

Chapter Two: Existing Conditions

SECTION 2.1: INTRODUCTION

Tredyffrin Township is located in the middle of an area known as the Great Valley, in east-central Chester County, about 20 miles west of central Philadelphia. The surrounding municipalities are East Whiteland Township, Charlestown Township, Schuylkill Township, Upper Merion Township, Easttown Township, Radnor Township and Willistown Township. The most prominent physical feature of the Township is topography that contains the North Valley and South Valley Hills with a broad valley lying between them. While the valley includes gently sloping hills and creeks, the uplands associated with the North and South Valley Hills include steep grades and ravines. A network of waterways traverses the Township, most notably Valley Creek, and Trout Creek, and their many associated tributaries. The land along these waterways is also the most common incidence of steeply sloping land.

The Township contains approximately 20 square miles (12,698 acres) of land area and measures just over nine miles east to west and about 3.75 miles from north to south.

Chapter Two describes Tredyffrin Township as it is today and begins to consider the future of the Township based on trends from the recent past and forecasts for tomorrow. This exploration investigates the Township's natural and built environment and analyzes changes in population, housing and employment, including forecasts for future growth and change. Grounded in an understanding of today's conditions, and how they have occurred over time, this chapter sets the stage for an intelligent exploration of the possibilities for the future in subsequent chapters.

The data, mapping and discussion included in the following sections are the result of months of data collection, analysis, and coordination with the Steering Committee, Tredyffrin Township staff, and members of the community at large. The analysis included in this chapter was developed to identify the existing conditions in Tredyffrin Township, in order to consider how to develop policies and strategies that will maintain residents' quality of life.

SECTION 2.2: EXISTING LAND USE

Current land uses in the Township represent a diverse mixture, with several recognizable geographic patterns that have been defined by the transportation corridors that run the breadth of the Township. The most visually prominent pattern is the substantial office and retail development that runs along the US Route 202 corridor. To

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the north of this corridor, low density residential development is widespread. The land south of the US Route 202 corridor (excepting areas along US Route 30) is predominately residential development, though it is to varying degrees more compact than the development located in the northern section of Tredyffrin Township. The US Route 30 corridor is substantially retail development, though some mixed-use development exists as well.

Other important land use features include: the Valley Forge National Historical Park, partially located within the boundaries of Tredyffrin Township in its northern section; significant open space preserves that have been acquired by the Open Land Conservancy, predominately in the western and northwestern portion of the Township; and, the Chesterbrook development, an innovative 1980s mixed-use, higher density development located in the north-central portion of the Township.

The examination of how land is currently used in Tredyffrin Township serves as the basis for discussions about the future. It is through an analysis of existing conditions that we can understand current land use. It also prepares us for a discussion of what might change in the future, and how land use may be guided to produce positive results for the Township.

The existing land use inventory, as depicted in Figure 2.2.1, was developed from information provided by Tredyffrin Township, itself derived from Chester County tax assessment data. This base information was then updated and revised by the consultant team through the use of 2005 aerial photography, field verification, and using the local knowledge of municipal staff and the members of the Steering Committee.

The existing land use map uses color to differentiate land uses. It depicts uses that relate to the more structured, built environment such as lands used for residential, commercial, industrial, and institutional development, as well as recreational, transportation and utility use. It also includes areas not defined by urban uses such as agricultural, vacant and open space land.

Residential Use

Historically, Tredyffrin Township was predominantly agricultural, with several crossroad villages strung along Lancaster Pike. During the 1950s and 1960s the Township experienced rapid residential growth, followed by a decline in the rate of growth in the 1970s. The 1980s saw strong residential growth followed by moderate population gains

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in the 1990s. The pace of residential growth has slowed partly because much of the most developable lands have been converted to residential use. Today, residential land uses cover about half of the Township or just over 6,200 acres; single-family detached residential units use the majority of that acreage.

The pattern and intensity of residential use follows the evolution of the Township's identity. The densest residential areas are generally located along Lancaster Avenue, where they developed as extensions of the original settlements. Exceptions include the higher density residential development that is part of the Chesterbrook development, built in the 1980s in the heart of Tredyffrin Township, just north of US Route 202.

As the Township moved away from its agricultural focus, natural and agricultural lands were generally converted to low density residential use in a wide band that extends north from Lancaster Avenue to the US Route 202 corridor. Residential development of similar densities also exists north of the US Route 202 corridor and east of Valley Forge Road. Very low density residential development is widespread in the northwestern portion of the Township.

Single-family attached and multi-family residential developments are scattered in the areas south of the US Route 202 corridor and are generally located closer to Lancaster Avenue. The exception to this pattern is higher density attached residential units located in the Chesterbrook development.

Commercial Use

The largest concentration of commercial land use is along the US Route 202 corridor, where the high accessibility to the regional transportation network makes this area attractive for this type of development. In addition, there are concentrations of commercial development along Lancaster Avenue. While Lancaster Avenue is generally a continuous commercial corridor throughout Tredyffrin and Easttown Townships, the Paoli and Strafford areas show more focused and substantial commercial development.

Commercial development comprises almost 11% or about 1,350 acres of land within the Township. Retail and commercial services are located along Lancaster Avenue, in the Gateway Shopping Center (located at the intersection of Valley Forge Road and Swedesford Road), in shopping centers along Route 202 (Valley Fair Shopping Center and others), and within the Chesterbrook Shopping Center. Many of these locations have auto-oriented retail uses, though Lancaster Avenue locations associated with R5

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Regional Rail stations and bus routes provide some opportunity for non-motorized access and pedestrian circulation to these establishments.

Although some office developments are located along Lancaster Avenue, the majority is located along the US Route 202 corridor. Substantial concentrations are located in the vicinity of Devon Park Drive in the eastern section of the Township, at the Chesterbrook Boulevard intersection with US Route 202 in the center of the Township, and in the vicinity of Cedar Hollow Road along Tredyffrin Township's western border with East Whiteland Township. These office developments vary in age and range from smaller scale, single-story buildings generally in the Devon Park area, to newer three-story office complexes in the Chesterbrook area. The majority of these office complexes are accessed by automobile, though some bus routes travel through this area; privately operated shuttles provide a link to the AMTRAK and SEPTA R5 train lines.

Industrial Use

Industrial uses comprise less than half a percent of the existing Township acreage, or just less than 50 acres. Industrial uses include enclosed manufacturing facilities located within the US Route 202 corridor.

Institutional Use

Public and private institutional uses are dispersed throughout Tredyffrin Township and use about three percent of the land, or close to 400 acres. They include public and private educational institutions, municipal buildings, public libraries, police and fire protection facilities and places of worship.

Transportation and Utilities

A network of highways, roads, and both passenger and freight rail are visually apparent on Tredyffrin's geography. These include the Pennsylvania Turnpike, US Route 202, US Route 30 (Lancaster Avenue), PA 252, and PA 422. Other prominent transportation features include the AMTRAK rail line that closely parallels Lancaster Avenue and is used by the SEPTA R5 Regional Rail line, a Norfolk Southern rail freight line that runs east-west through the center of the Township south of US Route 202, and the Chester Valley Trail, a pending rails-to-trails conversion that runs through the center of the Township parallel to US Route 202.

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This category also includes locations for water supply, waste water disposal, a twin 240-kilovolt electric transmission line that runs east-west through the center of the Township, and power generation facilities. Utilities and transportation uses combine to use approximately 1,500 acres of land, or 12% of the Township.

Recreation and Open Space

These two land uses are shown separately on the Existing Land Use map in Figure 2.2.1. They include all publicly and privately owned park and recreation facilities, and open space lands. Recreational uses occupy over 1,000 acres or more than 8% of the Township, with the majority of these uses constituting public parks and community fields associated with community recreation.

Open space resources include about 870 acres or nearly 7% of the Township. This category includes homeowner association open space integrated within residential developments and lands held by the Open Lands Conservancy as permanent open space.

Agriculture and Vacant Land

Agricultural and vacant land uses are generally found in the northwestern section of Tredyffrin Township, although there are scattered vacant parcels located throughout the Township. Combined, they represent approximately 7% of the Township's land or 870 acres.

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INSERT FIGURE 2.2.1 EXISTING LAND USE MAP HERE

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DEMOGRAPHICS, HOUSING & EMPLOYMENT

SECTION 2.3: DEMOGRAPHICS, HOUSING & EMPLOYMENT

Population forecasts are an essential part of planning for future growth, as they can be translated into approximations of the need for housing, community facilities, and other forms of development. Many factors are taken into account to estimate population forecasts and these factors are subject to constant change. The longer the time period of the forecasts and the smaller the present population, the less reliable the forecasts are. For instance, forecasts for individual municipalities are less dependable than those for a large region or the nation; five-year forecasts are usually more accurate than 15- or 20-year forecasts.

