

# BUCKS COUNTY COMPREHENSIVE PLAN 2011



**Bucks County Planning Commission**  
1260 Almshouse Road, Doylestown, Pennsylvania 18901  
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	<b>PAGE</b>
<b>I. Introduction</b>	
Purpose and Background.....	1
Public Outreach.....	3
Foundations.....	5
Regional Relationships.....	7
<b>II. Where are we?</b>	
Demographic and Socioeconomic Characteristics and Trends .....	11
Existing Land Use .....	25
<b>III. Where do we want to go?</b>	
Vision .....	39
Guiding Principles.....	41
Future Land Use.....	43
<b>IV. How do we get there?</b>	
<b>Principle 1: Protect Natural, Historic, and Scenic Resources</b>	
Natural Resources Protection .....	45
Historic Resources.....	69
Scenic Resources.....	79
<b>Principle 2: Preserve and Expand Parks, Open Space, and Agricultural Resources</b>	
Parks, Recreation, and Open Space .....	83
Agricultural Resources .....	103
<b>Principle 3: Promote Energy Conservation and Efficiency</b>	
Energy Conservation and Efficiency.....	115
<b>Principle 4: Protect Water Resources and Reduce Waste</b>	
Water Supply and Infrastructure .....	125
Wastewater Facilities .....	137
Stormwater Management.....	147
Solid Waste Management.....	159
<b>Principle 5: Mitigate Hazards to Life and Property</b>	
Hazard Mitigation.....	175
<b>Principle 6: Provide Adequate Community Facilities and Services</b>	
Community Facilities and Services.....	187
<b>Principle 7: Enhance Transportation Mobility</b>	
Transportation Mobility.....	201
<b>Principle 8: Promote Economic Opportunity, Housing Diversity, and Efficient Use of Land</b>	
Economic Development.....	231
Housing .....	245
Future Land Use: Planning for Smart Growth .....	271
<b>Plan Implementation.....</b>	<b>291</b>
<b>V. Appendices</b>	
Appendix A. Survey Results .....	A-1
Appendix B. Stakeholder Meetings Summary.....	B-1
Appendix C. Development District Analysis .....	C-1

**List of Tables and Figures**

**Demographic and Socioeconomic Characteristics and Trends**

Table 1 Population Change by Region, 1990–2000 and 2000–2010 .....13

Table 2 Municipal Population Change 1990–2000 and 2000–2010.....14

Table 3 Boroughs Share of County Population, 1970–2010.....15

Table 4 Educational Attainment, 1980–2010 .....18

Table 5 Race/Ethnicity, 1990–2010.....19

Table 6 Nativity, 2000–2010.....19

Table 7 Income and Poverty, 1990–2010.....21

Table 8 DVRPC and PSDC Population Forecasts/Projections for Bucks County, 2010–2030.....21

Table 9 DVRPC and PSDC New High and Low Population Forecasts/Projections for Bucks County, 2020–2030 .....22

Figure 1 Population Growth, 1930–2010 .....11

Figure 2 Regional Population Growth 1930–2010.....12

Figure 3 Housing Growth, 1940–2010 .....12

Figure 4 Municipal Population Change, 1990–2000 and 2000–2010.....14

Figure 5 Age of Population, 1980–2010 .....16

Figure 6 Seniors, 1980–2010.....17

Figure 7 Elderly, 1980–2010 .....17

Figure 8 Young Adults, 1990–2010 .....18

Figure 9 Household Characteristics, 1980–2010 .....20

Figure 10 Household Size, 1980–2010 .....20

Figure 11 Population and Housing Projections, 2020 and 2030.....23

**Existing Land Use**

Table 10 Land Use, 2009.....26

Table 11 2009 Land Use Distribution by Region, in Acres.....27

Table 12 Percentage Land Use Comparisons by Region, 1970–2009 .....32

Table 13 Average Acreage Per Dwelling Unit, 1970–2009 .....33

Table 14 Land Use Change, 1990–2009 .....34

Principle 1

**Natural Resources**

Table 15 Plant Diversity .....49

Table 16 Major Lakes.....55

Figure 12 Floodplains.....60

Figure 13 Riparian Forest Buffer Zone.....63

**Historic Resources**

Table 17 Covered Bridges .....73

Principle 2

**Parks, Recreation, and Open Space**

Table 18 Open Space Funding.....85

Table 19 State Parks .....88

	<b>PAGE</b>
Table 20 State Game Lands.....	89
Table 21 State Historic Sites.....	89
Table 22 County Parks and Nature Centers.....	90
Table 23 County Historic Cultural Properties.....	90
Table 24 County Special Use Parks.....	91
Table 25 County Undeveloped Parks.....	91
Table 26 Trails and Bike Routes.....	96
Table 27 Open Space Acquisition Goals.....	99
<b>Agricultural Resources</b>	
Table 28 Farm Characteristics, 2002 and 2007.....	104
Table 29 Top Commodity Groups, 2007.....	105
Principle 4	
<b>Water Supply and Infrastructure</b>	
Table 30 Major Community Water Suppliers.....	131
Figure 14 Categories of Public Water Systems.....	129
<b>Wastewater Facilities</b>	
Table 31 Municipal Sewer Departments and Municipal Authorities.....	139
Figure 15 Wastewater System Options.....	142
<b>Stormwater Management</b>	
Table 32 Stormwater Management Plans and PaDEP Approval Dates.....	151
Table 33 Non-Structural Stormwater Best Management Practices.....	154
Table 34 Structural Stormwater Best Management Practices.....	155
Figure 16 Hydrologic Cycle.....	148
<b>Solid Waste Management</b>	
Table 35 Materials Accepted at Southeastern Pennsylvania Hazardous Waste Collection Events.....	167
Figure 17 Total Recycling.....	160
Figure 18 2000 PaDEP Waste Composition Study.....	161
Principle 5	
<b>Hazard Mitigation</b>	
Table 36 Hazard Risk Factors.....	178
Principle 6	
<b>Community Facilities</b>	
Figure 19 Public School Enrollments, 1993–2019.....	192
Principle 7	
<b>Transportation Mobility</b>	
Figure 20 Land Use Transportation Cycle.....	210
Figure 21 Traffic Calming.....	213
Principle 8	
<b>Economic Development</b>	
Figure 22 Bucks County Profile, September 2011.....	232-233
Figure 23 Economic Shift, 1990, 2000, and 2007.....	234

**TABLE OF CONTENTS**

	<b>PAGE</b>
Figure 24	Unemployment Rate, 1980–2009 ..... 235
Figure 25	Response to 2009 Business Survey by Business Type ..... 239
<b>Housing</b>	
Table 37	Change in Housing Units and Population, 1940–2010..... 246
Table 38	County, State, and National Average Household Size, 1970–2010 ..... 247
Table 39	Top 5 Municipalities by Total Number and Percentage of Single-family Detached Units, 2009..... 251
Table 40	Top 5 Municipalities by Total Number and Percentage of Single-family Attached Units, 2009..... 251
Table 41	Top 5 Municipalities by Total Number and Percentage of Multifamily (3+) Attached Units, 2009 ..... 252
Table 42	Housing Tenure Type, 2010..... 253
Table 43	Housing Age, 2010 ..... 253
Table 44	Housing Occupancy, 2010 ..... 254
Table 45	Proposed Residential Development by Region, 2001 to 2010 ..... 255
Table 46	Housing Density (dwelling units per acre), 1970–2009 ..... 257
Table 47	Housing Prices and Foreclosures, 1 <sup>st</sup> Quarter 2010 ..... 260
Table 48	Median Monthly Rent for U.S., Pennsylvania, and Select Metro-Area Counties, 2010..... 261
Table 49	Affordable and Available Rental Housing Units in 2005–2006 and Changes from 2000 ..... 263
Table 50	Special-Purpose Housing, 2010 ..... 266
Table 51	Housing Program Income Standards, 2011 Standards for Philadelphia, Camden, Wilmington, PA-NJ-DE-MD Metro-Area ..... 268
Table 52	Monthly Rent Limits for Housing Programs, 2011..... 268
Figure 26	Population and Housing, 1940–2030 ..... 246
Figure 27	Household Types, 2000 and 2010 ..... 247
Figure 28	Age Distribution, 2000 and 2010 ..... 248
Figure 29	Poverty Rates, 2010 ..... 249
Figure 30	Disability Status, 2010 ..... 250
Figure 31	Disabled Persons by Age, 2010 ..... 250
Figure 32	Housing Type, 2010 ..... 251
Figure 33	Median Sale Prices, Bucks, Montgomery, Philadelphia, Mercer, and Burlington Counties, 2004–2009 ..... 260
Figure 34	Owner-Occupied Housing Cost Burden, 2010..... 262
Figure 35	Rental Housing Cost Burden, 2010 ..... 262
<b>Future Land Use: Planning for Smart Growth</b>	
Table 53	Housing Density (dwelling units per acre), 1970–2009 ..... 276

**List of Maps**

Purpose and Background

    Map 1: Bucks County Municipalities and Regions.....2

Existing Land Use

    Map 2: Upper Bucks Land Use, 2009 .....26

    Map 3: Central Bucks Land Use, 2009..... after Map 1

    Map 4: Lower Bucks Land Use, 2009 ..... after Map 2

Future Land Use

    Map 5: Future Land Use .....44

Principle 1

Natural Resources

    Map 6: Conservation Landscapes .....52

    Map 7: Hydrologic Resources .....54

    Map 8: Water Quality Classifications for Streams.....56

    Map 9: Impaired Stream Segments.....58

Historic Resources

    Map 10: Historic Resource Survey.....72

    Map 11: Significant Historic Resources ..... after Map 10

Principle 2

Parks, Recreation, and Open Space

    Map 12: Parks, Open Space, and Greenways..... 102

Agricultural Resources

    Map 13: Prime Agricultural Soils ..... 104

    Map 14: Agricultural Security Areas ..... 110

Principle 4

Water Supply and Infrastructure

    Map 15: Delaware River Basin Commission Groundwater Protected Area..... 128

Principle 7

Transportation Mobility

    Map 16: Major Transportation Facilities ..... 202

    Map 17: Critical Corridors and Transportation Projects..... 208

Principle 8

Future Land Use: Planning for Smart Growth

    Map 18: Development Constructed Inside Development Area, 1990 to 2009.... 276

    Map 19: Future Land Use ..... 286

Appendix C

    Map C1: Development Area..... C-2

**TABLE OF CONTENTS**

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# I. INTRODUCTION

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Purpose and Background  
Public Outreach  
Foundations  
Regional Relationships

Bucks County, Pennsylvania, is valued for its open spaces, wealth of natural resources and farmland, historic, scenic, and recreational amenities, and high quality of life. It is these very qualities that make Bucks County attractive to people and businesses looking for new opportunities. Over the years the county’s municipalities have made a concerted effort to plan for and adapt to the demand for new development. As a result of these efforts, we’ve preserved thousands of acres of open space and farmland and helped plan and develop good communities. But sprawl development continues to hinder us economically, environmentally, and socially—traffic congestion keeps getting worse, our natural and agricultural heritage has become more fragmented and diminished, and our neighborhoods remain disconnected from each other.

With the support and guidance of the Bucks County Board of Commissioners and Bucks County Planning Commission, the *Bucks County Comprehensive Plan* presents a common vision for the future of Bucks County and seeks to coordinate and assist the county’s municipalities, agencies, and the general public in the planning, development, and management of Bucks County’s natural and built environment.

Long-standing issues of traffic, flooding, water supply, and economic development are regional in character and cannot be solved by individual communities; it is only through the collective efforts of the county and each of its constituent municipalities that we can put into place long-term and comprehensive solutions. This comprehensive plan fulfills an important role by identifying regional issues, problems, and opportunities in guiding municipalities in the development of their own local planning and implementation programs.

**Role of the Bucks County**

Bucks County, Pennsylvania, is located along the Delaware River northeast of Montgomery County and the City of Philadelphia and is composed of 54 municipalities, including 23 boroughs and 31 townships (see Map 1). Bucks County’s Board of Commissioners comprises three commissioners, two majority and one minority, elected to four-year terms. The commissioners are responsible for the adoption and administration of the county operation budget (\$463.5 million in 2011), along with oversight of the third largest workforce in the county (more than 2,600 employees). Commissioners’ departments include:

<p><b>Community Services</b> Board of Elections/Voting Machines Community and Business Development Consumer Protection Guardian ad Litem Military Affairs Planning Commission</p>	<p><b>Health and Human Services</b> Area Agency on Aging Children and Youth Health Department Mental Health/Development Programs Neshaminy Manor</p>	<p><b>Finance and Administration</b> Board of Assessment Finance Human Resources Information Technology Purchasing Tax Claim</p>
<p><b>General Services</b> Asset Management/County Properties Capital Projects Facilities Maintenance Parks and Recreation Roads and Bridges</p>	<p><b>Corrections</b>  <b>Emergency Services</b> Emergency Communications Police Training Security Emergency Health Services Emergency Management Agency Fire Marshal</p>	<p><b>Public Information</b>  <b>Solicitor</b> Office of Open Records</p>

The Bucks County Planning Commission board serves in an advisory capacity to the county commissioners and consists of nine appointed members and a staff of 30 employees. The board members serve without compensation and provide guidance and advice on planning and land use issues. State laws, including the Pennsylvania Municipalities Planning Code (Act 247) and the Sewage Facilities Planning Act (Act 537), require that county planning commissions review plans of proposed development and sewage facilities. Other state-mandated activities include stormwater management planning for the county's watersheds. The planning commission is also responsible for oversight of the county's programs of open space and agricultural preservation, and recycling, and the dissemination of census information.

### **How to Use this Plan**

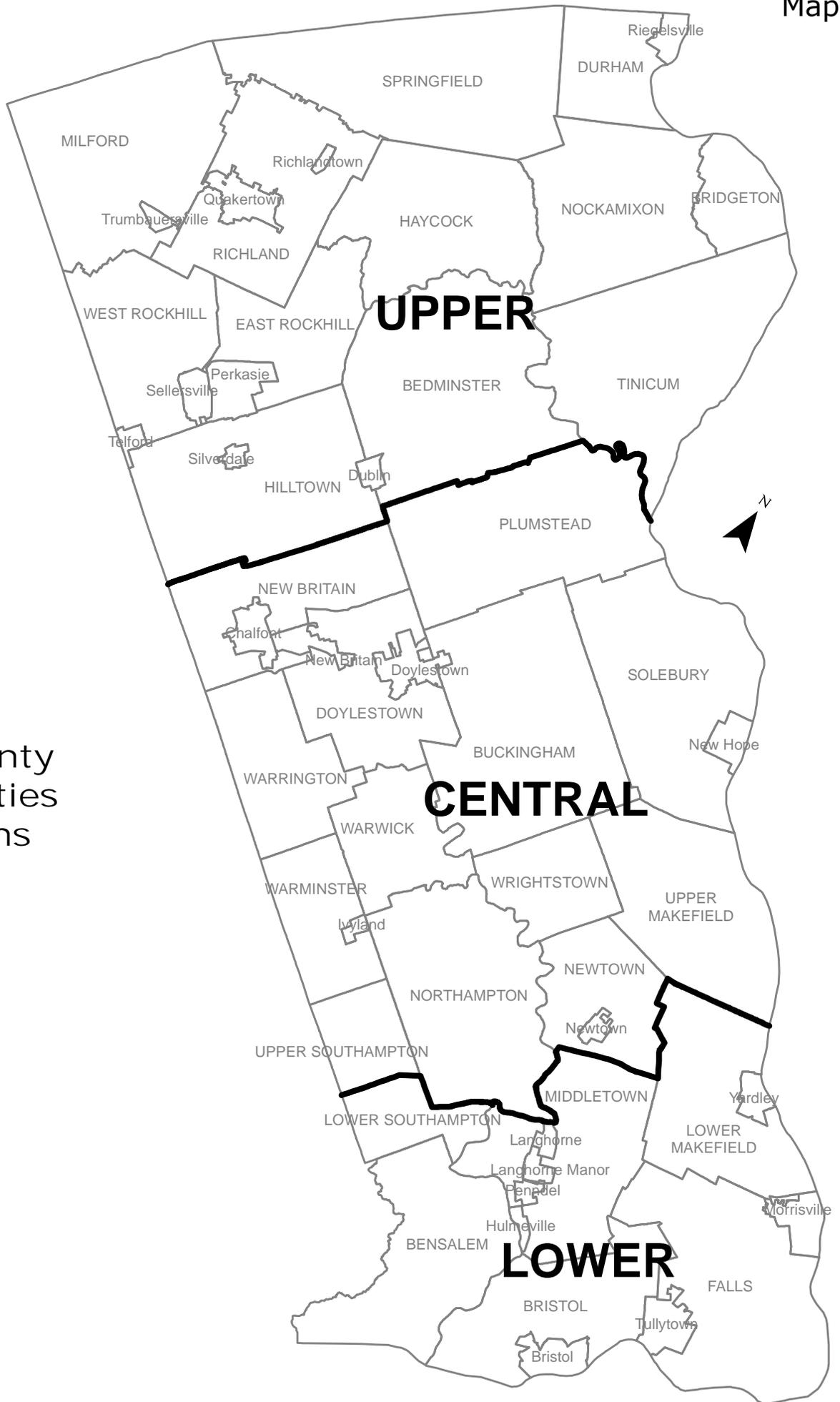
The *Bucks County Comprehensive Plan* is not meant as a mandate, but as a guide for local officials, residents, developers, business owners, and interested agencies. This plan seeks to set forth a common vision of the future of Bucks County and to coordinate, educate, and guide development and preservation in appropriate areas of the county. However, the maps included in this plan are not meant to provide county recommendations for specific sites. Local plans, ordinances, and conditions should always be considered when determining compliance with the strategies, actions, and land use recommendations of the *Bucks County Comprehensive Plan*.

