth Township is located along the northern boundary of Lancaster County and is bordered by Penn Township to the west, Warwick Township to the south, and Clay Township to the east. Heidelberg and South Lebanon Townships in Lebanon County border Elizabeth Township to the north. The following tables and histogram display population data for adjacent municipalities for recent decades:

POPULATION GROWTH IN ADJACENT MUNICIPALITIES/ELIZABETH TOWNSHIP						
Municipality	1950	1960	1970	1980	1990	2000
Clay Township	1,793	2,006	2,832	3,718	5,050	5,173
Elizabeth Township	1,164	1,555	1,828	2,379	3,691	3,833
Heidelberg Township	2,446	2,597	2,833	3,583	3,797	3,832
Penn Township	2,734	3,072	3,801	5,865	6,760	7,312
South Lebanon Township	4,488	6,584	7,706	7,431	7,491	8,383
Warwick Township	3,273	4,716	6,562	8,213	11,622	15,475
Total	15,898	20,530	25,562	31,189	38,411	44,008

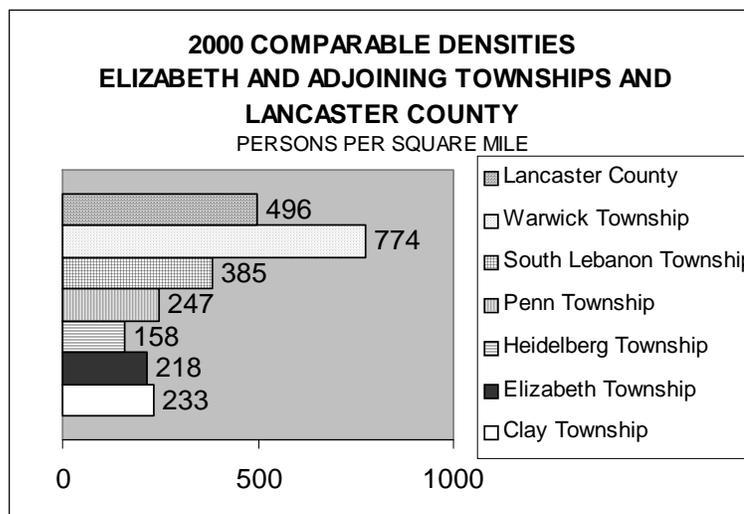
POPULATION GROWTH IN ADJACENT MUNICIPALITIES/ELIZABETH TOWNSHIP



PROPORTION OF GROWTH IN ADJACENT MUNICIPALITIES/ ELIZABETH TOWNSHIP		
Municipality	Net Change (Persons) (1950-2000)	% of Region's Total Growth
Clay Township	3,380	12%
Elizabeth Township	2,669	9%
Heidelberg Township	1,386	5%
Penn Township	4,578	17%
South Lebanon Township	3,895	14%
Warwick Township	12,202	43%
Total	28,110	100.0%

As can be seen, Elizabeth Township accounts for approximately 9% of total growth among its neighbors in this time period. The only municipality with a smaller share of the region's growth is Heidelberg Township to the north. Thus, although Elizabeth Township's rate of recent growth has been high, the absolute numbers of persons who have been added to its relatively small population base are exceeded by most of its neighbors. Neighboring Clay and Penn Townships to the east and west account for somewhat higher proportions of the region's growth than does Elizabeth Township. Fast-growing Warwick Township to the south alone contributes nearly half of the region's growth in this time period.

As population increases, so does density. Overall density is one gauge often used to determine to what extent a municipality is providing for its "fair share" of regional growth. The following graph depicts relative densities for adjoining municipalities and Lancaster County.



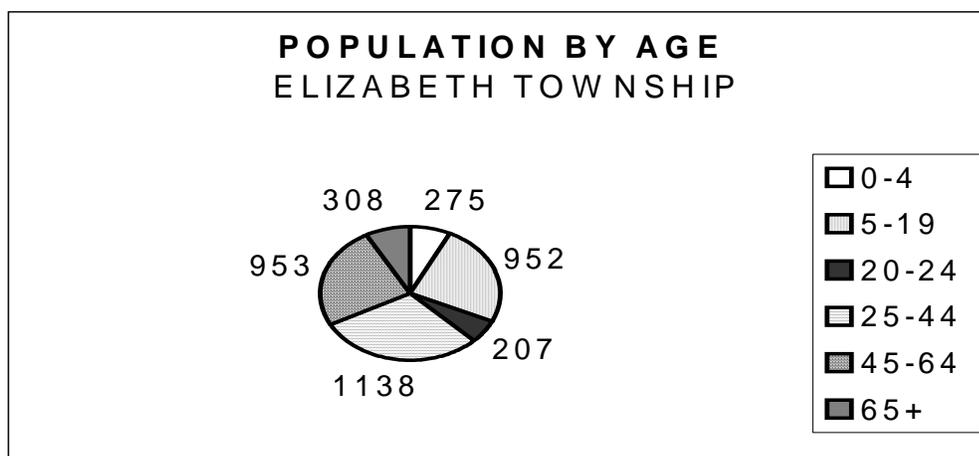
Elizabeth Township's density is less than half that of Lancaster County's as a whole, and the next to lowest in the region.

B. SOCIOECONOMIC DATA

Aside from sheer size, other characteristics of Elizabeth Township's population have important bearing upon the types and quantities of public services that may be needed. The following provides a brief summary of these characteristics.

POPULATION BY AGE

Different age groups have different public service needs that need to be specifically addressed. Age composition data has long been recognized as supplying important inputs for school and recreation planning analyses, with projections of age composition being of special concern in determining long-range facility needs and land requirements for school and recreation sites. Age data is also important in defining stages of the life cycle that, in turn, are used in studies gauging and analyzing activity patterns, household moving behavior, housing and various kinds of community facilities and services. For example, the numbers of children between the ages of 0 and 4 help to predict future elementary school classroom space needs and recreation programs geared for preschool-aged children. Those aged 5 to 19 comprise the school-aged population that poses distinct planning implications regarding school and recreation facilities and programs. The 20 to 24 age group represents the young adults who are just entering the labor force and who may rely heavily on the supply of rental housing. Those aged 25 to 44 comprise the young labor force and tend to produce the most children. This group, like those aged 20 to 24, is also highly mobile. The mature labor force, those aged 45 to 64, tends to be more settled and at the height of their earning power. Those 65 years and older comprise the senior sector of the population; this sector is generally characterized by limited purchasing power and an increased demand for health, public transit, and special recreation services. The following pie chart presents reported age characteristics for the 2000 Census.



Preschool-age children through age four comprise 7% of the Township's population. Children and teens from 5 to 19 comprise an additional 25% of the Township's population. Young adults from 20 to 24 make up 5% of the population. Childbearing adults ranging in age between 25 and 44 account for 30% of the population. Mature adults between 45 and 64 comprise 25% of the population and older adults 65 and over make up 8% of the population.

Elizabeth Township's population profile reveals a healthy proportion of young people, a particularly high proportion of adults, and a small ratio of elderly, all typical for a rural area within commuting distance of employment centers. The median age in the Township is 36, as compared with that for Lancaster County, which is 36.1.

Next, it is important to look at other socioeconomic data that helps to better describe the demographic composition of the Township. Such data includes sex and racial composition, household statistics, education levels, and income. The following tables illustrate this set of data.

2000 POPULATION BY SEX					
	Total Persons	Total Females	(%)	Total Males	(%)
Elizabeth Township	3,833	1,843	48.1%	1,990	51.9%
Lancaster County	470,658	241,204	51.2%	229,454	48.8%

2000 POPULATION BY RACE							
	Total Persons	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian and other Pacific Islander	Two or More Races or Other Race Not Indicated
Elizabeth Township	3,833	3,780	14	1	11	0	27
Lancaster County	470,658	430,456	12,993	681	6,802	158	19,568

2000 HOUSEHOLD STATISTICS							
	Total Households	Family Households			Non-Family Households		
		Married Couple	% of Total	Female Head (no husband)	One Person	% of Total	Two or More Persons
Elizabeth Township	1,303	999	76.7%	60	166	12.7%	138
Lancaster County	172,560	103,320	59.9%	14,900	39,801	23.1%	29,439

2000 EDUCATION DATA		
	Persons 25+ With High School Diploma	Persons 25+ With 4+ Years of College
Elizabeth Township	1,074	305
Lancaster County	117,501	41,643

2000 INCOME				
	Per Capita	Median Household	Median Family	Individuals Below Poverty Level
Elizabeth Township	\$19,078	\$50,720	\$54,181	169
Lancaster County	\$20,398	\$45,507	\$52,513	35,553

Socioeconomically, Elizabeth Township displays some differences from Lancaster County as a whole; however, it is similar to other rural townships in the County. Elizabeth Township has a slightly higher percentage of males than females, in contrast with the County's slightly higher proportion of females. Racially, the Township is extremely homogeneous, with only 1.4% of the population represented by minorities, compared to 8.5% for the County.

Elizabeth Township tends significantly more toward a family household orientation than does the County as a whole, with 76.7% of all households reported as families, as compared with 59.9% for the County. Similarly, the proportion of people living alone within the Township is slightly more than half the rate of those living alone within the County as a whole. According to 1990 Census Data, Township residents are somewhat more likely to have graduated from high school but somewhat less likely to have a four-year college degree than are people within Lancaster County as a whole.

Elizabeth Township residents tended to be more affluent than their Countywide counterparts. With the exception of per capita income, Elizabeth Township 2000 income statistics fall slightly higher than that of the County. This may be a reflection of the higher percentage of married couples in the Township. Consistent with these figures, the Township's percentage of population living in poverty (4.4%) is less than that for the County (7.8%).

C. POPULATION PROJECTIONS

Population projections are important to the future allocation of land use and the delivery of public services. The projections become a building block that will be used repeatedly to forecast future spatial and service needs. Consequently, great care must be exercised to assure that these figures represent the "best guess" as to how the Township will grow.

It is important to understand that no population projection can accurately forecast all of the factors that might cause a particular rate of growth. Instead, historical trends are analyzed and compared with perceived current trends to see how accurately they predict recent data; then, the most accurate method is used to predict future conditions.

Four different population projection techniques are applied to the Township's historic trends; each of these will be discussed, and one will be selected for use.

Method 1 (Arithmetic)

This method relies upon an arithmetic extrapolation projection technique. It forecasts growth at the same numeric levels as the past. Specifically, it was calculated that an average of 290 new residents has been added to Elizabeth Township in each decade, since 1950. This same net increase is then added to the 2000 figure, yielding the following projections:

2000	2010	2020
3,833	4,123	4,413

Method 2 (Geometric Extrapolation)

This method uses a geometric extrapolation projection technique. It forecasts a growth rate based upon historical population trends. By analyzing the percentage increases recorded in the Township since 1900, it was determined that the Township grows by an average of 16.5% during each decade. This technique assumes that the Township will grow at an average rate similar to that experienced since then. By applying this growth rate to the 2000 Census figures, the following projections result:

2000	2010	2020
3,833	4,465	5,097

Method 3 (Shift-Share)

This method employs geometric extrapolation and shift-share projection techniques. Specifically, Elizabeth Township's and its neighboring municipalities' historic growth (1950-2000) were totaled for each decade and the average growth rate computed and geometrically extrapolated (18% per decade). Then the Township's proportional share of 2000 total population (9%) was applied to the year 2010 and 2020 projections for the region. This method assumes that the same growth and development influences that have been affecting those municipalities that adjoin, will directly affect the Township, and that its share of growth will remain constant.

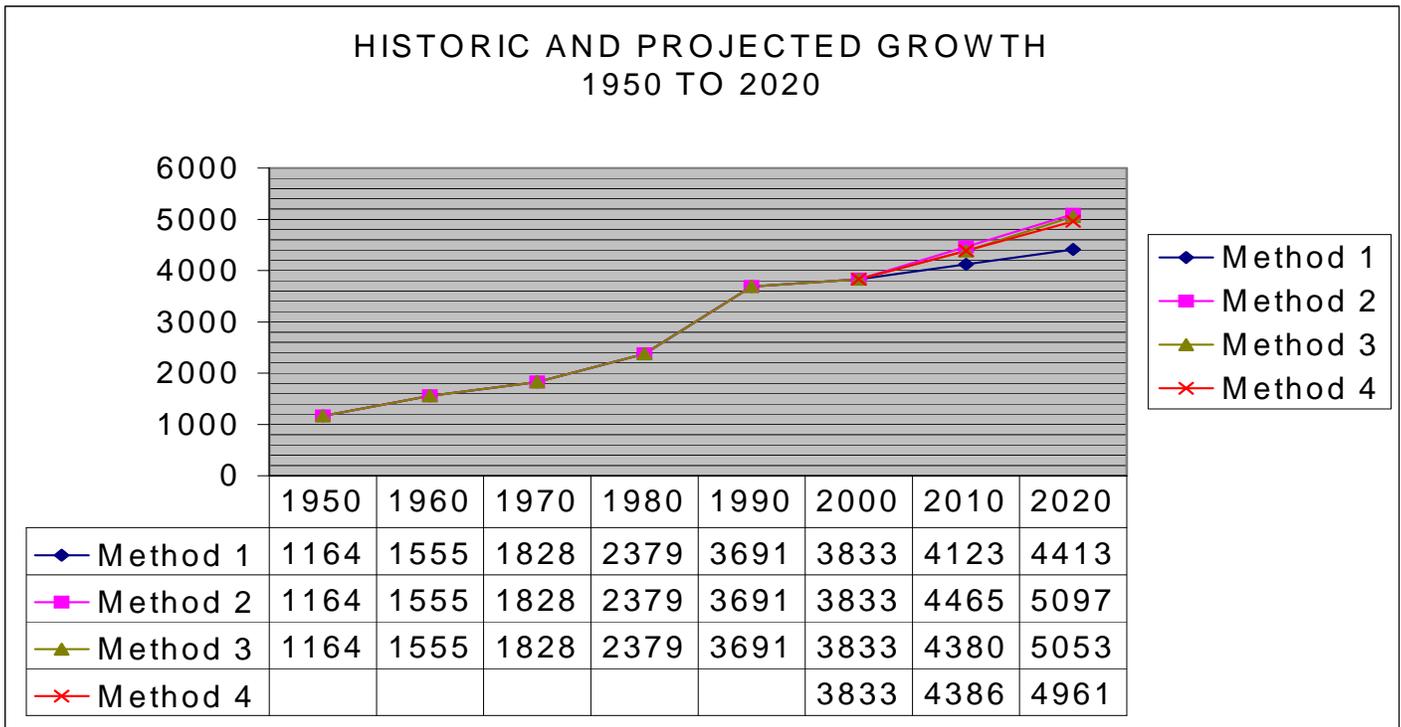
2000	2010	2020
3,833	4380	5053

Method 4 (Lancaster County Draft Population Projections)

Lancaster County Planning Commission has published the following draft population projections for Elizabeth Township. The County plans on finalizing these draft projections after this plan has been reviewed and adopted. The methodology the County planners utilized to prepare the projections is based on an average linear regression.

2000	2010	2020
3,833	4386	4,961

The results of the four prior-described population projections have been plotted, along with the Township's recent historical growth pattern, in the following graph:



The population projection that has been selected for the Township is Method 1. The Township has no public sewer system and does not anticipate the development of such a system in the near future. The Township could otherwise anticipate significant residential development pressure from the south for additional commuter suburbs. In light of the Township's limited commercial and industrial tax base, this would place a substantial strain on the Township's ability to provide for public services.

Finally, the selected population projection yields the lowest figures of all the methods used. In this scenario, the Township would gain 290 persons between 2000 and 2010, and another 290 persons between 2010 and 2020, for a total gain of 580 persons over the planning time horizon.

D. HOUSING ANALYSIS

An inventory of existing housing, including the rate of housing growth and characteristics of the existing housing stock, is important in determining current unmet housing needs as well as in forecasting future housing needs. Generally, the rate of housing growth in a community is higher than that of population growth as societal values change and fewer people live together. According to the 2000 Census, the total number of housing units within Elizabeth Township has grown by just over 5% from 1,269 units in 1990 to 1,336 units in 2000, while population growth has been 3.8% in the same time period. The average household size stayed the same between 1990 and 2000 at 2.9 persons per household.

HOUSING STOCK

In addition to studying the size and growth of the Township's housing stock, it is also important to determine the composition of housing. This information can be used to ensure that the Township is providing for its required wide range of housing options. The following table shows the number of housing units by type for Elizabeth Township. These figures may be compared to those for Lancaster County as a whole to gain a regional perspective of the provision of the range of housing types.

2000 HOUSING TYPES									
Area	SFDs	(%)	SFAs	(%)	MFDs	(%)	MHs	(%)	Total
Elizabeth Township	1,182	(88.5)	14	(1.0)	113	(8.5)	27	(2.0)	1,336
Lancaster County	100,952	(56.1)	34,044	(18.9)	36,492	(20.3)	8,502	(4.7)	179,990

The single-family detached (SFD) dwelling is by far the most common housing type in Elizabeth Township, accounting for nearly 88.5% of the Township's total housing stock in 2000, compared with just over 56% for the County as a whole. Single-family attached (SFA) dwellings as defined by the U.S. Census include row houses, townhouses, double houses, or houses attached to nonresidential structures. In Elizabeth Township, there are only 14 such units, which account for one percent of the total housing stock, as compared to 18.9% for the County as a whole. Multi-family dwellings (MFDs) include residential development at higher densities, such as apartment complexes and conversion apartments. Only 8.5% of the Township's housing stock consist of MFDs, significantly less than the 20.3% for the County as a whole.

While mobile homes (MHs) are normally defined as single-family detached dwellings, for the purpose of this analysis they are separated out to gain further insight into the composition of the Township's housing stock, as they provide particularly affordable housing opportunities. Only 2.0% of housing units are comprised of mobile homes in the Township, which is a smaller proportion than the 4.7% for the County as a whole.

A comparison of the Township's 2000 housing mix with its 1990 housing mix provides insight into the change in the types of housing being built in recent years:

CHANGE IN HOUSING TYPES					
Housing Type	1990 Housing Units	%	2000 Housing Units	%	1990–2000 Housing Units Gained
SFD	1,076	(85)	1,182	(88.5)	106
SFA	13	(1)	14	(1)	1
MFD	85	(7)	113	(8.5)	28
MH	95	(7)	27	(2)	-68
Total	1,269	(100)	1,336	(100)	67

As can be seen in the above table, the Township has a good portion of its mobile homes decreasing over the last 10 years. Single family detached dwellings displayed the most growth in the Township over the ten-year time frame, while single family attached and multi-family detached units did not increase significantly.

HOUSING AFFORDABILITY

Access to affordable housing is an issue of increasing significance in most communities as incomes continue to fail to keep up with the cost of housing. The term “affordable housing” no longer refers just to low-income, subsidized housing projects, or mobile home parks. More and more people find themselves unable to afford homeownership or sometimes even rentals. A community’s young adults, newly-married couples, young families, and elderly are some examples of those often in need of affordable housing opportunities.

“Affordable housing” was defined in a state-level study titled *Pennsylvania Housing (1988)* as housing requiring less than 30% of gross monthly income for rent or less than 28% for a mortgage and other related housing costs.

One way to measure housing affordability is to analyze the relationship between low and moderate income households, and monthly housing costs. According to the U.S. Department of Housing and Urban Development, a moderate income household is a household with a gross household income equal to or more than 50%, but less than 80% of the median gross household income for households of the same size within the housing region. A low-income household is a household with a gross household income equal to 50% or less of the median gross household income for households of the same size within the housing region.

According to the 2000 Census, the 54% of specified owner-occupied housing units with mortgages in the Township have a median monthly owner cost of \$1,045, while the 43% of specified owner-occupied housing units without mortgages have a median monthly owner cost of just \$301. Owner costs refer to the mortgage, property tax and homeowner insurance costs associated with homeownership. Housing costs are

somewhat more affordable to Elizabeth Township residents because of their higher median household income of \$50,720. Recently, mortgage interest rates have come down considerably, making homeownership more affordable for more people, by lowering the monthly owner costs.

Another way to determine housing affordability is to compare housing costs with adjacent municipalities and Lancaster County. The following is the median housing values for Elizabeth Township and its adjacent as well as Lancaster and Lebanon County's median housing value:

Clay Township, Lancaster County:	\$126,800
Elizabeth Township, Lancaster County:	\$126,000
Heidelberg Township, Lebanon County:	\$115,300
Penn Township, Lancaster County:	\$124,100
South Lebanon County, Lebanon County:	\$105,000
Warwick Township, Lancaster County:	\$131,600
Lancaster County:	\$119,300
Lebanon County:	\$100,700

Elizabeth Township's median housing value is comparable to all the adjacent municipalities in the region and falls slightly above that of Lancaster County.

RENTAL HOUSING

The proportion and cost of rental housing in a community is another measure of the provision of affordable housing. Elizabeth Township's proportion of rental housing and rental costs as compared to Lancaster County in 2000 is as follows:

RENTALS			
Area	No. of Rentals	%	Median Monthly Gross Rent
Elizabeth Township	135	(10)	\$532
Lancaster County	48,406	(27)	\$572

Gross rent is contract rent plus utilities and fuel.

As can be seen from the table, Elizabeth Township's proportion of rental units is much lower than that for the County. Median monthly rents in the Township are in the same range as those for the County as a whole.

The Township's gross rent figured to be less than thirty-five percent of the total household income according to 2000 Census data. Therefore, indicating that affordable rental housing is available for various income levels in the Township.

FAIR SHARE HOUSING

The Pennsylvania Municipalities Planning Code (MPC) requires the provision of “all basic forms of housing,” including a reasonable range of multifamily dwellings, mobile homes, and mobile home parks. The MPC adheres to the “fair share” principles embodied in a line of Pennsylvania exclusionary zoning court decisions, calling on each municipality to plan to meet the housing needs of present and future residents by permitting different dwelling types at appropriate densities for households of all income levels. This Plan will seek to provide adequate and appropriately-located areas to accommodate a range of dwelling types and densities to meet the needs of households of all income levels.

VACANCY RATES

Vacancy rates are a good indicator of the existence of a housing surplus or shortage. An owner vacancy rate reflects the percent of vacant units for sale of the total homeowner inventory. A renter vacancy rate reflects the percent of vacant units for rent of the total rental inventory. Vacancy rates for 1990 for Elizabeth Township and Lancaster County are indicated in the following table.

VACANCY RATES				
Area	Total Vacant Units	Seasonal Use	Owner Vacancy Rate	Renter Vacancy Rate
Elizabeth Township	31	8	0.7	3.3
Lancaster County	7,430	808	1.4	4.9

Vacancy rates in the vicinity of 2% are generally considered adequate to provide sufficient choice in the housing market for the purchase of homes. Vacancy rates in the vicinity of 5% are generally considered adequate to provide sufficient choice in the housing market for renters. Both owner and renter vacancy rates in the Township are quite lower than those for the County. This indicates a tight market, low turnover rate, and/or a demand for housing which exceeds the supply.

HOUSING CONDITION

All residents of a community should be entitled to safe housing. Safe housing is reflected in estimates of substandard housing. The U.S. Census defines substandard housing as the number of units lacking some or all plumbing facilities plus an estimate of other dilapidated units. In 1990, Elizabeth Township had zero housing units, which lacked adequate plumbing facilities, and seven housing units (.5%) which lacked complete kitchen facilities.

Additional factors such as the age of the housing unit, number of persons per room, and the estimated value of the unit may be considered by a municipality in estimating the extent of substandard housing. The great majority of housing in the Township is relatively new; only 16% percent of the housing stock was built before 1940. The number of persons per room in a housing unit is used as an index of crowding: a unit with more than 1.0 persons per room is considered overcrowded. In 1990, Elizabeth Township had 13 occupied housing units (1.0%) with 1.01 or more persons per room. The Township does not utilize a building code.

HOUSING PROJECTIONS

The need for future housing is calculated by dividing the year 2010 and 2020 population projection increases by 2.94 persons, which is the average household size from the 2000 Census Data. The following table shows the projected future growth in housing as compared with population:

Year	Projected Population	Projected Population Increase	Projected Housing Units
2000	3,833		
2010	4,123	290	99
2020	4,413	290	99

The Township can anticipate gaining approximately 99 new units between 2000 and 2010, and an additional 99 units between 2010 and 2020, for a total of 198 new units over the planning time horizon. At the same time, it will be accommodating an additional 290 persons between 2000 and 2010, and 290 persons between 2010 and 2020, for a total of 580 new persons.

These projections will be used to determine needed acreages to accommodate future housing in the Future Land Use chapter.

SUMMARY OF HOUSING NEEDS

In order for Elizabeth Township to promote more affordable housing, to assure a choice of housing, to provide for its fair share requirements, and to bring its housing mix and share of rentals more in line with that of the County as a whole, the following recommendations are made. First, a greater proportion of single-family attached and multi-family housing units, as well as rentals, should be encouraged within areas planned for alternative wastewater and community water systems and access to other services. Second, the Township should assure that land development regulations do not unnecessarily increase the cost of new housing; narrower streets and smaller lot sizes can be permitted so long as they do not jeopardize the public safety or function of the development. Third, inclusionary zoning provisions can be implemented to assist in the availability of affordable housing by requiring developers to include in their developments a prescribed percentage of homes for low and moderate income households.

E. ECONOMIC ANALYSIS

The health of an area's economy has an obvious major impact on the overall welfare of the community. A healthy economy provides not only employment opportunities, but also tax revenues that pay for public facilities and services. Residential development seldom pays its own way in tax and fee revenues. The deficit must be made up by the tax yield from industrial and commercial properties that the community must attract and hold.

There are a number of measures of the health of a community's economy, among them the employment rate, the diversity of the local economy, and the balance between basic and non-basic industries.

BASIC VS. NON-BASIC INDUSTRIES

Basic industries are those industries producing goods for export, such as manufacturing and the extractive industries - agriculture, lumber, and quarrying. These industries are considered the economic lifeblood of communities as they sustain the flow of money into the community that can then be paid out in wages, local taxes, and reinvested in capital improvements. A healthy economy requires that income derived from the export of locally-produced goods equals the income used to import goods and services from outside the area. Without basic industries, most of a community's money would drain out of the area, leaving an unstable, deficient economy.

Basic industries also tend to generate secondary "spin-off" industries and services, and have what is known as a "multiplier" or ripple effect throughout the entire economy. For instance, local agriculture supports local agricultural machinery and food processing industries, which in turn provide related service jobs in trucking and retail sales. Basic industries are sometimes referred to as being comprised of heavy and light industrial uses. Heavy industrial uses are the more traditional land-intensive, sometimes polluting uses, whereas light industrial uses refer to the more recent high-tech and other non-polluting industries.

Non-basic industries, or commercial uses, are those providing employment in wholesale and retail sales, services, and other related areas. While they supplement the local economy and serve the community, they usually provide lower wages and generally do not bring significant outside income into the area. Examples of types of personal services would include barber and beauty shops, shoe repair shops, and dry cleaners. Commercial services are sometimes referred to as heavy commercial uses and include automobile sales and repair establishments, plumbing shops, and building supply outlets.

ECONOMIC SECTORS

Elizabeth Township's economy has historically centered on iron forging, glass manufacture, lumber, and agriculture. Today, agriculture and lumber are the Township's largest local contributors to the economy. A small aluminum foundry and a machine shop are the only other industrial uses in the Township. Commercial uses are limited to several small-scale businesses along PA 322 and 501. Most residents now commute outside the Township to their places of employment, and the Township has largely come to be a community of commuters. Most of those who commute travel south into the larger Lancaster urban area.