Population Trends for Tredyffrin Township & Vicinity

Recent population trends for Tredyffrin Township, the seven surrounding municipalities (Schuylkill Township, Charlestown Township, East Whiteland Township, Willistown Township, Easttown Township, Radnor Township, and Upper Merion Township), the eight-municipality area including all of the preceding municipalities, as well as Chester, Delaware, and Montgomery Counties are presented in Tables 2.3.1 and 2.3.2.

Over the 30-year period from 1970-2000, Chester County experienced a significant population increase of 155,755 residents (56.1%). Similarly, Montgomery County had strong growth, with an increase of 126,017 residents (20.2%) during this time. In contrast, Delaware County experienced a moderate population decrease of 52,592 inhabitants (-8.7%) over the same period. Over this period, Tredyffrin Township grew by 5,658 persons, a 24% increase. Taken collectively, Tredyffrin and its neighboring municipalities (8 municipalities) experienced population growth over that period of 3,257 (2.7%) persons. This data indicates that while Tredyffrin Township was growing at a rapid rate, some of its neighboring municipalities were declining in population.

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Table 2.3.1
Tredyffrin Township & Vicinity
Population Trends, 1970 - 2000

	1970	1980	1990	2000
Tredyffrin Township	23,404	23,019	28,028	29,062
Charlestown Township	3,528	2,770	2,754	4,051
Easttown Township	9,565	9,064	9,570	10,270
East Whiteland Township	7,242	9,468	8,398	9,333
Schuylkill Township	5,779	5,993	5,538	6,960
Willistown Township	9,128	8,284	9,380	10,011
Radnor Township	28,782	27,676	28,703	30,878
Upper Merion Township	36,743	26,138	25,722	26,863
8 Municipality Area	124,171	112,412	118,093	127,428
Chester County	277,746	316,660	376,396	433,501
Delaware County	603,456	555,023	547,651	550,864
Montgomery County	624,080	643,377	678,111	750,097

Table 2.3.2
Tredyffrin Township & Vicinity
Population Change, 1970 - 2000

	1970 - 1980		1980 - 1990		1990 - 2000	
	Number	Percent	Number	Percent	Number	Percent
Tredyffrin Twp	(385)	(1.6%)	5,009	21.7%	1,034	3.7%
Charlestown Twp	(758)	(21.4%)	(16)	(0.6%)	1,297	47.0%
Easttown Twp	(501)	(5.2%)	506	5.6%	700	7.3%
East Whiteland Twp	2,226	30.7%	(1,070)	(11.3%)	935	11.1%
Schuylkill Twp	214	3.7%	(455)	7.6%	1,422	25.7%
Willistown Twp	(844)	(9.2%)	1,096	13.2%	631	6.7%
Radnor Twp	(1,106)	(3.8%)	1,027	3.7%	2,175	7.6%
Upper Merion Twp	(10,605)	(28.9%)	(416)	(1.6%)	1,141	4.4%
8 Municipality Area	(11,759)	(9.5%)	5,681	5.0%	9,335	7.9%
Chester County	38,914	14.0%	59,736	18.9%	57,105	15.2%
Delaware County	(-48,433)	(8.0%)	(7,372)	1.3%	3,213	0.6%
Montgomery County	19,297	3.1%	34,734	5.4%	71,986	10.6%

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Age Characteristics

The population of Tredyffrin Township is aging (Table 2.3.3). According to data compiled by the U.S. Bureau of the Census, the median age for residents in the municipality rose 12% from 1980 to 2000, increasing from 34.6 years to 40.4 years. The percentage of the population over 45 years of age has increased only slightly. In 1980, 37.0% of the Township's population was 45 years of age or older; this figure increased slightly to 37.3% in 1990, and by 2000 the number rose again to 41.9%.

The needs of Township residents in the future may differ from the recent past in terms of housing, community facilities, and accessibility based on median age and on the characteristics of the population. For example, an aging population in single-family detached dwellings may represent a strong potential demand for alternative dwelling structure types, such as single-family attached dwellings and multi-family dwellings.

Table 2.3.3
Tredyffrin Township
Population by Age Groups, Median Age, 1980-2000

	1980*		1990		2000	
Age Groups	Number	Percent	Number	Percent	Number	Percent
0-4	989	4.3%	1,679	6.0%	1,811	6.2%
5-17	3,393	14.7%	3,003	10.7%	3,892	13.4%
18-24	3,924	17.0%	3,328	11.9%	2,446	8.4%
25-44	6,214	27.0%	9,573	34.2%	8,746	30.1%
45-64	6,373	27.7%	7,113	25.4%	7,892	27.2%
65-74	1,356	5.9%	2,214	7.9%	2,445	8.4%
75+	770	3.4%	1,119	4.0%	1,830	6.3%
TOTALS	23,019	100%	28,028	100%	29,062	100.0%
Median Age	34.6 years		37.7 years		40.4 years	

*1980 age distribution: 0-4; 5-14; 15-24; 25-44; 45-64; 65+

Housing Units

According to the 2000 Census, Tredyffrin Township had a total of 12,223 dwelling units within its boundaries. This figure increased slightly from 11,924 dwelling units in 1990, a growth rate of 7%. New housing construction averaged about 80 units per year between 1990 and 2000, corresponding to an increase of approximately 103 residents annually based on population change.

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The primary housing type in Tredyffrin Township is single-family detached dwellings (Table 2.3.4). In both 1990 and 2000, roughly 54% of residents lived in single-family detached units. Single-family attached dwellings and multi-family dwellings with five or more units each comprise roughly one-fifth of the municipality's housing inventory.

Table 2.3.4
Tredyffrin Township
Housing Unit Inventory, 1990-2000

Structural Type	1990		2000	
	Number	Percent	Number	Percent
Single-Family Detached Units	6,438	54.0%	6,736	53.7%
Single-Family Attached Units	2,348	19.7%	2,531	20.2%
Two to Four Family Buildings Units	373	3.1%	488	3.9%
Five or more Family Buildings Units	2,625	22.0%	2,779	22.1%
Mobile Homes Units	140	1.2%	17	0.1%
TOTALS	11,924	100.0%	12,551	100.0%
Total Occupied Housing Units	11,427		12,223	
Total Vacant Housing Units	497		328	

Population Forecasts

Municipal population forecasts for 2030 were prepared by the Delaware Valley Regional Planning Commission (DVRPC) based on control totals for Chester County as a whole. For Tredyffrin Township, a 2010 population of 29,440 and a 2030 population of 32,630 were forecast in March 2005. The DVRPC forecasts are shown as *Alternative 1* in Table 2.3.5.

Alternative 2 takes the actual annual growth rate for the Tredyffrin Township from 1990 to 2000, around 0.37% per year, and projects this rate over 30 years from 2000 to 2030 on the Township's starting population of 29,062 (the 2000 Census figure). The results show approximately 32,409 people would live in Tredyffrin Township by the year 2030.

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Table 2.3.5
Tredyffrin Township
Alternative Population Forecasts

Alternative	1990	2000	2010	2020	2030	2000-2030	
						Number	Percent
1. DVRPC Forecast (March 2005)	28,028	29,062	29,440	30,920	32,630	3,568	12.3%
2. Township Growth Rate, 1990-2000 (0.37%/yr.)	28,028	29,062	30,137	31,252	32,409	3,347	11.5%

Housing Units to be Constructed

Based on the forecasts and projections discussed above, including a prospective Township population of between 32,400 and 32,850 residents, an estimate of the number of housing units to be constructed over the planning period has been formulated (Table 2.3.6).

The table assumes 99.4 percent of the population will live in households and the average number of persons per household will be 2.4. Despite a drop in household size from 2.8 to 2.4 from 1980 to 1990, it remained constant from 1990 to 2000. The table also assumes vacancies will comprise 2.6 percent of the total housing stock and there will be a modest need to replace some of the existing housing stock over the planning period. (Figures used are consistent with the U.S. Bureau of the Census for Tredyffrin Township for 1980, 1990, and 2000 and area population and housing trends.)