### **How this Plan is Organized**

This plan begins with a discussion of the process used to develop it. *Part I. Introduction*, relates to the Bucks County Planning Commission's public outreach efforts, examines the foundations of the comprehensive plan, "Sustainability and Stewardship," and establishes the plan's relationship to other regional planning initiatives. Land use and demographic information in *Part II. Where Are We?*, provides a baseline for where the county stands as of today and points to possible future conditions. The core of the *Bucks County Comprehensive Plan* is organized around a plan Vision and set of Principles contained in *Part III. Where Do We Want to Go?* The Vision and Principles set forth a vision of the ideal Bucks County 20 years hence and provide direction to achieve this plan's aspirations.

To coordinate future planning, preservation, and development activities, the comprehensive plan depicts a Future Land Use Plan map following the plan Vision and Principles. The Future Land Use Plan and map provide a framework for managing new development, enhancing existing land uses, and protecting natural and agricultural resources. The Future Land Use Plan map embodies the principles of Smart Growth and serves as a visual guide for implementing these principles in Bucks County.

Each Principle encompasses individual plan components, which examine and analyze existing county conditions and recommend strategies and actions for improving those conditions. Implementation concludes the *Bucks County Comprehensive Plan* by identifying roles of implementers, priorities for action, plan monitoring, and supplemental products.



Bucks County Municipalities and Regions

An essential step in the comprehensive plan's process was to gather public opinion to make it inclusive and representative of both county residents and stakeholders. This process involved three key activities: distribution of a public opinion survey, hosting stakeholder meetings at various locations in the county, and consideration of public comments on the draft plan during the required public comment period.

### **Survey**

The comprehensive plan survey was open to Bucks County residents and was available to be completed online through the Bucks County Planning Commission webpage and as a paper copy to be submitted by mail. The county received 1,746 completed surveys. Due to the method of distribution, the survey cannot be considered a statistically random sample. However, it can still serve as a tool to examine the opinions of county residents about the major planning issues facing the county.

The survey comprised nine questions. The first three questions asked the respondent's place of residency expressed as a zip code, age of the respondent, and the role the respondent may play in the community. The following six questions were designed to gauge what residents liked the most about the county, how satisfied they are with community services, and what planning priorities they would most prefer in the future. The full results of the survey are located in Appendix A of the plan.

### **Stakeholder Meetings**

The three stakeholder meetings planning commission staff conducted targeted municipal officials and representatives, county residents, community organizations, special interest groups, and regional agencies. The purpose of the meetings was to seek consensus on the comprehensive plan, to uncover any issues that needed to be addressed, and to hear what may require modification.

Meeting attendees were organized into groups where specific comprehensive plan topics were discussed openly between planning commission staff and participants. The stakeholders were asked questions relating to the comprehensive plan topics and responses were recorded. At the end of the session, stakeholders were asked to review all the comments gathered and agree upon summary statements which best captured the main points of their discussion.

The opportunity to continue to provide feedback for the plan was provided for community members who could not attend the meetings. These comments, along with the summary statements developed during the stakeholder meetings, were used to create a summary which includes all the common concerns, issues, and recommendations from the participants. A summary of the stakeholder meetings is located in Appendix B of the plan. The insight and input from the stakeholders has helped to shape the emphasis, direction, and recommended strategies of the *Bucks County Comprehensive Plan*.

### **Public Comment**

Two public meetings were held before the plan was submitted to the county commissioners for adoption. Municipalities, school districts, and the general public had 45 days to submit additional feedback to the planning commission. The public comment process was in accordance with MPC requirements.



The *Bucks County Comprehensive Plan* is founded on the long history of innovative planning carried out by the Bucks County Planning Commission and the values and principles embodied in the concepts of sustainable development and stewardship.

The planning commission was formed in 1951, in response to major changes brought about by the construction of U.S. Steel's Fairless Works and plans for the massive 17,000-home Levittown community. The planning commission has continued to work with municipal, county, regional, state, and federal agencies, as well as civic and professional groups, in planning for the future of the county.

In 1961, Bucks County was the first county in the Commonwealth to enact a comprehensive plan. The *Bucks County Comprehensive Plan* was revised in 1977 and again in 1993. Over the years, the planning commission has developed innovative guidance documents and spearheaded groundbreaking initiatives such as:

- *Performance Zoning* (1973)
- *Village Planning Handbook* (1989)
- *Bucks County Natural Resources Plan* (1999)
- Stormwater Management Planning
- Bucks County Open Space Preservation Program
- Household Hazardous Waste Collection Program

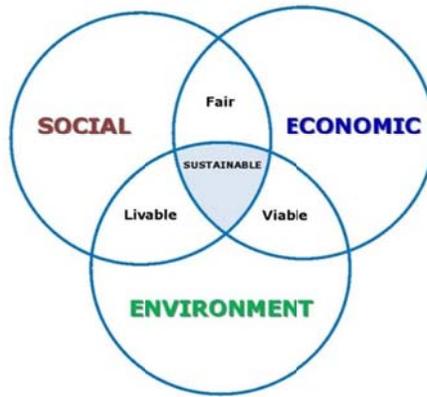
The comprehensive plan is a continuation of the leadership role taken by the county over the course of its history. It has been developed with the understanding of the responsibility of this role and with the acknowledgment that the values represented in this plan must also reflect the values of the county's citizens.

## **Sustainable Development**

Sustainable Development is most often defined as development which meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept, which uses the term "development" in the socio-economic sense, was first popularized by the 1987 United Nations document *Our Common Future*.

A key recognition of the document is that the many crises facing the planet are in fact interlocking. For example, in some parts of the world the failure to prevent deforestation has had devastating impacts on communities' ability to feed and shelter themselves, and these conditions have further led to spiraling disease and mortality rates and long-term political instability. While the problems of Bucks County are not nearly as dire, it is clear they are interconnected. One community's uncontrolled growth will eventually become everyone else's traffic and congestion problem. Thus, at its core, sustainable development, attempts to understand how things influence one another within a whole and seeks to address the root causes of problems rather than just the symptoms.

Sustainable development is often thought of as environmental sustainability, such as ensuring our long-term water supplies for a region or ensuring that species habitat is preserved for the future. But sustainable development grasps that we cannot help the environment without also addressing people’s social needs and basic standard of living. Sustainable development can be broken into its constituent parts of economy, environment, and society, and is often represented as interlocking circles of influence.



Development which is sustainable addresses each of the constituent influences, seeking to create communities which are fair, livable, and viable. Sustainable development is not an end to be achieved, but an ideal for which to strive.

The concepts of Sustainable Development are implicit in the principles, strategies, and actions of the comprehensive plan. Each element of this plan looks at the issues in the context of the overall system and seeks to address underlying causes. This plan also gives equal consideration to the human needs of society, economy, and environment. The comprehensive plan puts into practice the concepts of sustainable development most evidently by emphasizing a Smart Growth planning framework. Smart Growth and its related policy framework, Smart Transportation, are detailed in the Future Land Use and Transportation Mobility sections of Part IV of the plan.

### Stewardship

Stewardship is the careful and responsible management of something entrusted to one’s care. Stewardship is a natural outgrowth of sustainability in that it is long-term in concept, implies reasonable economic use, but also emphasizes social and environmental responsibility. When we think of the county’s many natural, cultural, and historical resources, we as members of the community and private landowners, must think of how we can maintain and enhance these resources for the enjoyment of future generations. Stewardship also emphasizes the responsibility we have in ensuring that our activities have minimal impact on our neighbors, community, and region.

Stewardship is most often applied to open space and agricultural preservation activities, but it also applies to our responsibilities to other resources, including water resources, mineral and energy resources, forested lands, scenic resources, and fauna and flora. Therefore, each citizen of the county must be a steward of the resources that support and maintain our high quality of life. Stewardship is a foundation of the principles and planning elements of the comprehensive plan.

The *Bucks County Comprehensive Plan* is one of many planning efforts in this region that aims to provide a common development vision for the future. State, county, regional, and local actors have put forward plans for the future of their jurisdictions. Among these planning efforts are:

### State

- *Keystone Principles and Criteria for Growth, Investment, and Resource Conservation*

### Regional

- *Delaware Valley Regional Planning Commission: Connections 2035*
- *Lehigh Valley Comprehensive Plan*
- *Montgomery County Comprehensive Plan*
- *Philadelphia 2035 Comprehensive Plan*

### Countywide

- *Bucks County Waterfront Revitalization Plan*
- *Landmark Towns of Bucks County*
- *Bucks County Open Space and Greenway Plan*
- *Bucks County Natural Areas Inventory*
- *Bucks County Bicycle Plan*
- *Bucks County Hazard Mitigation Plan*

While these planning initiatives<sup>1</sup> are marked by individual differences in approach, study area, and program type, collectively, they have many common principles and strategies. Most supportive and reflective of these efforts are the Commonwealth’s Keystone Principles.

The Principles are designed as a coordinated interagency approach to fostering sustainable economic development and conservation of resources through the state’s investments in Pennsylvania’s diverse communities. The Principles lay out general goals and objectives for economic development and resource conservation agreed upon among the agencies and programs that participated in their development. They are:

1. **REDEVELOP FIRST.** Support revitalization of Pennsylvania’s many cities and towns. Give funding preference to reuse and redevelopment of “brownfields” and previously developed sites in urban, suburban, and rural communities for economic activity that creates jobs, housing, mixed use development, and recreational assets. Conserve Pennsylvania’s exceptional heritage resources. Support rehabilitation of historic buildings and neighborhoods for compatible contemporary uses.

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<sup>1</sup> Each of the above regional initiatives was examined for consistency with the *Bucks County Comprehensive Plan*, in accordance with Pennsylvania Municipalities Planning Code requirements. Where conflicts exist—or are proposed—in land uses of regional impact, the common principles of this comprehensive plan and all associated plans shall be used to mitigate any cross-border impacts.

2. **PROVIDE EFFICIENT INFRASTRUCTURE.** Fix it first: use and improve existing infrastructure. Make highway and public transportation investments that use context sensitive design to improve existing developed areas and attract residents and visitors to these places. Provide transportation choice and intermodal connections for air travel, driving, public transit, bicycling, and walking. Increase rail freight. Provide public water and sewer service for dense development in designated growth areas. Use on-lot and community systems in rural areas. Require private and public expansions of service to be consistent with approved comprehensive plans and consistent implementing ordinances.
3. **CONCENTRATE DEVELOPMENT.** Support infill and “greenfield” development that is compact, conserves land, and is integrated with existing or planned transportation, water and sewer services, and schools. Foster creation of well-designed developments and walkable, bikeable neighborhoods that offer healthy life style opportunities for Pennsylvania residents. Recognize the importance of projects that can document measurable impacts and are deemed “most-ready” to move to successful completion.
4. **INCREASE JOB OPPORTUNITIES.** Retain and attract a diverse, educated workforce through the quality of economic opportunity and quality of life offered in Pennsylvania’s varied communities. Integrate educational and job training opportunities for workers of all ages with the workforce needs of businesses. Invest in businesses that offer good paying, high quality jobs, and that are located near existing or planned water and sewer infrastructure, housing, existing workforce, and transportation access (highway or transit).
5. **FOSTER SUSTAINABLE BUSINESSES.** Strengthen natural resource based businesses that use sustainable practices in energy production and use, agriculture, forestry, fisheries, recreation and tourism. Increase our supply of renewable energy. Reduce consumption of water, energy and materials to reduce foreign energy dependence and address climate change. Lead by example: support conservation strategies, clean power and innovative industries. Construct and promote green buildings and infrastructure that use land, energy, water and materials efficiently. Support economic development that increases or replenishes knowledge-based employment, or builds on existing industry clusters.
6. **RESTORE AND ENHANCE THE ENVIRONMENT.** Maintain and expand our land, air and water protection and conservation programs. Conserve and restore environmentally sensitive lands and natural areas for ecological health, biodiversity and wildlife habitat. Promote development that respects and enhances the state’s natural lands and resources.
7. **ENHANCE RECREATIONAL AND HERITAGE RESOURCES.** Maintain and improve recreational and heritage assets and infrastructure throughout the Commonwealth, including parks and forests, greenways and trails, heritage parks, historic sites and resources, fishing and boating areas and game lands offering recreational and cultural opportunities to Pennsylvanians and visitors.

8. **EXPAND HOUSING OPPORTUNITIES.** Support the construction and rehabilitation of housing of all types to meet the needs of people of all incomes and abilities. Support local projects that are based on a comprehensive vision or plan, have significant potential impact (e.g., increased tax base, private investment), and demonstrate local capacity, technical ability and leadership to implement the project. Coordinate the provision of housing with the location of jobs, public transit, services, schools and other existing infrastructure. Foster the development of housing, home partnerships, and rental housing opportunities that are compatible with county and local plans and community character.
9. **PLAN REGIONALLY; IMPLEMENT LOCALLY.** Support multi-municipal, county and local government planning and implementation that has broad public input and support and is consistent with these principles. Provide education, training, technical assistance, and funding for such planning and for transportation, infrastructure, economic development, housing, mixed use and conservation projects that implement such plans.
10. **BE FAIR.** Support equitable sharing of the benefits and burdens of development. Provide technical and strategic support for inclusive community planning to ensure social, economic, and environmental goals are met. Ensure that in applying the principles and criteria, fair consideration is given to rural projects that may have less existing infrastructure, workforce, and jobs than urban and suburban areas, but that offer sustainable development benefits to a defined rural community.



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## II. WHERE ARE WE?

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Demographic and Socioeconomic  
Characteristics and Trends

Existing Land Use

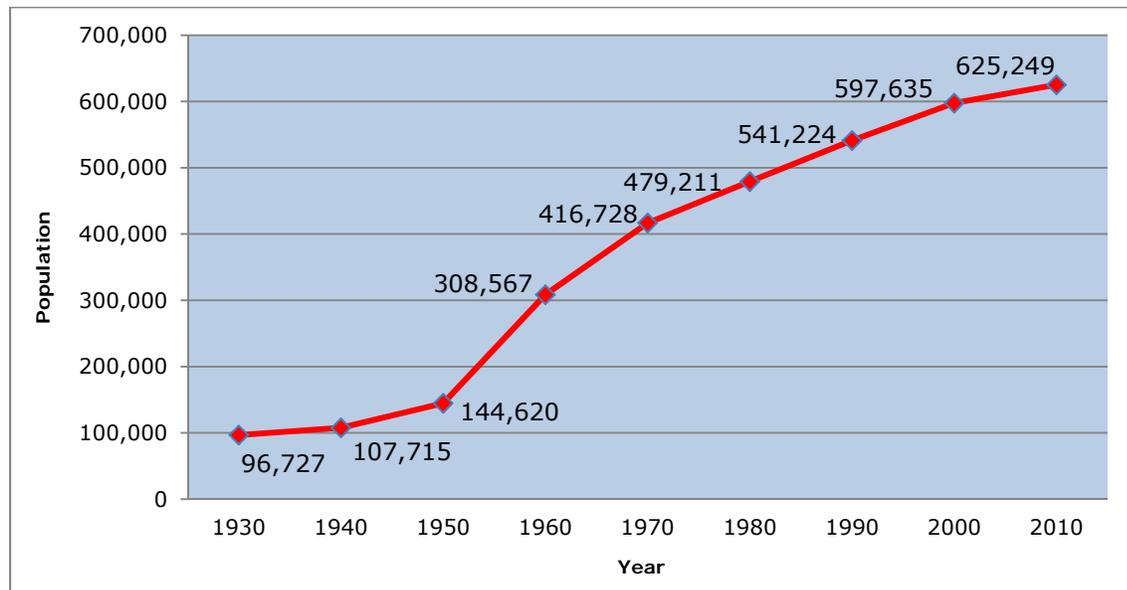
Bucks County’s population has changed over the past 80 years and will continue to change due to factors from inside and outside the county’s boundaries. The following presents a picture of how Bucks County has grown, current demographic conditions, and how the county may grow in the future. The information is based on data from several sources.<sup>2</sup>

**Population and Housing Growth**

Bucks County has grown significantly every decade since the 1930s as shown in Figure 1. The most rapid period of growth was between 1950 and 1960 when Bucks County grew by 113 percent. The county’s population more than doubled over the last 50 years but has slowed during the past 10 years.

After 1970 the county population increased approximately 60,000 each decade. The decade intervals after 1970 showed a growth of 10 percent. Between 2000 and 2010 county population grew by only 27,614 persons, or 4.6 percent. The county’s 2010 population of 625,429 makes it the 4<sup>th</sup> largest county in Pennsylvania.