Because so many of Elizabeth Township's residents make their livelihoods outside the Township's boundaries in other parts of the County, it is important to examine the overall make-up and health of the County's economy. The following table identifies the types of industries in the County together with number of employees in 2000:

COUNTY EMPLOYEES BY INDUSTRY 2000	
Industry	No. of Employees
Agriculture, Forestry, Fishing, Hunting, and Mining	6,735
Construction	18,242
Manufacturing	53,028
Wholesale Trade	10,734
Retail Trade	30,563
Transportation, Warehousing, and Public Utilities	10,157
Information	4,388
Finance, Insurance, Real Estate, Rental, and Leasing	10,432
Professional, Scientific, Management, Administrative, and Waste Management Services	15,674
Educational, Health, and Social Services	42,794
Arts, Entertainment, Recreational, Accommodation, and Food Services	15,856
Other Services (except public administration)	12,332
Public Administration	4,751
Total	235,686

Note: The figures above do not include government employees, railroad employees, and self-employed persons.
Source: U.S. Bureau of Census, Census 2000

Lancaster County has diversified its economy over the last several decades by introducing a number of major new industries. Diversification is healthy because it insulates the community against economic downswings in any particular sector of the economy. Among the County's major new industries are tourism and the manufacture of food and kindred products, both directly related to agricultural production. The strong agricultural presence has provided the County with a major comparative advantage over other places in the creation and maintenance of these new industries. Agriculture remains a particularly strong component of the rural County economy, including that of Elizabeth Township. While there is every reason to believe that agriculture will remain a major County industry, state and national trends indicate that future diversification will probably be in the service sector.

LABOR FORCE CHARACTERISTICS

Employment and labor statistics reveal that, in 2000, 86.7% of Elizabeth Township's labor force was employed by private enterprise, 5.2% by the government, .7% unpaid family workers, and 7.3% are self-employed.

The Township had a very low unemployment rate of 1.5% in 2000, lower than the County's overall rate of 2.0%.

FUTURE ECONOMIC DEVELOPMENT POSSIBILITIES

There is presently an imbalance in the amount of land devoted to industrial uses in Elizabeth Township as compared to the land in residential use. Presumably because the unemployment rate is so low, this has not been perceived to be a problem. However, over time, and as the demand for the level of local services increases, the Township may find itself short of the financial resources to continue to provide these services. This is because residential development typically does not pay its way but rather is supported in part by tax revenues from local business enterprises. For this reason, residential, commercial, and industrial uses need to develop in balance with one another, and all three uses need to be carefully planned for.

A second reason for accommodating and even encouraging a limited amount of economic development in the Township is that it would provide opportunities for residents to work and shop close to home who otherwise must now commute. Such opportunities could foster a sense of community, in the Brickerville area especially.

It is important to carefully plan for the siting and other needs of potential incoming industry. Industrial development requires large, flat, or nearly flat sites with soils having good load-bearing qualities. However, merely designating such areas on the Future Land Use Map will do little by itself to attract industry. Other factors such as the availability of public sewer, water and other utilities, and railroad or major road access, as well as prevailing wage scales, the local cost of living, land prices, utility rates, and tax levels also influence the selection of sites. Resource-based industries must be near their raw materials sources, and proximity to other suppliers and markets is often an important consideration. Increasingly, industries are attracted to communities that are perceived to have a high quality of life, meaning an area with an adequate housing supply, freedom from deterioration and blight, high quality schools, and other public facilities and services.

Elizabeth Township's chief assets for attracting economic development are probably its high quality of life, relatively low land costs, major road access, local market, and proximity to wooded lands and recreation areas. Future industrial and commercial uses should be located on major access roads, with commercial development conveniently accessible to the public and located in areas of concentrated development.

No formulas are proposed to compute the need for commercial and industrial lands in the future for the Township. Instead, lands that are allocated for commercial and

industrial uses will be sufficient to assure a balance among all land uses and carefully selected to meet future needs.

One strategy for actually attracting incoming industry to the Township would be for the Township to determine what products or services it might have a comparative advantage in producing or providing. For instance, portions of the wooded Furnace Hills area could be a source for a woodworking industry. The State Game Lands and Speedwell Forge areas could provide opportunities for tourist and recreation-oriented businesses.

Another strategy for improving the health of the local economy is to utilize what is known as "import substitution" to determine what goods and services the Township could produce or provide that are now being imported, or for which people now go elsewhere. This strategy seeks to retain more economic activity within the local community by curtailing the leakage of consumer dollars out of the community.

For example, energy conservation and alternative energy sources are important in keeping money in a community. Since most communities import their electricity, gasoline, and natural gas, conservation efforts and the development of solar, wind, and other local alternative energy sources can result in substantial savings and boost the local economy. The Township could also encourage the siting of certain small-scale businesses to meet currently unmet needs of Township residents.

Low-interest loans and other financing is available for industrial enterprises and businesses through the PA Industrial Authority arm of the PA Department of Commerce. The Lancaster County Chamber of Commerce can also provide information and assistance both to potential incoming businesses and to municipalities.

SUMMARY OF ECONOMIC DEVELOPMENT NEEDS

It is in the Township's best long-term interests to both protect its existing resource base and provide for and encourage the development of additional commercial and industrial uses which will generate additional tax dollars and provide local employment opportunities. In order for Elizabeth Township to meet these goals, the following recommendations are made:

First, existing agricultural and forestry uses should be protected from conflicting adjacent uses and development that would erode these resource bases. Second, the Township could research opportunities to utilize import substitution to meet more of its own identified needs. Finally, the Township could determine what comparative advantages it might have for providing goods and services to others outside its boundaries.

V. EXISTING LAND USE

One important element of this Plan is the inventorying of existing land uses. The historical identification of land use activities provides periodic gauging of development trends within the Township. The character of existing land uses provides insight as to the quantities and types of land uses that are desired by the public or have particular market demand. Finally, existing land use studies and associated mapping provide valuable assistance in the identification of appropriate future development areas. All of these considerations are fundamental to the formulation of a future land use scheme and regulatory policies that respond to the Township's goals and objectives.

To provide a detailed land use inventory, several information sources were used. First, 1993 Lancaster County tax records were researched and mapped, yielding a lot-by-lot inventory. This was followed by a windshield survey conducted in August 1993, to verify the findings revealed by the tax records. Finally, aerial photography was used to verify the extent of forested areas within the Township. The Existing Land Use and Adjacent Planning Map depicts the results of this process as illustrated on the Township's updated property line base map.

Elizabeth Township is characterized by rugged, forested topography to the north and gently rolling hills and valleys in the central to southern areas. The historic village of Brickerville and vicinity, in the northeast-central portion of the Township at the crossroads of PA Routes 501 and 322, have come to be the major developed area in Elizabeth Township. Other developed areas include Poplar Grove in the north-central part of the Township, Elm to the southwest, and Lexington to the south. The Township's development is rural in nature. The following summarizes existing land uses inventoried by land use category within the Township.

A. AGRICULTURE

The Township's largest and most fertile agricultural area is in the southeast portion of the Township. This area is underlain by a predominance of prime agricultural soils and soils of Statewide significance. Very little development has intruded on the area and farm ownerships are still large. Other areas of agricultural production, also underlain by fertile soils, include areas north of Brickerville, south of Poplar Grove, east of Speedwell Forge, and along the southwestern edge of the Township. Major agricultural activities include corn production and dairying.

B. SINGLE-FAMILY RESIDENTIAL

Single-family residential uses include single-family detached dwellings and mobile homes on individual lots. Single-family residential uses are largely concentrated in the Brickerville vicinity. Other concentrations are found in Poplar Grove, Elm, and Lexington. Large-lot rural development exists adjacent to Speedwell Forge, along Fox Road to the north, and scattered throughout the remainder of the Township. Mobile homes are fairly evenly distributed throughout the rural area.

Only 17% of the Township's housing was built before 1940. Most of the older housing is found in Brickerville, Lexington, Elm, Poplar Grove, and on farmsteads. Most of the newer subdivisions have occurred in the Brickerville vicinity and in Elm, and are characterized by curvilinear streets and cul-de-sacs. Most of the recent rural development tends to be stripped out along rural roads.

C. MULTI-FAMILY RESIDENTIAL

Multi-family residential includes development at higher densities, including single-family attached units, duplexes, townhouses, multi-family dwellings, and mobile home parks. Multi-family residences found in Elizabeth Township include a mix of apartment houses, three-family dwellings, duplexes, and a 13-unit mobile home park in Poplar Grove. The Township's apartment houses are found in Lexington, Brickerville, and Webster, while its three-family dwellings are found in Elm and Lexington.

D. COMMERCIAL

The commercial land use category includes retail stores, personal services, commercial services, offices, and wholesale sales and distribution. The majority of commercial uses within the Township are located in small clusters along PA Route 322, from the intersection of PA Route 501 to the Clay Township line. The only other concentration of commercial uses is found along PA Route 501 south of Brubaker Valley Road. A few other commercial uses may be found scattered across the Township. A number of commercial uses in the Township appear to be rural occupations which began as accessory uses to residences and evolved to be the dominant use of the property.

Most of the Township's commercial activity can be described as highway-related, including automobile services, convenience stores, a motel, restaurants, tourist-oriented antique and gift shops, and a number of garden/nursery businesses. Such commercial uses are largely geared to providing goods and services to travelers, rather than to Elizabeth Township residents. There are few commercial uses serving local residents and it would appear that most of the Township's residents do a large portion of their shopping and utilization of services outside the Township, particularly in Lititz and Warwick Township.

E. INDUSTRIAL

The industrial land use category includes manufacturing and warehousing. There are only a handful of small-scale industrial uses within the Township. These include a machine shop in Halfville, a used auto and truck parts/salvage operation west of Brickerville, and a printing shop, asphalt/paving business, aluminum castings operation, computer components business, and mini-storage, all on PA Route 322 in the Brickerville area.

F. PUBLIC

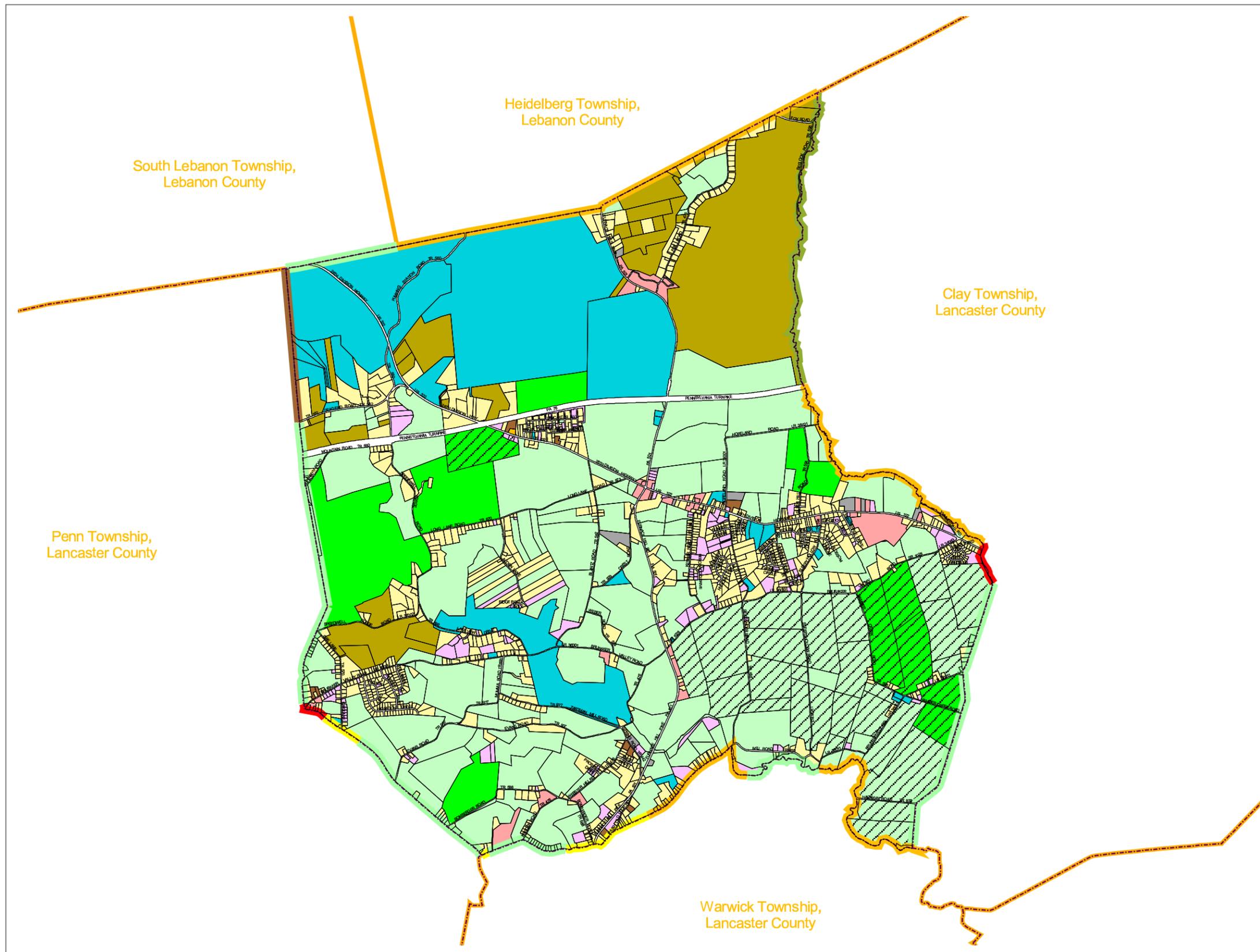
The public land use category includes public, as well as semi-public, and nonprofit uses. These include public and private schools, municipal offices, government buildings and structures, utility holdings, railroads, fire and police stations, hospitals, churches, cemeteries, public parklands, civic buildings, and any other similar uses.

Aside from State Game Lands (see Conservation/Recreation), Elizabeth Township has two large public landholdings, including Speedwell Forge and surrounding lands maintained by the State Fish and Game Commission, and the new Speedwell Forge County Park. Other public uses include the Township municipal building, Township Park, and Brickerville Fire Company. Semi-public and nonprofit uses include the Lexington Rod and Gun Club, Lions Club Park, and Denver and Ephrata Telephone. Finally, the Township includes several churches and cemeteries, as well as a church-run counseling/residence center.

G. CONSERVATION/RECREATION

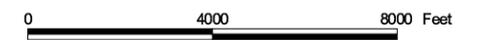
Conservation/recreation areas include private parks, campgrounds, woodlands, and State Game Lands. The majority of this land use category is located north of the Pennsylvania Turnpike and is associated with the heavily wooded southern slope of the Furnace Hills. Included in this area are the J. Edward Mack Boy Scout Camp, Spring Lake Park, and State Game Lands. Scattered throughout the Township are private woodland holdings.

Map 6
Existing Land Use and Adjacent Planning Map
Elizabeth Township, Lancaster County



Legend

- Preserved Farm (Green circle)
- Agricultural Security Area (Hatched circle)
- Existing Land Use
 - Agriculture (Light green circle)
 - Residential (Yellow circle)
 - Two Family Residential (Orange circle)
 - Multiple Family Residential (Brown circle)
 - Commercial (Pink circle)
 - Community Facility (Blue circle)
 - Industrial (Grey circle)
 - Woodland (Dark green circle)
 - Vacant (Purple circle)
- Adjacent and Regional Planning
 - Agriculture (Green wavy line)
 - Commercial (Red wavy line)
 - Conservation (Brown wavy line)
 - Forest/Recreation (Dark green wavy line)
 - Low Density Residential (Yellow wavy line)
 - Rural Residential (Orange wavy line)



Base Map: Lancaster County GIS Department Landbase
Projection: Pennsylvania State South, NAD 83, U.S. Feet
Adopted: September 8, 2003
Plot Date: September 26, 2003

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VI. ADJACENT AND REGIONAL PLANNING

The Existing Land Use and Adjacent Planning Map depicts the planned land uses in municipalities that adjoin Elizabeth Township. As can be seen, a variety of planned land uses is located adjacent to the Township's boundary. The following will summarize those land uses planned for each municipality bordering the Township.

A. PENN TOWNSHIP

Penn Township adjoins Elizabeth Township along its western border. The *Manheim Central Region Comprehensive Plan*, adopted in June 1993, shows most of those areas adjoining Elizabeth Township to be proposed for Agricultural or Conservation uses. North of the Interstate, State Game Lands comprise the bulk of the area planned Conservation, while just south of the Interstate, private woodlands and lands with septic or development constraints make up the remainder of lands proposed Conservation. Commercial uses are planned for the intersection of Newport, Speedwell Forge, and Brubaker Valley Roads at Elm, reflecting existing commercial uses in this area. A small area of Low-Density Residential is planned along Newport Road, just southeast of this intersection, again reflecting existing uses.

The remaining land area bounding Elizabeth Township, both to the north and the southeast of Elm, is planned for continued Agricultural use, reflecting existing agricultural activity and productive farm soils. The Agricultural Plan designation is implemented with effective agricultural zoning. An area between Oak Lane to just south of Hill Road is additionally enrolled in an agricultural security area, indicating the long-term interest in agriculture in the area (see Section G, Pennsylvania Agricultural Security Area, which follows).

B. WARWICK TOWNSHIP

Warwick Township adjoins Elizabeth Township along its southern border. The recently adopted (1999) *Lititz/Warwick Strategic Comprehensive Plan* proposes a mix of land uses in this area. A very small area along Lexington Road in Halfville is planned for Low-Density Residential uses, as is a larger area in Lexington, from west of PA Route 501 to east of Chestnut Street, all reflecting existing uses. From east of Chestnut Street to Hammer Creek is an area planned for Rural/Estate lots. The length of Hammer Creek, to the Clay Township line, is planned Conservation, reflecting the floodplain within this area.

C. CLAY TOWNSHIP

Clay Township adjoins Elizabeth Township along its eastern border. The draft 1992 *Clay Township Comprehensive Plan* shows most of those areas adjoining Elizabeth Township to be proposed for Agricultural or Conservation uses. The northernmost portion of Clay Township, along Segloch Run, is planned Forest/Recreation and is in private woodlands. To the south of this are State Game Lands, planned Conservation along Segloch Run, and Forest/Recreation to the interior. South of the State Game Lands and north of the Interstate, is an area in private woodlands planned Conservation. South of the Interstate to just short of Clay is an area planned Conservation, again along Segloch Run, and Rural to the interior. The Rural plan designation applies to a mixture of farmlands and wooded areas and is intended to permit agricultural and rural uses. Clay itself is planned Neighborhood Commercial on both sides of PA Route 322, reflecting existing and planned commercial uses, while the area along Middle Creek is planned Conservation. South of Clay, to the Warwick Township boundary, is planned Agricultural, reflecting existing agricultural activity and productive farm soils. The Agricultural Plan designation is implemented with effective agricultural zoning. In addition, most of the land south of Clay, to the Warwick Township boundary, is enrolled in an agricultural security area, and much of the land between Clay and Brunnerville Road consists of permanently-preserved farms.

D. HEIDELBERG TOWNSHIP

Heidelberg Township in Lebanon County adjoins Elizabeth Township along its northeastern border. The Township is nearing completion of an update to its 1970 *Heidelberg Township Comprehensive Plan*. The draft plan shows all land adjoining Elizabeth Township proposed for Agricultural uses. However, the Agricultural zoning applicable to the area does not limit the number of nonfarm dwellings, making it more of a Rural zone. The J. Edward Mack Boy Scout Reservation extends from Elizabeth Township up into Heidelberg Township, between Hammer Creek and Furnace Run, limiting development in this area.

E. SOUTH LEBANON TOWNSHIP

South Lebanon Township in Lebanon County adjoins Elizabeth Township for a short distance along its northwestern border. The 2000 *South Lebanon Township Comprehensive Plan* shows all land adjoining Elizabeth Township as proposed for Recreation, Forest, and Conservation uses. The great majority of the land area bounding Elizabeth Township lies within the City of Lebanon Watershed Area.

F. LANCASTER COUNTY COMPREHENSIVE PLAN

The Lancaster County Comprehensive Plan consists of four components: (1) the Policy Plan, (2) the Growth Management Plan, (3) the Action Plan, and (4) Regional Plans. The first component, the Policy Plan, contains policy goals and objectives concerning major issues facing the County. The Policy Plan was adopted by the Lancaster County Board of Commissioners in January 1991.

The Growth Management Plan (GMP) is the second component of the Lancaster County Comprehensive Plan. The GMP visually represents the land use goals and objectives contained in the Policy Plan. It is designed to assist the County and local municipalities in guiding and influencing the pattern, location, and timing of growth, and in determining areas appropriate for continued agricultural, resource, and rural uses.

The GMP proposes the use of urban growth boundaries as the primary way to manage growth effectively within the County. An urban growth boundary (UGB) is a line drawn on a map around an area that includes a city or borough at its center, developed portions of townships, and enough additional buildable lands to meet future land use needs to the year 2010. A UGB line provides a "boundary" that separates areas appropriate for urban growth and the extension of urban services, particularly sewer and water, from areas intended for agricultural, resource, and rural uses.

Some of the benefits UGBs provide include the preservation of community identity and character, the control of sprawled development patterns, the preservation of prime agricultural lands, predictability in capital improvements planning, tax savings in the efficient provision of public services and facilities, the revitalization of urban areas, and simplified decision-making at the urban edge.

A UGB has been adopted by Warwick Township to accommodate its projected year 2010 population projection. This boundary extends north of Lititz to the Elizabeth Township boundary and includes all of those lands planned for Low-Density Residential use in the Lexington area along the Warwick-Elizabeth boundary. The adjacency of this UGB provides Elizabeth Township the option to extend the UGB into the Township, should it choose to direct any significant growth, particularly that requiring public sewer and water, into this area.

The GMP also proposes the use of village growth boundaries as a way to manage growth in rural areas, such as Elizabeth Township. The same principles that apply to the use of UGBs would apply to village growth boundaries. The Township could choose to establish a village growth boundary for Brickerville as a means of controlling sprawled development patterns and creating a sense of community identity and character. Such a boundary would be sized to accommodate most, though not all, of the Township's growth to the year 2010.

G. PENNSYLVANIA AGRICULTURAL SECURITY AREA

Elizabeth Township currently has approximately 1,727 acres enrolled in agricultural security areas, all in the southeastern portion of the Township, south of Brubaker Valley Road, and west of the Clay Township boundary. Of this acreage, 493 acres in four farms are permanently preserved for agricultural use, while 50 acres are under term easement.

Typically, agricultural security areas comprise at least 500 acres of farmland identified by farm owners and township supervisors to secure the future of farming and agricultural industry. The main goal of agricultural security areas is to help slow urban development pressure exerted upon highly agriculturally productive areas. To carry out this goal, the municipality administers three policies. These policies include:

1. The township supervisors agree to support agriculture by not passing laws that restrict normal farming operations or structures;
2. The condemnation of farmland by a government in the agricultural security area must first be approved by the Agricultural Lands Condemnation Approval Board to determine if alternative sites are available for condemnation; and,
3. The farmland preservation options offered by the Agricultural Preserve Board are available to qualified farm owners in an agricultural security area. For example, only a farm owner in an agricultural security area may be eligible to receive cash for permanently preserving his farm with a conservation easement.

Elizabeth Township should be commended on its effort to preserve the agricultural heritage of the Township. ***However, additional farmlands should be continuously added to the total acreage comprising the agricultural security area. Policies resulting from this comprehensive planning effort and subsequent ordinances should also support the continued addition of farmland acreage to the agricultural security area.***

VII. PUBLIC FACILITIES AND SERVICES

A. SCHOOLS

A high quality education is a widely-held objective for most of our society. Historically, school districts have forecast short-term future demands for school facilities, enabling them to program additional building expansion, construction, consolidations, and closures to meet forecasted demands. School district planning can have a direct effect on, as well as be affected by, the land use activities within an area. For instance, new or expanded schools may generate increased nearby residential development, and school closures may contribute to the depopulation of communities. At the same time, long-range municipal land use planning may designate new growth areas at some distance from existing or planned school facilities. All of these issues underlie the importance of coordinating school district and municipal comprehensive planning processes to assure that growth of existing and future schools and planned community growth occur hand-in-hand.

To gain an understanding of the educational facilities and programs available to Elizabeth Township students, Dr. Stephen Iovino, Superintendent of the Warwick School District, was contacted on April 12, 2000.

The Warwick School District includes all of Elizabeth Township as well Warwick Township and Lititz Borough. The School District is governed by a nine-member school board whose membership is elected at large.

Presently, the School District employs the following grade format:

Elementary School	K-6
Middle School	7-8
High School	9-12

In addition to the normal curriculum, the School District provides facilities, programs, and services for its special education students. High school students are also eligible to attend one of the vocational/technical schools located in Lancaster County. This v-tech program is offered to seniors on a full-day basis and includes many practical and interesting areas of study.

Elizabeth Township is served by the John S. Beck Elementary School, the Warwick Middle School, and the Warwick High School, all of which are located in neighboring Warwick Township to the south. The following table and graph describe these schools:

School Name	Year Built	Renovation Dates	Rated Condition	Grades Housed	Rated Capacity	2001-02 Enrollment
Beck Elementary	1939	1987	Good	K-6	600	507
Warwick Middle School	1971	–	Good	7-8	1041	707
Warwick High School	1957	1965 & 1990	Good	9-12	1692	1387

The preceding table displays all school facilities that service Elizabeth Township. Based on this table, Warwick School District has adequate room for enrollment and could handle any additional growth that may occur over the next few years.

All of Elizabeth Township's students are presently bussed to their respective schools. ***To ease the District's bussing efforts, it is recommended that development in Elizabeth Township be concentrated in several development nodes rather than scattered along the Township's extensive road system. This would enable shorter bus journeys and lessen the congestion caused by stop-and-go rural bus routes.***

How growth is managed is a continued concern of the School District. Dr. Iovino would like to see each elementary school comprised of a diversity of students. This diversity enriches the educational experience through better socialization of the students who are exposed to different lifestyles and personal values. ***To accomplish this diversity, it is recommended that the Township allow a variety of residential densities in its growth areas.***

The School District has experienced a close-working relationship with the Township, inviting the Township to participate along with other District municipalities at a special annual meeting of the School Board. Overall, the Township appears to enjoy a high level of educational service from its School District. Local officials should feel confident that the School District is constantly monitoring population changes and student needs to avoid overcrowding and assure a high quality education.

B. PARKS AND RECREATION

The planning for both passive and active recreation opportunities is an important component of any comprehensive planning effort. Recognizing this, Elizabeth Township in partnership with Warwick Township, Lititz Borough, the Warwick Area School District, and the Lititz Community Center developed the Warwick Region Comprehensive Recreation, Park, and Open Space Plan (WRCRPOS Plan). The purpose of this study was to inventory and analyze all the facilities, programs, administration, financing, maintenance, and safety of the parks and recreation components within the Warwick Region and to recommend how to improve each aspect. The following are portions of the existing conditions and inventory analysis from the WRCRPOS Plan as it relates to Elizabeth Township. Additionally, portions of the recommendation section from the WRCRPOS Plan focusing on both the Township and the Region are provided.

EXISTING CONDITIONS

Although Warwick Region contains a variety of recreational areas available for public access, the following is a comprehensive listing of parklands available within Elizabeth Township:

PARK AND RECREATIONAL FACILITIES INVENTORY				
Site Name	Acreage	Ownership	Location	Facilities
Elizabeth Township Municipal Park	1.3	Elizabeth Township	Elizabeth Township beside Township building at corner of South View Dr. and Sleepy Hollow Rd.	Basketball court, restrooms, picnic tables, playground equipment, parking lot
Speedwell Forge Lake	148	Pennsylvania Fish and Boat Commission	Elizabeth Township off Rt. 501 North off Rt. 501 north	Pavilion, boating/fishing lake, hiking trails, parking lots
State Game Lands 156 and 46	1,387	Pennsylvania Game Commission	Elizabeth Township north of PA Turnpike eastward from Township line to Segloch Road	Open space
Middle Creek Wildlife Management Area (formerly Coleman Estate)	1,093	Pennsylvania Game Commission	Elizabeth Township off Rt. 322 at Hopeland Road	Open space
Speedwell Forge County Park	238	Lancaster County	Elizabeth Township south of PA Turnpike from Township line eastward to Speedwell Forge Road	Hiking trails, open space
Brickerville Fire Company	2.5	Brickerville Fire Company	Elizabeth Township off Rt. 322 on Hopeland Rd.	Playground equipment, pavilion, softball field
Penn-Elm Area Lions Club Park	1	Penn-Elm Area Lions Club	Elizabeth Township at corner of Newport Rd. and Oak Lane	Playground equipment, pavilion, restrooms
J. Edward Mack Boy Scout Reservation	984	Boy Scouts of America Pennsylvania Dutch Council	Elizabeth Township north of Rt. 322 on Rt. 501	Swimming pool, bathhouse, hiking trails, restrooms, pavilions, camping, fishing/boating pond, bike trails, archery area, shooting range, climbing
Horseshoe Trail	4 miles	Private	Elizabeth Township	Hiking and equestrian trail
Conestoga Trail	14.5 miles	Private	Elizabeth Township starts off Rt. 322 2 miles west of Rt. 501; ends in Warwick Twp. at Newport Rd. (Rt. 772) at Cocalico Creek crossing	Hiking trail

Source: Warwick Comprehensive Recreation, Park and Open Space Plan

Elizabeth Township road department staff maintains the small park area located adjacent to the Township building, with the exception of grass mowing which is contracted out to a private vender. Elizabeth Township has two full-time road department workers. One of the workers conducts monthly inspections of the equipment using a brief form designed for this purpose. The park owners maintain all the other park facilities within the Township.