Applying the method used in the table, the total number of new housing units to be constructed in the Township from 2000 to 2030, a thirty-year period, could range from 1,477 to 1,669, with about 1,573 new units corresponding to a “medium” rate of population growth. This latter figure translates into about 52 units per year. Based upon the estimated population forecast, the Township may expect construction of new housing units over the planning period at a lower rate than in recent history. Differences regarding how housing units were constructed in the past and how they may be constructed in the future will be discussed in the major planning concepts in Chapter 3.

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Table 2.3.6
Tredyffrin Township
Housing Units to be Constructed, 2000-2030

	"Low"	"High"
Population Projection, Year 2030	32,400	32,625
Population in Households (99.4%)	32,206	32,429
Persons per Household	2.4	2.4
Occupied Housing Units	13,419	13,412
Vacant Units (2.6%)	358	361
Total Housing Units Required	13,777	13,873
Existing Stock, Year Round Housing Units, 2000	12,551	12,551
Net Additions to Housing Stock	1,226	1,322
Replacement of Existing Stock (3%)	377	377
Conversions (1%)	-126	-126
Total Housing Units to be Constructed, 2000-2030 (30 years)	1,477	1,573
Average Number of Housing Units to be Constructed per Year (2000-2030)	49	52

Employment Trends and Forecasts

Employment trends and forecasts are important in planning for future growth. Just as population forecasts and housing data can be translated into approximations of the future need for housing units and land for new housing construction, employment forecasts for a given locale may be converted into estimates of potential demand for land for new commercial and industrial establishments. Both kinds of forecasts may give clues as to the future need for varying kinds of community facilities and services.

Unfortunately, employment data for smaller geographic areas are not as readily available as population data. While the U.S. Department of Commerce, Bureau of the Census conducts a Census of Business every five years, it does not cover all economic sectors and the data it reports are riddled with gaps because of the disclosure rules under which it operates. A more complete accounting of employment patterns has recently become available from the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce, but the smallest unit for which it provides data is the county level.

Employment forecasts completed by DVRPC are based on the previously mentioned BEA data and were reviewed with a panel of economists from the Delaware Valley

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region. However, forecasting future employment is more difficult than population due to many factors influencing employment at the national, regional, and local levels. Unlike population changes, which generally tend to be more gradual and relatively predictable, employment forecasts may vary widely due to broad forces such as foreign trade, world economics, politics, military conflicts, national monetary policies, demographic trends, and social forces. Local factors such as labor force availability, land prices, transportation networks, and local political climate also play an important role in determining employment levels. Sources of current employment data often vary. At the federal level, the Bureau of Labor Statistics (BLS), the BEA, and the Bureau of Census all provide data on current employment; however, the methods and sources of the data vary among different agencies, producing conflicting results.

DVRPC estimates the number of persons employed in establishments in Tredyffrin Township in 2000 at 36,522, based on Bureau of the Census data. DVRPC last undertook municipal employment forecasts in March 2005. At that time, DVRPC forecast that employment in Township would increase to 38,659 by 2010, 41,555 in 2020, and 44,587 by 2030. See table 2.3.7 for details.

Table 2.3.7
Tredyffrin Township
Employment Forecast

	2000*	2010	2020	2030	2000-2030	
					Number	Percent
DVRPC Forecast (March 2005)	36,522	38,659	41,555	44,587	8,065	22.1%

These numbers underscore the difficulty of forecasting employment trends for municipalities. The loss of one significantly sized development in Tredyffrin Township could cause the number of local employees to decrease rather than increasing as forecast by DVRPC for the planning period. On the other hand, the arrival of several major new employers could render the DVRPC forecast excessively modest.

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SECTION 2.4: PATTERN OF CHANGE

Residential, office and retail development in Tredyffrin Township has been extensive since the 1980s, particularly the residential and office components. The pattern of construction was widespread, though new development is most visible north of the Norfolk Southern freight rail line, with office and retail development most prominent along the US Route 202 corridor and residential development in the northwestern section of the Township, including north of the Pennsylvania Turnpike. In total, more than 3,000 acres or 24% of Tredyffrin Township's land was developed for residential, office, retail, open space and recreational and institutional uses from 1980 to the present. The type, location and year of the developments are shown on the Recent Development map (Figure 2.4.1).

Residential Use

Since 1980, about 1,800 acres of new residential development occurred, constituting 60% of the total area of new developments. Residential construction was largely single-family detached unit developments, with the exception of the single-family attached and multi-family units built as part of the Chesterbrook development. The majority of the land used for residential development occurred north of the Norfolk Southern freight rail line and west of Chesterbrook Boulevard and PA Route 252, except for a large development to the east of North Valley Forge Road. Very low density developments occurred in the vicinity of and to the west of North Valley Road and north of the Pennsylvania Turnpike.

Commercial Use

Office and retail uses accounted for about 820 acres or 27% of recent development in the Township. These areas were largely focused along the US Route 202 corridor as the Township continued to establish itself as a regional employment center. Substantial office developments occurred in the vicinity of Chesterbrook and the interchange of US Route 202 and PA Route 252 beginning in the late 1980s and continuing to more recent development. The late 1990s and 2000 saw Vanguard establish a significant presence near Cedar Hollow Road in the western portion of the Township and also along Devon Park Drive. Retail development occurred in the Chesterbrook area, including a hotel in the mid-1980s, the Chesterbrook Village Shopping Center in 1980, renovation of the Gateway Shopping Center in the late 1990s, development of the old AMP facility along PA Route 252 in the vicinity of Contention Lane and shopping center renovations in the Paoli and Strafford areas along Lancaster Avenue.

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Parks and Open Space Use

Since 1980, the Open Lands Conservancy has preserved over 220 acres of land, and placed conservation easements on over 45 additional acres of land. The late 1990s saw the Township acquisition of the 90-acre Wilson Park in the center of the Township and Crabby Creek Park located east of PA Route 252 and south of the Norfolk Southern freight line.

Institutional Use

The 1980s saw the construction of the Vanguard School. In the 1990s, a new Township Building was constructed, renovations were completed at the Valley Forge Middle and Elementary Schools, a new post office distribution center was built along West Valley Road, and the Valley Forge Military Academy built a new athletic building. Since 2000, Conestoga High School underwent substantial renovations and the School District rebuilt Teamer Field.

Pending and Proposed Development

Pending and proposed development includes development proposals that have been approved but not built and proposals that are at some stage within the subdivision and land development approvals process. (Figure 2.4.2) The total land area in pending and proposed developments is about 230 acres. Of these pending and proposed developments, the most substantial in acreage include the two low density residential subdivisions that have been proposed for the northwestern portion of the Township.

Public proposals include those devised as part of the Paoli Intermodal Transportation Center Plan and the Paoli Community Master Plan. The first of the two plans entails the construction of a new Paoli Station and station-related development and parking on the former rail yard to the north. The second plan proposes a revitalization approach to encourage mixed-use development focused on the new Paoli Station with integrated ties to the surrounding community. In addition, the Tredyffrin Public Library has completed a 10,000 square foot addition to its facility located on Upper Gulph Road.

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INSERT FIGURE 2.4.1 RECENT DEVELOPMENT

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INSERT FIGURE 2.4.2 PENDING & PROPOSED DEVELOPMENT

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HOLDING CAPACITY

SECTION 2.5: HOLDING CAPACITY

The discussion of *holding capacity* continues this chapter's examination of existing conditions through a comparison of the forecasted need for land for new residential and non-residential development with the land potentially available to meet that need. In Section 3, the examination of population and employment trends and forecasts provided a glimpse of how many new residents and workers could live and work in Tredyffrin Township by the year 2030. These potential residents and workers translate into the need for new dwellings and floor area for businesses. These estimates forecast the need for land and may be compared to the supply or *holding capacity* of vacant or otherwise easily-developable or redevelopable parcels in the Township.

A Holding Capacity map has been prepared (Figure 2.5.1), indicating *developable* and *redevelopable* lands. This map was prepared using GIS data combined with an examination of aerial photography and field verification. Developable land refers to areas generally unencumbered by existing urban development, whereas redevelopable land indicates areas deemed underutilized and generally susceptible to change.

The developable land inventory included areas designated as vacant or agricultural in the land use database. These were crosschecked against any lands held in easement and therefore unavailable for development. Redevelopable lands were determined first by identifying non-residential lands as defined by the land use database. (Residential lands are unlikely to “turn over” whereas non-residential land may.) Subsequent review of the 2005 aerial mapping and field work determined those parcels that could be considered underutilized. Examples of underutilization include a large parcel with a small building on it. Other examples included older obsolete structures, one-story buildings where multi-story buildings are permitted by development regulations, and situations where generous surface parking areas could be potentially used for building in the future. In these cases, it was determined that tomorrow's market demands might cause the existing structure to be replaced by new buildings that would be supported by current or changed zoning regulations.