**Figure 1  
Population Growth, 1930–2010**

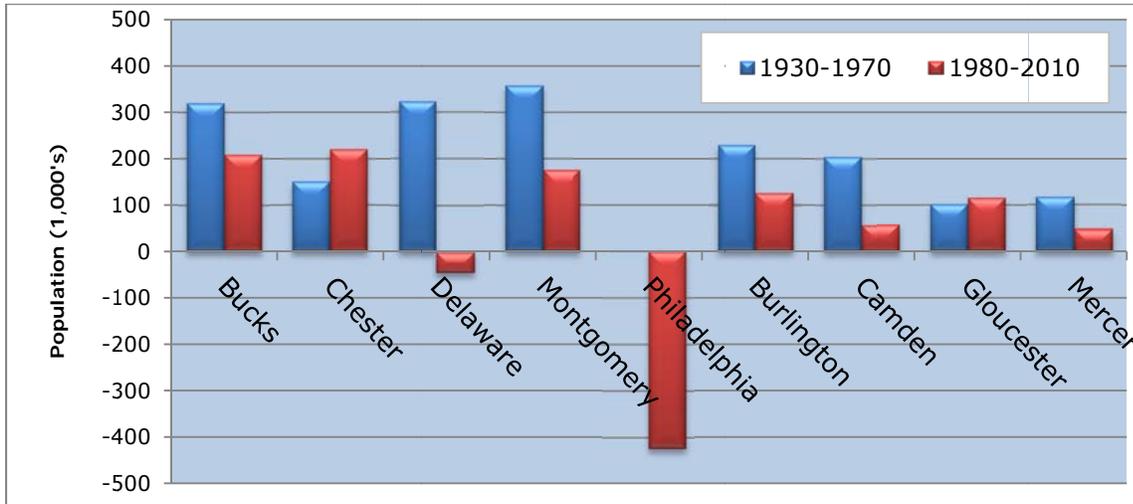


Bucks County is part of the larger Delaware Valley region and has accommodated a share of the region’s population growth in the last 80 years. Between 1930 and 1970 Bucks County had the 3<sup>rd</sup> highest population growth in the region. Only Chester and Montgomery counties grew more. Philadelphia, the region’s core, was almost stable from 1930-1970 but lost significant population after 1970 as shown in

<sup>2</sup> The information sources used are the U.S. Census, American Community Survey (ACS), Delaware Valley Regional Planning Commission (DVRPC) and Penn State Data Center (PSDC). The U.S. Census Bureau mails the ACS as a sample to 3 million households every year to generate a sample of demographic and housing information. The 2005-2009 ACS 5 year and 2010 one year estimates data source for municipal and county counts where 2010 Census data is not yet available. Growth models were applied to PSDC and DVRPC data to generate projections for population and housing growth.

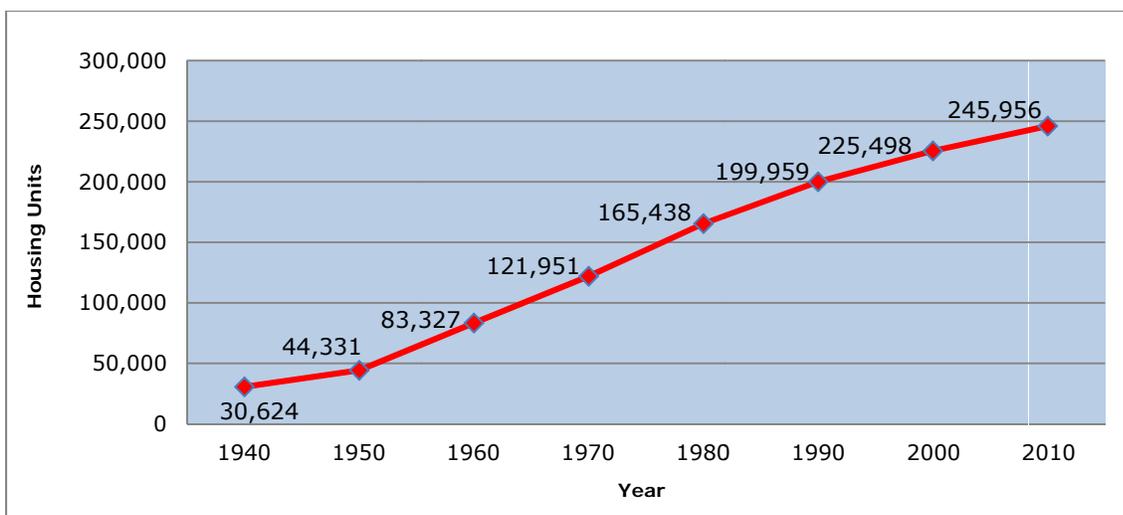
Figure 2. Much of this population loss was due to residents leaving for the growing suburbs in adjacent counties.

**Figure 2**  
**Regional Population Growth, 1930–2010**



Housing growth in Bucks County has mirrored population growth as shown in Figure 3. The housing in Bucks almost doubled in number between 1950 and 1960 but the greatest absolute growth was between 1970 and 1980 (43,487). Housing growth since 1990 has slowed compared with the period after World War II. Housing growth has slowed since 2000. (Housing conditions and trends are discussed in more detail in the Housing section in Part IV of the Plan.)

**Figure 3**  
**Housing Growth, 1940–2010**



## Regional and Municipal Population Change

Growth in the 1990s took place primarily in central Bucks, which increased by more than 40,000 people or 21.6 percent (Table 1). Upper Bucks began to see more significant growth than previous years, increasing by nearly 8,000 people or 9.1 percent. The population of lower Bucks, consisting predominantly of mature suburban communities, grew by over 8,000 people, or 3 percent.

The county’s growth patterns changed in the last decade, as shown in Table 1. During the 2000-2010 period, upper Bucks continued to see greater growth, increasing by over 9,000 people, or nearly 10 percent. Central Bucks saw the largest growth (over 18,000) of the regions in the county, but this was a decline from the 40,000 person increase in the prior decade. Lower Bucks saw an overall population decrease.

**Table 1**  
**Population Change by Region, 1990–2000 and 2000–2010**

	1990-2000		2000-2010	
	Amount	Percentage	Amount	Percentage
Upper Bucks	7,810	9.1%	9,291	9.9%
Central Bucks	40,541	21.6%	18,569	8.1%
Lower Bucks	8,060	3.0%	-246	-0.1%
<b>Bucks County</b>	<b>56,411</b>	<b>10.4%</b>	<b>27,614</b>	<b>4.6%</b>

The municipal most significant increases and losses in population between 1990 and 2000 and 2000 and 2010 are shown in Table 2 and Figure 4. The most significant growth in the 1990s occurred in Lower Makefield Township and in the central Bucks communities of Buckingham, Plumstead, Warrington, and Warwick. Bristol and Warminster townships had the greatest losses.

The most significant growth during the 2000-2010 period took place in the central Bucks communities of Warrington, Buckingham, and Warwick townships and in the upper Bucks communities of Richland and Hilltown townships. The communities that lost the most residents were the municipalities of Bristol, Falls, Lower and Upper Southampton townships, and Morrisville Borough.

Warminster Township has had losses and gains within the past 20 years, losing almost 1,500 residents between 1990 and 2000 but bouncing back with a gain of 1,299 between 2000 and 2010, due to the construction of Anne’s Choice and other retirement communities.

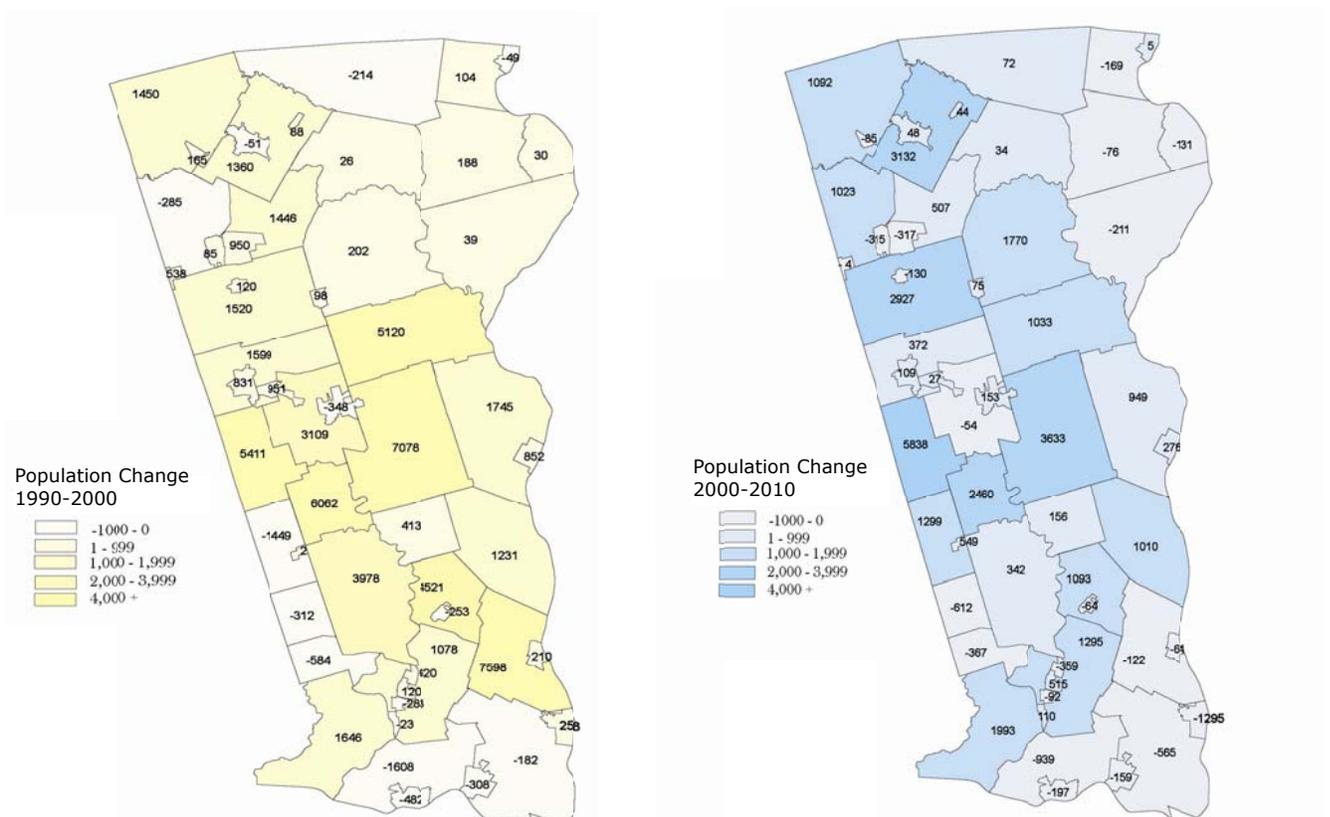
**Table 2**  
**Municipal Population Change 1990–2000 and 2000–2010**

Top Municipalities with Population Increases					
	1990–2000			2000–2010	
	Amount	Percentage		Amount	Percentage
Lower Makefield Township	7,598	30.3	Warrington Township	5,838	33.2
Buckingham Township	7,078	75.6	Buckingham Township	3,633	22.1
Warwick Township	6,062	102.5	Richland Township	3,132	31.6
Warrington Township	5,411	44.5	Hilltown Township	2,927	24.2
Plumstead Township	5,120	81.4	Warwick Township	2,460	20.5

Top Municipalities with Population Losses					
	1990–2000			2000–2010	
	Amount	Percentage		Amount	Percentage
Bristol Township	-1,608	-2.8	Morrisville Borough	-1,295	-12.9
Warminster Township	-1,449	-4.4	Bristol Township	-939	-1.7
Lower Southampton Township	-584	-2.9	Upper Southampton Township	-612	-3.9
Bristol Borough	-482	-4.6	Falls Township	-565	-1.7
Doylestown Borough	-348	-4.1	Lower Southampton Township	-367	-1.9

**Figure 4**  
**Municipal Population Change, 1990–2000 and 2000–2010**



**Municipal Distribution of Population and Density**

Early development in Bucks County was concentrated in lower Bucks, when Fairless Hills, Levittown, and other areas closer to Philadelphia and Montgomery County were developed. The recent pattern of population growth has shown more development in outlying townships, slower population growth in boroughs, and a decline in population in some of the older communities. Over the past 40 years almost half of the boroughs have lost population, and their share of the county’s population has declined. One of the county’s oldest borough, Bristol Borough, lost more than 20 percent of its population (almost 3,000 people) over the last 60 years. The townships are gaining a greater share of the population growth, while boroughs have remained stable or have declined.

**Table 3  
Borough Share of County Population, 1970–2010**

Year	Borough Share of Population (%) *
1970	17.2
1980	15.4
1990	14.3
2000	13.7
2010	12.9

\*23 of the county’s 54 municipalities are boroughs

Boroughs grew up as centers of commerce at crossroads, rail stations or, in the case of Bristol, a port. These communities were built in the 19<sup>th</sup> century. Townships have grown in the 20<sup>th</sup> century and have a lower density enabled by mobility offered by the personal automobile and the desire for larger lot sizes.

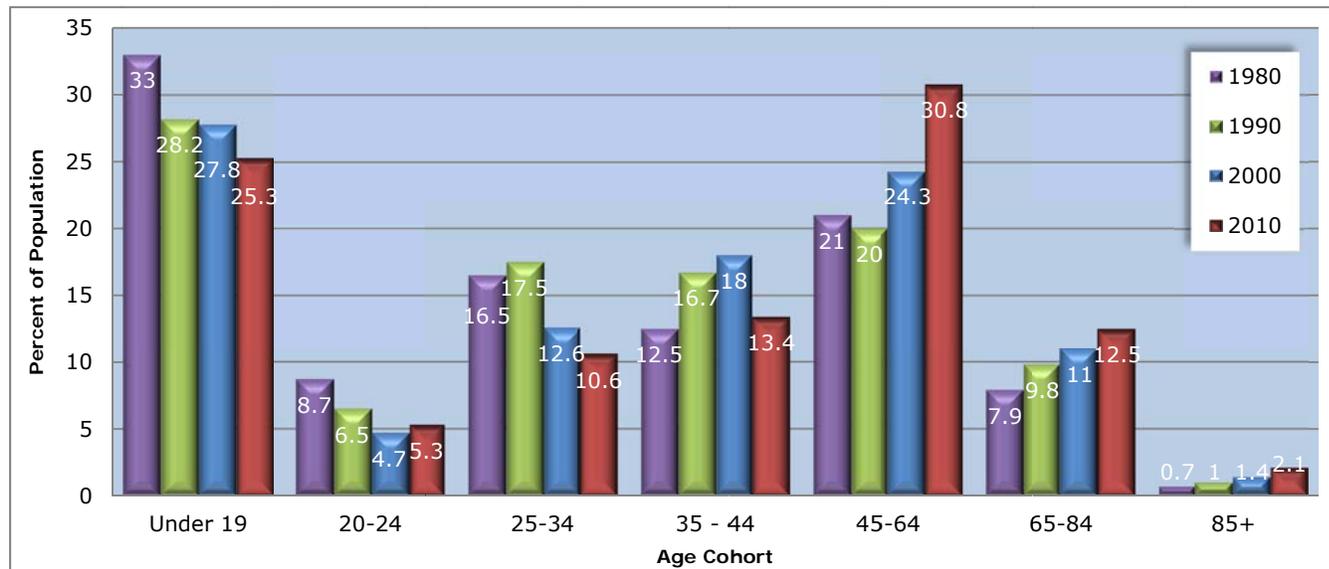
Within the last several years there have been more large proposals for infill development and redevelopment in lower Bucks communities and the more urban communities of central Bucks. Concentrating future development in and adjacent to existing developed areas, such as boroughs, has been a successful strategy for keeping infrastructure and services efficient and limiting sprawl development.

**Age**

The growth of the county’s population has occurred unevenly within the age cohorts, or groups of similarly-aged residents. An examination of different age cohorts can show trends across time within a population. Figure 5 shows the changes in several age cohorts over the past 30 years.

The Under 19 cohort is the largest, but this is due in part to the aggregation of four 5-year cohorts. This cohort makes up a smaller share of the total population than it did 30 years ago, due to a declining birth rate. The 20-24 age cohort is small because it contains only five years and because some Bucks County residents who are away at school are not counted as living here. The next cohorts, 25-34 years and 35-44 years, have declined. The only two age groups that have shown steady growth over the past 30 years are 45-64 year and 65-84 year age groups. In each decade since 1980, these age groups have made up an increasingly large share of total population in Bucks County.

**Figure 5**  
**Age of Population, 1980–2010**



***Baby Boomers***

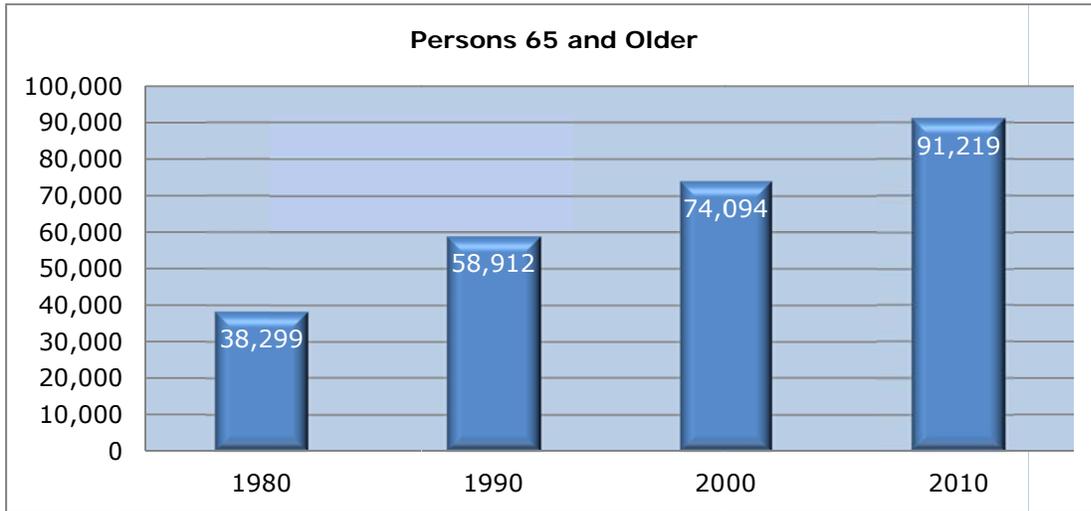
The county’s population is aging, which will lead to new and different demands for development and services. The most significant demands come from the aging of the Baby Boomers (persons born between 1946 and 1964) who made up almost one third of the county’s population in 2010. Boomers have found attractive housing opportunities, good schools and a quality of life amenable to raising a family in Bucks County. The first wave of Baby Boomers turned 65 in January, 2011.