BUDGETING PROCESS FOR RECREATION AND PARKS

Budgets are the financial documents adopted each calendar year that serve as a guide to control spending and identify work to be accomplished.

The elected officials in each municipality adopt a proposed budget not later than November 30, which is then open for public inspection. Final budgets are approved no later than December 31 of each year.

The General Fund Budget is the document that contains funding for most activity carried out by local government. Listed below is a five-year summary of all General Fund revenues and expenses for each municipality. While not all of the individual line items can be compared between municipalities, all do make expenditures for Parks and Recreation purposes.

ELIZABETH TOWNSHIP BUDGET

	1997	1998	1999	2000	2001	2001
Revenues	Actual	Actual	Actual	Actual	Budget	%-age
Taxes	\$357,610	\$379,805	\$380,856	\$420,530	\$398,000	79.1%
Licenses & Permits	5,626	6,100	6,538	7,348	7,550	1.5%
Fines & Forfeits	3,644	8,187	5,944	5,299	5,500	1.1%
Interest	43,178	49,724	66,761	53,608	50,000	9.9%
Intergovernmental	5,364	5,774	5,386	3,016	2,980	0.6%
Earnings	38,363	17,000	61,468	-4,108	28,800	5.8%
Misc.	12,488	8,176	10,884	10,315	10,000	2.0%
Total General Fund	\$466,273	\$474,766	\$537,837	\$496,008	\$502,930	100%

	1997	1998	1999	2000	2001	2001
Expense Category	Actual	Actual	Actual	Actual	Budget	%-age
General Government	\$69,581	\$64,242	\$77,232	\$126,199	\$95,955	16.7%
Public Safety	57,785	48,648	97,081	66,238	89,600	15.6%
Public Works	161,447	211,287	116,570	305,768	325,850	56.7%
Parks & Recreation	10,991	10,888	7,404	7,166	9,400	1.6%
• Lititz Library	(7,000)	(7,500)	(5,000)	(7,000)	(7,000)	
• Salaries and Wages	(2,856)	(3,243)	(2,086)	(66)	(2000)	
• Supplies	(396)	(145)	(318)	(100)	(400)	
• Capital Purchases	(739)	(0)	(0)	(0)	(0)	
Benefits & Misc.	48,014	41,184	41,567	47,327	53,700	9.4%
Transfers	0	0	0	24,152	0	
Total General Fund	\$347,818	\$376,243	\$339,853	\$576,850	\$574,505	100%

BUDGET NOTES

1. Elizabeth Township does not levy any real estate tax. There is no mandatory dedication requirement for residential land development or subdivision. There is no income from parks and recreation facilities or services.
2. The Elizabeth Township Secretary presents a draft proposal in November for review and finalization by the Supervisors.
3. Parks and Recreation spending is budgeted at \$2.45 per capita in 2001 (\$9,400 divided by 3,833 population).
4. Parks and Recreation salaries and wages reflect the payroll expense for the road crew to perform maintenance to the recreation area.
5. Contracted mowing of the municipal building and adjoining park is paid from the General Government expense category.
6. There is no capital budget for parks and recreation in 2001.

ANALYSIS OF EXISTING CONDITIONS

Warwick region residents are fortunate to have a diversity of park land and recreational facilities available to them. Equally as diverse is the list of owners of these properties.

All of the community's regional park land is located in Elizabeth Township, within easy driving distance of Warwick region residents. Lititz Borough provides a public outdoor swimming pool for the region, while the Lititz Community Center provides an indoor swimming pool. A large number of privately-owned athletic fields exist and are open for public use. They are scattered throughout the region and are primarily stand alone facilities. The area's private schools allow public use of their facilities, as does the public School District. The municipalities and the School District have been actively involved in acquiring and developing park land and trails, particularly Warwick Township, which has taken a lead role.

PARK CATEGORIES

Warwick region parks have been classified into six (6) categories for analysis. Listed below are the categories and a brief definition.

- Neighborhood parks are generally areas of 10 acres or less that are developed for both active and passive recreation activities. They are geared specifically for those living within a half-mile service radius.
- Community parks are larger in size than a neighborhood park, usually containing between 20 and 50 acres. Their focus is to meet active and passive recreation needs as well as preserving unique landscapes and open spaces. The service area for community parks is a three-mile radius.
- School parks include public school sites with facilities that could serve as a neighborhood or community park.
- Greenways/trails are linear park areas that focus on passive recreation and the natural environment. These areas frequently form connections throughout the community.
- Private parks/recreational facilities are those owned by for-profit enterprises and those owned by non-profits, which are exclusively available to members.
- Regional parks are large areas, usually over 200 acres in size, used for outdoor recreation. They serve several municipalities and include county parks, game lands, and wildlife management areas.

The following Table reports the total parks and recreation acreage, by category, within each municipality and the entire region.

Warwick Region Park Land Acreage by Category

	Neighborhood Parks (1)	Community Parks (2)	School Parks (3)	Greenways/ Trails (4)	Private Parks (5)	Regional Parks (6)	Total
Elizabeth Township Population: 3,833	1.3			11 miles	988.5	2,886	3,855.8 11 miles
Lititz Borough Population: 9,029	4.7	24.5	57.9	5.8 0.3 miles	64.4		157.3 0.3
Warwick Township Population: 15,475	26.4	66.4	66.3	2.3 14.1 miles	170.9		332.3 14.1 miles
Warwick Region Population: 28,337	32.4	90.9	124.2	8.1 25.4 miles	1,223.8	2,866	4,345.4 25.4 miles

Elizabeth Township Parks by Park Category

- (1) Neighborhood Parks
Elizabeth Township Municipal Park
- (2) Community Parks
None
- (3) School Parks
Warwick School District Facilities
- (4) Greenways/Trails
Horseshoe Trail
Conestoga Trail
- (5) Private Parks/Recreational Facilities
J. Edward Mack Boy Scout Reservation
Penn-Elm Area Lion's Club Park
Brickerville Fire Company
- (6) Regional Parks
Speedwell Forge Lake
State Game Lands
Speedwell Forge County Park
Middle Creek Wildlife Management Area

PARK LAND ACREAGE STANDARD

The following table compares the existing Warwick region neighborhood, school, and community park land with the park land standard established by the Lancaster County Planning Commission. The comparison is made within each municipality and also for the entire region.

The Lancaster County Planning Commission recommends municipalities should have a minimum of 10 acres of community and neighborhood parks for every 1,000 residents, and five acres of regional park land for every 1,000 residents. The Warwick region feels that this standard meets their needs for park land and has accepted its use.

The analysis reveals an existing deficiency of park land in Elizabeth Township (37) acres. Warwick Township exceeds the park land standard by 6.6 acres. Lititz Borough exceeds the standard by 2.6 acres largely because of School District facilities. The population figures used are from the 2000 census.

Comparison of Available Park Land to County Standard

	Existing Neighborhood School and Community Parks	Lancaster County Standard (10 acres/1,000 pop.)	Excess (+) or Deficit (-)	Existing Regional Parks	Lancaster County Standard (5 acres/ 1,000 pop.)	Excess (+) or Deficit (-)
Elizabeth Township	1.3	38.3	(-) 37	2,866		(+)2,724.3
Lititz Borough	92.9	90.3	(+) 2.6	0		
Warwick Township	161.4	154.8	(+) 6.6	0		
Region	255.6	283.4	(-) 27.8	2,866	141.7	(+)2,724.3

NEED FOR ADDITIONAL RECREATION AND PARKS STAFF

Recreation and parks services in the Warwick region are understaffed. The communities have no parks and recreation director, no one with the training and experience whose work focuses on the improvement of the park system and coordination of community recreation programs and park and field use. Only Warwick Township has a staff person dedicated solely to parks and recreation, a full-time park maintenance worker.

The municipalities provide no recreation programming, and look to the Lititz Community Center to do so. The Lititz Community Center focuses its attention at the present time internally within its building, rather than providing many programs at other community locations. The Lititz Community Center appears to need additional staff, particularly professional staff with strong recreation and parks programming backgrounds.

FINANCE:

MANDATORY DEDICATION

The Pennsylvania Municipalities Planning Code provides local governments with a financial tool to assist with the capital expense of creating parks and recreational areas and facilities to serve the future residents of new housing developments. Subdividers and land developers can be required to provide an amount of land for recreation or pay fees in lieu of dedication under specific conditions. Warwick Township and Lititz Borough have each enacted a mandatory dedication ordinance that requires .04 acres of land be set aside for each new dwelling unit constructed. In the event a fee in lieu of dedication is required, the fee is determined by assessing the value of land that was required for dedication.

The Municipalities Planning Code requires that this income be deposited into an interest bearing account, clearly identifying the specific recreation facilities for which the fees were collected. Interest earned on such accounts becomes funds of these accounts.

Elizabeth Township has not enacted this important financial tool to provide funds for parks and recreation. Should the Township enact a mandatory dedication ordinance that requires .04 acres of land be set aside for each new dwelling unit constructed the Township, based on 2010 and 2020 projections, would expect to receive 3.96 acres of parkland by 2010 and a gross of 7.82 acres of parkland by 2020.

Formula:

<u>Projected Increase</u>	+	<u>2000 average household size</u>	=	<u>New Dwelling Units</u>
290 persons per decade	+	2.9	=	99 new units per decade
<u>New Dwelling Units</u>	x	<u>Land Dedication Per Unit</u>	=	<u>Total Dedication Acres</u>
99 new units per decade	x	.04	=	3.96 acres per decade

RECREATION PROGRAM SPENDING

None of the municipalities in the Warwick region spend money directly on recreation programming.

All three municipalities make annual contributions to the Lititz Public Library and two donate funds to the Lititz Community Center. These contributions are made to generally support these organizations, with no strings attached, rather than to provide community recreation programs. Listed below is a summary of these contributions.

	<u>Lititz Public Library</u>		<u>Lititz Community Center</u>	
	<u>Amount</u>	<u>Per Capita</u>	<u>Amount</u>	<u>Per Capita</u>
<i>Elizabeth Township</i>	\$ 3,900	\$1.83	N/A	N/A
<i>Lititz Borough</i>	\$10,000	\$1.11	\$18,000	\$1.99
<i>Warwick Township</i>	<u>\$20,000</u>	<u>\$1.29</u>	<u>\$ 8,000</u>	<u>\$0.52</u>
Region Totals	\$37,000	\$1.57	\$26,000	\$1.10

RECOMMENDATIONS

Based on the results of the Inventory and Analysis Phases of the Plan, the following Recommendations are made in each category of Goals:

1. Cooperation and Partnership

Goal: Strengthen existing relationships and develop partnerships among municipalities, the school district, churches, private schools, non-profit organizations, community groups, individual volunteers, and local businesses through greater coordination and cooperation, that expand and improve park facilities and recreation program opportunities for the region's citizens.

Policies: Develop as many partnerships as possible in the provision of regional parks and recreation services.

Improve communication among potential partners.

Encourage a volunteer focus by exploring ways to effectively involve citizens, groups, and organizations to improve park facilities and provide recreation programs.

Recommendations:

- Forge a close working relationship between the Community Center and Library to include cross-promotion of programs.
- Work with existing community special event providers to enhance and improve the events.
- Promote and improve communication and identify opportunities for collaborative efforts and sharing of resources by establishing a network of park facility and recreation program providers to help them better understand their role as part of the regional recreation and parks system.
- Consolidate reservation for and scheduling of park facility use to one office.
- Utilize Linden Hall, Millport Conservancy, The Mill, Speedwell Forge Lake, and other publicly and/or privately-owned facilities as sites for community recreation programs and special events.
- Forge new and strengthen existing partnerships with the retirement communities, commercial recreation providers, civic and service groups, churches, businesses, etc. to enhance recreation services in the region.
- Place a priority on making municipal and School District park development and improvement work, and expansion of recreation program opportunities, cooperative projects that involve a number of partners, both public and private.
- Explore opportunities among municipalities, the School District, and other recreation providers to apply for grants together.
- Develop a teen center in partnership with the Warwick Ministerium and the Community Center.

- Improve community access of School District recreation facilities, both indoor and outdoor, by reviewing and updating the scheduling and approval process with the help of groups who use the facilities.

2. Recreation Administration

Goal: Within a regional system, operate existing and plan for future park and recreation facilities and programs that make efficient use of all resources.

Policies: Provide regional administration for parks and recreation services.

Allow opportunities for the region's providers to have input into the operation of the parks and recreation system.

Recommendations:

- Establish a Parks and Recreation Commission in Elizabeth Township.
- Establish a Regional Recreation Commission by adopting an intergovernmental agreement among five partners: Lititz Borough, Elizabeth Township, Warwick Township, Warwick School District, and Lititz Community Center; or any combination of the partners. Charge the Commission with developing a Strategic Plan based on the WRCRPOS Plan, develop specific tasks to achieve the desired results, and measure the success of the tasks.
- Apply for a DCNR Circuit Rider grant to hire a Recreation and Parks Director for the region. The Recreation and Parks Director's work will focus on coordination, cooperation, and collaboration to improve the region's parks and recreation system. The aim of the Director will be to integrate all of the separate providers of recreation services to create a comprehensive regional system. This will be accomplished by:
 1. Facilitating joint marketing and promotion (regional park map and brochure, volunteer opportunities, recreation program guide, etc.),
 2. Coordinating the scheduling of municipal and School District park and recreational facilities for community group use,
 3. Assisting the municipalities with park acquisition and development projects,
 4. Writing grant applications for recreation and park funding for municipalities,
 5. Working with municipalities to expand greenway and trail network,
 6. Working with existing providers to enhance community special events,

7. Working with park and recreation facility providers (public and private) to ensure proper upkeep and care of facilities and adherence to safety standards,
 8. Finding ways to fill in the gaps in the recreation system and ways to eliminate duplication, and suggesting these to providers to help ensure that all segments of the population are well served with recreation programs,
 9. Promoting and improving communication among recreation program providers and identifying opportunities for collaborative efforts and sharing of resources by establishing a network,
 10. Expanding use of school indoor facilities for community recreation programs,
 11. Recruiting volunteers for recreation programs and park enhancement and clean-up projects,
 12. Encouraging development of programs in addition to youth sports at park locations, and
 13. Assisting partners with the implementation of the Regional Comprehensive Recreation, Park, and Open Space Plan recommendations, and
 14. Find ways to fill in the gaps in the recreation system and ways to eliminate duplication, and suggest these to recreation providers to help ensure that all segments of the population are well served with recreation programs.
- Assist partners with the implementation of the WRCRPOS Plan recommendations.
 - Have the Regional Recreation Commission join the Pennsylvania Recreation and Park Society.
 - Provide office space for the Recreation and Parks Director as an in-kind contribution from one of the partners.
 - Place the Recreation and Parks Director on the payroll, insurance, and pension systems of one of the partners.
 - Write a detailed job description for the Recreation and Parks Director position.
 - Fund the Recreation and Parks Director's salary at a competitive level to hire a professionally trained and experienced person for this position.
 - Gauge the effectiveness of the Recreation and Parks Director's performance by establishing measurable work goals and objectives to achieve the results desired by the region.

- Consider the Community Center as the clearinghouse agency for all recreation and parks information in the region and the agency to provide clerical staff assistance to the Recreation and Parks Director, in exchange for increasing the municipal donations to the Community Center. The image of the Community Center will be enhanced by being the place for people to call and get answers. At the same time, the municipalities will get increased value for their donations to the Community Center.

3. Recreation Programming

Goal: Meet community recreational needs by integrating existing recreation providers into a comprehensive regional system.

Policies: Offer the public a balanced schedule of recreation programs that limits duplication of effort.

Create a network of recreation program providers who understand their role within the regional parks and recreation system.

Develop a variety of year-round recreation programs for people of all ages, incomes, and abilities.

Recommendations:

- Expand recreation programming in these areas:
 - Summer youth programs
 - Cultural arts
 - Outdoor concerts – weekday lunchtime, weekend afternoon/evening
 - Older adult fitness/wellness activities
 - Coed adult sports leagues
 - Performing arts
 - Sports camps and clinics
 - Teen recreation
 - Community service
 - Club sports for teens
 - Intergenerational programs
 - Family programs – children with parents/grandparents
- Establish a nature center/environmental education program for the region and consider Millport Conservancy and/or Speedwell Forge Lake as the location.
- Encourage the development of recreation programs, in addition to youth sports, at park locations.
- Encourage youth sports associations to adopt a code of ethics and conduct that must be signed by officers, coaches, parents, and children.
- Encourage recreation program providers to implement the processing of background clearances for staff and volunteers as a condition of employment or volunteering.

- Look for ways to enhance family involvement in all recreation programs and community special events.
- Develop a formal relationship with Community Hospital for rehabilitation, health, fitness and wellness-related programming.
- Increase the number of cooperatively planned recreation programs.
- Adopt a written policy statement regarding inclusion of persons with disabilities for recreation programs that is agreed upon by providers, and develop an inclusion process for them to follow.
- Promote which recreation providers allow access to programs regardless of ability to pay, and standardize as much as possible the process participants need to follow if they are unable to pay the full fees.

4. Finance

Goal: Pursue the region's appropriate allocation of funds and development of income sources to maintain existing parks, trails, and greenways; acquire and develop additional neighborhood, community, and linear parks, and offer recreation programs for its citizens.

Policies: Fund the provision of community recreation programs on a regional basis.

Fund parks and open space acquisition and recreational facility development.

Identify potential sources of funding to improve parks and recreation opportunities.

Recommendations:

- Develop a standardized fee schedule for park facility rentals that is uniform among the region's municipalities.
- Encourage each of the region's municipalities to provide per-capita contributions to the Community Center and Library.
- Establish lines of communication between the Regional Recreation Commission and the region's businesses to promote, encourage their continued involvement in, and thank them for their participation in the funding of park areas, recreation facilities, and programs.
- Enact a mandatory dedication of land/fee in lieu of land dedication ordinance for Elizabeth Township.
- Pursue business sponsorship of community recreation programs and special events.
- Encourage the municipalities to budget additional general fund dollars to support the operation, development, and maintenance of park areas and recreation facilities.

- Provide municipal funding for the Regional Recreation Commission to cover benefits, if not provided in-kind, and salary for the Recreation and Parks Director.
- Pursue and write grant applications for funding for park acquisition, recreation facility development, and staffing needs.

5. Parkland Development and Open Space Conservation

Goal: Acquire and develop new and maintain and update existing parks and recreational areas that will meet the needs of the region's citizens, protect significant cultural and historic resources and sensitive natural resources, and provide a system of open space linkages between communities and facilities.

Policies: Strive to meet the current Lancaster County parkland and open space acreage standards or the standards as established by the needs of each individual municipality through the acquisition and development of new park lands and facilities.

Develop consistent standards within the region for facilities that are to be provided, both in terms of primary recreation facilities and support facilities. Plan new facilities and upgrade existing facilities to meet these requirements.

Provide sufficient indoor recreation areas and facilities for the region.

Continue to connect schools, parks, library, community center, recreation facilities, and other services with a trail system.

Identify and preserve existing natural, historic, and cultural features within the region.

Recommendations:

Within Elizabeth Township:

- Provide 37.03 acres of community and neighborhood parkland to meet current population needs at the rate of 10 acres of parkland per 1,000 residents (3,833 residents need 38.33 acres of parkland, 1.3 acres are currently available). Provide the bulk of required parkland in one Community Park in the Brickerville area; a park that could combine primarily active recreation facilities with some passive pursuits. Develop the Community Park in phases in order to limit the financial burden on the Township.
- Provide an additional 8.07 acres of community and neighborhood parkland within the next ten years to address the anticipated shortfall represented by projected population growth (the population is projected to grow by 807 residents to a total of 4,640 by 2010).
- Adopt land dedication or fee-in-lieu provisions at the rate of 0.04 acres per dwelling unit or lot. The recommended rate is based on the land dedication that can be substantiated to meet the requirements of the PA Municipalities Planning Code.

- Encourage developers to provide fees-in-lieu of land dedication to generate funds that could be utilized for Community Park acquisition and improvement. Seek to augment Township financial resources with Lancaster County Park Initiative and Keystone Grant funding.
- Encourage developers to provide open space within developments to create neighborhood parks that meet and/or exceed the shortfall within the Township, once the Community Park is developed. Consider use of full land dedication (if parkland is then to be improved by the Township) or combination of land dedication and improvements (if parkland is to be developed at no additional capital cost to the Township).

Within the Region:

- Encourage the School District to provide new recreation facilities for emerging sports (including rugby and lacrosse) and for community use as it embarks on new campus construction projects; including athletic fields (across the board as well as midget football fields) and gymnasium space at Kissel Hill and/or John Beck Elementary Schools (especially for elementary school wrestling program). Encourage the District to improve the Bonfield athletic field surfaces, as required.
- Provide the following additional recreation facilities within the above-described municipal parkland or school campus sites:

	Base- Soft-ball/ Soccer	Basket- ball	Fishing/ Ice Skating	Roller Hockey	Tennis	Volley- ball
New Elizabeth Township Park	1 each/ 1 ea. (future)	1		1(future)	1 (future)	1 (future)

- Review the above list of recreation facilities with the community's recreation program providers to determine if additional primary facilities are needed (that could be provided on new School District lands, if applicable, or within new park lands developed in cooperation with development projects), what support facilities are desirable, and what additional requirements/considerations are warranted.
- Seek to acquire municipal parkland adjacent to School District campuses in order to facilitate the joint use of facilities and further encourage cooperation with the School District.
- Develop areawide, multi-use trails with connections to the Conestoga Trail North, Middle Creek and Segloch Run Greenway, and Horseshoe Trail. Also plan for possible connection to other municipalities' systems or community features (schools, libraries, parks, commercial centers, and community gathering places). Provide consistency in design, construction, and selection of furnishings in order to create a seamless trail system.

- Conduct market analysis and/or feasibility study to determine viability of commercial dance club, theater, roller rink, and bowling complex within the region, recognizing that many of these facilities exist or are currently being planned in surrounding municipalities.
- Retain the variety of locations at which athletic/sports organization fields are located to create interest in traveling to new areas within the region. However, in preparing plans for new park and recreation facilities, consider grouping similar fields for ease of maintenance and conduct of tournaments.
- Provide sufficient support facilities at each new public park. At existing public parks, provide the support facilities (signage, furnishings, parking, and rest rooms) noted below. At existing School sites, consider the following, as well:

Elizabeth Township Municipal Park

- Basketball nets and protective padding on uprights
 - Pavement under site furnishings (to eliminate trim mowing)
 - Pavilion with inclement weather escape, rest rooms, drinking fountain, and storage
 - Sign with rules and regulations
- Consider strategic placement of field lighting to expand use of facilities for after-dark use.
 - Develop standards for park maintenance and upkeep, including routine playground inspections.
 - Encourage Continuing Care Retirement Communities to provide playground improvements (for visiting grandchildren) and computer facilities for resident and visitor use (possibly through local company/business trade-in program).
 - Encourage private facility owners to improve recreation facilities to the same standards as required of public providers (especially as regards playground safety, accessibility, maintenance, and support facilities).

6. Maintenance, Safety, Security, and Accessibility

Goal: Ensure that public parks and recreational facilities and programs are accessible to all, well-maintained, meet current safety and security standards, and provide an enjoyable environment for participation, and encourage private facility and program providers to do the same.

Policies: Provide parks and recreational facilities that meet all safety and accessibility guidelines.
Encourage owners or lease holders of private facilities used for public recreation programs to maintain their facilities according to public facility standards.

Plan all park improvements to minimize vandalism, allow oversight of facilities, and increase safety and security for visitors.

Encourage a natural/organic approach to lawn and landscape maintenance of public lands and open space.

Recommendations:

- Establish joint minimum standards of care for all public park areas and recreation facilities owned or operated by the municipalities and School District.
- Schedule the necessary rehabilitation to improve park areas and recreation facilities to meet the minimum standards of care that have been established and to correct the deficiencies identified in the site inspections conducted for this plan.
- Establish a standardized inspection schedule and forms, together with a method to resolve identified safety and use issues for all park areas and recreation facilities owned or operated by the municipalities and School District. Initiation of a monthly playground inspection program should be a priority (see Warwick Township's program as example).
- Encourage other public and private park areas and recreation facility providers to complete needed rehabilitation identified in the site inspections conducted for this plan and to maintain their facilities according to the same standards established by the municipalities and School District.
- Assist the municipalities in establishing a year-round schedule of routine maintenance duties that must be performed to achieve the minimum standards of care.
- Work with youth sports organizations to enhance their field maintenance capabilities by explaining standards, methods of work, and equipment and material availability of the partners and/or owners of the park areas and recreation facilities.
- Enhance the opportunity for maintenance equipment to be shared and/or jointly purchased among municipalities, School District, and other potential partners such as youth sports organizations.
- Develop written maintenance equipment and vehicle replacement schedules for municipalities and School District.
- Standardize, adopt, and post park rules and regulations at all municipal and School District park areas and recreation facilities to both inform the public and allow police enforcement (see Warwick Township's ordinance as example).
- Evaluate contracting a variety of maintenance services such as turf fertilization and right-of-way and turf chemical applications.
- Schedule the necessary work identified in the site inspections conducted for this plan to ensure that all park areas and recreation facilities meet the Americans with Disabilities Act accessibility guidelines.

- Increase safety and security of all park areas and recreation facilities using a combination of passive (lighting, landscaping, fencing, etc.) and active (police patrols, neighborhood watch, etc.) measures.
- Establish a transition period to switch from a pesticide/synthetic fertilizer program to a natural/organic one, to include written guidelines and strategies with respect to current budget and equipment constraints, and training of maintenance personnel.
- Prepare a public education flyer that explains the benefits of the natural/organic approach and the effect it will have on the lands where the approach is applied, and include a list of web sites for further information, such as www.safeturf.com, www.motherearthorganics.com, www.fertrell.com, www.organicapproach.com, and www.sunfireinstitute.com.
- Encourage the development of a community composting site and educate residents about the importance of composting lawn and garden debris.
- Target and prioritize sensitive lands including wellhead protection areas, lands adjacent to wetlands, streams, floodplains, and sinkholes, and lands within close proximity of schools and residential developments.

7. Public Relations and Communication

Goal: Promote the value and importance of recreation and parks services to the quality of life in the Warwick region and encourage awareness and use of facilities and programs by the region's citizens.

Policies: Promote park areas, facilities, and recreation programs on a regional basis.

Increase the public's knowledge and awareness of the value of recreation.

Encourage the public's participation in park and recreation facilities and programs.

- Create and keep updated a comprehensive listing of recreation programs, providers, and contact information that is shared by partners and placed on websites.
- Expand the recreation program guide produced by the Community Center to include information on as many community recreation programs and events as possible.
- Establish links from all websites of the municipalities, School District, Library, and Community Center to each other, and to other major recreation providers in the Warwick region.
- Include information on park facilities and recreation programs in each issue of municipal and School District newsletters.
- Publish a Warwick region park brochure and map, featuring all park areas and recreation facilities (public and private ones available for public use).