The holding capacity analysis identified approximately 788 acres of developable and 560 acres of redevelopable land in Tredyffrin Township, for a total of 1,348 acres, which is about eleven percent of total Township area.

The population forecasts for Tredyffrin Township in the year 2030 (in Section 2.3) range from 32,400 to 32,625 residents. These figures translate into the need for between

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1,477 and 1,573 new housing units by the year 2030. Based on recent land consumption trends for residential development in Tredyffrin Township (averaging one-half acre per dwelling unit), the forecast 2030 population would therefore require 739 to 835 acres of land for new residential construction through the year 2030. A “medium” rate of population growth would correspond to 1,573 new housing units and 787 acres of land would be required. Since this analysis was conducted in 2007, the housing unit forecast was calculated for the 23-year period extending from 2007 to 2030. The rate of 52 dwelling units per year would produce about 1,200 new units during this period, requiring almost 600 acres, assuming one half acre of land per dwelling unit.

The employment forecast for Tredyffrin Township in the year 2030 (made in Section 3) is 44,587 employees or around 8,065 new jobs over the planning period. Assuming that 40% of the new jobs were in office employment centers (at forty employees per acre), 30% were in business park (at twenty employees per acre), and 30% were in the retail sector (at ten employees per acre), then 440 acres of land would be need for new non-residential development.

Taken as a whole, the need for additional land to accommodate new residential and non-residential development by the year 2030 is about 1,040 acres, which means that this demand level can be supported by the quantity of developable and redevelopable lands available.

The holding capacity analysis makes many assumptions concerning which parcels may be available for development or redevelopment. In reality, some parcels identified by this analysis may never develop or redevelop and others, not identified, could be subject to developer interest. However, it appears that the supply of land for new development could accommodate additional population and jobs in Tredyffrin Township to the year 2030.

Some may consider that, based on this holding capacity analysis, Tredyffrin Township will approach the “build-out” of the municipality by the year 2030. However, the notion that build-out means development activity will cease should be regarded with caution. Recent development trends in more highly-developed municipalities in the region suggest that the idea of an ultimate build-out of the community, beyond which new development will be impossible because there will not be any more room for new construction, is somewhat illusory. Land development in Tredyffrin Township will continue to be demand-generated. While the Township will continue to see interest in remaining undeveloped parcels, development activity will also include “infill”

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development, and redevelopment of already built lands as the community continues to mature beyond 2030. For example, the prospect for redevelopment of office and light industrial parks with existing one- and two-story buildings as office complexes with four-to-six-story buildings may be contemplated as a possibility for Tredyffrin Township, even if this occurs after the year 2030.

Chapter Two: Existing Conditions

HOLDING CAPACITY

INSERT FIGURE 2.5.1 HOLDING CAPACITY

Chapter Two: Existing Conditions

HISTORIC RESOURCES

SECTION 2.6: HISTORIC RESOURCES

Note: This section contains excerpts from the Historic Preservation Plan that has been prepared concurrent with the Comprehensive Plan. Please see that Plan for additional detail and in depth discussion of historic preservation issues.

The geography and landforms of the Township have played a central role in how Tredyffrin Township has developed. Historically, and still today, the Township is centered along a low valley that runs in an east-west direction and is flanked by steep valley walls to the north and south. The rich limestone soils in the valley were the perfect setting for the Township's early agricultural heritage and the valley walls resulted in the development of industries such as kilns and quarries. It is because of these natural features, the slopes and the valley, that the first settlers chose Tredyffrin Township. The primary reason for the growth and expansion of the Township over the past few decades is directly associated within its geographical location and proximity to primary transportation corridors.

The Township actually owes its name to the early Welsh settlers who established homes and farms on the land beginning in 1682. "Tre" is the Welsh word for Township and "Dyffrin" means a wide cultivated valley; together, Tredyffrin is said to mean a Township in a wide cultivated valley, which is perfectly descriptive of the community's historic origins.

With a rich history associated with the Welsh Tract settlement and agriculture, famous battles of the Revolutionary War, and the growth of the railway system, Tredyffrin Township contains a wide variety of historic resources and an inviting character. This agricultural community began to change as early roads were built to connect these communities with markets for their agricultural products. Early settlements formed along these roadways to provide community meeting locations and services for travelers and merchants bringing their goods to market. Families grew and farms were subdivided to provide land for the next generation. With successive generations grew the need for further subdivision of agricultural parcels and an increase in the construction of homes, barns, outbuildings and other community facilities to serve the needs of this growing population.

Railroad improvements in the late nineteenth century led to the rail stations such as the Paoli and Strafford stops that became the catalyst for new communities. However, the most substantial change came when highways gained prominence and improved access

Chapter Two: Existing Conditions

HISTORIC RESOURCES

to these agricultural areas. In particular, the development of the US Route 202 corridor directly through the center of the Township not only eliminated some existing settlements, but also divided the Township in half. Improved access and a declining agricultural economy subsequently led to farm parcels gradually converting from working farms to gentleman farms owned by the wealthy to residential and non-residential uses.

Today, Tredyffrin Township remains proud of its heritage and has preserved many of the buildings and resources associated with its early development. However, as with so many suburban communities surrounding Philadelphia and throughout the nation, growth and development over the last three decades has continued to encroach on these resources. Increased residential and non-residential development has consumed historic landscapes and led to increased traffic along local and regional roadways, requiring their expansion.

The Township completed a Historic Resources Survey in 2003 that included an inventory of 356 historic and cultural resources that reflect the history and evolution of the Township since its founding. In 1966, Tredyffrin Township adopted an ordinance, establishing an historic district, which identified properties to be monitored by the Tredyffrin Township Historical Architectural Review Board. There are currently thirty-one (31) properties on the list. Any building permit submitted to the Township for a property on the Historic Sites List, or within 250 feet of a protected historic site on the list, is required to be reviewed by the Historical Architectural Review Board to ensure that historic resources are appropriately preserved before being considered for approval by the Board of Supervisors.

Chapter Two: Existing Conditions

HISTORIC RESOURCES

The following properties are listed on the Township's Historic District Ordinance and displayed on Figure 2.6.1:

1. Quarters of Major General William Alexander, Lord Stirling
2. Quarters of Brigadier General Henry Knox
3. Quarters of Brigadier General William Maxwell
4. Quarters of Major General Marquis de Lafayette
5. Quarters of Brigadier General Louis Lebeque DuPortail
6. Quarters of Brigadier General Anthony Wayne
7. Quarters of Brigadier General Count Casimir Pulaski
8. Quarters of Brigadier General Enoch Poor
9. Quarters of Brigadier General James Potter
10. Quarters of Major General Nathanael Greene (Demolished)
11. Quarters of Sir William Howe
12. Quarters of Brigadier General William Woodford
13. Quarters of General Charles Cornwallis
14. Quarters of General Charles Lee & Thomas Bradford
15. Quarters of Captain John Davis (Site does not exist)
16. Diamond Rock Octagonal School
17. Old Eagle School
18. DeAddio Log Cabin
19. Shumway-Davis Log Cabin
20. Roye-Heybrun-Clarke Log Cabin
21. Wetherby-Hampton-Snyder-Atlee-Wilson Log Cabin
22. Van Leer Curwin Log Cabin
23. Hughes Hollow-Browning Log Cabin
24. Drexel-Paul-Thompkins Log Cabin
25. First Blue Ball Tavern
26. Second Blue Ball Tavern
27. The Great Valley Mill
28. Knox Bridge
29. Barn, Stirling's Quarters
30. Prescott Springhouse
31. Strafford Railroad Station

Chapter Two: Existing Conditions

HISTORIC RESOURCES

INSERT FIGURE 2.6.1 HISTORIC RESOURCES

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TRANSPORTATION

SECTION 2.7: TRANSPORTATION

The information provided in this section describes the transportation network for Tredyffrin Township. It includes a discussion of the functional and jurisdictional classification of the roadways, traffic demands, public transportation options, and the bicycle and pedestrian network. This analysis focuses on the major components of the transportation network that facilitate transportation within and outside the Township. It is not intended as a detailed examination of all subdivision streets.

Tredyffrin Township's transportation network provides it with a high degree of accessibility that has been both historically a key factor for development and continues to play a key role in the location and intensity of development. Three major highways cross the Township from east to west. These include the Pennsylvania Turnpike in the northern section of the Township; US Route 202, which bisects the Township; and US Route 30 (Lincoln Highway or Lancaster Avenue), which passes through the southern portion of the Township.