The traits of this generation (e.g., more mobile, more educated, more working women, more likely to occupy professional and managerial positions, more single and non-married couple household than previous generations) will affect the future characteristics of the senior population as well as community needs for long-term health care options, housing styles, and transportation facilities. The construction of age-restricted housing in the 2000s has been a response to the first wave of Baby Boomers. Declining mobility of older residents has already led to studies and programs to accommodate older drivers and people who anticipate not being able to drive in the future.

***Seniors and Elderly Increase***

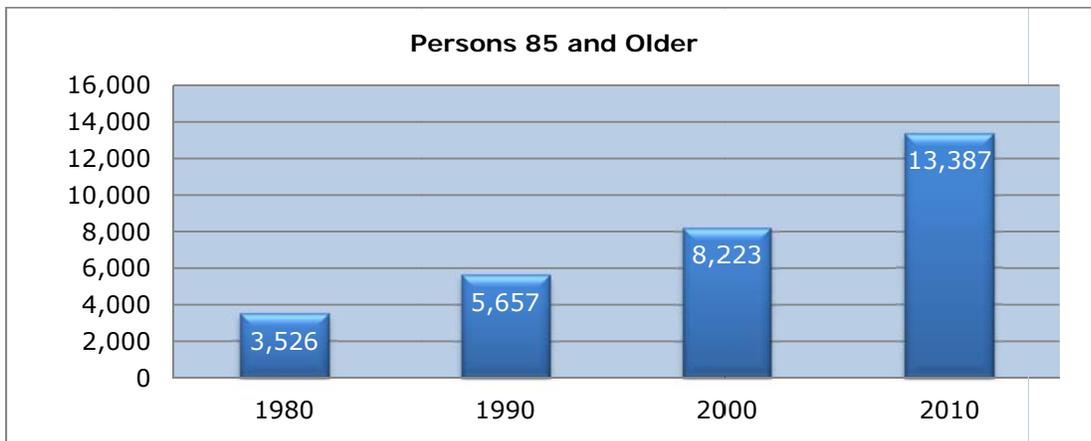
The numbers of seniors continue to increase (see Figure 6). Bucks County has the lowest percentage of those over 65 (12 percent) and over 75 (6.4 percent) of the Delaware and Lehigh Valleys. Health care improvements will continue to allow for longer and healthier life spans.

**Figure 6**  
**Seniors, 1980–2010**



The numbers of those aged 85 and older have increased significantly in Bucks County as shown in Figure 7.

**Figure 7**  
**Elderly, 1980–2010**



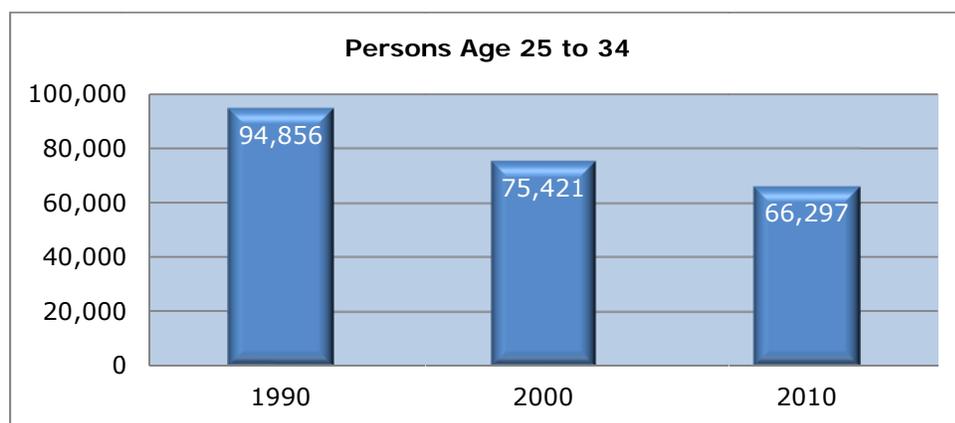
The impacts of aging Baby Boomers and a growing elderly population cannot be easily predicted because it is a new phenomenon. But as older residents will make up a larger percentage of the county’s population, community changes will occur. Trends predicted by the Bucks County Area Agency on Aging will affect how communities grow and plan for the future. These trends include health care needs, transitions in housing and community needs, and transportation demands as mobility declines with age. ‘Aging in place or community’ initiatives are growing from grassroots efforts as residents express preferences for staying in their homes longer. Senior centers, long-term care options, service delivery, and alternative transportation needs will be factored into the profile of Bucks County communities.

**Brain Drain**

Figure 8 shows that the county’s age 25-34 cohort has been declining in actual numbers, much of this due to smaller numbers of previous generations moving up in age. The number of births in this generation was significantly smaller than the Baby Boomers, meaning that there are fewer people in this age group to start with. But the decline is also caused by young working-age adults leaving the county. This phenomenon has been labeled the “brain drain” to describe the trend of young professionals migrating to other areas with more options for employment and housing.

Keeping and attracting this generation is important to the county’s business environment, so that jobs left by retiring baby boomers can be filled and businesses that require a skilled labor force will be able to locate or expand in Bucks County.

**Figure 8  
Young Adults, 1990–2010**



**Education**

The residents of Bucks are well-educated and are becoming more so in terms of graduating from high school and earning college degrees. As Table 4 shows, over 93 percent of residents finished high school and 35 percent had a college degree by 2010. These education attainment rates are higher than those of the state and nation as a whole.

The younger age groups have educational attainment levels which exceed those of older residents. Of those age 65 or older in 2009, 78.5 percent had graduated from high school and 20.5 percent had a bachelor’s degree. Nearly 95 percent of residents aged 45-64 graduated from high school and 35 percent had bachelor’s degree.

**Table 4  
Educational Attainment, 1980–2010**

	Percentage of Persons 25+			
	1980	1990	2000	2010
High School Graduates	75.0	82.9	88.6	93.5
4+ Years College	19.0	24.8	31.2	35.3

***Race and Origin of Birth***

Bucks County is homogenous in terms of race. Table 5 indicates that 89.2 percent of residents are White. Most of the nonwhite residents were Black and Asian. About four percent were Hispanic or Latino. Since 1990, number of minorities has increased. The fastest growing racial and ethnic groups are Asians and Hispanics, each growing by nearly 7,000 between 2000 and 2010. Of the total population growth in that period, a quarter was Hispanic.

**Table 5  
Race/Ethnicity, 1990–2010**

Race/Ethnicity	Percentage		
	1990	2000	2010
White	95.0	92.5	89.2
Black	2.8	3.3	3.6
Asian	1.6	2.3	3.8
American Indian/Alaskan	0.1	0.1	0.2
Hispanic or Latino	NA	2.3	4.3

\*99 percent of census of respondents chose one race in 2000, and 98.3 percent in 2010

As Table 6 shows, more than 90 percent of county residents in 2010 are United States natives and nearly 70 percent were born in Pennsylvania. The number of foreign-born county residents has increased by about 14,400 from 2000 to 2010. County government and social service agencies have responded to an increase of foreign-born residents by providing language and other services necessary to meet needs.

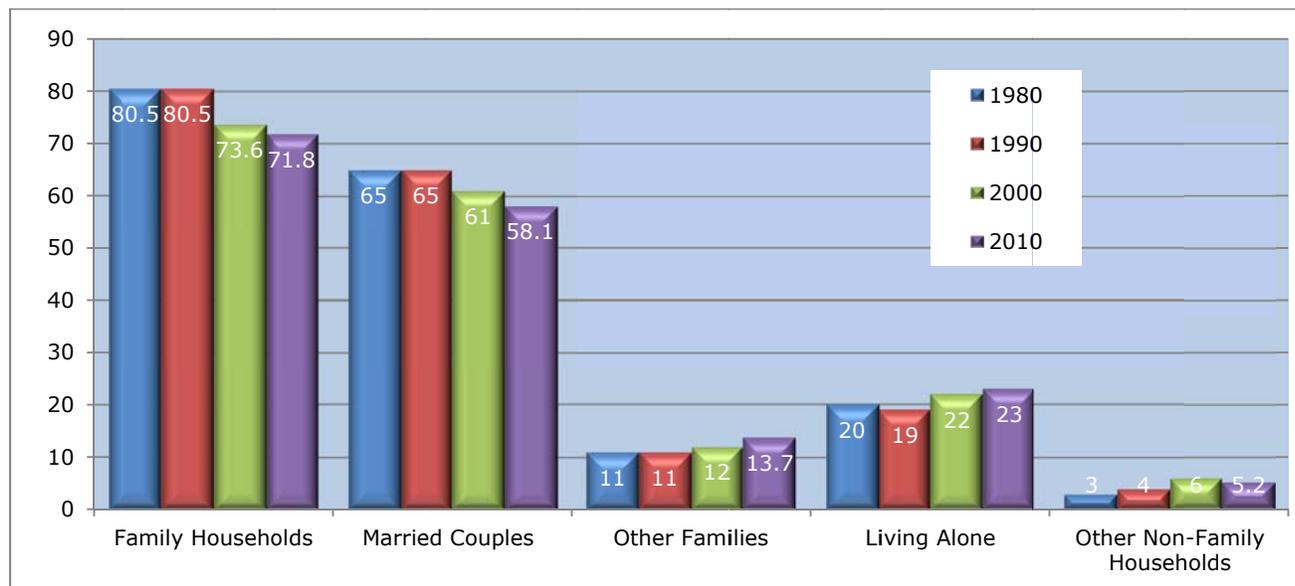
**Table 6  
Nativity, 2000–2010**

	Born in Pennsylvania	Born in United States	Foreign Born
2000	69.5%	94.1%	35,442 (5.9%)
2010	69.6%	91.0%	49,804 (8.0%)

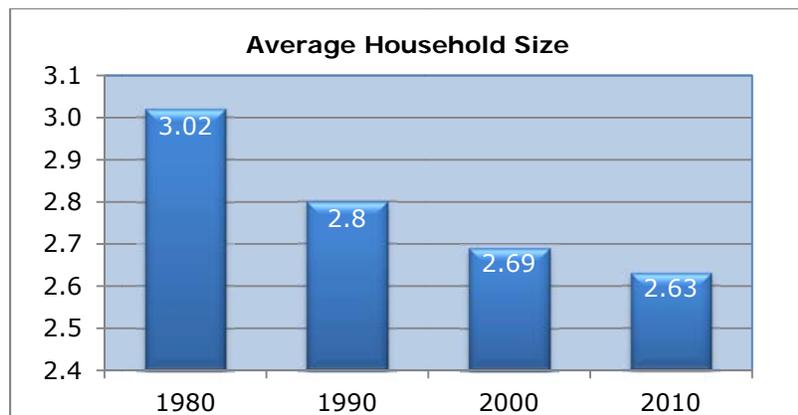
***Household Characteristics***

Households in Bucks County have been changing over the past 20 years. The number of people living alone and in non-family households has increased. The percentage of family households and married-couple households has decreased, although households of related people continue to be the largest single group of households. The average number of persons per household has decreased in Bucks, as it has in Pennsylvania and the United States. Families are getting smaller, there are fewer children per household, and there are more single-headed households. Household statistics are shown in the Figure 9 on the next page.

**Figure 9**  
**Household Characteristics, 1980–2010**



**Figure 10**  
**Household Size, 1980–2010**



Smaller household sizes have increased demand for smaller dwelling units in Bucks County, and the market has responded by planning for more townhouse-type developments in the past 5 years.

***Income***

Income and poverty statistics show the relative wealth of individuals and households and, in the aggregate, the affluence of a community. Per capita income or average income per person, and median household income have grown since 1990 and at a rate faster than inflation. The 1990 per capita and household incomes adjusted for inflation to 2010 are \$30,578 and \$72,319, respectively.<sup>3</sup> Average

<sup>3</sup> These figures were attained by using the U.S. Bureau of Labor Statistics inflation calculator at [www.bls.gov/data/inflation\\_calculator.htm](http://www.bls.gov/data/inflation_calculator.htm) which applies the 2009 Consumer Price Index to the 1990 per capita and household income figures.

income in Bucks County has risen slower than inflation. Nevertheless, the increase in incomes reflect the increase in the number of people earning higher incomes in Bucks County. Income for Bucks County, the state and nation are shown below in Table 7. Within the county, the median household income for municipalities in 2000 ranged from Bristol Borough (\$35,378) to Upper Makefield Township (\$102,759).

**Table 7  
Income and Poverty, 1990–2010**

	1990	2000	2010	PA (2010)	U.S. (2010)
Per Capita	\$18,292	\$27,430	\$35,534	\$26,374	\$26,059
Household	\$43,347	\$59,727	\$79,999	\$49,288	\$50,046
Families below Poverty	2.9%	3.1%	4.1%	9.3%	11.3%
Individuals below Poverty	4.0%	4.5%	6.2%	13.4%	15.3%

The percentage of people below the poverty income levels has increased slightly in Bucks County, but this still remains a much smaller percentage of the population than is evident in Pennsylvania and the U.S. as a whole.

**Population and Housing Projections**

Future projections provide a view of how Bucks County is expected to grow during the next 20 years. Projections are the basis for future planning for housing, park and recreation facilities, senior services, emergency services, and other community facilities.

Population and housing projections reflect existing conditions and trends. Population forecasts were prepared by two agencies and include projections for Bucks County. The Delaware Valley Regional Planning Commission (DVRPC) prepared their population forecasts for the nine-county Delaware Valley region in 2007. The Penn State Data Center (PSDC) prepared projections for Pennsylvania counties in 2008 (see Table 8). Both the DVRPC population forecasts and the PSDC population projections are based on an age-cohort component model that incorporates birth rates, death rates, survival rates, and estimates of migration rates.

Both DVRPC and the PSDC prepared these forecasts before the 2010 Census numbers were available and before impacts of the economic recession were evident. The amount of new development proposed in Bucks County has been at historically low levels for the past few years. Estimates of migration of new residents into Bucks County are too high and result in both sets of forecasts being too high.

**Table 8  
DVRPC and PSDC Population Forecasts/Projections for Bucks County, 2010–2030**

Population Forecast/Projection	2000*	2010*	2020 Forecast/Projection	2030 Forecast/Projection	Percent Change 2000 – 2010	Percent Change 2010 – 2020	Percent Change 2020 – 2030
DVRPC	597,635	625,249	694,893	735,579	4.62	11.14	5.86
PSDC			673,124	697,961		7.66	3.69

\*Source: U.S. Census

Therefore, new population and housing projections were developed for this plan by applying the recent rate of population growth to future years. In doing so, a more representative 2020 county projection was developed by holding the 10-year rate of population growth between 2000 and 2010 (4.62 percent) for the next ten years as the economy continues to recover. This would result in a 2020 county population projection of 654,140. A high and low 2030 population projection is developed by applying the DVRPC 2030 forecast growth rate (5.86 percent) and the PSDC 2030 projection growth rate (3.69 percent) to the new 2020 projection. This would result in a new 2030 high population projection of 692,440 and a low population projection of 678,270, which provides a range of growth for the year 2030. Table 9 compares the new county population projections to the DVRPC and PSDC population forecasts/projections.

**Table 9  
DVRPC and PSDC New High and Low Population Forecasts/  
Projections for Bucks County, 2020–2030**

Population Forecast/ Projection	2000*	2010*	2020 Forecast/ Projection	2030 Forecast/ Projection	Percent Change 2000 - 2010	Percent Change 2010 – 2020	Percent Change 2020 – 2030
DVRPC Forecasts	597,635	625,249	694,893	735,579	4.62%	11.14%	5.86%
PSDC Projections			673,124	697,961		7.66%	3.69%
New High Projections			654,140	692,440		4.62%	5.86%
New Low Projections			678,270	678,270		3.69%	3.69%

\*Source: U.S. Census

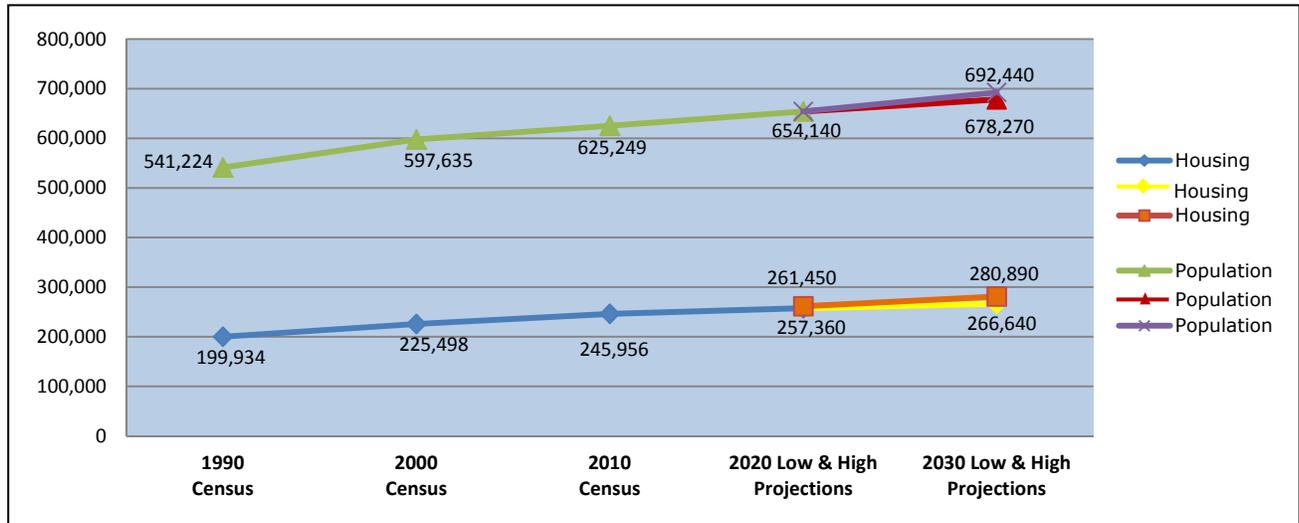
Translating projected population growth into projected housing growth is needed for the plan to address future land use needs and area needed to accommodate future growth. A set of municipal housing projections has been prepared, the sum total of which comprise the county housing projections. The municipal housing projections are based on a set of municipal population projections developed by using the total county population projections as control figures.