- Establish one of the partners as the centralized place for the public to obtain information on all recreation and park facilities and programs in the region. The Recreation and Parks Director will provide clerical support staff with information so that they will be able to answer questions from the public. The clerical staff will also provide administrative support to the Recreation and Parks Director.
- Promote volunteer opportunities available in the region by developing a comprehensive listing that is available on-line on municipal, School District, Community Center, and Library websites, since providing to others as a community service is an important recreational activity for teenagers and adults.
- Develop an understanding on the part of the public about why recreation and parks services are important by promoting the individual, community, environmental, and economic benefits of park facilities and recreation programs.
- Place Community Center and Library printed information, as well as that of other recreation providers, at all municipal and School District offices.
- Write recreation program descriptions by describing the benefits of involvement to participants.

C. POLICE PROTECTION

Police protection is an obvious public service benefiting residents and businesses. The traditional role of the police involves three functions: law enforcement, order maintenance, and community service. Law enforcement involves the application of legal sanctions, usually arrest, to persons who injure or deprive innocent victims of life or property. Order maintenance involves the handling of disputes, or of behavior that threatens to produce disputes. The third aspect of the police function, and the one most likely to occupy the major portion of an officer's time, varies from community to community according to tradition and local ordinances. These are activities not necessarily related to criminal acts and include such tasks as traffic control, rescue operations, animal control, and ambulance and first aid services.

Elizabeth Township does not provide local police protection but instead relies upon the Pennsylvania State Police for coverage. To better understand how police services are rendered, an interview was conducted on April 5, 2000 with Sergeant Steven Miller, the Station Commander for the Ephrata Headquarters of the Pennsylvania State Police.

The State Police is a State agency founded in 1905, with headquarters first established in Lancaster County in 1920 in East Lampeter Township and Ephrata. Today, both original headquarters are a part of the larger Lancaster County-Chester County Troop J. The primary mission of the State Police is to provide police service to those municipalities that do not have local police departments, or that operate police departments on a part-time basis. Secondary duties required of the State Police include driver licensing, fire investigations, narcotic investigations, laboratory facilities, aviation assistance, SWAT teams, and safety education in schools.

The Ephrata headquarters of the State Police Troop J is the dispatch serving Elizabeth Township. State Police protection is broken down into patrol zones, Elizabeth Township comprising patrol zone no. 36. Needed manpower within patrol zones is determined based on consultations of statistical runs on calls. Normally, one patrol car with one police officer is assigned to Elizabeth and Clay Townships for each of two shifts from 6:00 a.m. to 2:00 p.m. and from 2:00 p.m. to 10:00 p.m. During the midnight shift (10:00 p.m. to 6:00 am), one patrol car with one police officer covers all of northeastern Lancaster County, as well as a small part of Chester County. Overlapping split shifts are utilized and back-up manpower is available from the East Lampeter headquarters when needed. The Ephrata headquarters houses 21 officers and three police communication officers.

The Ephrata headquarters, built in 2000, is adequate to meet current and projected future needs, according to Sergeant Miller. This facility has its own crime investigation unit and truck inspection service, and an accident reconstruction. The accident reconstructionist specializes in complex accident investigations where a fatality is involved and prosecution is considered. All other services are handled either out of the East Lampeter or Harrisburg headquarters.

One performance measure used to evaluate police effectiveness is response time, or the time that it takes an officer to arrive at the incident site. According to Sergeant Miller, no information is available on average response time for emergency calls within Elizabeth Township. However, he did note that response time is highly dependent upon the type of call (emergency calls receive quicker attention than non-emergency calls), time of day, the location of the officer on duty, the distance of the call site, traffic, and other factors. The State Police make every effort to respond to incidents as quickly and as effectively as possible. According to Sergeant Miller, the average State Police response times during the night hours can be long, because of the large territory the State Police must patrol. ***Township officials should continually monitor this critical indicator and determine whether or not average State Police response times are sufficient to meet the needs of Township residents.*** At this time, the small population, modest projected growth, and relative lack of serious crime in the Township suggest that existing State Police service may be adequate to meet needs for now and into the near future.

Should the Township determine at some future point that State Police can no longer meet the growing needs of the Township, there are several alternatives. Using the standard rule-of-thumb that local police departments should have on full-time patrol one officer for each 1,000 residents, Elizabeth Township would project the following manpower needs: 1990 population - 3,691, four officers needed; 2000 population - 4,126, four officers needed; 2010 population - 4,614, five officers needed. These officers could be provided either through (1) the creation of a local police department, (2) inclusion in a regional police department, or (3) contract with a neighboring police department. While support for additional police protection in rural areas is growing throughout the County due to increased growth, the costs associated with improved police protection often prove unacceptably high.

To devise a specific strategy for future local police protection transcends the scope of this project. At such time as the Township determines that additional police protection is needed, it should seek advice and/or proposals for service from other adjoining

municipalities, and consult a qualified police professional to assess the feasibility and correct course of action regarding this vital public service.

D. FIRE PROTECTION

Fire protection is a basic public safety service that is important to the Township. Obviously, fire protection is intended to minimize the loss of life and property due to fire and related hazards. The level of fire protection also affects the rate which area residents and business owners must pay for fire insurance.

To understand how the Township's fire protection services are delivered and to identify current and future needs, interviews were conducted in April and May, 2000, with Sid Adams, Fire Chief of the Brickerville Fire Company, Kenneth Mearig, Fire Chief of the Brunnerville Fire Company, and Gerald Wolfe, Fire Chief of the Penryn Fire Company.

The Brickerville Fire Company was formed in 1947 to protect residents of the Township from fire loss due to the long response times of the Lititz Fire Company which, up until that time, served Elizabeth Township. The Brickerville Fire Company served all of Elizabeth Township until the 1970s, when the company relinquished parts of its service area to the Penryn and Brunnerville fire companies. The Penryn Fire Company was chartered in 1927 in neighboring Penn Township and the Brunnerville Fire Company in 1944 in neighboring Warwick Township.

Since the establishment of the Countywide 911 central emergency communication/dispatch system in 1972, each fire company within the County has identified its own mutually exclusive primary service area. The actual boundaries of these primary service areas are mutually agreed upon by adjoining fire companies, and then described to County dispatch for future use. The primary service area represents that land area that an individual fire station has "first-call" responsibility for providing fire protection service.

The Brickerville Fire Company has a primary service area that includes most of Elizabeth Township and part of neighboring Clay Township. The Penryn Fire Company has a primary service area that includes a small part of Elizabeth Township in the Elm area as well as a large part of Penn Township and a small area of Rapho Township. The Brunnerville Fire Company has a primary service area that includes a part of Elizabeth Township in the Lexington area and parts of Warwick, Clay, and Ephrata Townships. Primary service boundaries within Elizabeth Township are shown on the Public Facilities and Services Map.

All three fire companies provide mutual-aid assistance to one another. In addition, other nearby fire companies provide mutual-aid assistance. Mutual-aid assistance provides secondary support to the primary service company. This practice enables neighboring companies to augment their sometimes limited equipment stock to offer a wider range of firefighting capabilities. The Brickerville Fire Company provides, and is provided mutual-aid assistance by Durlochmont, Schaefferstown, Lincoln, Penryn, and Brunnerville fire companies. The Penryn Fire Company provides and is provided mutual-aid assistance by the Hope, Mastersonville, Lititz, Brunnerville, and Brickerville fire companies. The Brunnerville Fire Company provides, and is provided mutual-aid assistance by the Lititz, Rothsville, Durlach, Mount Airy, Penryn, and Brickerville fire

companies. The three fire chiefs note that there exists a high degree of cooperation among Elizabeth Township's emergency service providers.

The three fire companies serving Elizabeth Township are all geographically centrally located to their respective primary service areas. The Brickerville Fire Company is located at 10 Hopeland Road in Brickerville. The Penryn Fire Company is located in the 700 block of Penryn Road in northern Penn Township, and the Brunnerville Fire Company is located on the north side of Church Street in the center of Brunnerville.

The location of any fire company is important because of its effect on emergency response times. With any emergency service, average response time is a critical indicator used to determine the effectiveness of emergency service delivery. Response time can be broken down into two periods. The first period is the average amount of time it takes from the minute an emergency call is received until the time a vehicle has left the fire station. The second period is that amount of time it takes to arrive at the scene of an emergency. The first period of the average response time for the Brickerville Fire Company ranges from five to eight minutes, while for the Penryn Fire Company it averages five to six minutes. The Brunnerville Fire Company does not break down its average response time but is able to be at the scene of the emergency generally within six to seven minutes. Overall response times vary depending upon time of day and the location of the emergency. Factors such as traffic and limited manpower also affect response time.

Specifically, all three fire companies experience difficulty manning rigs during the daytime when there is limited manpower because of volunteers who work during that time period. The lack of employers within the Township requires many would-be volunteer firefighters to commute outside of the Township on a daily basis. This situation depletes available manpower during working hours and can lead to increased response times, even if manpower is available. Chief Adams of the Brickerville Fire Company states that manpower is often low during hunting season and over holidays. Many of these problems are inherent in the structure of volunteer manpower.

Municipal officials should keep a close eye on this critical indicator and determine whether or not average emergency response time is sufficient to meet the needs of local residents. In the event any of the fire companies' response times becomes too long, local officials may need to investigate alternatives to augment manpower during critical time periods, possibly by utilizing paid Township personnel, such as road crews. Local officials could also seek to attract employment-based uses that will provide jobs within Elizabeth Township to enable volunteer firefighters to remain in the area on a daily basis, rather than commuting elsewhere for employment.

The delivery of fire protection services is highly dependent upon manpower. As for most municipalities within Lancaster County, Elizabeth Township's fire companies are staffed entirely by voluntary personnel. Presently, the Brickerville Fire Company has 32 firefighters and 10-12 fire police. The Penryn Fire Company has 33 firefighters and six fire police. Finally, the Brunnerville Fire Company has 25 firefighters, four of whom double as fire police, and six fire police. All three fire chiefs say that for the present the numbers of volunteers are adequate although Chief Adams notes that there are cycles

when there are inadequate numbers of volunteers. Chief Mearig commented on six new junior firemen that if they make it through their training will suppress the need for additional volunteers over the next few years.

In general, the number of fire calls increases with a growing population. All three fire companies have experienced a significant rise in the number of responses to fire calls, particularly those within each of the companies' primary service areas.

All three fire chiefs indicated that false alarms are not a problem within Elizabeth Township. Overall, it appears that the Township's three fire companies experienced a significant increase in primary service area responses. At the same time, the level of mutual-aid assistance has remained relatively steady, indicating that all three fire companies appear to be able to respond to the calls they receive within their own primary service areas, and no one or two fire companies is having to provide an unreasonable amount of assistance to another company. ***It is important for local officials to monitor the number of mutual-aid responses for any one fire company to determine whether or not a disproportionate amount of service is being provided to, or being received by neighboring companies.*** This can be a reflection of a decline in volunteer manpower or difficulty manning a rig during certain times of the day.

According to Chief Adams, the Brickerville fire station is adequately designed to meet current and future needs over the time-frame of the Plan, although the addition of living facilities might help to recruit more volunteers. Other than for some aged (1978) equipment, the Penryn fire station is adequate to meet current and future needs, according to Chief Wolfe. The Brunnerville fire station is considering adding office space and additional garage space for a new squad vehicle. Major equipment stock owned by the three fire companies is shown in the following table:

Fire Company	Engines		Tankers		Other
	Gallons/Minute	Gallons Capacity	Gallons/Minute	Gallons Capacity	
Brickerville	1,000 750	500 1,200	1,000	3,000	Squad truck
Penryn	2,000 1,000	1,000 1,000	750	4,000	squad/rescue truck
Brunnerville	1,750 750	1,000 1,000		3,000	

Chief Adams indicates that one replacement engine will be needed within the next five years for the Brickerville Fire Company. Chief Wolfe indicates that the Penryn Fire Company has two older vehicles that should be upgraded. Chief Mearig indicates that a squad truck is planned to be purchased within the next year.

None of the three fire companies has access to a public water supply and so rely on rural water sources, including three 18,000-gallon cisterns, Speedwell Forge, and various streams and drafting pits to supply their tankers. Virtually all farm ponds within the Township are inaccessible because of the long farm roads in to them. All three fire chiefs expressed a need for greater access to streams and drafting pits in certain parts of the Township. **Local officials should assess the need for increased stream access and additional drafting pits within the Township.**

Currently, all three fire companies receive small annual donations from Elizabeth Township, which are based on the size of the primary service areas within the Township. All three fire chiefs site difficulty securing sufficient monies to keep their companies adequately equipped and housed. The Brickerville Fire Company participates in considerable fund-raising activities, as do the Brunnerville and Penryn Companies to lesser extents. Chief Mearig noted that Warwick Township has recently set up a capital fund for equipment and other capital expenditures for its fire companies, and suggests that local officials set up such a fund in Elizabeth Township. **In addition, more money is needed from local government to help defray operating costs and the acquisition of peripheral and support equipment and supplies.**

The need for residential building codes and mandatory smoke detectors is a major concern among all three fire companies. **Local officials should assess the need for such provisions as well as the Township's willingness to provide enforcement for them.**

All three chiefs addressed problems related to the lack of visible property numbers, despite the existence of a local ordinance addressing this issue. Chief Adams estimates that approximately 30% of Township properties have addresses that are not sufficiently visible from the road. Trying to locate the scene of an emergency without proper numbering can result in delayed response time and additional injury to property and person. The enforcement of such a system can be difficult, but other municipalities have implemented mandatory address numbering ordinances, and have enforced it by withholding mail of the property owner until he/she has complied with the ordinance. Elizabeth Township has indicated that a street numbering system is underway to aid in property identification. Another tool to help firefighters and other emergency service personnel locate properties is the premise address map. **Elizabeth Township should prepare a premise address map.** This premise address map could be formatted

much the same as the maps associated with this Plan, and clearly indicate the locations of various addresses, utilizing a property-specific base map. Finally, all three chiefs expressed a desire to be informed of recently-approved subdivisions and new streets within the Township to enable them to provide the best possible service.

New dwellings under construction can catch fire and their locations need to be known by emergency service personnel. ***It is recommended that the Township apprise all three fire companies in a timely manner of any approved subdivisions or new streets within each of their respective primary service areas.***

In summary, the Township possesses effective volunteer fire companies that cooperate closely and are committed to providing the best possible fire protection. However, these companies face serious manpower, monetary, water supply, equipment, and facility shortages. It is imperative that local government stands ready to help these companies confront and overcome these problems to enable them to continue this vital service.

E. AMBULANCE SERVICE

Ambulance service is an obvious lifesaving service. Ambulance services can be divided into two general types. First, emergency ambulance service involves the pick-up of patients at the scene of an accident or medical emergency. Then, patients are expediently transported to local medical care facilities for treatment. The second form of ambulance service is called routine transports, in which case patients are transported from one medical care facility to another.

Ambulance service within Elizabeth Township is provided by the Brickerville Fire Company and is headquartered at that Company's station. To understand how service is provided, an interview was conducted on April 5, 2000 with Dave Groff of the Brickerville Fire Company ambulance service.

The Brickerville Fire Company first began offering ambulance service in 1969 because a local group of residents felt that the closest service that was until then available to Elizabeth Township residents out of Ephrata Borough was too far away.

The Brickerville Fire Company ambulance service is responsible for serving the whole of Elizabeth Township as well as that part of Clay Township to which it also provides fire protection. Emergency ambulance service as well as routine transport is available. The Public Facilities and Services Map identifies the location of the Brickerville Fire Station which houses the ambulance service.

The Brickerville Fire Company ambulance service provides second call back-up service to Ephrata, Warwick, and Schaefferstown, and in turn is provided reciprocal service by the Ephrata, Warwick, and Schaefferstown ambulance companies. Second call back-up service is utilized in the event that one company's ambulances are already in use or cannot respond, or when there are multiple injuries that cannot be adequately served by one company. In addition, the Company's ambulance accompanies the fire vehicles to the scenes of fires where needed.

Ambulance service is available 24 hours per day, seven days per week. Since its inception, this service has operated on a volunteer basis. The Company utilizes 26 trained volunteers for its ambulance runs, many of whom are cross-trained as

firefighters. At the Brickerville Fire Company, a full-time paid Emergency Medical Technician (EMT) has been hired to address calls that occur 7:00 am until 6:00 pm. During the daytime hours and on weekends, the Company utilizes an "all-call" procedure wherein all volunteers are notified and the first to arrive at the station go to the scene along with the full-time EMT. All volunteers are required to live no more than six minutes distance from the station. Weekdays, from 6:00 p.m. to 6:00 a.m., assigned crews are utilized. Crews normally consist of three persons. About half of the ambulance volunteers are trained as EMTs, while the remainder have either First Responder Training or Advanced First Aid training. All crews are required by the state to include an EMT.

According to EMT Groff, State training requirements have exacerbated already existing manpower shortages. The primary problem with the State mandate is the time required to train for EMT certification, which requires 140 hours of class time. Manpower shortage is particularly acute during daytime hours, when the Company has on occasion been unable to respond to calls. As noted under the foregoing section on Fire Protection, the lack of employment centers within the Township has resulted in the need for many residents to commute to other areas, making them unavailable during working hours. All of these issues factored into the decision for the full-time EMT.

Response time is an important indicator of emergency service effectiveness. Under Pennsylvania emergency dispatch guidelines, the first-call ambulance company must respond to a call by acknowledging it and having a vehicle on the street within 10 minutes of the initial call. If the first-call cannot meet this deadline, then a second-call ambulance company is dispatched and is asked to respond to the emergency. Average response time is between four to six minutes, generally closer to four minutes. Once a crew has left the ambulance building, it generally takes no more than four additional minutes to reach the scene of the emergency.

In 1999, the ambulance services in Elizabeth Township have responded to 263 calls. As of March 30, 2000, 89 calls were responded to in the 2000-year thus far. Based on these numbers and the rise in the level of fire calls, the Township should monitor the response to all calls that the ambulance services from Brickerville Fire Company provides to the community.

The Company presently runs one ambulance which, according to EMT Groff, was purchased within the last five years and is adequate to meet current needs. Renovation to the existing firehouse is planned over the next couple of years.

The annual donation made by the Township to the Brickerville Fire Company is intended to be used for the ambulance service as well.

Any person who makes a donation to the Fire Company is entitled to free ambulance service. EMT Dave Groff strongly stressed the need for additional manpower and funds over the coming years. ***Specific assistance the Township could provide includes recruiting volunteers, and funding for EMT training, vehicles, equipment, or insurance. Township officials should continually monitor the response level of its ambulance service to its primary service calls.***

F. WARWICK EMERGENCY SERVICES ALLIANCE

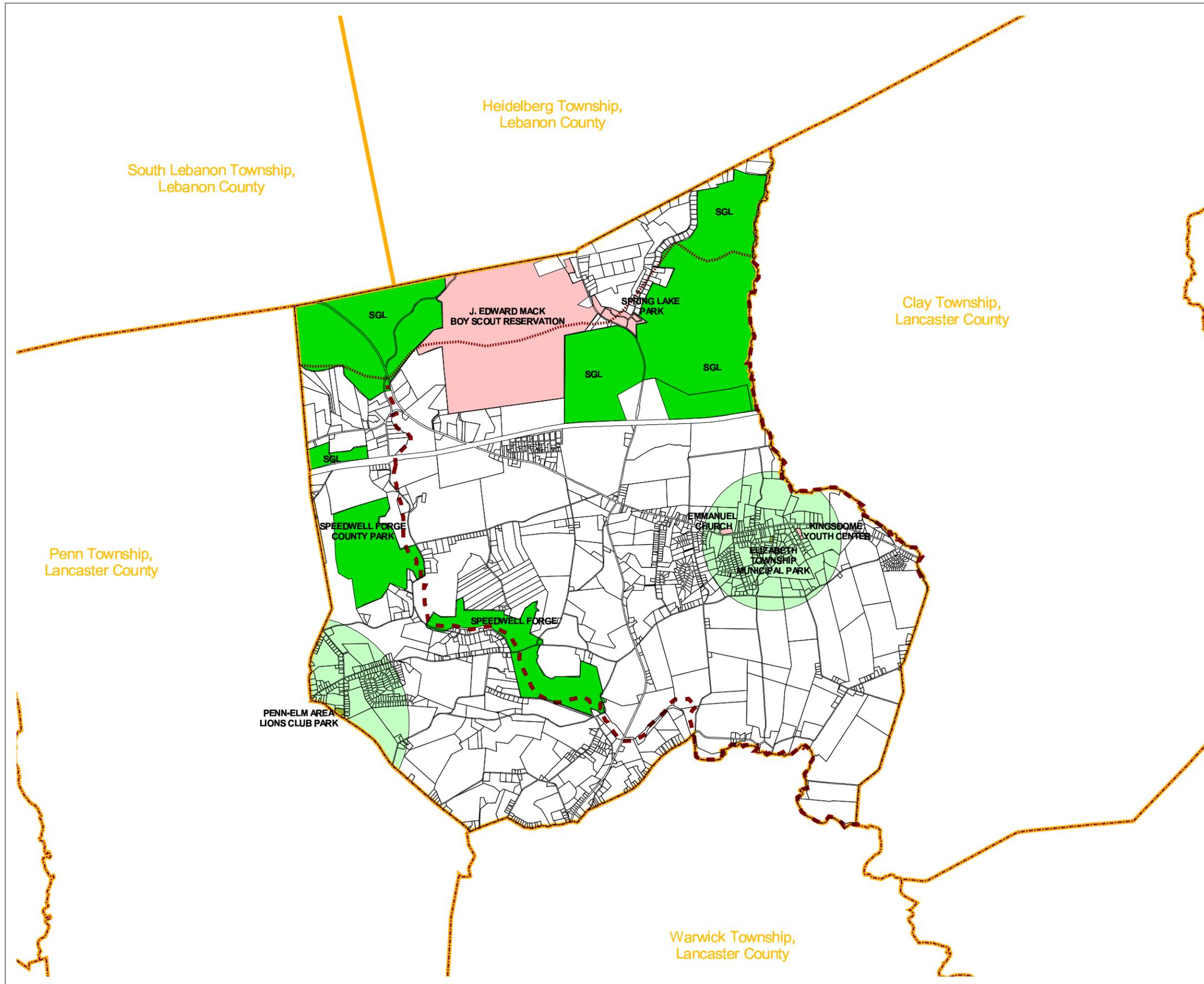
In the early part of 2001, Elizabeth and Warwick Township along with Lititz Borough executed a municipal agreement to establish the Warwick Emergency Services Alliance (WESA). The alliance consists of the three municipalities and the following emergency service organizations: Lititz , Brunnerville, and Rothsville Fire Company as well as Warwick, Rothsville, and Brickerville Ambulance Services. A part-time administrator has been hired for WESA which was partially supplemented by the Pennsylvania Department of Community and Economic Development (DCED). The mission of WESA is as follows:

- Ensure dependable, efficient emergency services are provided to the public.
- Preservation and enhancement of the volunteer emergency services.
- Organizing and improving fund raising campaigns on behalf of all member organizations.
- Promoting personal and community involvement and increased interest in the emergency services.
- Establishing a central administration structure.
- Reducing costs and duplication within the alliances.
- Informing and communicating to the community the value of volunteer emergency services.
- Establish educational and innovative fire protection program for the region.

The two significant challenges facing the volunteer emergency services organizations is lack of volunteers and adequate public support in fund raising. The goal of WESA will be to support the emergency service organizations and their important role in the community.

As noted in the foregoing section on fire protection, a premise address map and enforcement of the Township's ordinance on the visibility of property numbers would facilitate the ability of ambulance personnel to locate the scenes of emergencies. This issue is of even more importance for ambulance crews than for firefighting crews, because the locations of fires are often obvious from the presence of smoke, fire, and people, whereas the locations of medical emergencies are often not obvious, and those who might otherwise flag down an ambulance, are often indoors with the person in need of care. ***Finally, notification on the part of the Township of recently-approved subdivisions and new streets would make local ambulance service better aware of the location of new development.***

Map 7
Parks and Recreation Map
Elizabeth Township, Lancaster County



Legend

-  Proposed Linear Parks
-  Horseshoe Trail
-  Regional Parks
-  Neighborhood Parks
-  Commercial/Private Recreation
-  Neighborhood Park Service Area

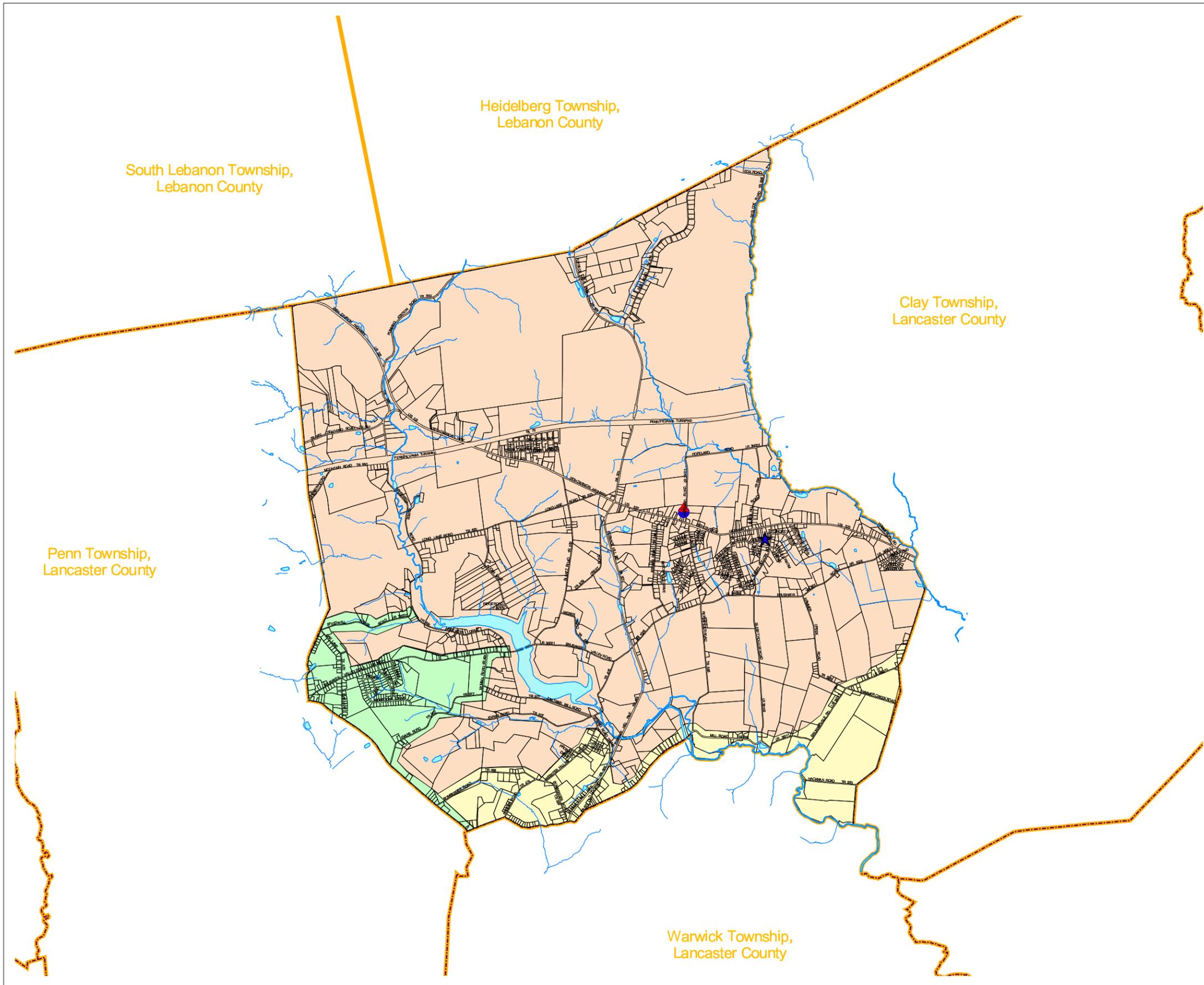


Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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Map 8
Public Facilities and Services Map
Elizabeth Township, Lancaster County



Legend

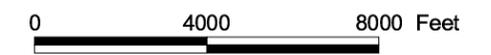
- Stream
- Lake, Pond
- Parcel

Community Facilities

- Brickerville Fire Company
- Brickerville Fire Company Ambulance
- Elizabeth Township Building

Fire Service Area

- Brickerville Fire Company
- Brunerville Fire Company
- Penryn Fire Company



Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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VIII. UTILITIES

A. SEWAGE DISPOSAL

There is currently no provision of public sewer service within Elizabeth Township because of its rural character and distance from boroughs and other developed areas. The nearest sewage treatment facility and sewage lines are in neighboring Warwick Township to the south.