The Pennsylvania Turnpike's Valley Forge interchange is located in Upper Merion Township, just northeast of Tredyffrin Township's border. This interchange connects the Turnpike with US Route 202, providing a direct link into the Township. The same interchange links US Route 202 with I-76, the Schuylkill Expressway, providing direct access to this major arterial and a connection to the City of Philadelphia.

Tredyffrin Township's interchanges with US Route 202 provide the central portion of the Township with superb access to an important regional highway. This high degree of accessibility has directly influenced the location of intense commercial and office development along that corridor and likely increased the desirability of residential development in its vicinity.

US Route 30 (Lancaster Avenue) is an important regional highway that historically provided access to this area. Today, it is a major transportation and commercial corridor. Lancaster Avenue has been the main street for centers like Paoli, Berwyn, and Strafford, and is still something of a main street today, though its width and high volume of traffic create an atmosphere that is quite different than that of the pre-World War II era.

PA Route 252 provides an important route through the center of Tredyffrin Township,

Chapter Two: Existing Conditions

TRANSPORTATION

and PA 422 (County Line Expressway) enters the Township along its northeastern border with Upper Merion Township, and terminates at US Route 202.

Other important roads in the Township network include Swedesford Road, Chesterbrook Boulevard, Yellow Springs Road, Valley Road, Valley Forge Road, Old Eagle School Road, Conestoga Road and Upper Gulph Road. These roads provide connections into adjacent communities and to other roadways and residential streets throughout the Township.

The historic Main Line of the Pennsylvania Railroad, now owned by AMTRAK and used by it and by the Southeastern Pennsylvania Transportation Authority (SEPTA) for its R-5 Regional Rail service, also passes through the southern part of the Township in the vicinity of Lancaster Avenue, and includes the AMTRAK/SEPTA Paoli station, as well as the Daylesford and Strafford SEPTA stations on this portion of the line. SEPTA also operates buses on fixed routes through the Township.

The Commonwealth of Pennsylvania operates two park-and-ride lots in East Whiteland Township, located to the west of Tredyffrin Township. The Matthews Road Park-and-Ride Lot is adjacent to the interchange of US Route 202 and PA Route 29, while the West US Route 30 Park-and-Ride Lot is adjacent to the interchange of US Route 202 and US Route 30.

Functional Classification

Functional classification describes a roadway's purpose. These classifications include expressways, arterials, collectors and local roads. As one moves downward through the hierarchy of roadway classifications from expressway to local road, the expected traffic volumes and speeds decrease and the level of access from adjacent properties to the roadway increases. Expressways are limited access highways intended to move large volumes of traffic at relatively high rates of speed over substantial distance. Arterials have some similarities to expressways in that they move large volumes of traffic and, though they do allow property access, mobility is more important. They may be used for some local trips but are primarily used for longer trips. Some of the differences between major and minor arterials include that major arterials may be longer roads, have higher traffic volumes and less focus on property access, and may have median control or turning lanes. Collectors are smaller roads that balance property access with mobility. These roads are intended to be used to access the higher order roadways and often to reach destinations within a community. Distinctions between major and minor

Chapter Two: Existing Conditions

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collectors include that major collectors are longer and carry more traffic. Local roads are intended to provide direct access to properties and be used for short trips to destinations or to enter the higher order roadways for longer trips.

Functional classification is a planning tool used for reasons ranging from determining setback regulations, right-of-way preservation, access management regulations, road design standards, intersection separation distance and scenic road designations.

Figure 2.7.1 shows a map of the functional classification of Tredyffrin Township's roadways. Table 2.7.1 lists the Functional Classification of many of the major roadways. The source for the classifications is the Pennsylvania Department of Transportation.

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INSERT FIGURE 2.7.1 FUNCTIONAL CLASSIFICATION

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Table 2.7.1
Tredyffrin Township
Functional Classification of Roadways

Roadway	Classification
I-76 (Pennsylvania Turnpike)	Expressway
US Route 202	Expressway
PA 422	Expressway
US Route 30 (Lancaster Avenue)	Major Arterial
PA 252	Major Arterial
Devon State Road	Minor Arterial
Old Eagle School Road	Minor Arterial
Swedesford Road	Minor Arterial/Major Collector
Valley Forge Road	Minor Arterial
Chesterbrook Boulevard	Major Collector
Conestoga Road	Major Collector
Duportail Road	Major Collector
Upper Gulph Road	Major Collector
North Valley Road	Major Collector
Walker Road	Major Collector
Yellow Springs Road	Major Collector
Cedar Hollow Road	Minor Collector
Contention Lane	Minor Collector
Devon Park Road	Minor Collector
Howellville Road	Minor Collector
West Valley Road	Minor Collector
King of Prussia Road	Minor Collector
Cassatt Road	Minor Collector
Mill Road	Minor Collector

Jurisdictional Classification

While functional classification describes how a roadway is intended to be used, jurisdictional classification indicates what entity controls and maintains the roadways. Figure 2.7.2 shows a map of the Jurisdictional Classification of Tredyffrin Township's roadways. Table 2.7.2 lists the Jurisdictional Classification of many of the major roadways in the Township. The source for the classifications is the Pennsylvania

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TRANSPORTATION

Department of Transportation, and was updated by Tredyffrin Township staff.

Table 2.7.2
Tredyffrin Township
Jurisdictional Classification of Roadways

Roadway	Jurisdiction
I-76 (Pennsylvania Turnpike)	State
US Route 202	State
US Route 30 (Lancaster Avenue)	State
PA 422	State
PA 252	State
Cedar Hollow Road	State & Municipal
Conestoga Road	State
Devon State Road	State
Swedesford Road	State
Upper Gulph Road	State
North Valley Road	State
Valley Forge Road	State
Yellow Springs Road	State
Howellville Road	State & Municipal
Old Eagle School Road	State & Municipal
Chesterbrook Boulevard	Municipal
Contention Lane	Municipal
Devon Park Road	Municipal
Duportail Road	Municipal
Walker Road	Municipal
West Valley Road	Municipal

There are 43 miles of state highways and 107 miles of municipal roads within Tredyffrin Township. The state highways within Tredyffrin Township are controlled and operated by the Commonwealth of Pennsylvania through its Department of Transportation. With the exception of any private roads, the remaining roadways are under the jurisdiction of Tredyffrin Township.

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TRANSPORTATION

INSERT FIGURE 2.7.2 JURISDICTIONAL CLASSIFICATION

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Traffic Volumes

Average Annual Daily Traffic (AADT) counts have been compiled by PennDOT and are shown as ranges on Figure 2.7.3, Traffic Volume Counts. These ranges acknowledge that the actual traffic volumes will vary by roadway segment, based on adjacent development and travel patterns. In Tredyffrin Township the highest traffic volumes are carried by the Pennsylvania Turnpike, US Route 202, PA Route 422 and US Route 30. Turnpike traffic within the Township ranges from an average of 50,000 to just under 70,000 vehicles per day. US Route 202 and PA Route 422 average between 50,000 and 100,000 vehicles per day, and US Route 30 averages between 12,000 and 24,000 vehicles per day.

While not of the same magnitude, the Township arterials and collectors are busy, particularly for two-lane roadways. Most of the major local roads handle substantial daily traffic, including Yellow Springs Road, North Valley Road, Swedesford Road, Cedar Hollow Road, PA Route 252, Chesterbrook Boulevard, Howellville Road, Valley Forge Road, Devon State Road, Walker Road, Old Eagle School Road, and Conestoga Road.

Roadway Projects

Several significant PennDOT and Turnpike roadway projects are in progress or being studied for implementation in Tredyffrin Township and its vicinity. These include widening US Route 202 from four to six lanes, which will require rebuilding the existing underpasses and overpasses along the route in the western portion of the Township. Projects also include a “slip ramp” interchange between the Turnpike and PA Route 29 just west of the Township in East Whiteland Township, widening PA 422, and widening the Pennsylvania Turnpike to six lanes from the Valley Forge exit to the Exton interchange with PA Route 100.

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INSERT FIGURE 2.7.3 TRAFFIC VOLUME COUNTS

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Public Transportation

Tredyffrin Township is served by both rail and bus public transportation. AMTRAK owns and operates the former Pennsylvania Railroad main line that passes through the Township near Lancaster Avenue (see Figure 2.7.4 for the location of the routes and stations). From the Paoli train station, Township residents can take AMTRAK trains west to Lancaster and Harrisburg and east to Philadelphia's 30th Street Station, from where they can access north and southbound trains that travel the busy Northeast Corridor.