The 2020 municipal projections were generated by applying the rate of growth projected for individual municipalities, but these municipal growth rates are adjusted to consider local conditions, recent municipal growth trends or growth policies established in recent municipal comprehensive plans or regional plans. The 2030 high and low municipal population projections were generated using the same methodology, assuming that the sum of all municipal population would equal either the high or the low projections for the county as a whole.

The 2020 and 2030 county low housing projections are the sum of the low municipal population projections, divided by the 2010 municipal persons per housing unit (held as a constant). The 2020 and 2030 county high housing projections are the sum of high municipal population projections, divided by extrapolated municipal persons per housing unit adjusted for trends between 1990 and 2000 and between 2000 and 2010. Certain municipal persons per housing unit are adjusted to ensure realistic decreases or increases in these figures.

Any projection of future growth is tentative and subject to a set of assumptions holding true for a defined period of time and the constraints of the projection method employed. Nevertheless, the population and housing projections shown in Figure 11 should provide a fairly good picture of population and residential growth to the year 2030. The assumption to maintain the recent pace of growth is more than reasonable considering the current slow economic and housing market recovery that is anticipated to have reverberating effects for the next five to ten years.

**Figure 11**  
**Population and Housing Projections, 2020 and 2030**



**Summary of Demographic and Socio-Economic Trends**

The following summarizes the county’s significant demographic and socioeconomic trends influencing growth and development and affecting planning for housing, public services, and transportation and the demand for private market goods and services necessary to ensure a high quality of life.

- **Population growth** in Bucks County grew more slowly between 2000 and 2010 than it had in prior decades. The county is projected to continue this slower rate of growth through 2030.
- **Increases in older residents**, including Baby Boomers and older seniors, and the decline in the numbers of younger residents, through a “Brain Drain,” are the two of the most significant demographic trends facing the county.

**Baby Boomers**

- The most significant demographic changes will involve the Baby Boomers (born between 1946 and 1964) who made up almost one third of the county’s population in 2010.
- The health care, housing, and service needs of this group are already evident and will affect future land use and transportation planning.

**Brain Drain**

- Bucks County has lost significant numbers of young people aged 25-34 who are in the stages of life involving the first job after college and family formation.

- Young people who grew up in Bucks County have left for education, jobs, or other types of communities.
- These young workers are important to the business and job development in the county.
- **Households** in the county have become smaller, with more single headed households, more single households and fewer children. This may lead to a greater demand for smaller housing types.
- **Demographic diversity** is increasing slowly (race, foreign born, income).
- **Per capita income and average household income** in Bucks have grown since 1990 and at a rate faster than inflation.
- **Educational attainment** is high, with average education levels in Bucks County exceeding the averages in the state and the United States.

Just as demographic and socioeconomic information paints a picture, a review of land use in a community or region provides a snapshot of an area's character and physical surroundings. Analyzing existing land use information is an important component of any comprehensive plan and is necessary for the development of other plan components, in particular, the Future Land Use section.

Maps 2 through 4 identify existing land use as of 2009 for the upper, central, and lower regions of the county. The land use maps and corresponding information were developed using data from the Bucks County Board of Assessment office. In cases where assessment codes did not correspond with land use categories used for planning, aerial photographs and municipal records were used to determine the true nature of the land use. The list below provides a detailed description of the ten land use categories shown on the existing land use maps and used in the following narrative.

**Single-Family Residential** – Consists of properties with single-family detached, or attached, one- or two-unit dwellings on lots less than 5 acres. This category also includes mobile home parks.

**Multifamily Residential** – Includes properties with 3 or more attached dwelling units.

**Rural Residential** – The same as single-family residential except dwellings are on lots that are 5 acres or more (but do not qualify as agricultural).

**Agricultural** – Based upon an analysis of 2005 aerial photos, land that consists of 20 acres or greater where at least one-third of the parcel exhibits agricultural or farm-related characteristics such as stables, orchards, and active or fallow fields. This category may also include residential dwelling units and farm related structures on the same lot.

**Mining and Manufacturing** – Consists of heavy manufacturing industries, and painting and advertising industries, as well as building and landscaping material extraction.

**Government and Institutional** – Includes all municipal, county, state, and federal buildings and facilities, except those that are park and recreation related. All private, parochial and public schools are included, as well as churches, cemeteries, emergency service facilities, and fraternal organizations. This category includes medium- to long-term housing accommodations, such as retirement complexes, assisted living facilities, continuing care retirement communities, and nursing homes. This category does not include independent living units.

**Commercial** – Includes (but is not limited to), wholesale and retail trade establishments, finance and insurance, real estate, and hotels.

**Parks, Recreation, and Protected Open Space** – Consists of municipal, county, and state parks and game lands, county preserved land and flood control sites, golf courses, scout camps, and campgrounds. Includes land preserved by conservation organizations and deed-restricted land or common open space areas associated with residential developments.

**Transportation and Utilities** – Consists primarily of utility installations and right-of-ways, terminal facilities, automobile parking, and stormwater management basins. Calculated roadway acreage is also included.

**Undeveloped** – Includes parcels without dwelling units or buildings containing nonresidential uses but may include structures such as barns, stables, sheds, etc.

**Land Use Patterns**

There are three land uses which, when combined, cover 60 percent of the county. Single-family residential comprises 23 percent of the county, making this the predominant land use in Bucks County. Rural residential is a close second at 21 percent, or slightly over one-fifth of the county’s area, followed by Agricultural uses which comprise 16 percent of Bucks County.

Park, recreation, and protected open space land use accounts for 11 percent, a little over one-tenth, of the county. Undeveloped and transportation and utilities each have 9 percent of the land area with Undeveloped land slightly greater in acreage by approximately 1,450 acres. Government and institutional accounts for 4 percent of the land. Commercial and mining and manufacturing each represent 3 percent of the county’s land area, with commercial slightly greater in acreage by almost 1,000 acres.

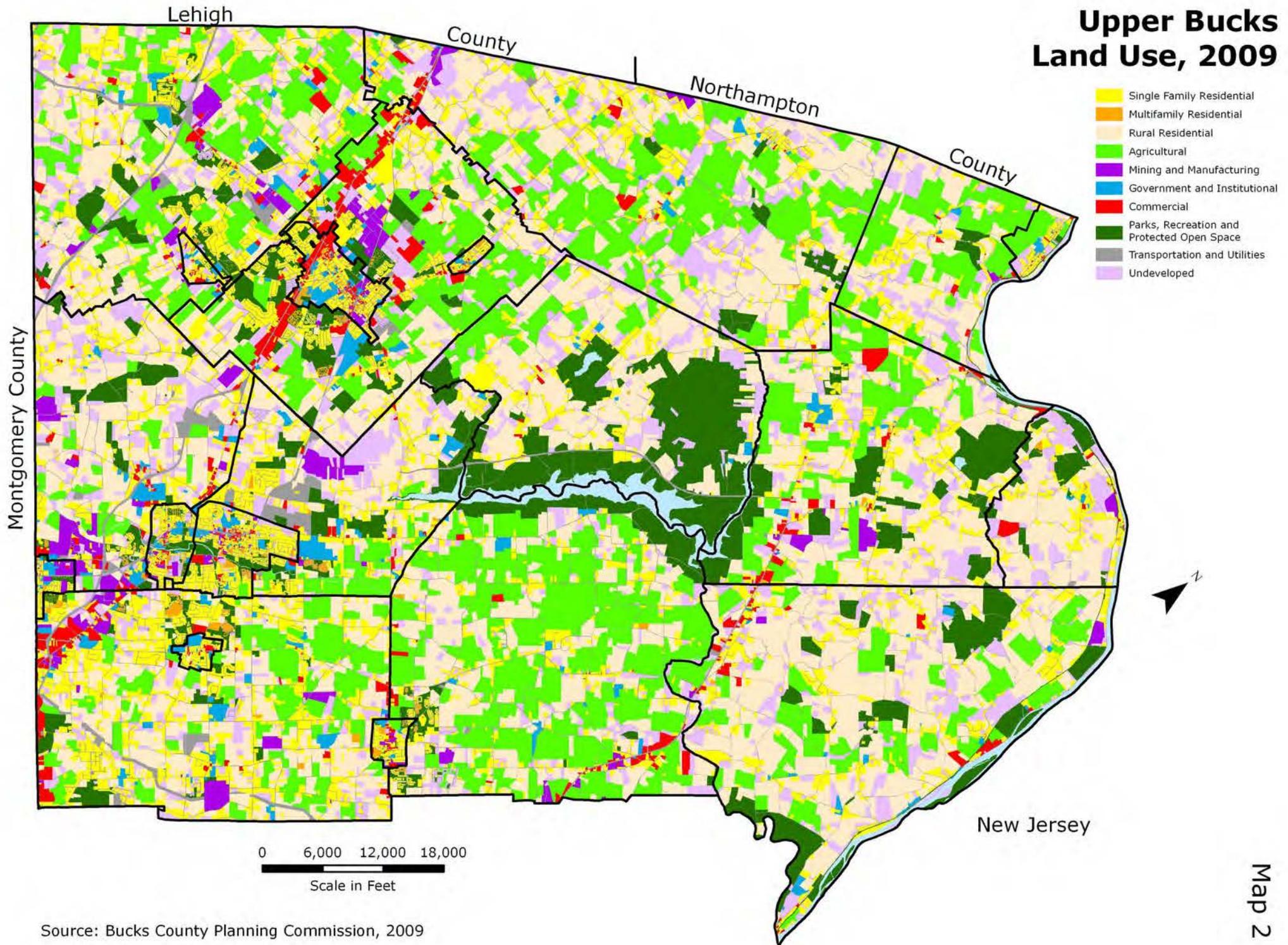
Multifamily residential uses about 1 percent of the county land area. By its nature, multifamily residential uses less space since units are attached and occupy a smaller footprint. It’s a denser type of development that doesn’t require as much land as other residential uses.

Table 10 provides a breakdown by acreage and percentage of the county’s land use.

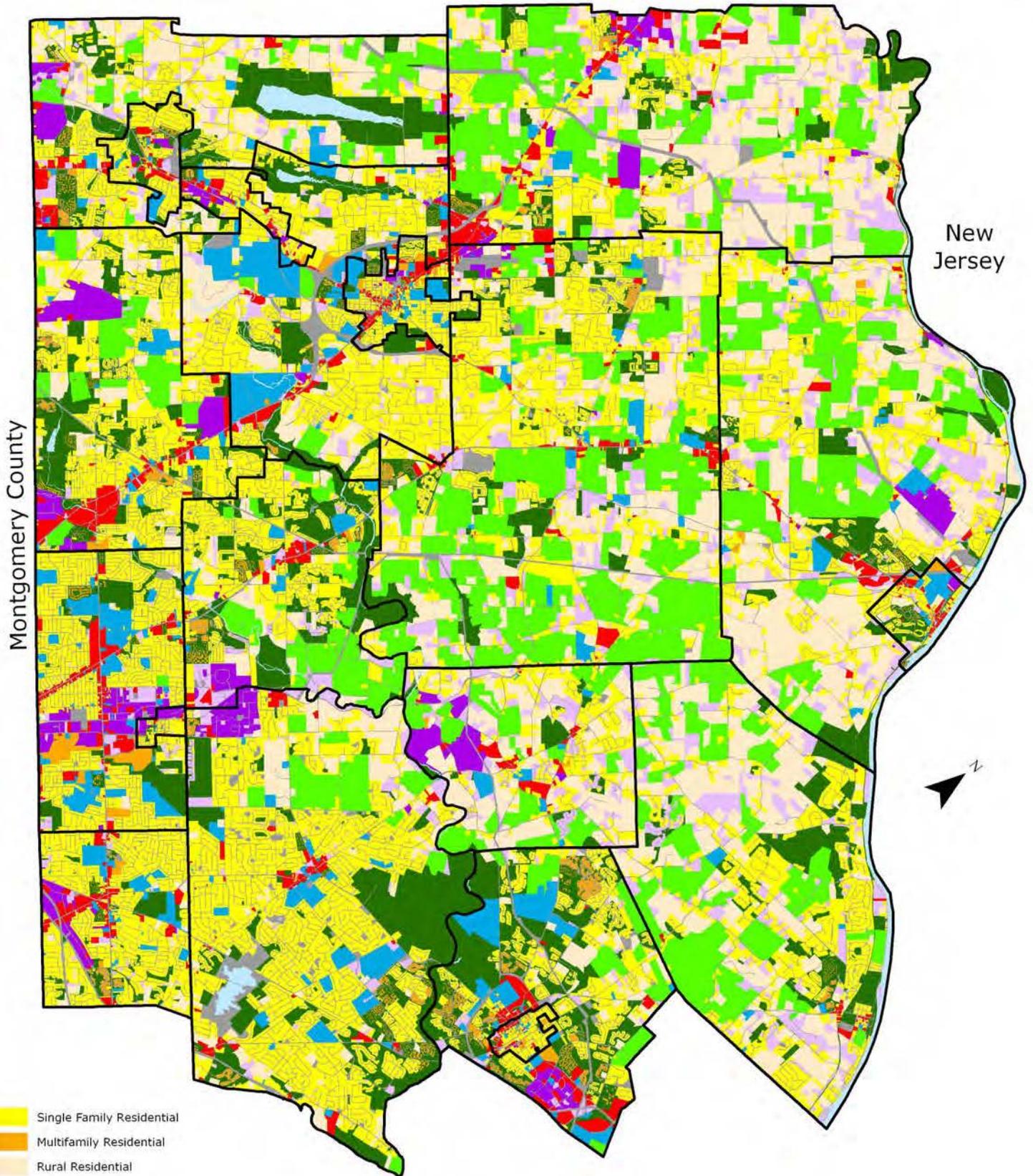
**Table 10**  
**Land Use, 2009**

Land Use	Acreage	Percentage
Single-Family Residential	88,829	23%
Rural Residential	81,441	21%
Agricultural	60,908	16%
Park, Recreation, and Open Space	43,963	11%
Undeveloped	34,841	9%
Transportation and Utilities	33,394	9%
Government and Institutional	13,616	4%
Commercial	13,367	3%
Mining and Manufacturing	12,398	3%
Multifamily Residential	4,672	1%
<b>Total</b>	<b>387,429</b>	<b>100%</b>

# Upper Bucks Land Use, 2009



Source: Bucks County Planning Commission, 2009



- Single Family Residential
- Multifamily Residential
- Rural Residential
- Agricultural
- Mining and Manufacturing
- Government and Institutional
- Commercial
- Parks, Recreation and Protected Open Space
- Transportation and Utilities
- Undeveloped