According to Elizabeth Township's 1993 Act 537 Official Wastewater Facilities Plan, there are three private non-industrial dischargers in Elizabeth Township. Treatment and disposal methods for these dischargers include a sand filter with discharge into Kettle Run, a septic tank and sand filter with discharge into Hammer Creek, and a septic tank and sand filter with discharge into an unnamed tributary of Hammer Creek. The 537 Plan recommends against the use of any new package plants except for addressing remedial situations where no other alternatives exist.

ON-LOT DISPOSAL SYSTEMS

Two community on-lot systems operate within the Township. The 41-lot Clay Manor Subdivision utilizes individual tanks for each lot, which connect to four above-surface sand mounds. The 12-unit Poplar Grove Mobile Home Park is served by an on-site subsurface sewerage system. All other sewage treatment in the Township is via the use of individual on-lot subsurface disposal systems. These systems are usually comprised of a septic tank and tile drainfield, cesspool, seepage bed, or elevated sand mound. The 537 Plan computes total estimated flows being treated by on-lot systems within the Township as 281,750 gallons-per-day based on the approximate usage of 250 gallons-per-day per dwelling unit.

The potential for on-lot malfunction is always a cause for concern with the use of on-lot systems, because of the possibility of contamination of groundwater and surface water resources and the health risks associated therewith. Of particular concern is the sometimes relatively close proximity of on-lot disposal systems and on-lot wells. On-lot disposal systems installed prior to 1975 were not regulated by the Pennsylvania Department of Environmental Protection. On-lot disposal systems can malfunction when they have outlived their useful lives, are not cleaned on a regular basis, are improperly operated, are sited on marginal or poorly-drained soils, are designed or installed improperly, or when lot sizes are too small. While some malfunctions are obvious, others are not apparent, although they may continue to contribute to pollution of ground and surface waters.

The Township's 537 Plan notes that from 1979 to 1990, 73 on-lot systems were repaired or replaced, 57 of which were malfunctioning. All malfunctioning systems have been able to be repaired or replaced. Most malfunctions have involved wastewater at the surface or physical deterioration of the system. The largest concentration of malfunctioning systems (54%) has been along PA 322, where the Township's oldest on-lot systems are located. Other historic areas of malfunction include Poplar Grove and Spring Lake Park, as well as other areas along major roads throughout the Township. The number of repaired malfunctioning systems computes to approximately five percent of total on-lot systems. However, this figure may underestimate the number of actual malfunctioning systems, as repairs often do not occur until complaints initiated by neighbors result in an inspection by the sewage enforcement officer. Areas of historic on-lot problems are shown on the Utilities Map.

The Township's 537 Plan calls for the continued use of on-lot disposal systems as the primary method of meeting future needs for sewage disposal. Soils that have the fewest development constraints for on-lot systems within the Township include the Bedington, Duffield, Hagerstown, Lansdale, Bucks, and Ungers soil series. However, all of these soils are also prime agricultural soils, and those in the southeast portion of the Township underlain by limestone geology are further prone to transmitting sewage effluent through solution channels into the groundwater aquifer.

The 537 Plan notes that future development proposals south of the Turnpike will probably require extensive hydrologic studies to determine to what extent proposed development would contribute to existing nitrate-nitrogen loading. This is because of high existing nitrate-nitrogen levels in much of the Township's groundwater (see related discussions in Chapter II under Groundwater Quality and Chapter VII under Water Supply). Proposed development in areas with more than 10 milligrams per liter of nitrate-nitrogen will not be approved by the DEP, while proposed development in areas with between 5 and 10 milligrams per liter will require very large lots if they are allowed at all.

It is recommended that zoning policies limit areas planned for development which should utilize on-lot disposal systems to those areas which will be best able to accommodate these systems without further degrading area groundwater. Zoning policies should also provide for a minimum lot size of one acre or greater for those areas of the Township planned for development which will rely on on-lot disposal systems. This generally provides sufficient lot area for one on-lot disposal system and another, should the initial system fail. It is also advised that each lot is required to specifically test for, and reserve, an on-site location for the second drain field as part of its sewage permit compliance. Such alternate drain field should then be protected from all grading and construction activities; in the event it is activated due to malfunction of the initial system.

The Township's 537 Plan also recommended the implementation of an On-Lot Disposal System (OLDS) Management Program to promote the successful long-term use of such systems where they exist. Elizabeth Township has recently adopted such an OLDS Ordinance and is implementing an educational program in support of it. The OLDS ordinance requires the routine maintenance of on-lot systems, including the periodic pumping-out of subsurface septic tanks, and, when necessary, the replacement of on-lot systems. ***Strict enforcement of the OLDS program needs to occur if existing and future on-lot systems are to function properly.***

ALTERNATIVE WASTEWATER SYSTEMS

Elizabeth Township's 537 Plan recommends that alternative wastewater systems be considered in areas of planned higher-density development. Alternative wastewater systems can permit compact growth patterns while reducing the potential for the pollution of area water resources. The Township's provision of needed housing types can be facilitated, while sprawled development patterns can be reduced and area water quality better protected.

Alternative wastewater systems offer various simple, effective ways to collect, treat, and dispose of sewage effluent that are suited to the particular needs of an area. Such systems are especially well suited to villages and small communities in rural areas because they can be sized to meet limited local needs, and designed to have a positive rather than negative impact on the environment. Construction costs are generally low, and maintenance is minimal. An example of such a system which has been used successfully in neighboring counties and which could be well-suited to Elizabeth Township is the lagoon treatment system with spray irrigation disposal.

A lagoon system accepts raw wastewater from a community and treats it in one or more manmade ponds. Natural biological processes, sometimes aided by aeration, break down the wastewater, providing a secondary level of treatment. The lagoons can be constructed with clay-amended soils or a synthetic liner to form an impermeable barrier, which prevents the escape of untreated wastewater. The sludge created during the treatment process collects at the bottom of the ponds, and only very infrequently (every 10-15 years) needs to be removed. Ponds generally are required to have a minimum of 60 days of storage capacity for extended periods when irrigation cannot take place. Ponds can be designed to provide storm water benefits, and final stage holding ponds can be used for firefighting needs.

Spray irrigation is a method of disposing of, or recycling, treated wastewater, rather than discharging it into a stream. Wastewater is disinfected through chlorination, then sprayed onto agricultural crops, golf courses, nurseries, or woodlands, where the first few feet of soil provide filtering, and the nutrients are taken up by plants as fertilizer. Water is near drinking-water quality at the time of irrigation. Groundwater is replenished without contamination. Over time, groundwater nitrate-nitrogen levels may be reduced as they are diluted with water containing lower nitrate-nitrogen levels. The land is irrigated at a rate based on the ability of the plants to use the nutrients and the ground to accept the water. Irrigation can occur daily, alternating days, or weekly. The best soils absorb 1.5 to 2 inches of treated water per acre per week. Wooded sites are more able to absorb water in freezing weather.

Siting standards for lagoons and spray irrigation fields need to be utilized to assure that adequate distances are maintained between these facilities and dwellings, wells, and property lines. DEP recommends that a distance of at least 100 feet be maintained between lagoons and homes, and at least 200 feet between spray fields and homes. Minimum distance between lagoons and wells should be 100 feet, depending on a variety of factors. The minimum distance between spray fields and wells is variable, depending on a number of factors; some spray fields are located directly over wells, providing replenishment of groundwater. It is recommended that buffer strips of at least 100 feet be utilized adjacent to property lines, as an extra measure of protection.

People sometimes have reservations about lagoon systems and spray fields that involve health concerns, odor, appearance, and use of the property. Alternative wastewater systems are not common in Lancaster County and few people are familiar with them. However, they are no longer considered experimental and have been in use for up to 20 years at a number of sites in adjacent counties. Lagoon systems with spray irrigation fields have proved particularly successful and increasingly acceptable to the public. Today, over 7,000 lagoons are being used nationwide to treat wastewater, most of them operated by small communities.

Lagoons have the appearance of farm ponds, sometimes have walking paths around them, and are generally considered to be attractive. Spray fields can provide a number of open space possibilities. Properly operated and maintained, lagoons and spray fields have no discernible odor. Chlorine is used to disinfect the water prior to spraying. Spray sites may be utilized by the public for recreational purposes, with no reason for health concerns. As a precautionary measure, DEP does not permit spray irrigation of treated wastewater on agricultural crops intended for human consumption.

Following is a preliminary analysis of soils that would be potentially suitable for alternative wastewater systems of the type described above. It is based on discussions with and literature from DEP, Tatman & Lee Associates, the *Soil Survey of Lancaster County, Pennsylvania* (1985), and other research and field studies. However, it is no substitute for the specific soils testing and site analysis required by DEP prior to the approval of any wastewater facility.

Soils in Elizabeth Township that may be suitable for lagoons are identified on Table 12 of the *Soil Survey of Lancaster County, Pennsylvania* (1985). Soils that may be suitable for spray irrigation fields are, according to Lester Rothermel of DEP, also generally those that are suitable for lagoons. More specifically, they are lands with a maximum recommended slope of 4-5% for agricultural fields, and 8-10% for wooded areas or land in permanent grass cover crop. They should be moderately well-drained, not eroded, not in wetlands, and not in floodplains. Soils should be at least 20 inches deep to the limiting zone. The soils suitability criteria for spray irrigation fields are generally less stringent than those for on-lot systems.

Suitable soil types for spray irrigation fields in Elizabeth Township would include the Bedington, Duffield, and Hagerstown series. Class I soils, because they are the most level, offer the best potential sites, while Class II soils are also suitable, particularly where they are wooded. These soils and their suitability for alternative wastewater systems, as well as soils that are suitable for on-lot and community subsurface disposal, are identified in the following matrix and on the Utilities Map.

SUITABILITY OF SOILS FOR SEWAGE DISPOSAL				
Soil Symbol	Soil Name	On-Lot or Community Systems	Lagoon Systems	Spray Irrigation Fields
BdA	Bedington silt loam	Medium	Medium	High
BdB	Bedington silt loam	Medium	Medium	Medium
BdC	Bedington silt loam	Medium	Low	Low
BuB	Bucks silt loam	Low	Medium	Medium
DbA	Duffield silt loam	Medium	Medium	High
DbB	Duffield silt loam	Medium	Medium	Medium
HaA	Hagerstown silt loam	Medium	Medium	High
HaB	Hagerstown silt loam	Medium	Medium	Medium
HbC	Hagerstown silty clay loam	Medium	Low	Low
LaB	Lansdale loam	Medium	Low	Low
LaC	Lansdale loam	Medium	Low	Low
UaB	Ungers loam	Medium	Medium	Medium
UaC	Ungers loam	Medium	Low	Low
UbB	Ungers extremely stony loam	Medium	Medium	Medium

More soil types are suitable for on-lot or community systems (13) than for lagoon systems (9). However, some soils are better suited for spray irrigation fields than they are for on-lot or community systems. Since lagoons and spray irrigation fields are commonly used together, providing respective treatment, storage, and disposal functions, alternative wastewater systems as a whole are more suitable for some soil types (BdA, DbA, HaA, BuB) than are on-lot and community systems, as suitable for other soil types (BdB, DbB, HaB, UaB, UbB) than are these systems, and less suitable for still other soil types (BdC, HbC, LaB, LnC, UaC). The primary variant among these soil types is slope. Lagoons and spray fields can be located together where soils are especially suitable, or can be separated where differing soil types are preferable.

The amount of land needed to accommodate a lagoon system and spray irrigation fields depends primarily on the anticipated wastewater flow and soil type. The very smallest systems designed for a single dwelling unit might require a little over one-half acre for both the treatment system and spray fields, with an overall minimum lot size of two acres. Larger systems designed to serve in the vicinity of 50 dwellings might require one acre for a lagoon system and five acres for spray fields, as well as land for a buffer. Still larger systems intended to serve between 100 and 200 dwellings might require two acres for lagoons and 10 acres for spray fields, as well as buffer land.

Typically, the land set aside for the lagoons in a new development is dedicated by the developer to the municipality, through negotiation, clustering, or other means. In an older development in a remedial situation, municipalities could permit additional development with inducements for developers to provide systems that would serve both the new and old areas.

In approving an alternative wastewater system to address a remedial situation, DEP is usually more flexible in its approval standards. A village cluster ordinance with bonus density provisions could be especially effective in encouraging the creation of alternative wastewater systems. Such an ordinance could also enable spray fields to be part of developments. Spray fields can be configured so as to create a number of open space options, including active recreation areas, passive woodlands, or farmland making up a greenbelt around part of a community.

An example of how an alternative wastewater system could be provided for a remedial area is as follows. The villages and communities with historic on-lot sewer problems have a range of lot sizes and dimensions. Lot length typically ranges between 170 and 250 feet, and lot sizes range from one-quarter to one acre or more. Where there are sufficient numbers of problem lots, and where lot length or lot size is adequate, the rear halves of any number of lots could be utilized to constitute part or all of a lagoon system and spray field, potentially eliminating the need to purchase the land for this purpose. Where there is insufficient room on existing lots, a developer might provide the required land, or the municipality could either purchase needed land outright, or purchase development rights for the needed land.

The creation of new lots in the vicinity of problem areas could be permitted, provided alternative wastewater systems are provided by the developer, which include the provision of service to remedial areas. Where no such systems are provided, new lots should be required to be two to three acres in size to minimize potential adverse impacts on groundwater quality.

Finally, it is recommended that either the individual municipalities or a regional authority own, operate, and regularly maintain the systems to assure that they are operating correctly. Any system serving more than several dwellings (2,000 GPD) must have a licensed operator, making a regional approach desirable. Either a municipality or an authority may levy tapping and user fees to cover the costs of constructing, connecting to, and operating these systems. However, an authority has some advantages in that it can sell tax-exempt municipal bonds, and its debt is separate from and not part of the municipal tax base. Elizabeth Township's 537 Plan calls for funding for such systems to come from homeowners or commercial associations. DEP is more likely to approve municipal or authority-operated and maintained systems than private ones or ones operated by homeowner associations, because the former tend to be more responsible in the maintenance of such systems.

The suitability of lands for alternative wastewater systems, in combination with the information that is known about existing and historic problem sewer and water areas, should be used to help determine appropriate areas for future growth in the Township. Future higher density growth should be directed into areas capable of supporting such systems and into and adjacent to the Township's existing villages and communities where existing or potential sewer or water problems are found. These areas might include Brickerville, Poplar Grove, Elm, and Spring Lake Park.

PUBLIC SEWER

Public sewer was constructed by the Ephrata Area Wastewater Treatment and Collection System (EAWTACS) for Clay Township as a result of a regional sewer planning process. These facilities extend from Ephrata along PA 322 into the Clay area immediately adjacent to and east of Elizabeth Township. Elizabeth Township chose not to participate in the regional sewer planning process because it does not believe public sewer is needed in the Township at this time. The eastern portion of Elizabeth Township in the vicinity of PA 322 is largely in agricultural use, with one residential subdivision and a few scattered commercial and residential uses.

Public sewer service is currently provided to that portion of the Lexington area within Warwick Township immediately adjacent to and south of Elizabeth Township. According to the draft 1993 Warwick Township Comprehensive Plan, the Lititz Borough Wastewater Plant, which treats wastewater from Warwick Township, has considerable reserve capacity. Should Elizabeth Township so desire at some point in the future, it could request the extension of public sewer service to a limited area of existing and potential new development north of the boundary. Such request would be for the purchase of treatment capacity in the Lititz Borough Wastewater Plant as well as permission for the use of existing sewer lines between Elizabeth Township and Lititz Borough owned by the Warwick Township Sewer and Water Authority. Such extension would probably involve the creation of a franchise area, Public Utility Commission approval, the location of a pumping station, and the extension of the Lititz-Warwick Urban Growth Boundary to include the area to be served.

The Township's 537 Plan recommends against the provision of public sewer service within or extension of public sewer service to any area within Elizabeth Township because of the area's rural character, low projected population growth, and low existing population density. According to the Lancaster County Comprehensive Sewerage Plan, the minimum population density suitable for a sewage collection system is 2,000 people per square mile, well above that which exists even in the Brickerville area.

An additional consideration when evaluating the desirability of public sewer service is the role on-lot and alternative wastewater systems play in groundwater recharge. Public sewer systems divert area water to treatment plants, whereas on-lot and alternative wastewater systems allow water to reenter the aquifer, thereby replenishing groundwater supplies. Brickerville and other areas of the Township currently experience generally low groundwater yields that could be exacerbated by the provision of public sewer without the concurrent provision of public water. Yet public water is not a realistic option for the Township at this time for reasons discussed in the following *Water Supply* section.

It is recommended that public sewer service not be extended from either Clay Township or Warwick Township into Elizabeth Township because public sewer service is not anticipated to be needed within the planning timeframe, and because such extension would result in the premature conversion of agricultural lands to developed uses.

B. WATER SUPPLY

There is no public water service provided within Elizabeth Township. All residences and businesses must rely on water from private, individual wells.

A complete discussion of groundwater yields and quality is included in the *Natural and Cultural Features* chapter of this Plan. As noted in that chapter, 60% of all wells tested recently within the Township had yields of 5 gal/min or less, indicating generally low but adequate groundwater yields in a majority of the developed portions of the Township. According to local officials, some of the lower-yielding areas are on ridges along PA 322, Reifsnyder Road, and other high-elevation places. Most development within the Township is underlain by the Cocalico geologic formation, which has a potential yield range of one to 100 gal/min. According to the 537 Plan, the Cocalico formation has the potential for being an excellent source for domestic water and a very good source for small public supplies and some industrial uses. To date, this potential appears not to have been realized. Geologic formations with perhaps the best potential for groundwater yields in the Township are not especially suitable for development; the Hammer Creek formation to the north has severe development limitations and the Ontelaunee formation to the southeast is limited in size and is susceptible to groundwater quality problems.

As noted earlier in this Plan, a preliminary hydrogeological analysis of groundwater involving the sampling of 25% of Township wells shows that 20.6% of tested wells have nitrogen-nitrate levels above 10 milligrams per liter, which is the upper limit of acceptable water quality. These wells are scattered across the Township but are concentrated somewhat in Elm and in the southeastern agricultural portion of the Township. In addition, 10.3% of wells have fecal coliform or total coliform levels above zero. These wells are located primarily in the central part of the Township. The primary contributors of these pollutants are agricultural pesticides, fertilizer, manure, and on-lot septic systems.

The availability of public water within Elizabeth Township does not appear to be likely any time in the near future. There is no existing or planned public water in neighboring Clay Township and no existing public water in northern Warwick Township. Neither does Elizabeth Township have the density of development, projected population growth or likely water supply to provide its own public water system. Wellwater yields, however, may be found to be adequate in some areas to support community water systems. ***Because of the possibility of insufficient wellwater yields in certain areas of the Township, local officials should consider requiring that proposed individual and community wells be drilled and tested for sufficient yield prior to the issuance of building permits and the subdivision of new lots. Such wells should also be tested for contamination and, if necessary, treated to assure acceptable drinking water quality.***

C. OTHER UTILITIES

Several utility lines pass through Elizabeth Township. Many of the rights-of-way (ROWs) associated with these utilities have distinct implications for future land use; land uses are typically restricted within these corridors. The Township's utility ROWs are shown on the Utilities Map and the guidelines and restrictions applicable to development within the ROWs are presented as follows in this section. ***This analysis should not be used as a substitute for direct contact with representatives of the various utility companies. Potential land developers and residents living near the ROWs should use the PA One Call System at (800) 242-1776 to contact representatives of the various utility companies in regard to any proposed projects that may involve any utility facilities or ROWs.*** The following briefly describes these utility companies' ROWs and the restrictions regarding them.

Pennsylvania Power and Light Company [Source William Aurand, Jr., Supervisor-Distr. Record System]

Pennsylvania Power and Light maintains one 69 kV transmission line in the northwestern portion of Elizabeth Township. The right-of-way width for this line is generally 100 feet, with the line located down the center.

Basic Restrictions for All Types of Requested Uses:

1. No buildings, swimming pools, or other structures, temporary or permanent, may be erected.
2. No changes to existing grades are allowed without the Company's prior approval based on detailed drawings.
3. Storage of material or regular parking of trucks that contain highly inflammable or explosive cargos is prohibited. Storage of inflammable fuels or fueling of vehicles is also prohibited.
4. The Company reserves unrestricted rights of ingress or egress for line maintenance or other work. Access to Company facilities shall at no time be impeded.
5. Blasting under or near the line is prohibited unless a blasting procedure is submitted and approved by the Company. The Company assumes no liability in approving the blasting procedure but reserves the right to prohibit any blasting that is not performed in a safe manner.
6. If counterpoise, usually 12 inches to 18 inches below grade, or any other Company facility is damaged or severed, the damage shall be reported immediately to the Company and re-established by the Company at the responsible party's expense.

7. The Company reserves the right to reconstruct the line including relocation or addition of poles and relocation or installation of buried counterpoise.
8. Barriers approved by the Company shall be installed, as required, to protect line structures.
9. The Company shall be relieved of all responsibility for environmental problems resulting from construction on or use of Company property or rights-of-way and any such problems shall be resolved without expense to the Company and with the approval of and to the satisfaction of all appropriate local, state, and federal governmental agencies.
10. The Company shall be relieved of all responsibility for damage or injury resulting from the use of the right-of-way or property.
11. Extreme caution shall be used when operating heavy equipment in the vicinity of Company facilities and energized conductors. Any contact with same shall be reported immediately to the Company.

Basic Restrictions for Installation of Parking Areas or Streets:

1. The Company reserves the right to restrict parking or use of roadways during performance of maintenance or other work.
2. No streets shall be constructed within 5' of the face of a tower or pole unless barriers approved by the Company are installed.
3. The Company reserves the right to reconstruct the line including relocation or addition of poles and relocation or installation of buried counterpoise without any obligation to restore paving or relocate barriers.

Basic Restrictions for Installation of Buried Pipelines (Sewer, Water, Gas, Etc.) and Underground Telephone and Electric Cables:

1. All underground facilities shall be installed to a depth that will withstand an axle weight of 50 tons without damage when traversed by PPL Company equipment.
2. All underground facilities shall be visibly marked in the field where they enter or leave the ROW.
3. A 20' minimum horizontal separation shall be maintained from the centerline of the underground facility to the nearest parallel overhead line conductor to provide a safety working space during construction and maintenance of the underground facility.

Basic Restrictions for Planting Trees and Shrubbery:

1. The Company reserves the right to trim or remove any tree or shrub that interferes with maintenance or operation of the Company's facilities without any obligation to restore same.
2. No planting shall be allowed to exceed the following heights for the highest voltage line existing or planned on the right-of-way:

Line Operating Voltage	Maximum Tree Height
69–110 kV	14 feet
138 kV	10 feet
230 kV	12 feet
500 kV	10 feet

Other Miscellaneous Restrictions:

1. Proposed signs or lighting structures shall be reviewed by the Company as to height limitations for the particular locations selected, and approved, before installation.
2. Fences shall not exceed 10' in height. If a fence is of a metallic type it shall be adequately grounded.
3. Fences which cut-off access to the line shall be equipped with gates and Company locks.”¹

Pennsylvania Gas and Water Company (PG&W) [Source - Emil Augustine, Property Management (717) 829-8633]

The Pennsylvania Gas and Water Company maintains one underground natural gas pipeline (the Hymil Line), varying in width from six to 12 inches, which runs north to south through the center of Elizabeth Township. The right-of-way associated with the pipeline is approximately 15 feet on each side. Within this ROW no buildings, structures, or unnecessary fill is permitted.

¹Pennsylvania Power and Light Company, “General Restrictions and Conditions Which Apply to Requests by Property Owners, Customers, Etc. for Use Of, or Encroachment On, Company Transmission Line Rights-of-Way, Building Restriction Limits, or Company Properties Encumbered by Transmission Line Facilities,” (Allentown, PA), April 12, 1982.

Metropolitan Edison Company [Source - William Strause, Manager-Transmission Engineering]

The Metropolitan Edison Company maintains one 500 dV transmission line that runs east to west through central Elizabeth Township. The right-of-way for this line is 200 feet, with the line constructed in the center. Restrictions on permitted uses within the ROW include no permanent buildings or structures (including swimming pools) and limits on the height of trees.

D. SOLID WASTE MANAGEMENT AND RECYCLING

By the early 1980's, the management and handling of solid waste had become increasingly sophisticated, and the amount of refuse generated within Lancaster County was on the rise. As a result of these conditions, and in accordance with the Pennsylvania Solid Waste Management Act of 1980, the Lancaster County Solid Waste Management Authority prepared a comprehensive and up-to-date Countywide municipal waste management plan. *The Lancaster County Solid Waste Management Authority Plan (1986)* was adopted by the Lancaster County Board of Commissioners on September 17, 1986. This plan was approved by the Pennsylvania Department of Environmental Protection (DEP) on September 30, 1987. The plan was updated in 1990 and again in 1999, becoming *The Lancaster County Solid Waste Management Authority Plan (1999)*. This plan joined Elizabeth Township and Lancaster County in an effort to plan for the efficient disposal of solid wastes. Under this agreement, Lancaster County and its Solid Waste Management Authority will assist all municipalities within Lancaster County with the disposal of municipal solid waste generated within the County. The plan also emphasizes the need for waste reduction, recycling, and resource recovery to increase the effectiveness of future disposal methods.

The primary objectives of the 1999 Plan are to continue operation of an environmentally safe, reliable, and efficient municipal waste management system to protect the health and welfare of the County. The Plan suggests continuing with the following objectives of the 1990 Plan:

1. Place emphasis on the recycling of marketable commodities. Achieve an increased recycling goal of 35%.
2. Have in-County processing and disposal of all non-recyclable municipal wastes that are generated within the County.
3. Minimize space consumption at the Frey Farm Landfill.
4. Conduct management of the system by the Lancaster County Solid Waste Management Authority.
5. Utilize private industry for operation of any aspect of the system so long as private industry provides competitive, efficient, environmentally responsible, and reliable services.

6. Have public (Authority) ownership of all critical transfer, processing, and disposal facilities.
7. Maintain the user fee structure to pay all costs associated with the planning, development, operation, and maintenance of the system.

The integrated waste management system currently utilized is sufficient to maintain and/or achieve these objectives for the next 10-year planning period and beyond. Each component will be utilized in the following manner:

Waste Reduction and Recycling

- Maintain curbside recycling programs and numerous recyclable drop-offs throughout the County.
- Continue utilization of the private sector for the collection, processing, and marketing of recyclable materials.
- Increase the recycling rate from 32% to 35%.
- Continue to separate, process, and market various elements of the municipal waste stream including tires, yard wastes, leaves, commingled glass and cans, certain metals, and white goods (large appliances).
- Continue to coordinate all recycling activities within the County, assist municipalities and recycling industry, expand markets, and provide recyclables receiving stations at each Authority facility for use by the general public and collection contractors.

Transfer Station

- Continue use of the Harrisburg Pike facility for separation of waste and transfer of construction/demolition waste to the Frey Farm Landfill and refuse to the Resource Recovery Facility.
- Consider expansion of the existing transfer facility or establishment of an additional transfer station if waste volumes increase substantially.

Resource Recovery Facility

- Continue processing all combustible municipal waste generated in Lancaster County at this facility.
- Continue selling electrical energy to the Metropolitan Edison Company.
- Dispose of non-processable wastes and combustion residues in the Frey Farm Landfill.

Frey Farm Landfill

- Construct Cell 5 in 2004 of the Frey Farm Landfill in Manor Township to serve as the disposal facility for all non-processable materials, residues from the Resource Recovery Facility, and dewatered sludge.
- The Frey Farm Landfill is expected to have adequate capacity through the year 2019.

Hazardous Materials Management

- Prevent the unauthorized disposal of hazardous wastes at any Authority facility through the existing compliance and waste inspection program.
- Continue to operate the existing Household Hazardous Waste Facility for the receipt of hazardous materials generated in Lancaster County households. Recycle those materials to the greatest extent practical and dispose of the remainder at appropriate facilities.