The SEPTA R5 Regional Rail line also operates on the AMTRAK-owned tracks. Within Tredyffrin Township, the Paoli, Daylesford and Strafford rail stations serve the SEPTA R5 line that takes commuters to and from Philadelphia and suburban destinations. In addition, the Berwyn and Devon train stations located in Easttown Township and the Wayne station in Radnor Township provide other convenient location to access the R5 commuter rail system.

SEPTA bus routes 92, 105, 124, 204, 205, and 206 serve Tredyffrin Township. These routes traverse and connect the two main locations for commercial development, the central and eastern portions of the US Route 202 corridor and the US Route 30 corridor. Route 92 and 124 serve the US Route 202 corridor, circulating along Swedesford Road, Devon Park Drive. Beyond Valley Forge Road, the routes diverge with Route 124 serving Chesterbrook Boulevard and portions of DuPortail, while Route 92 continues along PA Route 252, ultimately connecting with Lancaster Avenue, the Paoli rail station and points westward. Route 105 serves the length of Lancaster Avenue, beginning and ending beyond the Township boundaries. Routes 204, 205 and 206 all extend westward from the Paoli Rail Station. While Route 204 continues along Lancaster Avenue into adjacent municipalities, Route 205 heads north on Cedar Hollow Road to Matthews Road and then north on PA Route 29. Route 206 follows Lancaster Avenue west from the Paoli Rail Station heads north on PA Route 29.

In addition some corporations provide shuttle bus service to transit stations. For example Vanguard Corporation provides the "Crew's Line" program to shuttle employees from the corporate campus buildings to transit stations.

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INSERT FIGURE 2.7.4 PUBLIC TRANSPORTATION

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Pedestrian & Bicycle Mobility

The 2005 Park, Recreation and Open Space plan defined Recreational Corridors within Tredyffrin Township as including regional trails, local pathways and sidewalks. These features are described below and may be found on Figure 2.7.5.

Regional Trails

Regional trails will include the Chester Valley Trail, Horseshoe Trail, the future Patriots Path and the future Cedar Hollow Trail. The Chester Valley Trail will pass east-west through the center of Tredyffrin Township on a former railroad right of way. It will eventually provide a link between the Struble Trail, located to the west in Downingtown Borough, and east to the Chester and Montgomery County border in King of Prussia. Ultimately, Montgomery County wishes to provide a connection to the Schuylkill River Trail in Norristown, which would then provide a connection east to Philadelphia and west to Valley Forge Park and the Perkiomen Trail. Work on the Chester Valley Trail is expected to begin in 2009 and be completed in 2010.

The Horseshoe Trail passes along and within a small portion of northwestern Tredyffrin Township along the border with Schuylkill and Charlestown Townships. This 140-mile trail extends from Valley Forge National Historical Park to the Appalachian Trail in Dauphin County, northeast of Harrisburg. About 1.5 miles of the trail are actually within the Township.

The Patriots Path was proposed by Chester County and evaluated in a feasibility study in 2006 that was approved by the Chester County Commissioners. It is conceived as a multi-purpose trail that would connect the sites of the Paoli Massacre in Malvern Borough and the Battle of the Clouds in East Whiteland Township with Valley Forge National Historical Park. This path would primarily use portions of the future Chester Valley Trail and existing sidewalks. A connection will need to be constructed between Wilson Road and the Chester Valley Trail in Tredyffrin Township.

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INSERT FIGURE 2.7.5 PEDESTRIAN BICYCLE NETWORK

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The Warner Spur was a rail spur that once connected the Warner Quarry (now the Atwater Business Park) with the freight rail line that is now being converted to the Chester Valley Trail. This two-mile spur has been donated to the Township and runs adjacent to two Open Lands Conservancy properties and will connect to the Chester Valley Trail. The future trail will be called the “Cedar Hollow Trail.”

Local Pathways and Sidewalks

Local pathways exist within the developments in the Chesterbrook area and other small subdivisions. These are generally paved paths that provide connections between residential, office and commercial developments in the area. Tredyffrin Township’s limited network of sidewalks can generally be found in neighborhoods south of the Norfolk Southern freight rail line and mostly in the vicinity of Lancaster Avenue.

Bicycle Mobility

Bicycle mobility in Tredyffrin Township is generally achieved through the local road network that is also heavily used by cars and other vehicles for daily commuting and other trips. The potential for conflict between bicycles and vehicles varies depending on roadway factors such as lane width, the availability of a shoulder, narrow over and underpasses and traffic volumes.

The Chester Valley Trail, Patriots Path and the Cedar Hollow Trail will all provide multi-use trails that can be used for bicycle and pedestrian recreation and transportation.

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NATURAL RESOURCES

SECTION 2.8: NATURAL RESOURCES

The natural characteristics of the landscape in Tredyffrin Township have been an important factor in determining its historical pattern of development. Areas of significant physical constraint — floodplains, wetlands, and steep slopes — have generally been less likely to be subject to development. These natural features are not only current constraints for development, but they are also sensitive natural features that can become the focus for conservation and preservation activities. An inventory of environmental factors was completed as part of the inventory of existing conditions. These factors are critical components in any consideration of the balance between future preservation and future development.

Several analysis maps were prepared delineating these resources. This series of interrelated, interpretive maps has permitted the identification of areas requiring preservation, areas requiring conservation, and areas available for development within the Township. Areas requiring preservation include creeks, floodplains, and other lands that should generally be considered undevelopable due to the presence of sensitive natural resources, physical characteristics or statutory regulations. Areas in need of conservation include important environmental areas such as wetlands, steep slopes, and woodlands. These valuable resources should be protected or conserved due to the environmentally-sensitive nature of these areas and because of their importance to the community. Natural resource information was combined and synthesized to illustrate the relative level of development constraints affecting various areas of Tredyffrin Township and summarized into a Composite Constraints map (figure 2.8.3) for this Comprehensive Plan.

Additional factors should be kept in mind when considering the issues of resource protection. For example, areas in need of conservation may also include a variety of man-made factors; these areas often include historic sites and scenic features.

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NATURAL RESOURCES

Hydrology

Tredyffrin Township drains mostly into the Schuylkill River. The Valley Creek, Little Valley Creek and Trout Creek watersheds drain the vast majority of the Township to the Schuylkill River. The panhandle area of the Township also drains to the Schuylkill River via the Gulph Creek and Crow Creek watersheds. The southern upland areas of the Township, generally located in the vicinity of Lancaster Avenue, drain through the Crum and Darby Creek watersheds, eventually leading to the Delaware River.

Valley Creek is the dominant hydrological feature of the Township, flowing through the northwestern portion of the Township and into Valley Forge National Historical Park. In 1995, Valley Creek was designated as an Exceptional Value Watercourse by the Commonwealth of Pennsylvania. The Little Valley Creek, a tributary of Valley Creek, is also an important feature, entering the Township in its southwestern section and joining Valley Creek just west of the Chesterbrook area. Trout Creek is also an important waterway in the central and eastern portion of the Township. See the Hydrologic Features map for more detail (Figure 2.8.1).

In consideration of the future for the Township, these drainage patterns are critical in the analysis of stormwater runoff as well as in planning for sanitary sewers. Other hydrologic characteristics contribute strongly to delineating areas that are available for development and those that are constrained for development. Of major concern are wetlands and flood prone zones adjacent to bodies of water.

Wetlands are valuable natural resource areas because they control flooding, improve water quality, and support a wide variety of animal and plant species. Wetlands are characterized generally by a high water table, poor drainage, and some degree of surface ponding during the year. Tredyffrin Township's zoning ordinance requires a minimum 50 foot setback from wetlands. Wetlands are regulated by the U.S. Army Corps of Engineers and the Pennsylvania Department of Environmental Protection. Essentially, no development activity may occur in a wetland area without a permit. The permit process requires an investigation of development alternatives. Mitigation may be required if development is to proceed; creation of new wetlands may be required to replace those disturbed or destroyed by development activity.

Although no comprehensive inventory of wetlands in Tredyffrin Township currently exists, the National Wetlands Inventory (NWI) undertaken in the 1980s by the United States Fish and Wildlife Service and the (then) Pennsylvania Department of

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Environmental Resources delineated wetlands in the Township. These wetlands include surface water bodies, most floodplains, and other areas, generally along creeks, identified by means of aerial photography.