0 5,750 11,500 17,250  
Scale in Feet

Source: Bucks County Planning Commission, 2009

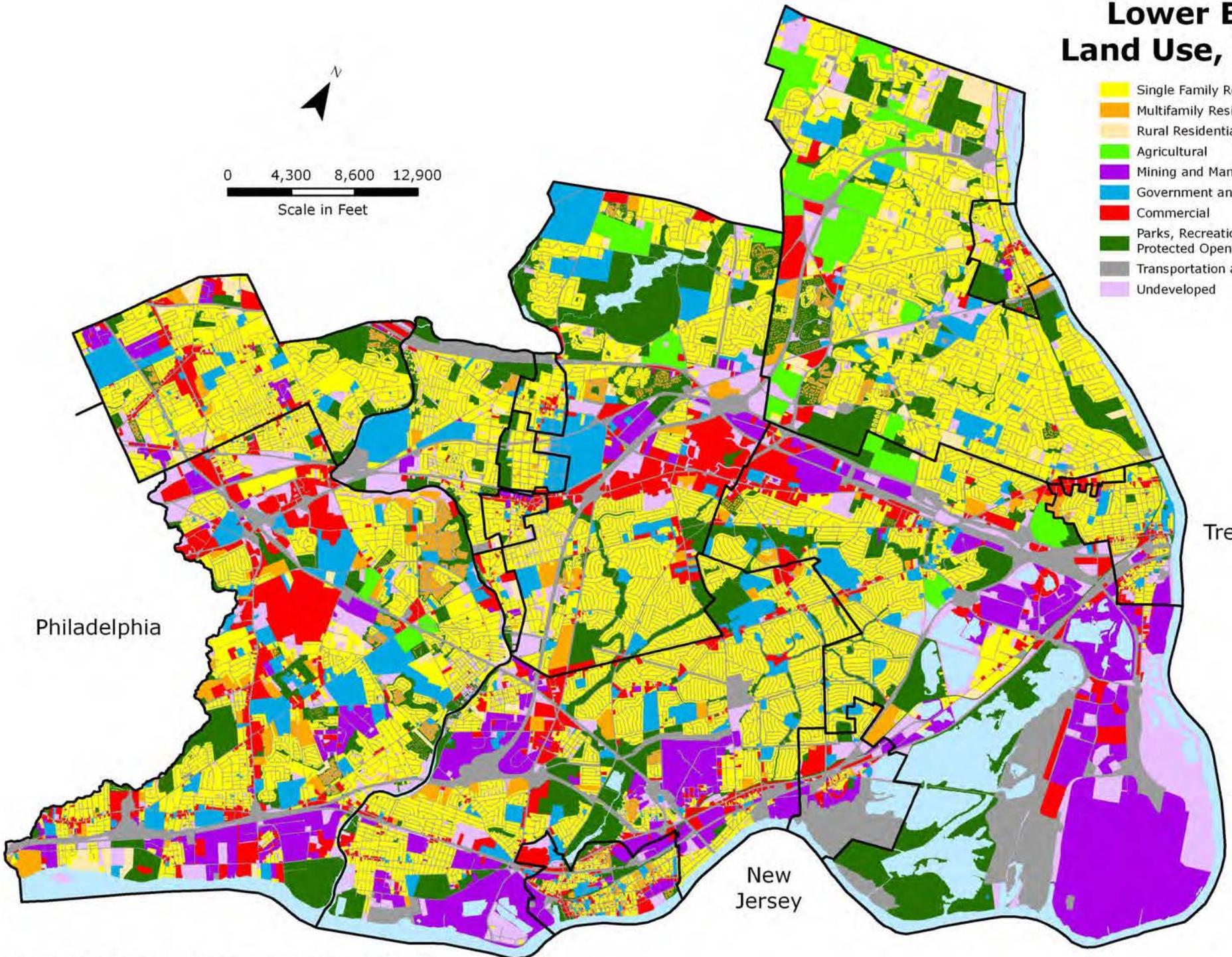
# Central Bucks Land Use, 2009

# Lower Bucks Land Use, 2009

- Single Family Residential
- Multifamily Residential
- Rural Residential
- Agricultural
- Mining and Manufacturing
- Government and Institutional
- Commercial
- Parks, Recreation and Protected Open Space
- Transportation and Utilities
- Undeveloped



0 4,300 8,600 12,900  
Scale in Feet



Trenton

Philadelphia

New  
Jersey

Map 4

## Regional Profiles: Existing Land Use and Development with Regional Significance

While all regions of the county contain developed areas as well as open space areas, there are distinct overall land use differences between the regions. Generally, upper Bucks is more rural in character than the other regions, central Bucks contains rural and suburbanized areas, while lower Bucks is considered more urbanized, which follows the patterns noted in the previous county comprehensive plan. Table 11 shows the percentages of each land use by region compared to the entire county.

**Table 11**  
**2009 Land Use Distribution by Region, in Acres**

Region	Single-Family Residential	Multi-Family Residential	Rural Residential	Agricultural	Mining and Manufacturing	Commercial	Transportation and Utilities	Government and Institutional	Park, Recreation, and Open Space	Undeveloped	Total
Upper Bucks	24,508	753	53,065	35,700	2,751	3,543	7,929	2,739	16,836	20,190	168,015
Central Bucks	43,427	1,839	27,440	23,323	3,342	4,478	12,454	6,072	17,897	9,494	149,767
Lower Bucks	20,894	2,079	935	1,885	6,305	5,346	13,010	4,806	9,229	5,158	69,647
<b>Bucks County</b>	<b>88,829</b>	<b>4,672</b>	<b>81,441</b>	<b>60,908</b>	<b>12,398</b>	<b>13,367</b>	<b>33,394</b>	<b>13,616</b>	<b>43,963</b>	<b>34,841</b>	<b>387,429</b>

### Upper Bucks

Upper Bucks is the most rural region within the county. Containing almost 170,000 acres, upper Bucks makes up roughly 43 percent of the total county area. While this region contains concentrated development in and around existing boroughs and villages, it has remained primarily rural and undeveloped compared to other county regions. It contains more than two times the amount of undeveloped land and rural residential land as central Bucks and almost four times the amount of undeveloped land as lower Bucks.

Within the upper Bucks region, the predominant land use is rural residential which is almost one-third of the region's total land area. Upper Bucks municipalities that contain over 5,000 acres each of rural residential land include: Bedminster, Hilltown, Milford, Nockamixon, Springfield, and Tincum. Tincum and Springfield townships, stand out as having the most rural residential land with 6,777 and 8,545 acres, respectively.

Agricultural uses cover over 21 percent of the region's land area, representing slightly greater than one-fifth of Upper Bucks County. Bedminster Township, stands out with almost 8,800 acres in agricultural use; followed by Springfield Township with slightly more than 5,700 acres.

Approximately 15 percent of the upper Bucks region contains single-family residential uses. Hilltown Township alone contains over 4,200 acres of single-family residential land. The next closest municipality is Milford Township with nearly 2,800 acres of single-family residential land.

This region is home to several large parks and significant areas of protected open space. In addition to Nockamixon State Park, the largest park in the county, upper Bucks contains Lake Towhee, Bucks

County Horse Park, Ringing Rocks, Tohickon Valley, and Tinicum county parks, as well as numerous areas of state game lands.

Major medical facilities located within the region include two hospitals: St. Luke's Quakertown Hospital in Quakertown Borough and Grand View Hospital in West Rockhill just outside of Sellersville Borough. The Upper Bucks Campus of Bucks County Community College is located along Hillendale Road in East Rockhill, near Perkasio Borough. The upper Bucks region is also served by three airports: Quakertown Airport in Milford Township, Pennridge Airport in East Rockhill Township, and a smaller public aviation airport, Van Sant Airport in Tinicum Township. These regional facilities primarily serve the population in northern Bucks County and northeastern Montgomery County.

In the last few decades, residential and nonresidential development in the region has typically located along or near the Route 309 corridor and around the boroughs of Quakertown, Sellersville, Perkasio, and Telford.

Route 309 is the primary commercial corridor through Upper Bucks County. While smaller commercial uses are scattered in various locations along the roadway, major nodes of commercial activity including regional shopping centers (300,000+ square feet of commercial space) are located in and around Quakertown and Richland and in Hilltown southeast of Telford, near the Montgomery County border.

With the exception of Bedminster Industrial Park, which is located along Route 611 in Bedminster Township, almost all of the industrial and business parks in upper Bucks are within close proximity to Route 309 and the Northeastern Extension of the PA Turnpike in the western portion of the county. Some of the larger industrial areas in this region are a conglomeration of several parks such as: Rockhill, Telford, and Hilltown industrial parks and Telford Business Park which are all located near Route 309 in West Rockhill, Hilltown and Telford; Quaker Industrial Commons, Del Val Industrial Site, Penn-Am Industrial Park and Baer Park Industrial Campus located near Route 309 in Richland Township; and the Kodiak Property, A.M. Industries Business Park, and Milford Industrial Commons along Route 663 near the PA Turnpike Interchange in Milford.

There is a concentration of quarry uses in several upper Bucks municipalities. At least five large, active quarry operations that supply materials regionally are located in this area of the county; two in West Rockhill, two in Hilltown, and one in Nockamixon.

A factor influencing development patterns in this region of the county has been the Quakertown interchange on the Northeastern Extension of the PA Turnpike in Milford Township. The area surrounding the interchange has experienced growth in industrial, office, commercial and residential development. Not far from the interchange along Route 663, a proposed development that will have regional significance is Milford Village which includes almost 900 residential units, as well as retail, office, and institutional space. Farther east, on the outskirts of Quakertown Borough, in Richland Township, the proposed Frontgate land development has received approval for 402 residential units.

Another area where proposed developments could have regional significance and impacts on upper Bucks communities includes several curative amendment sites in Tincum Township. Two developers have proposed several developments that, when combined, could result in almost 700 additional residential units in the western portion of Tincum Township. Located along the Route 611 corridor in the Ottsville area, the proposals include a range of housing types such as apartments, townhouses and single-family detached units. In addition, a sewage treatment plant that would serve the proposed units has been proposed.

## Central Bucks

Central Bucks contains rural and suburbanized areas and is the transitional area between the upper and lower Bucks regions. The total land area for this region is almost 150,000 acres, equating to roughly 30 percent of the county's total area. This region is considered the most diverse in the county due to existing land use patterns ranging from urban (boroughs), to suburban, to rural. It contains more land devoted to single-family residential, government and institutional, and park, recreation, and protected open space than either upper or lower Bucks. The central Bucks region contains the county seat of Doylestown and, as such, is home to county government offices and the existing Bucks County Administration and Courthouse facility. Government space in this region will increase significantly with the construction of the new Bucks County Justice Center. In addition, some of the more well-known cultural centers in the county, such as the Mercer and Michener museums and the Moravian Tileworks, are located in this region. The presence of these uses is why almost half of the county's government and institutional acreage is located within this region.

The top three land uses in upper Bucks are also the top three in central Bucks, although not in the same order. Within the central Bucks region, single-family residential is the predominant land use, consisting of almost one-third of the region. Northampton and Buckingham townships have the most acreage of single-family residential, each with well over 5,000 acres devoted to this use.

Approximately 18 percent, is devoted to rural residential. Plumstead and Solebury townships each contains slightly over 5,340 acres of rural residential land.

Agricultural uses also have a major presence in the central Bucks area, consisting of over 15.5 percent of the land. Buckingham and Plumstead, contain the most acreage in agricultural use in the region, at 6,528 and 4,218 acres, respectively.

Central Bucks contains more land designated as park, recreation, and protected open space than any other region in the county. Major parks in this region include: Tyler State Park, Washington Crossing Historic Park, Ralph Stover State Park, Peace Valley and Dark Hollow county parks, and Churchville Nature Center.

Major health facilities in this region of the county include Doylestown Hospital located in Doylestown Township and the former Warminster Hospital which is owned and operated by Abington Memorial Hospital and utilized primarily for outpatient procedures and for medical offices. The main campus of Bucks County Community College is located along Swamp Road in Newtown Township adjacent to

Tyler State Park. Also in the central Bucks region is Doylestown Airport, a public general aviation airport which is located north of Doylestown in Buckingham Township.

Central Bucks is home to the Newtown Grant residential development which brought over 1,700 residential units to a rural portion of Newtown Township in the 1990s and the Ann's Choice Retirement Community in Warminster which is projected to contain approximately 2,000 residential units and related uses when completed. This region has continued to see significant residential proposals such as the Carriage Hill development currently under construction in Plumstead which is approved for 463 residential units; the Station at Bucks County, a mixed use transit-oriented development in Warminster consisting of 233 residential units along with commercial and office space; and the Christ Home development in Warminster, which has approval for 512 dwelling units. These residential development proposals have the potential to have major impacts to the region in the future.

Central Bucks also contains areas of significant commercial development located primarily along the Route 611 and Street Road corridors. Several large regional shopping centers, such as Valley Square and Creekview, are located along Route 611 in Warrington. Similarly, Warminster is home to several regional shopping centers, such as Warminster Town Center and Center Point Plaza, located along the Street Road corridor.

With the exception of the Newtown Business Commons in Newtown Township, industrial land in this region is located primarily west of Route 413, and in close proximity to the major highway corridors of routes 611 and 263 and County Line and Street roads. A large cluster of approximately 15 contiguous industrial parks are located in Warminster, Ivyland, Warwick, and Northampton. The region is also home to a number of quarrying operations which have regional impacts due to materials they supply. An aggregation of quarrying operations are located in Wrightstown Township; other large quarry operations in this region are in Plumstead, the Solebury-New Hope area, Warrington and Doylestown townships.

Another area of potential development which may have major impacts to the region and beyond is the future disposition of the Naval Air Station Joint Reserve Base (NAS-JRB) at Willow Grove. This site is located in Horsham Township, Montgomery County, and is adjacent to Warrington Township in central Bucks. Under the purview of the Horsham Land Reuse Authority for NAS-JRB, planning for the redevelopment of this site is in the initial stages. Following numerous public meetings and discussions, three alternative development scenarios have been presented to the reuse authority for their consideration. All three scenarios entail a mixed use theme that includes a town center, additional roadways along with roadway improvements, and a corporate business center. Although initially discussed as a possible option, retention of the existing runway has not been included in any of these alternative development scenarios. The reuse authority will choose one plan which must be forwarded to the federal government for final review by the end of 2011. Future redevelopment of the almost 900-acre site will most likely have impacts to the surrounding areas which includes portions of central Bucks.

## **Lower Bucks**

Lower Bucks is the most urbanized region in Bucks County. Containing almost 70,000 acres, this region accounts for only 18 percent of the total land area in the county and is the densest and most intensely

developed of the three regions. Lower Bucks contains almost half of the county's land devoted to multifamily residential; more than half of the county's mining and manufacturing land; and, better than one-third of the county's commercial land area. The lower Bucks region has the highest percentage of nonresidential development (42 percent) in the county.

Within the lower Bucks region, single-family residential predominates covering almost one-third of the region. Lower Makefield and Middletown townships contain the most acreage in this category, each with over 3,500 acres.

Covering almost one-fifth of the region, at over 18 percent, are uses related to transportation and utilities. While roadway acreage accounts for much of the transportation and utility land, lower Bucks also contains some large tracts such as landfills, land devoted to rail lines and facilities, and lands containing utility infrastructure. Included in this land use category are two municipal solid waste landfills, the Tullytown Resource Recovery Facility in Tullytown and GROWS in Falls Township, that are located in adjacent municipalities in the southeastern portion of the region.

Slightly over 13 percent of the lower Bucks region contains land devoted to park, recreation, and protected open space. As the land use with the third highest amount of acreage within the region, it is a significant use within lower Bucks. When compared to other regions, lower Bucks contains 21 percent of the total amount of park, recreation, and protected open space land in the county. Neshaminy State Park in Bensalem and Bristol townships, Pennsbury Manor Historical Site in Falls Township, and Core Creek and Silver Lake county parks, in Middletown and Bristol townships, respectively, are the larger park areas in lower Bucks.

Major health facilities in the lower Bucks region include the St. Mary Medical Center campus in Middletown Township, which is Bucks County's only trauma center and one of the county's largest employers, Lower Bucks Hospital in Bristol Township, and Aria Health's Bucks County Campus in Falls Township. Colleges in the region include the Lower Bucks Campus of Bucks County Community College which opened in 2007 along Route 413 in Bristol Township. Generally, these health and educational facilities serve the population in lower Bucks and surrounding areas.

Regionally significant land uses in lower Bucks County include areas surrounding the PA Turnpike interchange in Bensalem near Neshaminy Mall, as well as areas along Business Route 1 including Oxford Valley Mall and several other regional shopping centers. These areas have evolved into major shopping and employment destinations as well as major regional entertainment centers with the presence of Sesame Place, mega-screen movie theaters and numerous restaurants. Much of the region's commercial land has developed along major highway corridors such as Business Route 1, Routes 13 and 413, and Street Road. In addition to the area around both malls, other significant nodes of commercial development in this region are located along Street Road near Hulmeville Road (Route 513) in Bensalem, in the Feasterville area of Lower Southampton, and along Route 413 near New Falls Road in Bristol Township. Recent redevelopment efforts include the Tullytown Town Center, a regional shopping center along Route 13 in Tullytown Borough.

Other regionally significant uses include the PARX Casino and Philadelphia Park Racetrack along Street Road in Bensalem and the Kinder-Morgan Port Facility along the Delaware River in Falls Township.

A majority of the county’s industrial land use is located in lower Bucks. Major industrial areas in this region are located along Routes 1 and 13, along Interstate 95, along the Delaware River waterfront, and at the former U.S. Steel site and surrounding area. Industrial parks such as Keystone and Riverview industrial parks in Bristol Township, Penn Warner and USX Realty industrial parks in Falls Township and Bucks County Business Park in Middletown are some of the larger industrial areas in this region.

Bensalem alone has received several large development proposals that may have major impacts to the region and beyond. They include: two large mixed-use riverfront developments that when combined could contain slightly over 1,100 residential units and over 50,000 square feet of commercial space; an age-restricted development containing 772 dwelling units; and, an expansion of the PARX Casino. Other significant developments that may have major impacts to the region include a proposed Transit Oriented Development in Pennel and Croydon and a 521-unit age-qualified development in Lower Makefield that is under construction and adjacent to an approved 143-residential unit development in Middletown.

**Land Use Trends**

**General Land Use Trends since 1970**

A comparison of current land use figures with those from previous years provides a perspective on how the county’s land use has changed over time. Table 12 provides an overview of general land use information for each decade since 1970.

Over the last 19 years, the amount of residential, nonresidential, and park, recreation, and open space land increased while land devoted to agricultural/undeveloped uses decreased. Overall, this pattern has been consistent throughout the last four decades, with the exception of park, recreation, and open space which dropped slightly between 1980 and 1990. However, from 1990 to 2009, land categorized as park, recreation, and open space almost doubled, increasing from 6 to 11 percent of the county’s land area.