Sludge and Septage Management

- Continue to provide landfill disposal for dewatered sludge and septage generated in the County. Encourage the wastewater industry to develop dewatering facilities.
- Continue the licensing program for all commercial haulers of sludge and septage, and assemble data via an annual survey to more accurately assess generation rates and existing disposal practices.

Other Facilities

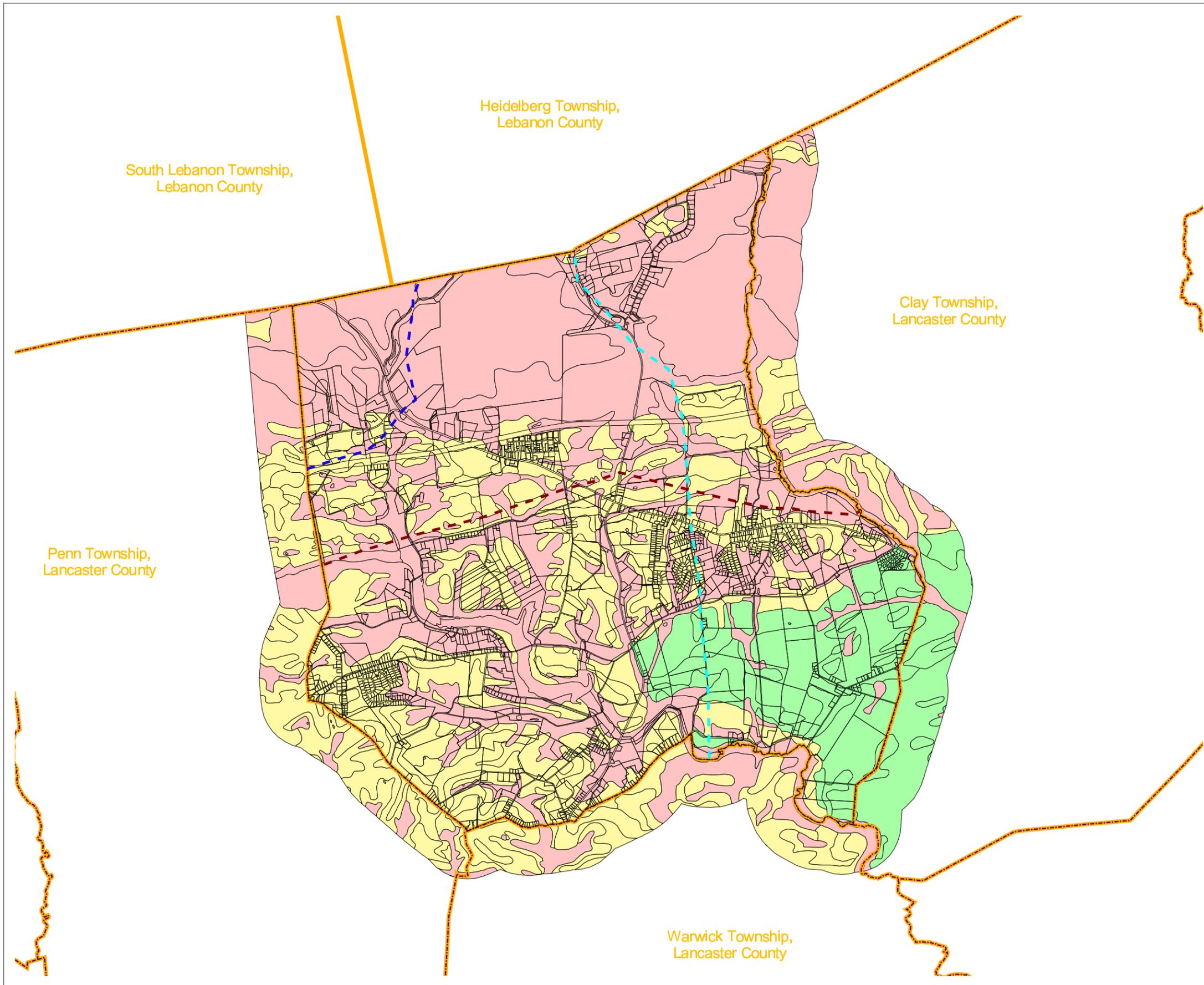
- There are numerous other facilities in Lancaster County that manage waste materials. There are farms and compost facilities which manage yard waste. There are facilities that manage clean fill, recycle wood, gypsum board, used concrete, and other material. The Plan includes a summary of all of these activities.

On July 28, 1998, Pennsylvania Governor Casey signed into law Act 101-1988, commonly known as the "Municipal Waste Planning Recycling and Waste Reduction Act." This Act aggressively required local municipalities whose 1980 population exceeded 5,000, to implement such a program.

Elizabeth Township's 2000 Census, showed the population did not exceed 5,000 persons and the Township, therefore, was not required to implement a local recycling plan pursuant to Act 101-1988. However, Elizabeth Township operates its own recycling program, consisting of a monthly drop-off the first Saturday of each month at the Township Municipal Building. The Township contracts privately with a recycler who accepts paper, cardboard, aluminum, metals, and glass. Recycling is on a voluntary basis and the participation rate is fairly high.

UTILITIES MAP

Map 9
 Utilities Map
 Elizabeth Township, Lancaster County



Legend

-  PG&W Gas Line
-  Met-Ed Electric Transmission Line
-  PP&L Electric Transmission Line
-  Parcel

Limitations for On-Lot Disposal

-  Generally Unsuitable
-  Elevated Sand Mound
-  Generally Suitable



Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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IX. TRANSPORTATION SYSTEM

Mobility has become one of the most sought-after qualities of life of this century. The widespread use and development of automobiles, trucks, and their road networks have enabled motorists to travel independently with great flexibility as to origins and destinations. Only recently, with increased congestion, has society begun to realize that the extensive use of the automobile may, in fact, be threatening both mobility and safety. This realization has led to efforts to better understand the relationship between transportation planning and land use planning, and has created renewed interest in alternative modes of transport.

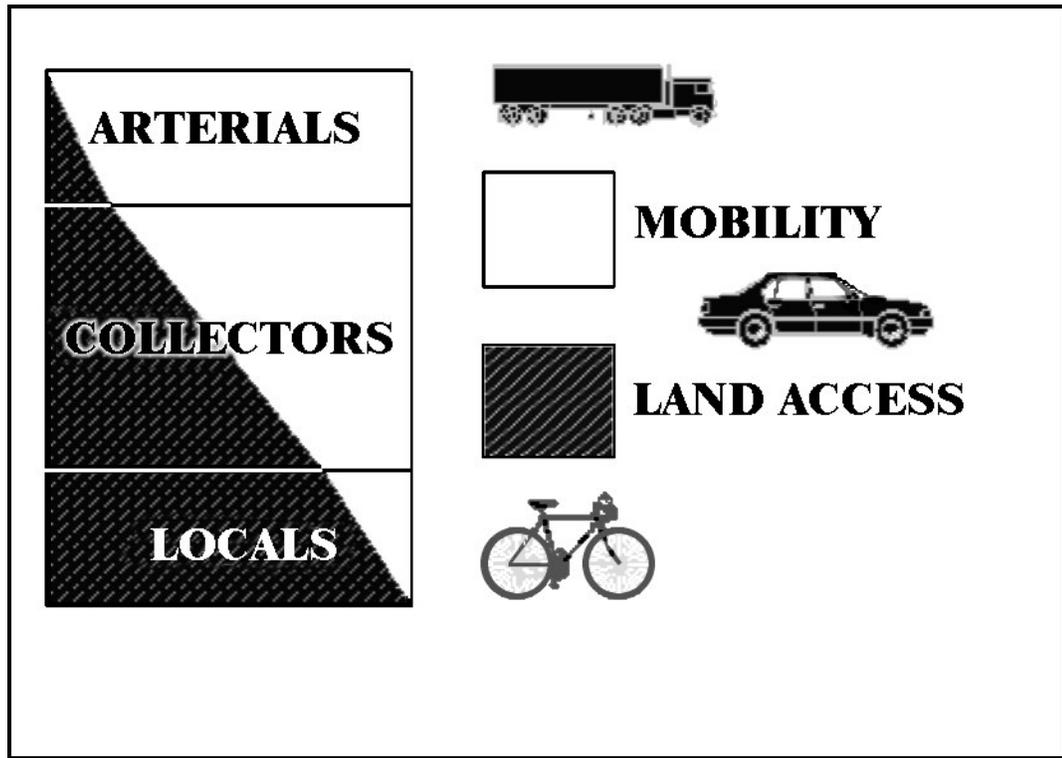
This chapter will inventory the Township's transportation system beginning by categorizing roadway functional classifications, describing roadway design standards, and presenting available traffic volume data and accident locations. A brief discussion of regional traffic impacts is followed by a description of alternative modes of transport. All of this data is then analyzed and applied to the Township's development objectives and other available plan information to form the basis for the chapter's recommendations on future transportation needs, land use scenarios, and implementation strategies.

A. ROADWAY CLASSIFICATIONS

FUNCTIONAL CLASSIFICATIONS AND DESIGN STANDARDS

Functional classification of roadways refers to a system by which roads are described in terms of their utility. Theoretically, roads provide for two separate functions. First, roads provide for mobility—the ability to go from one place to the next. Second, roads provide a measure of access to adjoining properties. Transportation experts use these two roadway characteristics to determine a road's functional classification. The following chart depicts the relationship between roadway mobility and roadway land access for each of the three general road types:

**RELATIONSHIP BETWEEN MOBILITY VS. LAND ACCESS
IN ROADWAY FUNCTIONAL CLASSIFICATION**



As the above diagram indicates, roads that provide for greater mobility provide for reduced land access, and visa versa. This important relationship should always be considered when allocating future land uses along existing or planned roads.

The above diagram illustrates three road types: arterials, collectors, and locals. These road types can be further subdivided into any number of different categories, depending upon the complexity of the roadway network. However, for the purposes of this study, the Township's roadway network can be adequately described by the following four categories: Arterials, Major Collectors, Minor Collectors, and Local Roads. The roads within the Township have been classified and identified on the Existing Road Network Map.

Arterials - Arterials are intended to provide for a greater degree of mobility than land access. Hence, individual driveway intersections with arterials should occur infrequently. Arterials generally convey between 10,000 and 25,000 average daily trips (ADT) for distances greater than one mile. These roads often connect urban centers with outlying communities and employment or shopping centers. Consequently, arteries are often primary mass transit routes that connect with “downtown” areas of nearby cities.

The following sets forth design standards associated with arterial roads:

ARTERIAL ROAD DESIGN STANDARDS						
Design Standards	ROW. Width	Cartway Width	No. of Lanes	Shoulder Width	Border Area Width	Design Speed (mph)
Maximum	126 ft.	60 ft.	5	10 ft.	20 ft.	50
Minimum	42 ft.	22 ft.	2	8 ft.	2 ft.	40

The following summarizes the existing characteristics of the Township's arterial roadways:

ARTERIAL ROADWAY CHARACTERISTICS								
Road Name	Route No.	1975 ADT	1998 ADT	ROW Width	Cartway Width	No. of Lanes	Shoulder Width	Speed Limit
Twenty-Eighth Division Highway	0322	2900-5600	5809-10,627	50-60 ft.	22 ft.	2	0-4 ft.	40-55
Furnace Hills Pike	0501	3600-6300	648-11,130	60 ft.	22 ft.	2	0-7 ft.	45-50
Pennsylvania Turnpike	76			200 ft. minimum	58 ft. (includes 10 ft. median strip)	4	12 ft.	65

All three of the Township's arterial roadways meet the recommended minimum design standards for right-of-way width, cartway width, and number of lanes, but parts of PA 322 and Furnace Hills Pike have little or no shoulder width. It should be noted that Elizabeth Township has no jurisdiction over the roadway design of the Pennsylvania Turnpike, which is under the sole jurisdiction of the independent Pennsylvania Turnpike Commission.

While PA 322 and Furnace Hills Pike provide for some land access in addition to their chief function of mobility, the Pennsylvania Turnpike provides for mobility alone, as a limited-access interstate highway. The Turnpike has no on-ramp or exit within Elizabeth Township, the closest access point being Route 72 in Rapho Township. However, a service road exists at the intersection of the Turnpike with PA 322, which is utilized by the Brickerville Fire Company to provide fire and ambulance service as needed to this transportation corridor.

Major Collectors - Major collectors provide for medium length travel distances (less than one mile)* and convey between 1,500 and 10,000 ADT. Major collectors also provide land access to major land uses such as regional shopping centers, large industrial parks, major subdivisions, and community-wide recreation facilities. Some sparsely developed rural uses also have direct access to major collectors. Major collectors primarily serve motorists between local streets and community-wide activity centers or arterial roads.

The following sets forth design standards for major collector roads:

MAJOR COLLECTOR ROAD DESIGN STANDARDS						
Design Standards	ROW. Width	Cartway Width	No. of Lanes	Shoulder Width	Border Area Width	Design Speed (mph)
Maximum	84 ft.	24 ft.	2	10 ft.	20 ft.	50
Minimum	42 ft.	22 ft.	2	8 ft.	2 ft.	40

The following table summarizes the characteristics of the Township's major collector roadways:

MAJOR COLLECTOR ROADWAY CHARACTERISTICS								
Road Name	Route No.	1975 ADT	1998 ADT	ROW Width	Cartway Width	No. of Lanes	Shoulder Width	Speed Limit
Newport Road	1036	2100	2400-2900	33 ft.	16 ft.	2	0	45
Brubaker Valley Road	4008 1028	650-950	1100-2100	33 ft.	16-20 ft.	2	0	35-40
Clay Road Brunnerville Road	1035	800	800-1400	33 ft.	16 ft.	2	0	40

While Brubaker Valley Road and Newport Road are classified by Lancaster County as minor collectors, they are, in fact, currently carrying the traffic volumes of and being otherwise utilized as major collectors. The bulk of the Township's new residential development is taking place on local roads having direct access to Brubaker Valley Road, while increased traffic levels along Newport Road can probably be attributed to recent growth in neighboring Warwick Township. Because these two roads, as well as Clay and Brunnerville Roads, were not originally designed as major collectors, they do not meet the recommended minimum design standards for right-of-way, cartway, or shoulder width.

*Major collector roads within Lancaster County often exceed one mile in length. This is due to the fact that these roads pass through rural areas and extend from one municipality to another.

Minor Collectors - Minor collectors provide for equal amounts of mobility and land access. These streets serve as the main circulation roads within large residential subdivisions and small rural settlements. Trip lengths tend to be shorter in “developed” neighborhoods but will be longer in outlying rural areas.

The following sets forth design standards for minor collector roads:

MINOR COLLECTOR ROAD DESIGN STANDARDS						
Design Standards	ROW Width	Cartway Width	No. of Lanes	Shoulder Width	Border Area Width	Design Speed (mph)
Maximum	82 ft.	22 ft.	2	10 ft.	20 ft.	30
Minimum	32 ft.	20 ft.	2	4 ft.	2 ft.	30

The following table summarizes the characteristics of the Township's minor collector roadways.

MINOR COLLECTOR ROADWAY CHARACTERISTICS								
Road Name	Route No.	1975 ADT	1998 ADT	ROW Width	Cartway Width	No. of Lanes	Shoulder Width	Speed Limit
Lexington Road	1024	1050–1100	1300–1800	33 ft.	14–18 ft.	2	0	45
Hopeland Road Reifsnyder Road Sleepy Hollow Road	1026	300–700	500–1200	33 ft.	16–18 ft.	2	0	35–40
Speedwell Forge Road	1037	250–400	400–800	33 ft.	18–22 ft.	2	0	35–40

Again, while Lexington Road is classified by Lancaster County as a local road, it is, in fact, currently carrying the traffic volume of and being otherwise utilized as a minor collector. All three minor collectors meet the recommended minimum design standards for right-of-way width, but generally lack sufficient roadway width and have no shoulder width.

Local Roads - Local roads are intended to provide immediate access to adjoining land uses. These roads are intended to serve up to 25 dwellings and are generally short in length within a suburban-type development. In outlying rural areas, local roads may run for greater distances and serve more individual properties; however, the sparsely developed character of these areas prevents congestion problems. Finally, local roads are intended to only provide for transportation within a particular neighborhood, or to one of the other road types already described.

The following sets forth the design standards for local streets:

LOCAL ROAD DESIGN STANDARDS						
Design Standards	ROW Width	Cartway Width	No. of Lanes	Shoulder Width	Border Area Width	Design Speed (mph)
Maximum	54 ft.	22 ft.	2	8 ft.	8 ft.	25
Minimum	28 ft.	20 ft.	2	4 ft.	2 ft.	25

All of the roads not previously classified as arterials or collectors are considered local roads. Two of these, Mountain Road (4032) and Zartman Mill Road (4031), are State-owned, while the remainder are Township-owned.

PRIORITY NETWORK SYSTEM

A second, special purpose roadway classification system exists that will be briefly described here. The Pennsylvania Department of Transportation has identified the most important through-routes for commerce in the Commonwealth, and designated these roads as the Priority Network System. These are roads that generally support high volumes of truck traffic. Two such types of roads are located within Elizabeth Township. They are:

1. Priority Commercial Network: These highways provide primary access to economic centers in Pennsylvania and surrounding states. Such highways are through-routes carrying a minimum of 500 heavy trucks per day.
2. Agricultural Access Network: These roads provide primary access from agricultural areas to the Priority Commercial Network. There is no minimum truck usage standard.

According to Lancaster County's *Draft Interim Long-Range Transportation Plan (1993)*, all three of Elizabeth Township's arterials—the Pennsylvania Turnpike, PA 322, and Furnace Hills Pike—are designated part of the Priority Commercial Network System. All of the roads described in this chapter as major or minor collectors, excepting Speedwell Forge Road, are designated part of the Agricultural Access Network.

The significance of this information is that it separates the utility of roads for commerce from their utility for personal use. The Priority Network System specifically identifies roads that are heavily utilized by truck traffic and farm vehicles. This can have implications for both land use and transportation planning. In Elizabeth Township, these roads are also well-utilized by personal vehicles. The County's *Transportation Plan* identifies obstructions and deficiencies in the Priority Network System, but lists none for Elizabeth Township.

B. TRAFFIC SAFETY

Along with congestion reduction, traffic safety is also an important consideration in the programming of roadway improvements. High accident locations can result from various factors, such as inadequate road design, insufficient sight distance, improper speed limits, driver negligence, etc. This section will describe traffic accident statistics within the Township so that the planning recommendations contained within this report can acknowledge these conditions. From the outset, it must be understood that these traffic safety discussions are not presented as qualified engineering analyses; instead, they are used solely to gain a general understanding of the location and severity of traffic safety problems.

Traffic accident data was obtained from the Pennsylvania Department of Transportation, Bureau of Highway Safety and Traffic Engineering, for the period 1994–1999. This six-year period provided the most recent accident data available at the time of writing this document. The location of all the accidents discussed on the following pages have been plotted on the Traffic Accidents Map.

The following describes those fatal accidents recorded within the Township between 1994 and 1999.

TRAFFIC FATALITIES (1994-1999)						
Accident Number	Date	Principal Road	At Intersection or Between Roads	Persons Killed	Type of Accident	Contributing Factors
1	6/13/95	Twenty-eighth Division Highway	Midblock between Sleepy Hollow Road and Elser Hill Road	1	two-vehicle	Improper Entrance
2	1/23/97	Furnace Hills Pike	Midblock between Zartman Road and Brubaker Valley Road	1	one-vehicle	Speed Related
3	4/10/98	State Route 501	Intersection of State Route 501 and Loop Road	1	two-vehicle	Improper Turning

Aside from the preceding fatal accidents, specific accident locations are ranked by frequency for the Township. These specific locations are ranked and reported in two categories. First, accidents that occurred at specific intersections at two or more roads are identified and ranked. Second, accidents that occurred along one road between two roads, or mid-block accidents, are enumerated and ranked. Mid-block accidents also include accidents that occurred along public roads at an intersection with a driveway. The following tables rank only the most frequently occurring accident sites.

INTERSECTION ACCIDENTS (1994- 1999)

Rank	Intersection	Total # of Accidents
1	Furnace Hills Pike & Brubaker Valley Road	17
2	Furnace Hills Pike & Twenty-eighth Division Highway	15
3	Furnace Hills Pike & Lexington Road & Bomberger Road	7
3	Twenty-eighth Division Highway & Brubaker Valley Road	7
3	Furnace Hills Pike & Loop Road	7
4	Brubaker Valley Road & Reifsnyder Road	4
5	Brubaker Valley Road & Oak Lane	3
5	Twenty-eighth Division Highway & Speedwell Forge Road	3
5	Speedwell Forge Road & Elm Road & Elizabethtown Road	3
6	Clay Road & Hackman Road	2
6	Twenty-eighth Division Highway & Sharona Drive	2
6	Speedwell Forge Road & Mountain Road	2
6	Furnace Hills Pike & Fox Road	2
6	Twenty-eighth Division Highway & Keener Road	2
6	Twenty-eighth Division Highway & Pumping Station Road	2
6	Twenty-eighth Division Highway & Sleepy Hollow Road	2
7	Twenty-eighth Division Highway & Hershey Road	1
7	Furnace Hills Pike & Oak Lane	1
7	Twenty-eighth Division Highway & Turnpike Road	1

MID-BLOCK ACCIDENTS (1994-1999)

Rank	Route	Between	Total # of Accidents
1	Furnace Hills Pike	Twenty-eighth Division Highway & Fox Road	14
2	Twenty-eighth Division Highway	Pumping Station Road & Mountain Road	11
3	Furnace Hills Pike	Zartman Mill Road & Brubaker Valley Road	7
4	Twenty-eighth Division Highway	Blantz Road & Long Lane	4
4	Twenty-eighth Division Highway	Furnace Hills Pike & Keener Road	4
4	Twenty-eighth Division Highway	Pennsylvania Avenue & Park Avenue	4
4	Twenty-eighth Division Highway	Yummerdall Road & Espensshade Drive	4
5	Furnace Hills Pike	Brubaker Valley Road & Crest Road	3
5	Sleepy Hollow Road	Snavelly Mill Road & Brubaker Valley Road	3
5	Twenty-eighth Division Highway	Park Avenue & Speedwell Forge Road	3
6	Brubaker Valley Road	Hammer Creek Road & Wheat Land Drive	2
6	Brubaker Valley Road	Keener Road & Reifsnyder Road	2
6	Brubaker Valley Road	Weber Road & Old Pike Road	2
6	Brunnerville Road	Snavelly Mill Road & Hammer Creek Road	2
6	Long Lane	Unknown Street & Unknown Street	2
6	Loop Road	Furnace Hills Pike & Unknown	2
6	Old Pike	Zartman Mill Road & Brubaker Valley Road	2
6	Old Pike	Unknown Street & Unknown Street	2
6	Pumping Station Road	Twenty-eighth Division Highway & County Line Road	2

MID-BLOCK ACCIDENTS (1994-1999)			
6	Pumping Station Road	Unknown Street & Unknown Street.	2
6	Sleepy Hollow Road	Unknown Street & Unknown Street.	2
6	Twenty-eighth Division Highway	Furnace Hills Pike & Long Lane	2
6	Twenty-eighth Division Highway	Hershey Road & Shrona Drive	2
6	Twenty-eighth Division Highway	Sleepy Hollow Road & Espensshade Drive	2
7	Blantz Road	Weber Road & Brubaker Valley Road	1
7	Brubaker Valley Road	Furnace Hills Pike & Old Pike Lane	1
7	Clay Road	Township 933 & Township 596	1
7	Crest Road	Unknown Street & Unknown Street.	1
7	Evans Road	Zartman Mill Road & Mumma Road	1
7	Fox Road	Furnace Hills Pike & County Line Road	1
7	Fox Road	Unknown Street & Unknown Street.	1
7	Furnace Hills Pike	Fox Road & Lebanon County Road	1
7	Furnace Hills Pike	Fox Road & Rosebud Road	1
7	Furnace Hills Pike	Lexington Road & Loop Road	1
7	Furnace Hills Pike	Twenty-eighth Division Highway & Brubaker Valley Road	1
7	Laurel Drive	Segloch Road & Fawn Hollow Road	1
7	Loop Road	Furnace Hills Pike & Snavely Mill Road	1
7	Loop Road	Unknown Street & Unknown Street.	1
7	Mountain Road	Penryn Road & Locust Grove Road	1
7	Oak Lane	Unknown Street & Unknown Street.	1
7	Penryn Road	Mountain Road & Scenic Drive	1
7	Reifsnnyder Road	Sunrise Avenue & Hickory Drive	1
7	Seglock Road	Unknown Street & Unknown Street.	1
7	Sleepy Hollow Road	Brubaker Valley Road & Apple Blossom Circle	1
7	Speedwell Forge Road	Oak Lane & Lake View Drive	1
7	Twenty-eighth Division Highway	Brubaker Valley Road & Clay Road	1
7	Twenty-eighth Division Highway	Brubaker Valley Road & Espensshade Road	1
7	Twenty-eighth Division Highway	Keener Road & Hopeland Road	1
7	Twenty-eighth Division Highway	Pumping Station Road & Speed Well Forge Road	1
7	Twenty-eighth Division Highway	Sleepy Hollow Road & Elser Hill Road	1
7	Twenty-eighth Division Highway	Speedwell Forge Road & Park Avenue	1
7	Zartman Mill Road	Mumma Road & Old Pike Road	1
7	Zartman Mill Road	Unknown Street & Unknown Street.	1

Aside from the obvious contributing factors to these traffic accidents, such as drunk driving, poor weather conditions, speeding, and careless motorist behavior, road design, limited or obstructed sight distance, and developed land uses along roads also contribute to the occurrence of accidents. By far, the Route 322 and Furnace Hills corridors have recorded the highest number of accidents within Elizabeth Township for the period 1994–1999. In fact, of the 196 total recorded accidents that occurred within the Township in this period, 137, or 70%, of them were reported along these two arterial corridors.

The location with the highest number of accidents is the intersection of Furnace Hills Pike with Brubaker Valley Road. The major cause of accidents at this site is pullouts after stops onto Furnace Hills Pike, where drivers apparently underestimate the speed of oncoming traffic. A second stop sign placed at this intersection this year should improve safety here. Other locations with high incidences of accidents include the entire stretch of the Furnace Hills Pike, north of its intersection with PA 322, and the stretch of PA 322 north of the Turnpike. The major contributing factor to a number of accidents in these areas is weather conditions, particularly ice and snow. These stretches were recently repaved and the shoulders improved, which should improve traffic safety in these areas.

Other problem locations include intersections with poor site distance, such as the intersection of PA 322 and Brubaker Valley Road, and that of Furnace Hills Pike and Lexington Road. A number of accident locations appear to be at curves, where vehicles crossed the centerline. Finally, accidents occur when the two road functions of access and mobility conflict along the same roadway, such as along PA 322 through Brickerville and Poplar Grove and Furnace Hills Pike in the Lexington area. These routes both carry relatively high volumes of traffic at high speeds, but also serve residential properties and other developed land uses that rely on the access provided by these roads.

C. REGIONAL TRAFFIC IMPACT

Before specific transportation-related recommendations can be made, it is important to understand that Elizabeth Township possesses several roads that serve a larger traffic shed than that of just the Township. First, PA 322 is an arterial roadway connecting Chester and Downingtown in Chester County with Harrisburg and State College to the northwest. Second, Furnace Hills Pike is another arterial roadway connecting the Lancaster metropolitan area with Lebanon County to the north. Both of these roadways carry moderately high volumes of through traffic, as well as local traffic generated from within Elizabeth Township. These routes will continue to experience growing traffic volumes, due to their importance as links between outside areas and the County, and between the Township and the Lancaster metropolitan area.

The Pennsylvania Turnpike has no discernible impact on Elizabeth Township, due to the lack of access points within or near the Township. There are no known plans for any new Turnpike access points in or near the Township at this time.

The Township's major collectors provide a primary means of transport to adjacent townships. Because of the regional nature of these roadways, traffic volumes can increase in short periods of time due to the planning and zoning policies of adjoining municipalities and beyond. Planned development in Warwick Township to the south can be expected to generate a significant increase in the level of traffic on Lexington Road, as well as Newport Road and Snively Mill Road.