According to the NWI, the most significant location of wetlands is along Valley Creek in a stretch that extends from Church Road to the approximate location of the old Warner Quarry rail spur. Other locations include along Valley Creek just west of North Valley Road and within the Trout Creek watershed between West Valley Road and Valley Forge Road.

Most hydric soils could also qualify as wetlands. A hydric soil is one that in its undrained condition is flooded, ponded, or saturated long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. Hydric soils that do not qualify as wetlands are classified as having a “seasonable high water table,” indicating that they may become saturated during spring runoff conditions. Hydric soils are located along Valley Creek west of North Valley Road, and associated with Little Valley Creek near Cedar Hollow road, along Crabby Creek in the vicinity of PA Route 252, and along Trout Creek.

Development in floodplains is hazardous to life and property, not only for prospective development sites but in existing developed areas downstream that may be subjected to unexpected changes in creek channel location or in flood heights and velocities. The 100-Year floodplain areas shown on the hydrologic features map have been identified by the Federal Emergency Management Agency (FEMA) under the National Flood Insurance Program.

The most extensive floodplains occur in lowland areas, where watercourse gradients are less and landscape profiles are wider than on hillsides. Floodplains for the tributary creeks tend to be relatively narrow. Floodplain soils are generally found adjacent to the creek network. These soils historically have been eroded, transported, and deposited by floodwaters and generally indicate an area susceptible to flooding. The Hydrologic Features Map illustrates the location of floodplains associated with Valley Creek, Little Valley Creek and Trout Creek.

Chapter Two: Existing Conditions

NATURAL RESOURCES

INSERT FIGURE 2.8.1 HYDROLOGIC FEATURES

Chapter Two: Existing Conditions

NATURAL RESOURCES

Topography

The most prominent physical features of the Township are the hills lying along its northern and southern boundaries and the broad, gently rolling, valley floor. The 1987 Tredyffrin Township Comprehensive Plan described the municipality in the following terms:

Tredyffrin Township lies entirely with the Piedmont Province of the Appalachian Highlands, a great band of rolling country that stretches from New York to Georgia. Within Tredyffrin, four major landform features are prominent: the Great, or Chester Valley coursing east-west across the northern half of the township; the North and South Valley Hills on either side; and to the south, a part of the West Chester-Paoli upland, a gently rolling plateau. Elevations range from a low of about 100 feet at the bottom of the Great Valley to a high of about 600 feet atop the parallel ridges of hills.

Two categories of slopes are shown on Figure 2.8.2: Fifteen to twenty-five percent and greater than twenty-five percent. The slope of land, expressed as a percentage, is determined by measuring the vertical change in feet over a one-hundred-foot horizontal distance.

The majority of the Township is unconstrained by significant slope. Areas of moderate to steeply sloping land (where the slope is between fifteen and twenty-five percent) and steeply sloping land (with slopes in excess of twenty-five percent) are found along the North and South Valley Hills. The most extensive area of sloped land is found north of the Pennsylvania Turnpike and west of Diamond Rock Hill Road in the northwestern section of the Township. However, moderate to steeply sloping land continues along this along the northern Township boundary to Valley Forge National Historical Park. The other areas that alternate between moderately sloping and steeply sloping land are along the South Valley Hills, generally located in a band just south of the existing Norfolk Southern freight rail line. These sloped areas generally frame Crabby Creek (a tributary of Valley Creek) and the tributaries to Trout Creek. They are also areas of residential development.

In many areas, steeply sloped lands are covered with woodlands that can limit the potential hazards of soil erosion and groundwater pollution and also provide significant scenic qualities for the community.

Chapter Two: Existing Conditions

NATURAL RESOURCES

INSERT FIGURE 2.8.2 STEEP SLOPES

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NATURAL RESOURCES

Vegetation and Wildlife

Dense hardwood forests once covered the Township, but land clearance for farming, commercial purposes, and other development has eliminated much of this woodland. Today, the remaining woodlands consist mostly of second- and third-growth mixed deciduous forest. These areas generally are associated with the wetter, low-lying areas of the Township along creeks and adjoining steeply sloped areas.

Many native and non-native species of plants and animals may be found in the Township's three main types of habitat — open field or pasture, forest, and wetlands. (Wetlands include creeks, springs, ponds, and meadows.) Although some species have adapted to more than one habitat, other flora and fauna have adapted to very specific needs and conditions, and are critically dependent upon particular habitat types. Generally speaking, man-made features are considered disruptive to natural habitats, but some, such as fields, pasture, hedgerows, and tree lines, offer important food and cover sources. The Tredyffrin Township Environmental Advisory Council is working to encourage the introduction of native plants and promote the removal of invasive plant species in the Township through homeowner education and native plant species planting demonstrations.

According to the Tredyffrin Township Park, Recreation, & Open Space Plan (2005 p. 14), the Natural Areas Inventory for Chester County has identified several unique natural areas in the northern section of the Township, generally north of the Pennsylvania Turnpike. These include the Diamond Rock Hill Woodland, General Wayne woods and several plant species that are considered rare, threatened or endangered.

Composite Constraints

The preceding natural resource information was combined and synthesized to illustrate the relative level of development constraints affecting various areas of Tredyffrin Township. Areas with very severe constraints are generally precluded from future development due to flooding, while very steep slopes and wetlands pose severe constraints for most development. These areas may be most suitable for natural resource preservation and wildlife habitat. Areas of seasonal high water table (hydric soils), with slopes between ten and twenty percent have moderate constraints for development. The balance of the Township has only slight development limitations.

The floodplains associated with Valley Creek, Little Valley Creek and Trout Creek, and

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the North Valley and South Valley Hills in Tredyffrin Township factor most prominently in the delineation of the Composite Constraints (Figure 2.8.3) map. It should be noted that the South Valley Hills areas constrained by the slope have already been somewhat developed and are subject to stormwater problems.

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INSERT FIGURE 2.8.3 COMPOSITE CONSTRAINTS

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COMMUNITY FACILITIES

SECTION 2.9: COMMUNITY FACILITIES

Township and Other Community Facilities and Services

Tredyffrin Township has a modern Township Building located at 1100 DuPortail Road to house municipal administrative functions, including the Township police and public works. Tredyffrin Township has its own police force consisting of 50 police officers and nine civilian support staff. The police officers include three in the administrative division, 42 in the patrol division and five in the detective division. These numbers show an increase of six over the police staff of 53 persons as documented in the 1987 Comprehensive Plan. The Tredyffrin police force currently uses 39 vehicles, compared to the 18 documented in 1987. While the Township police force does not serve adjacent municipalities, it provides assistance to other municipalities when requested. In addition, the force participates in a regional SWAT team that provides wide ranging services throughout the area and the Chester County Municipal Drug Task Force, which provides investigative services throughout the county.

The Paoli Fire Company is located in Tredyffrin Township. It is a volunteer fire company that was founded in 1909 and is located at 69 Darby Road near Lancaster Avenue in Paoli. The fire company includes a 45-member volunteer crew. The company employs full-time station crews of two career firefighters/emergency medical technicians Monday through Friday and a weekend station crew consisting of one career and one volunteer during the day. The company's equipment includes a pumper-tanker, rescue-pumper, tower-ladder, a field truck, a traffic rescue truck, ambulance and two command vehicles. The Paoli Company serves portions of Tredyffrin, Easttown and Willistown Townships, and supports neighboring fire companies as needed. The Paoli Fire Company covers the Township west of Mill Road/Route 252.

The Berwyn Fire Company was established in 1894 and is currently located at 23 Bridge Avenue, Berwyn, in Easttown Township. The fire company includes an active volunteer force of 65 members including EMTs, firefighters, and paramedics, with many of the volunteers cross-trained to be firefighters and either EMTs or paramedics. The company includes nine full-time career staff that work daytime and evening shifts; career firefighters and paramedics are on duty 24 hours a day. The company's equipment includes three pumper trucks, one tower-ladder truck, one rescue truck, a traffic safety unit, three ambulances, and two command vehicles. The Berwyn Fire Company covers the portion of the Township in between Old Eagle School Road and Mill Road/252.

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The Radnor Fire Company, located in Radnor Township, was incorporated in March of 1906. They have a fleet of three engines, a 100-foot ladder truck, one rescue truck, two chiefs' vehicles and two Basic Life Support ambulances. At the present time they have over 87 volunteer fire and ambulance personnel. The Fire Company and Ambulance cover all of Tredyffrin Township east of Old Eagle School Road, known as the panhandle.