**Table 12  
Percentage Land Use Comparisons by Region, 1970–2009**

Region	Residential				Agricultural/Undeveloped				Nonresidential				Park, Rec., and Open Space			
	1970	1980	1990	2009	1970	1980	1990	2009	1970	1980	1990	2009	1970	1980	1990	2009
Upper Bucks	18%	25%	24%	28%	73%	64%	62%	52%	3%	5%	8%	10%	6%	7%	6%	10%
Central Bucks	23%	29%	31%	39%	67%	57%	50%	32%	7%	9%	14%	18%	3%	5%	6%	12%
Lower Bucks	32%	30%	31%	34%	44%	29%	22%	11%	18%	33%	39%	42%	6%	8%	8%	13%
<b>Bucks County</b>	<b>22%</b>	<b>27%</b>	<b>28%</b>	<b>33%</b>	<b>65%</b>	<b>55%</b>	<b>50%</b>	<b>37%</b>	<b>7%</b>	<b>11%</b>	<b>16%</b>	<b>19%</b>	<b>5%</b>	<b>7%</b>	<b>6%</b>	<b>11%</b>

The success of the Bucks County Open Space Program and various municipal programs is evidenced by the large increase in the open space category. An additional factor that most likely played a role in increasing the amount of park, recreation and protected open space land is conservation or “cluster”

development. Subdivisions that utilize a cluster option, whereby minimum lot sizes are decreased and higher open space ratios are applied to the overall site, account for many of the residential subdivisions that have occurred in the county.

The residential category in Table 14 includes single-family, multifamily, and the first 5 acres of rural residential parcels. While the percentage of this category has declined within certain regions due to database methodologies, particularly for lower Bucks, most of the county has seen significant increases in residential land. Central Bucks experienced the largest increases to the amount of residential land in every decade.

Despite the continued residential growth, land consumption for residential development generally appears to be occurring at a lower rate. This is supported by differences in acres per dwelling unit for the last four decades as shown in Table 13. The reduction in rate of land consumption per dwelling unit may be attributed to concentration of residential development at higher net densities (using conservation or “cluster” development, smaller lot sizes, and attached and multifamily development). From an overall county perspective, however, the change in average acreage per dwelling unit has been minimal between 1990 and 2009.

**Table 13**  
**Average Acreage Per Dwelling Unit, 1970–2009\***

Region	1970	1980	1990	2009
Upper Bucks	1.610	1.620	1.230	1.190
Central Bucks	0.992	0.848	0.675	0.616
Lower Bucks	0.332	0.234	0.218	0.219
<b>Bucks County</b>	<b>0.718</b>	<b>0.648</b>	<b>0.537</b>	<b>0.536</b>

\*Calculated by dividing the amount of residential land acreage by the number of dwelling units.

The percent of nonresidential land has continued to increase in every region of the county since 1970. Following the pattern between each decade from 1970 to 1990, lower Bucks continues to stand out with the highest percentage of nonresidential land. At 42 percent in 2009, lower Bucks has more than double the amount of nonresidential land than central Bucks and more than four times the percentage of nonresidential land in upper Bucks.

Agricultural/undeveloped land in Table 14 includes agricultural and undeveloped land, as well as any acreage over 5 acres for every parcel identified as rural residential. Each region has seen significant decreases of agricultural/undeveloped land within the last 40 years. Since 1970, central Bucks has experienced the largest decline, losing roughly 35 percent of its agricultural/undeveloped land.

### Land Use Comparison between 1990 and 2009

Table 14 shows a comparison between 2009 land use figures and those from 1990 which were included in the last county comprehensive plan in 1993.

**Table 14**  
**Land Use Change, 1990–2009**

	1990 Acreage	Percentage of Total	2009 Acreage	Percentage of Total	Acreage Change	Percentage of Total Change
Single-family Residential	70,539	18%	88,829	23%	+18,290	+5%
Multi-family Residential	3,851	1%	4,672	1%	+821	—
Rural Residential	80,172	21%	81,441	21%	+1,269	—
Agricultural	87,781	23%	60,908	16%	-26,873	-7%
Mining and Manufacturing	12,400	3%	12,398	3%	-2	—
Government and Institutional	13,139	3%	13,616	4%	+477	+1%
Commercial	11,385	3%	13,367	3%	+1,982	—
Transportation and Utilities	25,459	7%	33,394	9%	+7,935	+2%
Park, Recreation, and Open Space	24,613	6%	43,963	11%	+19,350	+5%
Undeveloped	59,374	15%	34,841	9%	-24,533	-6%

Within the last 19 years, two categories experienced a significant decrease in acreage: agricultural and undeveloped. Between 1990 and 2009, agricultural land lost 7 percent or roughly 27,000 acres, while undeveloped land lost 6 percent or almost 24,500 acres. Combined, over 50,000 acres of both undeveloped and agricultural land were lost. Acreage losses in these categories resulted in increases to other land use categories, with single-family residential, park, recreation, and protected open space, and transportation and utilities experiencing the biggest increases.

Municipalities that experienced the greatest losses in agricultural land between 1990 and 2009 include Buckingham (-2,942 acres), Solebury (-2,480 acres), and Plumstead (-2,257 acres). Regionally, central Bucks communities lost the most acreage in agricultural land overall; however, the lower Bucks region lost the greatest percentage of land in agricultural use, losing almost 55 percent of its agricultural land in the same time frame.

The amount of undeveloped land has also declined throughout the county. Hilltown and Milford townships, both upper Bucks municipalities, experienced the greatest decreases of undeveloped land with each losing over 1,500 acres. Regionally, upper Bucks lost the most acreage of undeveloped land. However, lower Bucks and central Bucks each lost greater percentages of undeveloped land within their respective regions.

From 1990 to 2009, single-family residential land jumped 5 percent, with almost 20,000 additional acres added. Central Bucks was the recipient of most of this residential development with over 11,000 acres added in the 19-year time frame. Areas that experienced the greatest increases include Buckingham, Northampton, and Doylestown. At the municipal level, Buckingham Township gained the most single-family residential acreage with almost 2,000 additional acres, followed by Northampton Township which gained almost 1,500 acres of this land use.

Park, recreation, and protected open space increased by 5 percent, or almost 20,000 additional acres. Regionally, central Bucks gained the most land in this category, more than doubling its land by adding over 9,000 acres. Municipalities that experienced the greatest increase in park, recreation, and protected open space acreage include Buckingham, Warrington, Richland, Northampton, and Warwick, with each adding more than 1,000 acres to this category.

Transportation and utilities increased by 2 percent, or almost 8,000 acres. All regions experienced at least a 25 percent increase in this land use category, with central Bucks experiencing the greatest increase at 38 percent. Much of this increase can be attributed to additional roadway acreage as part of residential developments that were constructed in Buckingham, Northampton, Plumstead, Solebury, and Doylestown.

Land devoted to government and institutional increased by 1 percent between 1990 and 2010. While the amount of land in this category stayed relatively stable in lower Bucks and grew slightly in upper Bucks, central Bucks saw the greatest increase with almost 7.5 percent more land in this category. One factor contributing to the larger increase in central Bucks is the construction of additional school facilities to accommodate the region's growing population.

While land use percentages for multifamily residential, rural residential, commercial, and mining and manufacturing stayed the same from 1990 to 2010, all of these categories with the exception of mining and manufacturing saw an increase in acreage. Countywide, multifamily residential gained slightly more than 800 acres, with the greatest increase occurring in central Bucks. Newtown, Warminster, and Middletown townships experienced the largest increases with each adding over 100 acres of multifamily residential land.

Overall, the rural residential land use category grew by more than 1,200 acres between 1990 and 2010. Solebury gained the most acreage in this category with over 1,300 additional acres, followed by Haycock with over 900 additional acres since 1990. While the central and upper Bucks regions saw modest increases, lower Bucks lost more than half its acreage, experiencing a 51 percent decrease in this category.

Throughout the county, land devoted to commercial uses increased by almost 2,000 acres. While all regions in the county experienced an increase in commercial land cover, central Bucks lead the way in commercial development with a 46 percent increase, followed by upper Bucks with a 10 percent increase. Of the three county regions, lower Bucks gained the least commercial acreage between 1990 and 2010, but still leads the other regions with commercial acreage, containing 40 percent of the county's total. Much of the county's commercial land has developed along major roadways, such as Route 309 in upper Bucks, Route 611 in central Bucks, and along Street Road, Route 1 and Route 13 in lower Bucks.

The total amount of acreage devoted to mining and manufacturing in the county stayed virtually the same between 1990 and 2010. Upper and central Bucks experienced growth in this category while lower Bucks realized an overall decline of almost 20 percent of its industrial land. Municipalities seeing the

largest increases in land devoted to mining and manufacturing were Bristol, West Rockhill, Milford, East Rockhill, and Plumstead townships.

The municipality that experienced the largest decrease of mining and manufacturing land was Falls Township in lower Bucks, which lost almost 2,000 acres as land previously used for industry was reclaimed and converted to other uses. Despite that change, Falls still leads the county in acreage devoted to mining and manufacturing with much of the industrial activity located around the USX Industrial Park and the former Fairless Steel Works in the southeastern portion of the township. Overall, lower Bucks contains the majority of land in this category with over 50 percent of the county's mining and manufacturing land located within this region.

### **Existing Land Use and Land Use Trends Highlights**

- When combined, the top three land uses (single-family residential, rural residential and agricultural) cover 60 percent of the county. Single-family residential accounts for the most acreage of any single land use category, covering almost one-quarter of the county.
- Bucks County contains a significant amount of residential land. Almost half (45 percent) of the county land area is classified as single-family, multifamily, or rural residential land.
- Rural residential occupies over one-fifth of the county's land area and is concentrated primarily in upper Bucks.
- Despite losing almost 27,000 acres between 1990 and 2009, farming still has a major presence with nearly 16 percent of the county in some type of agricultural use. As with undeveloped land, agricultural lands will continue to face development pressures in the future.
- Park, recreation, and protected open space accounts for 11 percent of the county's land area, making it the fourth largest land use by acreage. From 1990 to 2009, this category almost doubled, gaining more acreage than any other land use category. This increase is indicative of the success of the county and municipal open space programs as well as a result of cluster developments which provide higher open space ratios.
- Undeveloped land decreased by slightly more than 24,500 acres from 1990 to 2009. Undeveloped land occupies nearly 9 percent of the county. While some sites may have limiting factors such as environmental constraints, it can be expected that some of this land will face development pressures in the future.
- Transportation and utilities accounts for 9 percent of the county's land area. This category, which includes utility installations and rights-of-way, parking and terminal facilities, stormwater basins and roadway acreages, gained almost 8,000 acres between 1990 and 2009. This increase is likely the result of additional roadways associated with new development.
- Commercial uses comprise 3 percent of the total land area. These uses are generally concentrated near major highway intersections and along major roadways. Between 1990 and 2009, commercial land increased by almost 2,000 acres, with almost half of the commercial development occurring in central Bucks.

- Mining and manufacturing accounts for roughly 3 percent of the county’s land use. The bulk of this use is within lower Bucks, mainly in and around the former U.S. Steel plant in Falls Township.
- At 1 percent, multifamily residential covers the least amount of land in the county. This use does not require as much land as other residential uses and generally uses less space since units are attached.



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## III. WHERE DO WE WANT TO GO?

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Vision  
Guiding Principles  
Future Land Use

## Introduction

This comprehensive plan update reaffirms the county's long-term goals of sustainability and good stewardship through a Vision Statement and Guiding Principles. This vision was developed by examining past accomplishments, such as Bucks County's long standing planning history, and current land use trends. The goal of the visioning process is to set direction and to create an inspirational image for what the county could achieve within the next 20 years. This Bucks County vision statement exemplifies where the county is going and what it could look like by the year 2030.

## Vision Statement

### *In the year 2030...*

Bucks County has a diverse population that enjoys a high quality of life. Our villages, boroughs, and townships are some of the most livable places in the nation. Our residents respect the environment, support economic opportunity, and provide for the needs of our communities. The county continues to benefit from the contributions of the older and younger population. The communities of Bucks County are dedicated to ensuring the Delaware River waterfront remains a regional amenity, with a vibrant and accessible public riverwalk, new and thriving businesses, and diverse residential uses.

Bucks County is a leader in job creation. Our public officials work to capitalize on our strategic location and cater to the economic needs of our residents and businesses. Bucks County's industrial sites are vital employment centers with a diverse combination of new endeavors and prosperous businesses. The county is a focal point for green business nationwide and our strong Main Streets and downtowns are centers of commerce with thriving business districts.

Bucks County residents have access to excellent community facilities and services that address the public's health, welfare, and safety. Lives and property are protected by highly-trained professional and volunteer emergency services personnel. Through the efforts and commitment of our government agencies, the county has reduced the impact of natural disasters and hazards through planning, equipping, and preparing our residents.

Bucks County has a distinguished history and natural beauty that create an ideal setting in which to live, work, and raise a family. Collectively, historic, natural, and scenic resources contribute to the county's unique identity and sense of place. Management of stormwater, water supply, wastewater, and solid waste helps to protect our water and natural resources. By reducing waste output and exceeding environmental regulations, the county is cleaner and safer for residents, businesses, and visitors.

The county continues to lead the region with its extensive open space system consisting of parks, recreational amenities, natural resources and agricultural land. These lands and amenities contribute to the cultural landscape, and they provide active and passive recreational needs of residents, while also supporting farming and tourism as a strong component of the county's economy. The County continues its artistic heritage, fostering the arts, music and many educational events.

A mature multi-modal transportation system meets the needs of our residents and visitors with safe, reliable mobility and supports our expanding population and developing economy. This transportation system connects our residents and visitors with other areas in our county and in the region. Biking and walking are an integral part of the county's transportation network. The system is not only safer, but more enjoyable, and adequately meets travel demand.

Bucks County is a leader in energy conservation. Our people conserve resources, wherever possible, and many residents and businesses get their energy from renewable, non-polluting sources.



The “ideal” setting expressed in the Vision Statement cannot come to fruition by accident; it can only come about through the collective decisions and actions of the county, its municipalities, and the people who live and work here. The following Guiding Principles identify the priorities of the comprehensive plan and serve to guide future decisions. They form the basis for the actions of the plan and, when implemented, ensure the plan is carried out in a manner that is consistent with the vision for Bucks County.

### **Protect Natural, Historic and Scenic Resources**

The county’s natural and cultural heritage provides biodiversity, stimulates tourism, triggers private investment, and fosters community pride. By utilizing effective land use planning and preservation methods, the county’s sensitive natural, scenic, and historic resources will be protected for future generations of residents and visitors alike.

### **Preserve and Expand Parks, Open Space, and Agricultural Resources**

Farmland, rural character and the county’s park and recreation facilities are what residents like best about Bucks County according to the comprehensive plan survey. The use and enjoyment of these open space amenities depends upon the continued support and improvement of the overall county’s greenway network.

### **Promote Energy Conservation and Efficiency**

Bucks County is committed to reducing energy demand and greenhouse gas emissions. Improving energy efficiency, raising community awareness of the importance of energy conservation, and transitioning to renewable sources of energy and green technology in the areas of transportation, land use and buildings, will lead to a decrease in the utilization of non-renewable and consumptive sources of energy.

### **Protect Water Resources and Reduce Waste**

Providing sound water infrastructure and treating wastewater, stormwater, and solid waste as a resource rather than a disposal problem will achieve the protection of water and the natural environment. In addition, integrating comprehensive water resources planning and integrative waste management combined with thoughtful land use planning will protect the quality and quantity of our water and environmental resources.

### **Mitigate Hazards to Life and Property**

Assessing the county’s vulnerability to hazards and developing mitigation actions as part of a prioritized implementation strategy will reduce the risk from potential hazards. Preventing new development from contributing to flooding problems, controlling development in the floodplain, and making changes in repetitive flooding areas are examples of needed actions.

### **Provide Adequate Community Facilities and Services**

Continuing to promote proactive, cost-effective and efficient community facilities and services will keep pace with and fulfill the changing needs of our citizenry. Bucks County’s exceptional community

services and facilities, such as excellent schools, libraries, medical care, fire and police protection, enhance the county's appeal as a desirable place to live and work.

### **Enhance Transportation Mobility**

To effectively manage traffic congestion, the county's transportation system should be multi-modal and be designed to improve safety, provide a well-functioning public transit system and promote non-motorized means of travel (e.g., biking, walking). A well-developed transportation system also allows for an efficient movement of goods, maintains air travel, and strengthens the transportation/land use connection.

### **Promote Economic Opportunity, Housing Diversity, and Efficient Use of Land**

Efficient land use is essential to Bucks County's ability to continue to thrive in the future. It creates livable communities by sparing resources and providing a mix of land uses, a range of transportation options, a pedestrian-friendly environment, and a distinct sense of place, all of which cater to the population's social, economic, and physical basic needs. It is supported by a varied and affordable housing stock and sustainable, job-creating economic growth. Opportunities are given to living and working arrangements that meet the needs of older residents and attract a younger, educated workforce.

The Future Land Use Plan map provides a countywide vision to implementing the principles of Smart Growth. Smart Growth is a land use planning strategy which seeks to focus development on existing developed areas, preserve open space and natural resources, and link transportation and land use planning efforts. This map is meant to assist in the coordination and implementation of local and regional planning efforts.

Map 5 Future Land Use was developed using a step-by-step process. The map was developed by analyzing data from the county's Geographic Information System (GIS), including existing land use characteristics, natural resources, water and sewer infrastructure, and transportation infrastructure. Also taken into account were population and development trends, the various plans developed by the County, and the local planning and zoning of Bucks County municipalities. The following nine future land use categories were identified in this process by analyzing the available data and incorporating the concepts of Smart Growth that are at the core of this plan. These categories are described more thoroughly in the Future Land Use section in Part IV of the plan.