D. ALTERNATIVE MODES OF TRANSPORTATION

PEDESTRIAN TRANSIT

Walking is an important means of transportation that is often overlooked in land use and transportation planning. Pedestrian walkways in residential and commercial areas can provide access between residences and nearby neighborhoods, shopping, schools, playgrounds, etc. Road shoulders in rural areas can enable pedestrians to walk safely to nearby villages, bus stops, etc. The lack of pedestrian facilities makes residents dependent on the automobile for even short trips that might otherwise be made on foot. Currently, there are few pedestrian walkways or road shoulders in Elizabeth Township that might facilitate walking. The lack of interconnected streets in many residential areas further discourages walking by increasing trip lengths. Increased provision of pedestrian facilities in Brickerville, especially, could reduce traffic congestion and safety hazards along PA 322.

BIKE TRANSIT

Biking is another means of transport that has the potential for greater application in the Township. Biking can be for recreation or commuting purposes. As for pedestrian traffic, bikers need safe routes to be encouraged in this practice. Biking has historically been an important means of transport among the Mennonite community in the southeastern part of the Township. However, the lack of road shoulders throughout most of the Township generally discourages biking. The provision of road shoulders or bike paths, lanes, or routes along specific roads could encourage increased bike use.

PUBLIC TRANSIT

The Red Rose Transit Authority (RRTA) operates a fleet of public busses serving much of Lancaster County. Presently, there is no RRTA service to Elizabeth Township because of the relatively low and scattered population that characterizes the area. Public transit is cost-effective only when it is extensively utilized. If a demand for public transit were to develop in the Township, the preferred route would be north on Furnace Hills Pike, then east on PA 322 through Brickerville. Route 10 already extends north as far as Lititz and could be extended to serve Elizabeth Township.

CARPOOLING

The RRTA is in the process of developing a Park-and-Ride Program for the use of car-poolers and transit riders. A number of informal park-and-ride lots already exist around the County. Potential locations for park-and-ride lots in Elizabeth Township include the intersection of PA 322 and Furnace Hills Pike, or the intersection of Brubaker Valley Road and Furnace Hills Pike. Lancaster County's *Transportation Plan* also recommends the County development of a Ride-Matching Program that would facilitate carpooling and employer van-pooling where desired.

PARATRANSIT

Public transit for the transportation-disadvantaged within Elizabeth Township is currently provided by Red Rose Access, a nonprofit agency offering Countywide specialized transportation services. Red Rose Access operates as a broker of paratransit service, contracting with four private operators utilizing 16 wheelchair-accessible vehicles to provide these services. Elizabeth Township is included in Red Rose Access service area number three.

RAIL AND AIR TRANSIT

There are no rail lines within Elizabeth Township. The closest freight line is a CONRAIL branch through Lititz connecting with CONRAIL's main line in East Hempfield Township. The closest passenger train service is available at the Amtrak station in Lancaster City. There are no airports within Elizabeth Township. The closest available public air service is the Lancaster Airport in Manheim Township.

E. RECOMMENDATIONS

Based upon the goals articulated in the *Community Planning Goals* chapter of this Comprehensive Plan, the Township's main objective in planning for its transportation system is to facilitate the safe and efficient movement of through traffic and to provide safe and convenient access to destinations within the Township.

The most important task before the Township is the need to separate through traffic from local traffic. One way of doing this is to classify, design, and improve roadways for their intended purposes. ***Existing roadways should be improved to the design standards for the various roadway types described earlier in the chapter.*** The implementation of such design standards for the various functional classifications is meant to maximize traffic flow and minimize safety hazards. The chart on the following page briefly outlines the necessary minimum remedial measures needed to upgrade the Township's roadway system, including its arterials, major collectors, and minor collectors.

This list is presented to make local officials aware of what is needed to bring these roads into minimum compliance with the roadway classification design standards specified by the Federal government. It should be noted that all of the listed roads are under State jurisdiction and would require State funding and involvement to upgrade. However, local governments should lobby the State and County for the funding for these and other projects.

REMEDIAL TRAFFIC IMPROVEMENTS CHART		
Roadway	Route No.	Remedial Measures
ARTERIAL		
Twenty-Eighth Division Highway	0322	Increase shoulder widths to a minimum of 8 feet on each side.
Furnace Hills Pike	0501	Increase shoulder widths to a minimum of 8 feet on each side.
MAJOR COLLECTOR		
Newport Road	1036	Increase right-of-way width to a minimum of 42 feet; increase cartway width to a minimum of 22 feet; construct shoulders with a minimum width of 8 feet each.
Brubaker Valley Road	4008 1028	Increase right-of-way width to a minimum of 42 feet; increase cartway width to a minimum of 22 feet; construct shoulders with a minimum width of 8 feet each.
Clay Road Brunnerville Road	1035	Increase right-of-way width to a minimum of 42 feet; increase cartway width to a minimum of 22 feet. Construct shoulders with a minimum width of 8 feet each.
MINOR COLLECTOR		
Lexington Road	1024	Increase cartway width to a minimum of 20 feet; construct shoulders with a minimum width of 4 feet each.
Hopeland Road Reifsnyder Road Sleepy Hollow Road	1026	Increase cartway width to a minimum of 20 feet; construct shoulders with a minimum width of 4 feet each.
Speedwell Forge Road	1037	Increase cartway width to a minimum of 20 feet; construct shoulders with a minimum width of 4 feet each.

To begin with, it appears that the Township's arterial roadway system is functioning at a generally appropriate level. PA Route 322 and Furnace Hills Pike have cartway widths and rights-of-way which meet the standards defined by the Federal government. Should these routes ever need to be widened in the future, there is sufficient land available to do so. However, shoulder widths should be increased where needed on both roads as a safety measure.

The Township's major collectors are currently the most deficient routes. This is because they were designed many years ago as local roads, but have evolved over time to be utilized now as major collectors. They all have 33-foot rights-of-way, mostly 16-foot cartways, and no shoulders. The cartways should be widened and shoulders constructed to meet recommended minimum standards. However, the 33-foot right-of-way limits the State's ability to do this without having to purchase portions of private properties that abut the roadway. ***One way local officials can reduce the high costs associated with the purchase of rights-of-way is to require that any future development along these routes be set back far enough for the needed additional right-of-way widths.***

Brubaker Valley Road is increasingly utilized by truck traffic, which has raised safety concerns among local officials because of the road's narrow cartway, lack of shoulders, narrow bridge, and curves. As a result, there has been some discussion of possibly limiting truck traffic on this route. However, because this road is State-owned, the truck traffic it carries may not be regulated by the Township. On the other hand, if the Township were to apply to the State's Turnback Program and be accepted, Brubaker Valley Road would be improved by the State to meet current design standards, then be turned back over to the Township as a Township road (see discussion under Project Funding). At such time the Township could elect to limit truck traffic on this route. However, this creates its own minor dilemma, as the improvements would then make the route safer for trucking. Nevertheless, PA 322 as an arterial is a more appropriate route for this truck traffic, and improvements to Brubaker Valley Road would certainly benefit the substantial flow of non-truck traffic utilizing this route.

The Township's minor collectors at present have adequate right-of-way widths, but deficient cartway widths and no shoulders. Again, local officials should lobby for funding for these improvements.

According to Glenn Martin, Elizabeth Township's Roadmaster, Township-owned roads are in satisfactory condition, with the only planned future improvement the widening of Snavely Mill Road, between Reifsnyder Road and Sleepy Hollow Road, next year. The Township has just completed major improvements to the Hackman Road Bridge, widening it from one lane to two lanes. Mr. Martin also states that the Township's few private roads are adequately maintained and create no problems for the Township. Elizabeth Township officials have discussed the desirability of participating in the State's Turnback Program (see discussion under Project Funding) to acquire Zartman Mill Road and Upper Reifsnyder Road. These are both local roads, providing primarily access to local residents. It might well be in the Township's best interest to own and maintain them.

A second method of separating through traffic from local traffic is to minimize the number of points of access onto the Township's arterial and major collector roadways. As described earlier, roads can either provide for greater mobility or greater access, but not function successfully as both. It is apparent from the number of vehicles traveling PA 322, Furnace Hills Pike, and other routes that they are being used for mobility between nearby communities and neighborhoods as either arterials or collectors. Equally apparent, however, is the large number of driveway connections and intersections occurring along these roads in certain areas of the Township. The combination of these two conflicting road functions can produce serious congestion and safety problems. ***By limiting the number of driveway and access drive connections through zoning requirements, local officials can decrease the potential for congestion and accidents associated with these roads. Zoning requirements that impose setbacks between driveways, a limit on the number of driveways, incentives for utilizing***

shared driveways, and required access to the street of lesser classification can be helpful.

A third and critical method of separating through traffic from local traffic involves the future allocation of land uses along the various road types. More intensive commercial, industrial or residential developments are obvious land uses that benefit from the improved mobility offered by arterial and collector roadways. However, these more intensive uses must be designed in a manner that minimizes driveway cuts. Stripped-out land uses of any type create multiple access points and worsen road congestion. Agricultural uses are often especially compatible uses along such roadways because of the lack of driveway cuts. Lower volume minor collector roads and local roads, designed to provide local access to adjoining properties, provide ideal locations for rural and single-family detached residential developments.

To further reduce congestion, it is recommended that future land uses be integrated as much as possible so as to reduce vehicle trip lengths and encourage the use of alternative modes of transport. This means locating local shopping, recreation areas, etc. within walking distance of residents. Another method of reducing congestion is requiring interconnected streets. This provides many options for travel for people and reduces the distances they must drive to reach their destinations. Many recently built roads in the Brickerville area do not connect from east to west, requiring drivers and pedestrians to utilize PA 322 or Brubaker Valley Road. The adoption of an Official Map could identify the desired location of future streets in the Township.

It is recommended that Township residents be provided with greater pedestrian and bicycle access, particularly in developed and developing areas. This can be accomplished through Zoning Ordinance provisions requiring pedestrian walkways and bike paths, or the Township could initiate such improvements in already built areas. Such walkways and paths should seek to link existing and future residential, commercial, industrial, and recreation areas. New road shoulders would provide a means of walking and biking in rural areas. If the Township believes there would be sufficient ridership at some point in the future, it should work with RRTA to establish a bus route and park-and-ride lot within Elizabeth Township.

Finally, to improve road safety, it is recommended that high traffic accident intersections and segments be further analyzed to determine if inadequate roadway or intersection design is causing repeated accident occurrences or whether some other element or contributing elements are causing these accidents. Locations that appear most in need of analysis include the intersections of Furnace Hills Pike and Brubaker Valley Road, PA 322 and Furnace Hills Pike, PA 322 and

Brubaker Valley Road, and Furnace Hills Pike and Lexington Road. Also, the entire PA 322 and Furnace Hills Pike should be analyzed to determine safety levels.

INTERSECTION IMPROVEMENT INVENTORY	
Intersection	Recommended Improvement
1. SR 0322 (Twenty-Eighth Division Highway), Yummerdall Road, and Brubaker Valley	Intersection realignment and improve sight distance
2. SR 0322 (Twenty-Eighth Division Highway) and Dead End Road	Vertical and horizontal alignment and improve sight distance
3. SR 0322 (Twenty-Eighth Division Highway) and Pumping Station Road	Realign Pump Station Road and improve sight distance
4. Brubaker Valley Road, Newport Road, Elm Road, and Speedwell Forge Road	Realign Brubaker Valley and Elm Intersections and Speedwell Forge Road with Brubaker Valley
5. Oak Lane and Brubaker Valley Road	Realign to provide opposing centerlines
6. Oak Lane and Newport Road	Align to 90 degree and improve sight distance at intersection
7. Newport Road and Lexington Road	Reconstruct intersection to a four way stop and improve storm water management facilities
8. SR 0501 (Furnace Hills Pike) and Loop Road	Realign Loop Road to 90 degree intersection with SR 0501 and add left turn lanes
9. Brubaker Valley Road and Lake View Drive	Improve sight distance and storm water management facilities
10. Hammer Creek Road and Brunnerville Road	Relocate Hammer Creek Road to improve sight distance
11. SR 0501 and Brubaker Valley Road	Improve site distance and conduct left turn lane and signal warrant analysis
12. SR 0501 and Fox Road	Improve vertical alignment and improve sight distance to the south
Source: Roadway Inspection conducted by Glenn Martin, Elizabeth Township's Roadmaster and James Caldwell, RETTEW Associates, Inc.	

F. PROJECT FUNDING

When local officials are faced with having to make roadway improvements, their first reaction is how much will it cost? Like most communities, financing transportation improvement projects could be one of the biggest challenges facing the Township. Projects on State-owned roads should be funded and built by PENNDOT. However, these types of projects compete on a statewide basis and funding levels are often low. Some projects on State roadways may require joint PENNDOT, County, and municipal financial participation. A request for funding requires the submittal of a municipal proposal for PENNDOT's consideration for placement on its Twelve-Year Transportation Improvement Program.

A second funding method allows each municipality to engage in fair, yet purposeful negotiations with developers for the provision of transportation improvement projects where proposed developments impact existing on-site roadway segments and/or intersections. However, this technique only solves acute design problems that are located on or adjacent to the development site.

Aside from these two funding methods, there are other transportation improvement funding options that can be investigated and applied simultaneously with the above described methods or applied individually. The following section identifies and describes some of these funding

programs available to the Township to help offset the costs associated with roadway improvements.

Federal Intermodal Surface Transportation Efficiency Act (ISTEA) - This Federal funding source approved in 1991 can provide funds for various projects that improve road safety. Among them is the “Surface Transportation Program,” which requires that ten percent of each state's allocated funds be distributed to certain safety improvement programs. The widening and resurfacing of narrow, heavily utilized roadways and the improvement of dangerous intersections are projects that would qualify.

A second ten percent of each state's allocated funds in this program must be spent for transportation enhancement activities. These funds are to be used to provide for pedestrian and bicycle use, acquisition of scenic easements and scenic or historic sites, and preservation of abandoned railway corridors to name a few. In order for local municipalities to “tap” into the funding provided by ISTEA, it is recommended that they inquire about funding for specific transportation improvements projects with the LCPC and PENNDOT's District 8-0 Office in Harrisburg.

Safety and Mobility Initiative Program (SAMI) - This program developed as a combination of the Federal Energy Conservation, Congestion Reduction and Safety Program (ECONS), and the Corridor Safety Initiatives Program (CSI). The focus of the program at this point is on the Federal Congestion Mitigation and Air Quality (CMAQ) mandates which include, but are not limited to, the implementation of the following Transportation Demand Management Programs: Park-and-Ride promotion and implementation, transit service promotion programs, staggered work shift hours, and pedestrian-ways and bikeways. This is another program funded under ISTEA. Again, it is recommended that local municipalities contact LCPC and PENNDOT District 8-0 for information regarding specific projects and the availability of funding under this program.

Highway Transfer or Road Turnback Program - Under this program, sponsored by PENNDOT since 1981, PENNDOT will bring a road up to current specifications and then dedicate or “turn it over” to the participating municipality. Annual maintenance fees are also included (up to \$2,500/mile) by PENNDOT. In most instances, the municipality gets a new roadway and funding for maintenance. This is one method of restoring and improving aging and deficient roadways within the Township. This program can be pursued by contacting PENNDOT's District 8-0 Engineer's Office in Harrisburg, PA.

Impact Fees - Some municipalities in Pennsylvania have followed the example of other states (especially Florida and California) of developing impact fees. Under this arrangement, the developer pays a set fee to the municipality for roadway improvements. Improvements can then be made to roadways and intersections impacted by the proposed development. Fees are established by a formula based upon the development impact using the number of trips generated during the peak hour. The State recently enacted

legislation (Act 209, amendment to Act 247) which permits municipalities to impose transportation impact fees. However, the preparation and adoption of such an ordinance requires rigorous planning analysis and transportation engineering expertise, and is of limited value to rural areas.

Transportation Partnerships - Act 47 of 1985, as amended, provides for the formation of “partnerships” between municipalities and, in most cases, local developers and businesses. A formal partnership requires the designation of a transportation development district in which all improvements will take place and in which assessments may be charged. This type of funding program is most useful in growing areas. Contact PENNDOT's office of planning for more information.

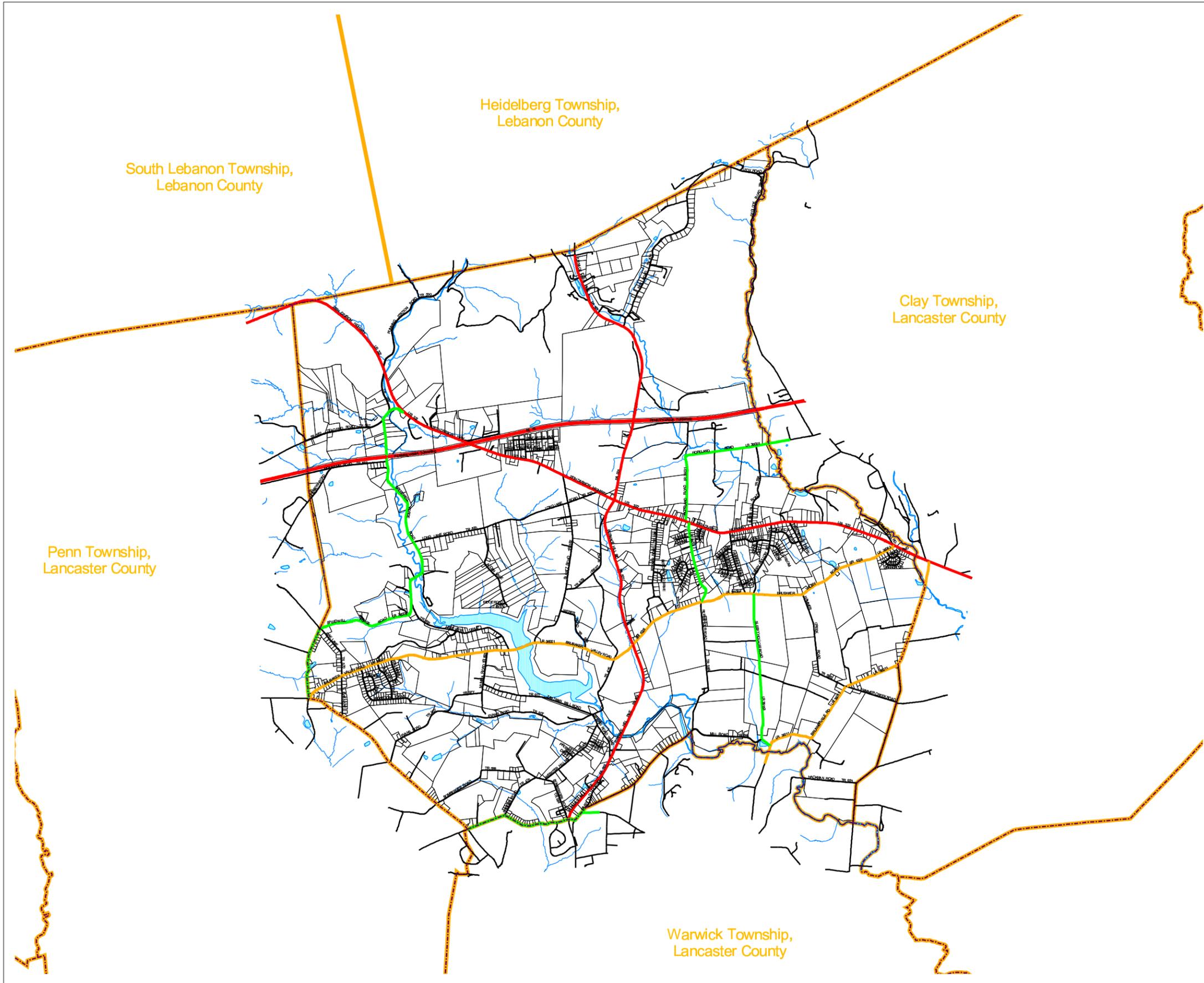
Local Share of Liquid Fuels Tax - This provides for a permanent allocation of a part of the liquid fuels tax collected by the state for municipalities. Liquid fuels tax allocations may be used for any road-related activity including maintenance, repair, construction, or reconstruction of public roads or streets. The funding source for this program is the Bureau of Municipal Services, PENNDOT; distribution of the funds is administered by Lancaster County.

Lancaster County Transportation Grant Fund - The Lancaster County Planning Commission has established a Transportation Grant Fund for projects that will reduce congestion, increase safety, or provide matching funds for other grant programs. The funding for this program is from the Liquid Fuels Tax revenues. Municipalities must submit their project requests in early spring of each year to be eligible for consideration. It should be noted that municipalities can only apply for either the Liquid Fuels Tax revenues or the Transportation Grant Fund, but not both. If additional information is desired, contact the Lancaster County Planning Commission.

Borrowing - Each municipality can use its borrowing power to raise funds for any specific project. This could be done at any time during the life of the Plan.

Highway Access or Capital Improvements Fund - This fund can be established as a special fund set aside for municipal capital improvements. Funds could come from a special tax or the use of excess revenues or both. For instance, a specified amount of the municipality's millage could be set aside for this fund. When this fund reaches a certain size, it could then be utilized to contribute to a variety of capital improvement demands. The accumulation of this fund can be used to pay for municipal-owned roadways or can be used as a matching fund for State or Federal grants.

Map 10
Existing Road Network
Elizabeth Township, Lancaster County



Legend

Road class

-  Arterial Roadway
-  Major Collector
-  Minor Collector
-  Parcel
-  Stream
-  Lake, Pond

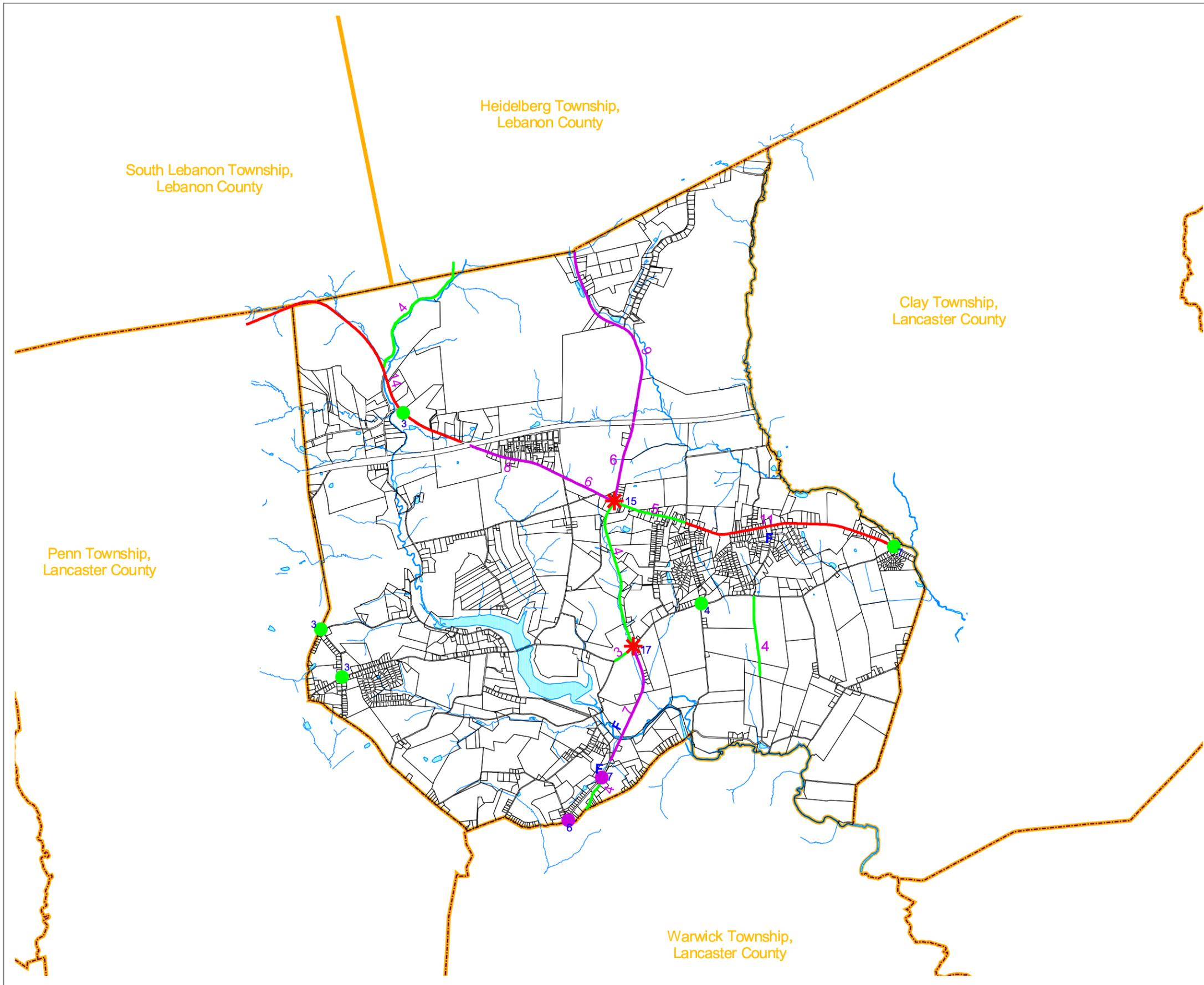


Base Map: Lancaster County GIS Department Landbase
Projection: Pennsylvania State South, NAD 83, U.S. Feet
Adopted: September 8, 2003
Plot Date: September 26, 2003

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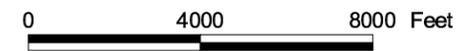


Map 11
 Traffic Accidents Map
 Elizabeth Township, Lancaster County



Legend

- F Fatal Accident Location
- Accident Intersections**
- 3 to 5 Accidents
- 6 to 10 Accidents
- * >10 Accidents
- Accident Road Segments**
- ~ 3 to 5 Accidents
- ~ 6 to 10 Accidents
- ~ >10 Accidents
- Parcel
- ~ Stream
- Lake, Pond



Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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X. FUTURE LAND USE PLAN

The culmination of the comprehensive planning process is the selection of appropriate growth areas. This effort utilizes all of the background information collected on natural features, public facilities, existing land use, population studies, and traffic patterns. Planned land uses are allocated in a manner that responds to this information and the community's desires, as expressed in the Community Planning Goals. What results is a Future Land Use Map that should be used to adjust zoning boundaries, and help properly locate future municipal investments, so to maximize their efficiency. This chapter should be used in conjunction with the Future Land Use Map.

The Elizabeth Township Comprehensive Plan is intended to address future growth and development until the year 2010. Accordingly, future growth areas have been located and sized to accommodate growth that is projected during this time frame. Consistent with expressed community planning goals as well as the Lancaster County Comprehensive Plan, this results in a “staged” future land use scheme that (1) reduces the conversion of productive farmlands, (2) confines development areas so that public and private improvements and services can be provided efficiently to a compact area, and (3) focuses on infill development in and around existing settlements.

While the Future Land Use Map acknowledges the majority of existing land uses, it specifically omits a number of scattered residences, small businesses, and industries that are widely dispersed throughout the Township. This deliberate omission is an attempt to portray a “future vision” of the Township toward which local regulatory efforts can strive and will require considerable use and emphasis on the administration of the Zoning Ordinance's nonconforming use provisions.

The Future Land Use Map utilizes a number of Plan designations, each identifying a recommended land use category. These Plan designations are intended specifically to guide and provide a framework of support for the applicable zoning in the area. Generally speaking, each Plan designation is intended to be implemented by a specific corresponding zone in the Zoning Ordinance, thereby providing consistency between planning and zoning. Plan designations on the Future Land Use Map are applied utilizing property lines, roads, and natural features, except where impractical.

As noted in Chapter 6 of this Plan, *Adjacent and Regional Planning*, Lancaster County's Growth Management Plan proposes the use of urban growth boundaries (UGBs) around the County's boroughs, within which the majority of future growth of adjacent townships is encouraged to be directed. These are areas within which the full range of public facilities and services are planned or already exist. A UGB separates areas intended for future urban growth and development from areas intended for agricultural, resource, and rural uses. The Growth Management Plan also proposes the use of village growth boundaries (VGBs) around the County's villages as a similar way to manage growth in rural areas.