The closest hospital to Tredyffrin Township is Paoli Memorial Hospital in neighboring Willistown Township. Tredyffrin residents also travel to Bryn Mawr Hospital located in Lower Merion Township, Phoenixville Hospital in the Borough of Phoenixville, and Chester County Hospital in West Chester.

Postal services are available within or adjacent to the Township in Paoli, Berwyn, Devon, and Wayne. In addition, residents in the northwestern portion of the Township use a Phoenixville post office box due to its proximity. There is also a regional distribution facility located on West Valley Road and the Paoli Carrier Annex located on Industrial Boulevard in Paoli.

The Tredyffrin Public Library includes its main branch along Upper Gulph Road in the Strafford area, and a branch library along Darby Road in Paoli. The library is the center for many programs and community functions. In 2007 its annual patronage was 291,870. The main library will complete a renovation and expansion in 2008.

Residences and businesses in the Township receive trash collection and recycling services through private contractors, per municipal ordinance.

Federal Land

The southern portion (168 acres) of the Valley Forge National Historical Park is located in the northeastern portion of the Township. The park memorializes the 1777-1778 winter encampment of the Colonial Army led by George Washington. In addition to historic interpretation features, the park includes miles of hiking and biking trails that serve as a regional attraction.

Township Parks and Open Space

The Township owns and operates 14 parks and operates two additional parks, Mazie B. Hall Park and West Valley Road Park, that are leased from other owners. The active parks include 268 acres and preserved open spaces total 69 acres. The largest active

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park by far is the 90-acre Wilson Farm Park located in the center of the Township in Chesterbrook. The largest preserved open space tract is the 48-acre Crabby Creek Park located to the east of PA Route 252 and south of the Norfolk Southern freight rail line. These resources are shown on the Community Facilities Map (Figure 2.9.1). They are described in more detail in the 2005 Park, Recreation and Open Space Plan.

Open Land Conservancy Preserves and Easements

The Open Land Conservancy is a not-for-profit public land trust that began its work with several preserves and conservation easements in the 1940s. The Conservancy owns seven nature preserves totaling 343 acres and has acquired conservation easements for an additional 118 acres throughout Chester County. The conservancy preserves include Airdrie Forest Preserve, Cedar Hollow Preserve, Cool Valley Preserve, Diamond Rock Preserve, George Lorimer Nature Preserve, Miller Preserve, and Valley Creek Preserve. These preserves are open to the public during daylight hours and several feature walking trails.

Other Private Recreation and Open Space Facilities

In addition to the publicly-held recreation and open space facilities, a number of privately-held facilities exist within Tredyffrin Township. These include Clark Field (little league), Daylesford Lakes Community Pool, Field of Dreams (little league), Glenhardie Country Club, Jenkins Aboretum, Picket Post Swim & Tennis Club, St. Davids Golf Club, and Valley Forge Mountain Racquet Club and Association. These facilities provide for additional active and passive recreational opportunities within the Township. Other recreational resources are available in the immediate area and beyond Township boundaries. In the Paoli portion of Willistown Township, just outside of Tredyffrin Township, there is a curling facility, and in Easttown Township, there is a YMCA that is an important recreational resource for Tredyffrin Township residents, as well as Rocket Sports in Upper Merion Township and the Waynesborough Country Club in Easttown Township.

Public Schools

The Tredyffrin-Easttown School District encompasses Tredyffrin Township and Easttown Township. Eight of the eleven school district facilities plus one additional property are located within Tredyffrin Township, including Conestoga High School, Hillside Elementary School, New Eagle Elementary School, Tredyffrin-Easttown Middle School, Valley Forge Elementary School, and Valley Forge Middle School, a bus garage, a

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maintenance building and the administrative offices (Figure 2.9.1). The School District also owns a plot of land on Jefferson Lane in Chestebrook. Two additional elementary schools are located in Easttown Township.

Private Educational Facilities

Within Tredyffrin Township there are also located a number of private educational facilities. These include Cabrini College, Crossroads School, Delaware Valley Friends School, Devon Preparatory School, The Timothy School, Valley Forge Military Academy, Vanguard School, and Woodlynde School. Of these establishments, Valley Forge Military Academy occupies the greatest land area, totaling 30 acres within Tredyffrin Township, with additional acreage located in Radnor Township.

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INSERT FIGURE 2.9.1 COMMUNITY FACILITIES

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Water Service

Tredyffrin Township's water supply consists of both public ("piped") water and on-site wells. Public water service is provided by Aqua America, formerly Philadelphia Suburban Water Company (PSW).

Aqua America is a regional water supplier that operates a large, integrated system that draws upon both surface water and groundwater sources. Aqua America operates 37 wells and withdraws water from Pickering Creek (near Phoenixville), Brandywine Creek, Crum Creek, Chester Creek, Ridley Creek, Schuylkill River, and the Susquehanna River. Tredyffrin Township customers may receive water from a variety of sources within the system at various times of the day, month, or year. With a system of this size, it is anticipated that Aqua America will have sufficient capacity to serve the future needs of the Township.

At properties where public water is not available or not utilized, on-site wells provide the water source. The legacy of older on-lot wastewater disposal systems has produced some sewer system malfunctions, with collateral threats to on-site well water quality.

Sewer Service

Wastewater disposal in Tredyffrin Township consists of the central Tredyffrin Township Municipal Authority sewer system, and private residence, on-lot systems. Figure 2.9.2 provides details regarding the sewer system.

The Municipal Authority owns and the Township operates the Township sewer system that includes over 133 miles of sewer lines and nine pump stations. Using a system of gravity lines, force mains, and pump stations the Township sends its wastewater to four treatment plants. These include Delcora (Chester), Matsunk & Trout Run (Upper Merion), and the Valley Forge Sewer Authority (Schuylkill Township).

The Municipal Authority owns and the Township operates the Valley Creek Trunk Sewer that conveys wastewater from Charlestown, Easttown, East Whiteland, Tredyffrin, and Willistown Townships and Malvern Borough to the Valley Forge Sewer Authority. The Valley Creek Trunk Sewer has experienced increased flows over the years as municipalities to the west of Tredyffrin have become more developed. Tredyffrin Township is conducting Act 537 planning for this trunk sewer, which includes the Wilson Road Pumping Station.

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INSERT FIGURE 2.9.2 SEWER SERVICE

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Tredyffrin Township's Public Works Department conducts a preventative maintenance program for sewer lines, manholes, and pump stations. Twenty-five to seventy-five thousand feet of sewer lines are cleaned, televised, degreased or root-abated a year. Certain mains are targeted for quarterly cleaning by Township personnel. Pump stations are inspected frequently by the Township, along with monthly inspections by an outside firm.

The Valley Forge Sewer Authority, of which Tredyffrin Township is a member, drafted a regional Act 537 plan update in November 2006 in order to establish and implement a plan for meeting the long-term wastewater treatment needs of the eight-member municipalities served by the authority.

The Radnor-Haverford-Marple Sewer Authority conveys sewage from Tredyffrin Township to the Philadelphia sewage treatment plant. This group is planning for expansion.

On-lot wastewater disposal systems serve some areas of the Township, particularly in the northwestern part of the Township, characterized as being an area generally having Swedesford Road as a southern boundary, North Valley Road as an eastern boundary, the Township line as a western boundary, and including the portion of the Township north of the Turnpike and west of Valley Forge National Historical Park.

According to the May 1993 Act 537 Plan, on-lot systems in this area have malfunctioned mostly due to the systems reaching the end of the expected life, or because they were designed and constructed before current design standards were in place. In these locations, due to large lot sizes, it is likely that the failing systems can be repaired with tile bed fields.

Township residents who operate on-lot systems are required to maintain their systems, including having the system cleaned as needed but at a minimum of every three years. Although on-lot systems fall under the jurisdiction of the Pennsylvania Department of Environmental Protection and the Chester County Health Department, residents must send proof of cleaning to the Township.

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Stormwater Management

Tredyffrin Township has an extensive stormwater network as shown on Figure 2.9.3. The network information shown on the referenced figure includes stormwater inlets, manholes, detention basins and a network that conveys stormwater from the inlets to areas for detention or to creeks. This network is important for managing stormwater in a way that helps reduce the chance of flooding and damage to property and the natural environment.

The Township provides substantial information regarding stormwater management on its website (www.tredyffrin.org).

Other Utilities

PECO Energy provides electrical service for Tredyffrin Township and provides gas service for portions of the Township. Twin 240-kilovolt electric transmission lines built by the Philadelphia Electric Company (now PECO Energy) run the length of the Township.

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INSERT FIGURE 2.9.3 STORMWATER NETWORK