A UGB has been adopted by Warwick Township that extends north of Lititz to the Elizabeth Township boundary and includes lands planned for low-density residential use along this boundary. While Elizabeth Township has the option to extend this UGB into the Lexington area, it has elected not to do so for several reasons. First and foremost, the Township considers itself rural; the extension of a UGB into the Township would carry with it the responsibility to provide an urban level of facilities and services to a relatively undeveloped area with little prospect within the planning time frame of being provided with public sewer and water. Second, an urban level of development in the Lexington area could exacerbate current high traffic accident rates in the area caused by largely noncorrectable land and road features. Finally, local officials have determined that Brickerville, as the Township's largest village, is the most appropriate location for the bulk of projected future growth and development within the Township.

Brickerville offers a number of public and private services and facilities to its residents, including the Township building and park, fire and ambulance station, churches, and businesses. The village further has the potential to grow into a community that can provide its residents with additional amenities, opportunities for greater community interaction, and the possibility of more locally-based jobs.

Most, although not all projected future growth within Elizabeth Township to the year 2010 is anticipated to occur within the Brickerville area. Other limited development will be accommodated in Elm, Poplar Grove, Lexington, and other areas of the Township.

The following provides a description of each of the recommended plan designations depicted on the Future Land Use Map.

A. AGRICULTURE

Chapter 3 of this Plan, *Natural and Cultural Features*, estimates that about one-half of the Township is comprised of prime agricultural soils and soils of Statewide importance. Like much of Lancaster County, Elizabeth Township is planned to include a large component of agriculture through the Year 2010.

Areas proposed for Agriculture are those areas with large concentrations of prime farmlands and existing or historically farmed lands. In addition, many of the areas depicted as Conservation on the Future Land Use Map correspond to floodplains that should not be developed, but are prime agricultural soils. While farming should dominate land uses within this classification, other limited uses can provide benefits to the farming community.

First, a number of rural nonfarm residences have been included in lands planned Agriculture. This reflects the fact that many of these residences were, and will continue to be, permitted under applicable agricultural zoning. A limited amount of rural housing should continue to be permitted in agricultural areas, based on the size and ownership of land at the time effective agricultural zoning provisions were originally adopted by the Township. More extensive development should be strongly discouraged, as it would result not only in the conversion of agricultural land, but would introduce incompatible adjacent uses into agricultural areas that would conflict with normal farm operations.

As also noted in Chapter 3 of this Plan, groundwater testing has revealed high nitrogen nitrate-levels in some parts of the Township, increasing the difficulty of gaining DEP approval for new on-lot systems in these areas. Should any rural lots gain DEP approval, such lots should be sufficiently sized to accommodate one approved on-lot sewage disposal system, and one alternative system. Additionally, proposed residential development should be (1) located to minimize loss of valuable farmland, (2) grouped with other adjoining residences, and (3) designed to minimize property lines shared by active farmland.

Second, on-farm occupations can provide important income-earning opportunities for farm family members. Such uses should be permitted where they would be secondary to the primary farm use, and subject to zoning regulations, assuring their compatibility within a rural context. Third, farm-related businesses can provide convenient goods and services for local farmers and should be permitted, subject to zoning regulations that assure their utility to the farm community.

Fourth, not all farming is alike. In recent years, intensive livestock and poultry operations have sprung up within Lancaster County. Often, these involve several massive aluminum buildings on relatively small farms. The lot coverages of these operations generally fail to meet zoning requirements imposed within agricultural areas and have storm water management implications. Furthermore, the potential odor impacts associated with these operations can be greater than those associated with typical tilling operations. Uncontrolled livestock stream-crossings and grazing can create localized surface water degradation. Finally, the management of farm animal waste is of critical concern in these high animal-density farms. For these reasons, intensive livestock and poultry operations should be permitted only with specific criteria imposed to minimize adverse impacts.

To reduce local groundwater and regional surface water pollution, farmers should be encouraged to use sound conservation practices, including streambank protection. Soil conservation keeps productive topsoil in place, thereby reducing sediment load in surface water and minimizing the need for fertilizers. The Township should also work with the Lancaster County Conservation District in the development of suitable manure management practices to stem water pollution.

Farmers should be encouraged to enroll their farms in Agricultural Security Areas and in the Clean and Green tax deferral program as ways to obtain various legal, financial, and tax benefits.

Finally, the long-term viability of agriculture within the Township deserves discussion. The Township will maintain a strong component of agricultural land for many decades. Surely, some loss of farmlands will occur. But, by continuing the staged growth concept begun in this plan, local farming can be maintained. Furthermore, recent amendments to the Pennsylvania Municipalities Planning Code require municipalities to plan and zone for the protection of prime farmlands. This enabling legislation would seem to authorize the application of the legal “fair share” principle to agricultural uses, in addition to its more common connection with developed ones. Consequently, local officials can remain steadfast in their community goals to preserve the agrarian landscape and lifestyle.

B. RESIDENTIAL

Residential land uses have been divided into three separate categories: Rural Residential, Suburban Residential, and Village Residential. Before specific recommendations are provided for each of these categories, some general recommendations regarding residential land use are offered.

First, all non-sewered areas of the Township should be subject to an on-lot disposal system (OLDS) management program. This would prevent many malfunctions as have occurred in the past and thereby greatly reduce the need for the extension of public sewer to the Township at some point in the future. This program should require by ordinance, routine maintenance of systems to include the pumping out of subsurface septic tanks. Strict enforcement of the OLDS program needs to occur if existing and future on-lot disposal systems are to function properly. Administratively, an OLDS program should require property owners to furnish a receipt by a licensed septic hauler once every three years upon the request of the Sewage Enforcement Officer.

Second is the responsibility of every municipality to provide for a variety of housing types and densities. It is further important that the proper amount and location of these various housing types be compatible with existing development and/or adjoining planned uses. Three different residential densities (Rural, Suburban Residential, and Village Residential) have been allocated to provide a balanced opportunity for housing of all types and costs.

Third, infill growth is emphasized to promote compact development and reduce the need to convert larger tracts of land to residential use. Finally, future residential areas are sized and block-shaped to encourage developments that run perpendicular to adjoining major roads, rather than in a strip-development pattern paralleling these roads.

Chapter 4 of the plan, *Demographic Studies*, identifies needed additional housing units through the Year 2020 in Elizabeth Township, as follows:

Net Housing Unit Increases			
Area	2000 — 2010	2010 — 2020	Total Increase
Elizabeth Township	290	290	580

Based on the goal expressed in this plan to accommodate a “fair share” of growth and reflecting the County's comprehensive plan policy to direct rural growth into existing villages and communities, it is assumed that most future growth in the Township will occur in the Brickerville, Elm, and Lexington areas. The following residential densities are assumed for the purposes of calculating the amount of land needed for future residential development:

Elizabeth Township Year 2000 — 2020 Residential Densities	
RESIDENTIAL CATEGORY	DENSITY (DU/AC)
RURAL	0.5
SUBURBAN RESIDENTIAL	1
VILLAGE RESIDENTIAL	1-4 ¹

¹ The higher density assumes the use of alternative wastewater systems and community water systems.

Assuming an average residential density of one dwelling unit per acre, and allowing for an additional fifteen percent market flexibility factor, Elizabeth Township will need to provide approximately 667 acres for residential development to the year 2020. More than adequate acreage has been allocated for all three residential categories to the year 2020.

RURAL

The Rural Plan designation is intended to promote a continuation of the rural character of the area, which is characterized by a mixture of agricultural and sparsely developed residential uses. In addition, other small-scale nonresidential uses have developed. This land use designation will continue these development trends but will install additional protection for agricultural uses and rural residences from the impacts of other nonresidential uses.

Appropriate uses in Rural areas include single family dwellings, mobile homes, and other accessory and compatible uses. Rural areas are not likely to be served by public sewer or water facilities within the foreseeable future; therefore, larger lot sizes are indicated. Proposed rural lots should be sufficiently sized to accommodate one approved on-lot sewage disposal system, and one alternative system. Minimum lot size should be two acres per dwelling unit, or larger if needed to accommodate the on-lot systems.

The Rural area has been deliberately located away from large areas of productive farmlands; nonetheless, extensive areas have been placed within this land use category, owing to the Township's overall rural flavor. Because of the vastness of these areas, some steep slopes are included. For this reason, specific lot design requirements should be imposed on steeply sloped development sites. Finally, several more intensive land uses have been proposed in the rural area. These uses have been targeted for the rural landscape as a means of protecting the Township's sensitive environmental features, its prime agricultural soils, and its other more densely populated portions. Numerous protective criteria should be attached to these uses to ensure their compatibility within this and other land uses within the Township.

Siting standards in zones permitting rural development should encourage the placement of rural homes in small groupings so as to promote neighborliness and social interaction, facilitate the protection of environmental features, and minimize conflicts with adjacent agriculture.

SUBURBAN RESIDENTIAL

The Suburban Residential Plan designation is intended for application to existing low-density residentially developed areas in Elm, Lexington, Poplar Grove, and Brickerville, as well as to lands suitable for similar development in these areas. Areas planned for Suburban Residential use are characterized by traditional curvilinear or cul-de-sac streets, lots of one acre or more, and reliance upon on-lot sewer and water. Because these areas do not offer any significant level of existing public or private facilities or services that would support additional growth, they are proposed for limited expansion.

Appropriate uses in Suburban Residential areas include single-family dwellings, mobile homes, and other accessory and compatible uses. Proposed lots should be sufficiently sized to accommodate one approved on-lot sewage disposal system, and one alternate system. Minimum lot size should be one acre per dwelling unit, or larger if needed to accommodate on-lot systems.

Both conventional and cluster development scenarios would be allowed with cluster development encouraged to promote the creation of common open space areas and other amenities (see further discussion under Village Residential).

VILLAGE RESIDENTIAL

The Village Residential Plan designation is intended to encourage more compact residential development and a variety of housing types within the Brickerville area. The particular site chosen for application of the Village Residential designation has good access to two arterials, is adjacent to commercial uses, and is large enough in area to accommodate a community park, should such become desired and feasible. Appropriate uses in the village residential district would include single family dwellings, duplexes, townhouses, multiple family dwellings, mobile home parks, and other accessory and compatible uses. To assure that the Township is able to provide for its fair share of low and moderate income housing in this single district, it is recommended that all dwelling types be permitted either outright or subject to clear and objective approval standards, and that incentives described as follows be provided to encourage a mix of housing. It is also recommended that single family dwellings be permitted on relatively small lots to avoid allegations of exclusionary zoning practices.

The Village Residential plan designation provides the Township with the opportunity to promote innovative development patterns in the Brickerville area through the utilization of cluster development and/or the creation of a “livable community.” Zoning provisions should permit village-style development, encouraging compatibility and integration, to the extent possible, with existing development and street systems.

Where no public water and/or sewer systems are provided, new lots should be required to be at least one acre in size. Planned growth areas in Brickerville are situated both on and adjacent to soils that are suitable for alternative wastewater systems. Lagoons and spray irrigation fields might, therefore, be located on-site or in adjacent agricultural areas. Where community water systems are planned, there should be a suitable distance between wells and lagoons.

Density bonuses also should be granted for cluster development providing common open space and/or other amenities. Such development would involve grouping dwellings on a portion of the site and reserving the remainder for common open space, usually that area characterized by natural features or development constraints. Common open space areas might also accommodate lagoons or spray irrigation fields. The open space area could comprise between 30% and 50% of the site, and is usually maintained by a homeowners association, or dedicated to the Township. This results in an increased density on the portion of the tract that is developed, and can result in cost savings to developers because of the compact provision of utilities and services. A density bonus of one to two dwellings per acre would provide a good incentive for the use of a cluster provision.

As discussed in Chapter 7 of this Plan, *Public Facilities and Services*, Elizabeth Township is in need of a community park facility at a central location. The plan calculates a future need for 23 to 37 acres in community parkland. Municipal revenues or mandatory dedication of parkland provisions could be utilized in combination with common open space requirements to create a community park at this site. Because the Township utilizes Lancaster County's Subdivision and Land Development Ordinance, it should request the County to apply its mandatory dedication of parkland ordinance to the Township in its reviews. The adoption of an “Official Map” reserving this area for this public use would provide maximum interim protection to this site, and is strongly encouraged.

C. COMMERCIAL

Two Plan designations have been utilized for allocating future commercial land uses, described as follows.

VILLAGE COMMERCIAL

The Village Commercial Land Use Plan designation is intended to be applied to the core areas of the Township's existing villages in the interest of promoting the provision of neighborhood goods and services within walking distance of local residents. The designation was applied primarily based on proximity to other public and private services. A number of developed residential properties have also been designated Village Commercial in both Brickerville and Elm in the expectation that some will be converted to commercial use over time.

The Village Commercial Land Use Plan designation is suitable for a number of neighborhood commercial and public uses, including corner grocery stores, general stores, child day care, banks, restaurants, churches, municipal buildings, libraries, schools, post offices, doctors offices, etc. Regulations should limit the types and sizes of such uses to ensure their local orientation.

Local officials should seek to combine several related uses on one functional and attractive site, with combined utilities, rather than allowing a scattering of haphazard uses. The outdoor storage of goods and materials should be managed. Landscaping and screening can improve appearance and compatibility with adjoining residences. Parking at the side or rear of buildings can improve appearance from the street, but must be buffered and screened to protect any adjoining residences. The potential for pedestrian access to the adjacent Village Residential and Suburban Residential areas should be investigated and, if possible, provided to promote easy accessibility of this site to nearby residents.

HIGHWAY COMMERCIAL

The Highway Commercial Land Use Plan designation is intended to provide suitable locations for larger-scale and/or highway-oriented retail, service, and entertainment businesses. Access to these areas is provided by adjoining major roads, such as US 322 and PA 501. The uses located in the Highway Commercial area typically involve outdoor activities and/or storage areas like service establishments and automobile, boat, and trailer sales. The uses provided in this Zone are meant to serve local residents as well as those motorists passing through the Township.

Regulations implementing the Highway Commercial Land Use Plan designation should limit the number of driveway cuts to preserve the primary functions of PA 501 and PA 322 for mobility. Outdoor storage, off-street loading, and parking should be managed. Design standards should encourage functional, yet attractive sites when viewed from adjoining properties and roads. This would involve required landscaping, screening, buffering, and a limitation on freestanding signs.

D. INDUSTRIAL

As is the case for much of Lancaster County, farming is Elizabeth Township's primary industry. Areas appropriate for continued agricultural use have been designated for Agriculture and Rural uses. Both the Agricultural and Rural Zones will protect and promote agriculture as the important sector of the economy that it is by strictly limiting the conversion of farmland to other uses, minimizing potential conflicting uses, and accommodating farm occupations and farm-related businesses.

The three industrial plan designations (Business Campus, Limited Industrial, and General Industrial) are intended to be applied to areas that are suitable and needed for industrial uses. Given the rural nature of the Township, the potential for industrial development is limited. Three Plan designations have been utilized for allocating future industrial land uses, described as follows.

BUSINESS CAMPUS

The Business Campus Land Use provides an alternative land use that will provide for the orderly and integrated development of mixed professional, industrial, and commercial uses. The land use is intended to apply to large parent tracts or blocks of land where the purpose and intended design elements of the land use can be effectively and equitably applied.

The land use will provide for a mix of commercial, professional, and industrial uses and their related accessory uses. The proposed land use is recommended for the ± 70 acre portion of the property that is located north of Route 322 and west of Route 501.

Design standards should require the site to be developed as a single, integrated unit served by an interconnecting interior road system with limited access points onto the adjoining streets. All proposed lots would be served from this road system. Interconnected parking facilities, pedestrian facilities, and common storm water management facilities would be provided.

Landscaped perimeter setbacks and perimeter building appearance standards would be provided along the existing road frontages to provide pleasant aesthetics along the corridor. Setbacks along interior streets would be reduced from those required along the perimeter to allow for efficient use of land. Additional interior street and parking lot landscaping and lighting requirements would be provided to enhance the visual appearance of the project.

LIMITED INDUSTRIAL

The Limited Industrial Land Use provides areas in which a variety of limited industrial uses and some commercial uses may be located. Essentially, this land use provides for limited industrial uses as permitted by right, along with limited commercial uses and accessory retail sale of uses produced or stored on the same lot. New residential uses of land are to be excluded in this Zone. To facilitate the continued existence and natural expansion of the Township's few existing industrial operations, Limited Industrial areas have been located to coincide with the locations of these existing uses.

One new Limited Industrial area has been located adjacent to US 322, west of its intersection with PA 501. Approximately 15 acres of vacant land has been allocated for Limited Industrial use in this location. These sites were chosen for several reasons, including access to the Township's major arterial roads, and the availability of good-sized sites without significant development constraints.

Design standards should be imposed on proposed uses in the Limited Industrial areas to create attractive site designs and moderate the objectionable impacts associated with industrial uses. Substantial setbacks should also be used to protect adjoining residences. Regulations implementing the Limited Industrial Plan designations should also limit the number of driveway cuts and freestanding signs, and manage outdoor storage, off-street loading and parking. Design standards should encourage functional yet attractive sites when viewed from adjoining properties and roads. This would involve required landscaping, screening, and buffering. Additionally, prospective industries should demonstrate compliance with all applicable Federal and State operations standards.

GENERAL INDUSTRIAL

The General Industrial Plan designation is suitable for a variety of limited and heavy industrial uses. Zoning regulations for industrial uses should allow for small start-up businesses and light industry as permitted uses. Other heavier and potentially more objectionable industries should require the approval of a conditional use. The benefits of the conditional use process will (1) require the developer to fully explain the nature of the proposed uses; (2) give local citizens the opportunity to express support or concern over the use; (3) provide the Township time to engage professional review assistance of the use and its expected impacts; and (4) allow local officials to attach reasonable conditions of approval to mitigate any negative effects of the use.

As in the case of the Limited Industrial Land Use designation, regulations implementing the General Industrial Plan designations should also limit the number of driveway cuts and freestanding signs, and manage outdoor storage, off-street loading, and parking. Design standards should encourage functional yet attractive sites when viewed from adjoining properties and roads. This would involve required landscaping, screening, and buffering. Additionally, prospective industries should demonstrate compliance with all applicable Federal and State operations standards.

E. CONSERVATION

Conservation areas correspond to those sensitive natural features that either should not be developed, or which can support only very limited development. These areas include both lands with severe development constraints, and lands characterized by sensitive environmental features that should be preserved. The protection of these areas is critical to the environment as well as to human welfare.

Steep slopes, wetlands, and floodplains comprise the areas with severe development constraints. Elizabeth Township has a floodplain ordinance that protects its floodplains. State and Federal wetlands laws should protect wetland areas. Development could be limited in steep-sloped areas by adjusting development zones away from Conservation areas, as depicted on the Future Land Use Map, and by applying specific zoning ordinance review standards to development on steep slopes.

Woodlands, high and exceptional value watersheds, streamside corridors, and proposed linear parkways comprise the areas with sensitive environmental features. These features, together with steep slopes, characterize major portions of the Township, including the majority of lands north of I-76 and a significant portion of the western part of the Township. These areas are extensive enough to warrant the application of a Conservation Zone where development should be restricted both to preserve extensive, sensitive environmental features and areas with severe development constraints. More isolated woodland areas can be protected in a number of ways, including the application of agricultural zoning where the environmental feature comprises a small portion of the total ownership, and rural residential zoning where extensive parcelization exists. Development in such areas should be sited or grouped together to minimize impacts on sensitive environmental features. Streamside vegetative removal standards and development setbacks could be utilized to preserve tree stands and prohibit development within a certain distance of identified streams. The Township may also choose to apply for funding to the County or the State to create linear or other parks in areas to be preserved.

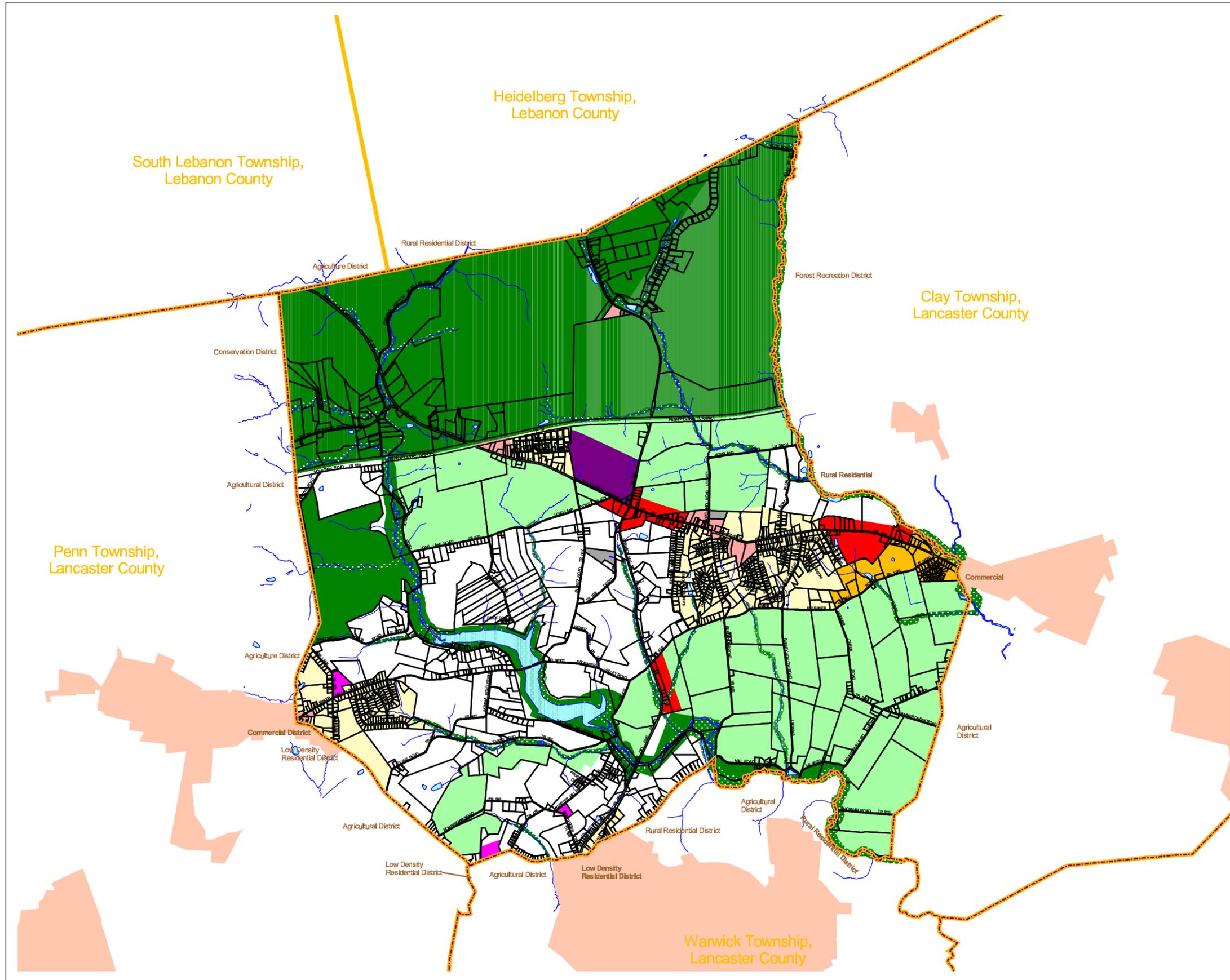
The locations of some conservation features should be viewed as general and subject to detailed on-site verification during the development process. It is recommended that the identified areas be used as a triggering mechanism for detailed investigations through Township development impact regulations.

F. COMMUNITY FACILITIES

The Community Facilities Plan designation identifies land uses that serve some public or civic function. Specifically it includes municipal lands, buildings and parks, school sites, churches, and cemeteries. The Community Facilities category is intended to recognize such existing land uses, as well as certain proposed public uses.

The Community Facilities category is not intended to be implemented by a single zone. Rather, public and civic uses are generally to be permitted through residential and commercial zoning, where they would serve the largest numbers of people. Large-scale undeveloped public or civic uses with significant environmental features are planned for Conservation.

Map 12
 Future Land Use Map
 Elizabeth Township, Lancaster County



Legend

- Future Land Use
- C - CONSERVATION
 - A - AGRICULTURAL
 - R - RURAL
 - R-1 - SUBURBAN RESIDENTIAL
 - R-2 - VILLAGE RESIDENTIAL
 - VC - VILLAGE COMMERCIAL
 - HC - HIGHWAY COMMERCIAL
 - LI - LIMITED INDUSTRIAL
 - I - GENERAL INDUSTRIAL
 - Urban and Village Growth Boundaries
 - Lake, Pond
 - Stream
 - Parcel
 - Municipal Boundary



0 4000 8000 Feet

Base Map: Lancaster County GIS Department Landbase
 Projection: Pennsylvania State South, NAD 83, U.S. Feet
 Adopted: September 8, 2003
 Plot Date: September 26, 2003

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RETTEWSM

XI. IMPLEMENTATION

This Comprehensive Plan has extensively outlined a future direction for growth within Elizabeth Township through the year 2020. This future direction is premised upon the comprehensive set of recommendations and locally expressed goals and objectives set forth in this Plan. In order to carry these out, an implementation strategy must be put into motion. This strategy can be achieved through the various municipal planning program components.

The following table identifies an Action Plan of major tasks that need to be accomplished if this Plan is to be implemented. While this list in no way covers all of the Plan's recommendations, it emphasizes those that are most important to carry out the major themes of the Plan. The completion dates of these tasks have been spread out over a several year period so as not to overwhelm local resources.

The table plots an ambitious list of recommended activities. These tasks are vital if Elizabeth Township is to optimally manage its growth and development. The completion of many of these tasks should result in an improved quality of life in the Township and should help to avoid problems that are plaguing other developing areas.

Local officials are responsible for monitoring and evaluating the implementation strategy aimed at achieving the recommendations and locally expressed goals set forth in this Plan. Cooperation among all administrative bodies and levels of government is an essential component to a streamlined and successful implementation strategy. The continued use of public participation is also a very important duty of municipal officials. If, at some point in the future, the recommendations of this Plan do not appear to address current conditions, local officials should not hesitate to amend portions of this Plan or any policy to rectify those deficiencies.

Along these same lines, it is recommended that the Township appoint several local officials to serve on an implementation committee. Traditionally, this has been the Planning Commission. Such committee could meet several times a year to monitor progress on the implementation of the recommendations of this Plan and to share other concerns.

This Plan holds a wealth of information that is easily accessible and understood. Its implementation should be equally understood so that all residents, businesses, and visitors know the Plan is vital, and that the future of Elizabeth Township is deliberate, and the result of considerable analysis and public scrutiny.

Task	Performance Date
<i>1. Assist local fire companies in providing additional water drafting sites</i>	<i>Ongoing</i>
<i>2. Provide additional financial assistance to fire companies to help defray operating costs and acquisition of equipment and supplies</i>	<i>Ongoing</i>
<i>3. Assist the Brickerville Fire Company ambulance service in its recruitment and funding efforts</i>	<i>Ongoing</i>
<i>4. Request assistance from PENNDOT to improve Brubaker Valley Road to major collector standards and to improve the safety of its intersection with SR 0501.</i>	<i>2002</i>
<i>5. Adopt ordinance provisions requiring demonstration of adequate water supply prior to development approval</i>	<i>2002</i>
<i>6. Request that the Lancaster County Planning Commission require the utilization of the Mandatory Dedication of parkland (or fee-in-lieu) provision found in the Lancaster County Subdivision and Land Development Ordinance</i>	<i>2002</i>
<i>7. Prepare and adopt an Official Plan to reserve identified lands for future public, park, and road uses</i>	<i>2003</i>
<i>8. Consider enactment of provisions to protect the Township's high quality and exceptional value streams and wetlands along with significant woodland areas.</i>	<i>2003</i>
<i>9. Consider enactment of provisions to regulate the demolition, removal, or exterior alterations of the Township's historical structures</i>	<i>2003</i>
<i>10. Consider enactment of provisions requiring developers to improve existing roadways to current design standards.</i>	<i>2003</i>