**Town Centers** have unique history, character and a sense of place and are typified by high-density land uses and mixed-use building types. Town Centers are pedestrian-oriented and may include SEPTA regional rail service and public services including hospitals, schools, and social services. The residential areas are traditional neighborhoods and the primary commercial areas are typical of "Main Street."

**Secondary Town Centers** are similar to Town Centers but do not have the full range of public services, infrastructure, or the mix of uses found in Town Centers. Secondary Town Centers include boroughs not identified as Town Centers and other nodes of commercial activity. Secondary Town Centers are expected to continue to function as focal points for the areas that surround them.

**Mature Suburban Areas** are the older, residential areas of the county which were mostly planned and developed during the period immediately following World War II. These areas are generally built-out and have had limited population growth during the latter part of the 20<sup>th</sup> century. A full range of infrastructure and public services are available for infill and redevelopment.

**Emerging Suburban Areas** are those areas with available public infrastructure and services intended for future development by municipalities. These areas have experienced significant population gains within the last 20 years. They conform generally to the Development Areas identified by municipalities anticipating intense development.

**Employment Areas** are where primarily nonresidential growth (commercial, industrial, and office development) has and will continue to occur along, or in close proximity to, arterial corridors having access to the regional transportation network (i.e., rail, interstate highways, and ports). These areas are often characterized by single use and land intensive development.

**Rural Centers** are commercial villages that are adjacent to or within Rural Resource or Natural Resource/Conservation Areas. There is a concentration of commercial uses but fewer public services and less infrastructure than a Secondary Town Center.

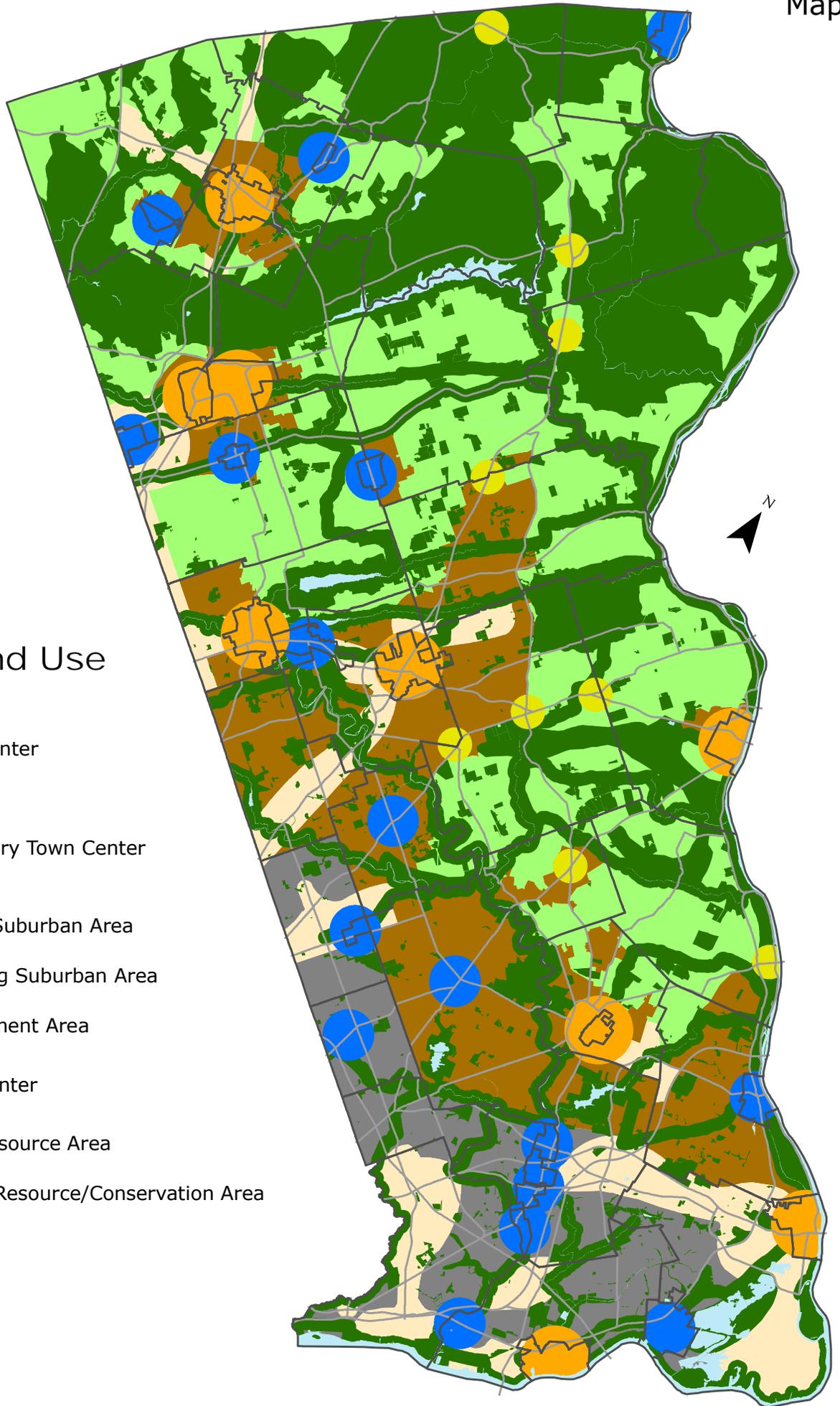
**Rural Resource Areas** mostly contain rural residential and agricultural uses, but may include limited nonresidential uses. The rural residential uses are characterized by large lots with very low density. Rural Resource Areas include farms, significant agricultural soils, and other natural resources of economic value (e.g., mineral and timber areas) not meant for significant development. Development should be constructed in a way that preserves these resources to the greatest extent possible.

**Natural Resource/Conservation Areas** include greenway corridors, recreation areas, and significant natural resource areas. These areas are largely undeveloped due to the presence of natural resources. The Natural Resource/Conservation Areas may include Rural Resource Areas.

**Unique Land Uses** are those uses which have countywide significance, including airports, quarries, and landfills. Unique land uses are too small to be shown on the Future Land Use map and will be assumed to continue in their current use.

### Future Land Use

-  Town Center
-  Secondary Town Center
-  Mature Suburban Area
-  Emerging Suburban Area
-  Employment Area
-  Rural Center
-  Rural Resource Area
-  Natural Resource/Conservation Area



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## IV. HOW DO WE GET THERE?

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### **Principle 1**

Natural Resources Protection  
Historic Resources  
Scenic Resources

### **Principle 2**

Parks, Recreation, and Open Space  
Agricultural Resources

### **Principle 3**

Energy Conservation and Efficiency

### **Principle 4**

Water Supply and Infrastructure  
Wastewater Facilities  
Stormwater Management  
Solid Waste Management

### **Principle 5**

Hazard Mitigation

### **Principle 6**

Community Facilities and Services

### **Principle 7**

Transportation Mobility

### **Principle 8**

Economic Development  
Housing  
Future Land Use: Planning for Smart Growth

## Principle 1:

### **Protect Natural, Historic, and Scenic Resources**

The county's natural and cultural heritage provides biodiversity, stimulates tourism, triggers private investment, and fosters community pride. By utilizing effective land use planning and preservation methods, the county's sensitive natural, scenic, and historic resources will be protected for future generations of residents and visitors alike.

Bucks County has an abundance of beautiful and important assets including natural resources, historic properties and scenic views. These assets are an integral component of Bucks County's character and make the county a desirable place to live. Natural resources include the county's geology, soils, water resources, slopes, and vegetation. Scenic resources are natural and visual features, among them special geological formations, and pristine landscapes and byways. A historic resource comprises architectural, archaeological, or cultural buildings or place. Planning for these amenities takes a coordinated, concentrated effort by government officials, the private sector, and the public to protect and sustain this shared heritage.

Natural features, such as geology, soils, streams, wetlands, hillsides, and vegetation, define the Bucks County landscape. Protecting natural resources means preserving the most important environmentally sensitive areas as well as respecting the landscape when development occurs, so that water quality, scenic characteristics, and habitat are protected and hazards such as erosion and flooding are avoided.

Protection of the natural environment is a goal that has been embraced by all levels of government. Federal laws protect clean air and clean water. State laws protect floodplains, wetlands, and coastal areas.

County governments protect farmlands and open space through preservation programs and protect soil and water systems through county health departments and conservation districts. Protection of natural resources has been a guiding principle of Bucks County's comprehensive plans for the past 40 years and is a requirement under the Pennsylvania Municipalities Planning Code (MPC).

Local governments are directed by the MPC [Section 603 (g)(2)] to include protection of natural resources as one of the functions of zoning, and Bucks County municipalities uniformly use local ordinances to protect soil, water, streams, wetlands, floodplains, slopes, and other natural features.

## **Land Resources**

Land resources are defined as geology, topography, soils, flora, fauna, and significant natural areas, all of which have economic, recreational, aesthetic, scientific, and educational benefits which can be diminished if resources are not protected. Loss of farmland soils, poor water quality, and increased flooding are some consequences that can occur if development fails to respect the natural environment.

### ***Geology***

The underlying bedrock affects the type of soil formed, and in conjunction with the hydrologic cycle, is responsible for the topography, slopes, location of streams, waterbearing capacity of aquifers, plant and animal habitat diversity, and vegetation.

While there are numerous geologic formations (groups of rock with similar characteristics) in Bucks County, there are a few major formations. Two-thirds of the county is underlain by large and small alternating bands of sandstones of the Stockton formation, argillite and shale of the Lockatong formation, and red shale, mudstone, and siltstone of the Brunswick formation. Much of the gentle rolling hills of the county are a result of these formations. The shale and sandstone produce good-to-excellent agricultural soils and abundant building stone. The Lockatong and Brunswick formations contain limited water-yielding aquifers, which can and have been problematic for intensely developed areas relying upon groundwater for water supply.

The Diabase formation is the primary rock type that underlies many of the prominent wooded ridges, steep slopes, hillsides, and narrow stream valleys in Upper Bucks County (Unami Area, the Rockhills, Nockamixon/Bridgeton area). This formation underlies 11 percent of the county. The igneous (formed by molten rock) nature of diabase rock creates its physical characteristics as dense, crystalline, erosion-resistant outcrops that form large boulders. These rocks can occur in broad fields such as the Ringing

Rocks County Park located in Upper Black Eddy and can be seen driving through “The Rockhills” of Bucks County (i.e., along Route 313 north of Lake Nockamixon). Diabase formations are difficult to farm, have limited water-bearing capacity and limited capacity for wastewater disposal.

Several formations of unconsolidated sand and gravel deposits are spread across the flat, low-lying southern portion of the county and along the Delaware River edge as far north as Riegelsville. These deposits, underlying 8 percent of the county, are the result of fluvial (relating to or part of a river or stream) outwashes and deposits along floodplains of the Delaware. Sand and gravel are valuable resources, not only as a prime source for local building materials but also as productive, high water-yielding aquifers. Their unconsolidated nature and the high permeability make them vulnerable to groundwater contamination.

Two areas of carbonate or Karst geologic formations make up two percent of the county; one is the Buckingham Valley area and the other is the Durham Valley area. Carbonate geology is generally an abundant source of groundwater, and Karst landscapes have fertile valleys with carbonate-derived soils formed from the dissolution of soluble rocks such as limestone and dolomite. The presence of several sinkholes and subsidence and the potential for groundwater contamination limit the development potential of carbonate areas.

The five municipalities in the Buckingham and Durham valleys have regulations for development in carbonate geology, including prohibition for specific uses, restriction of impervious surfaces coverage, best management practices for stormwater management, and protection of Karst features.

Other special geologic features in the county include Haycock, Buckingham, Solebury, and Jericho mountains, Durham Caves, Bowman’s Hill, and the Fall Line (an area where an upland region and a coastal plain meet that traverses the county in lower Bucks). Five of these features are identified as outstanding scenic geological features of Pennsylvania in the Pennsylvania Geological Survey: The Lookout, Monroe Border Fault, Nockamixon Cliffs, Ringing Rocks (the diabase boulder field in Ringing Rocks County Park), and Sentinel Rock in Nockamixon State Park. Other features such as the rings of diabase surrounding the Quakertown swamp are an outstanding scenic geologic feature of Pennsylvania.

Mineral resources (limestone, shale/argillite, sand and gravel) provide construction materials for local and regional markets. Bucks County municipalities balance the economic value of mineral resources with the local impact of quarrying activities as they plan and regulate quarries to avoid conflicts with residential areas, assure safe access and proper traffic circulation, and protect significant and sensitive environmental features from quarry activities. The majority of the municipalities having quarries within their borders have established quarry districts in their zoning ordinances to permit mineral extraction in accordance with specific operations requirements. Protecting surface water and groundwater supplies is an important consideration in regulating oil, gas and mineral resource extraction.

Regulation of oil and natural gas exploration is under the authority of the Pennsylvania Department of Environmental Protection (PaDEP) to regulate drilling operations and set specific standards for well location, casing requirements, site restoration, bonding, and others. Municipalities have no authority

over how drilling is done, since this is pre-empted by state laws, but zoning laws can regulate in which zoning district this type of activity is permitted.

### ***Topography and Steep Slopes***

Topography across the county varies from the flat coastal plain in lower Bucks, to the rolling hills of central Bucks, to the foothill-type topography in upper Bucks into Lehigh County. The stream valleys and steep slopes of the rolling hills and foothills of Bucks County remain forested and support a wide spectrum of vegetation and wildlife.

Topography affects development capacity, stormwater runoff, wastewater and solid waste facility siting, and potential for soil erosion. Development on steep slopes is managed to prevent erosion and sedimentation of drainage ways, increased stormwater runoff and flooding problems.

Generally, slopes less than 8 percent are suitable for most types of development. Development should be conducted in a manner that is sensitive to the topography and minimizes disturbance. Disturbance of slopes of 15 percent or greater should be limited by zoning regulations by controlling lot sizes, amount of disturbance, and types of activities.

All but a few Bucks County municipalities regulate disturbance on steep slopes by limiting the amount of disturbance in accordance with the steepness of the slope. Some municipalities have implemented protection measures that are only applicable in areas greater than 2,000 or 3,000 square feet, while exempting areas less than these thresholds. Certain municipalities have expanded the regulations to address uses (e.g., zoning districts that permit only certain uses on slopes of 15 percent to 25 percent and only very limited permitted disturbance on slopes greater than 25 percent).

### ***Soils***

Soil is a complex mixture of minerals, water, air, decaying organic material and living organisms. Soil conditions affect drainage, the depth to the water table, permeability, and the potential for flooding, and limitations on building activities. While many different soil types exist in Bucks County, soils of particular importance are agricultural soils and restrictive soils.

The undeveloped agricultural soils and farmlands are located mainly in central and upper Bucks County. The number of farms and the amount of acreage devoted to agriculture has been declining in the county, but aggressive preservation programs have saved many important farms with good farming soils. (Agricultural soils and preservation programs are detailed in the Agricultural Resources section of Part IV of this plan.)

Restrictive soils, or soils that limit development due to their characteristics, are classified as erodible, shallow, hydric and floodplain by the Natural Resource Conservation Service (NRCS).

Erodible soils have a low resistance to wind or water erosion. They exist throughout Bucks County. Erosion rates are accelerated when farming practices and earthmoving from construction activities

disturb soil. Topsoil is usually more erodible than the associated subsoil. Temporary removal of topsoil during site preparation can reduce the hazard of erosion.

In some soil types, the deeper soil layers may be more erodible, as with Chester and Lawrenceville. For those soils, topsoil removal can expose the underlying subsoil to more extensive erosion during construction periods. Inadequate site stabilization can cause substantial soil losses. Prior to any earth disturbance activities, site-specific soil analysis must be used to identify erodible conditions, combined with slope analysis and depth to bedrock measurements.

Shallow soils are characterized by shallow depth to bedrock (layer of solid rock formations below the soil) of less than 20 inches, low moisture holding capacity and density of bedrock. Shallow soils can easily move and weather, and their shallow depth does not accommodate subsurface wastewater disposal systems. Saturation of these soils can cause stress on subsurface foundations, and low resistance to erosion can lead to increased sedimentation in streams, rivers, lakes and ponds.

Hydric soils are subject to conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (without oxygen) conditions. These soils favor the growth and regeneration of wetlands vegetation and pose basic limitations for development due to the low permeability, low run-off rates, and subsurface saturation conditions. Development on hydric soils is difficult because they cannot support on-lot subsurface wastewater systems. Alterations to drainage patterns through fill, drain fields, or channels, can affect off-site drainage conditions negatively by changing water flows.

Floodplain soils are deposited from previous floods along stream banks or other watercourses by stormwater. Floodplain soils may indicate flooding but are not always directly related to Federal Emergency Management Agency (FEMA) maps. Significant floodplains and floodplain soils occur along the Neshaminy Creek and the Delaware River and, to a lesser extent, other streams and tributaries throughout the county.

All soils can be impacted by erosion and sedimentation caused by construction activities and the extraction of minerals. Soil can become compacted during the construction process, which prevents water from infiltrating into the ground.

Under Pennsylvania State Code Title 25, Chapter 102, regulations require erosion control planning for all types of earthmoving: land development, agricultural plowing and tilling, forestry, mining, utilities, and others. Plans and inspections for soil erosion and sedimentation control are handled by the Bucks County Conservation District.

### ***Flora and Fauna***

Bucks County's plants (flora) and animals (fauna) are among the most diverse of any county in the state. According to the Pennsylvania Flora Database, 2,003 species of native and naturalized plants that have been documented in the county. Of those, 1,380 are native and 613 are non-native species have become naturalized since European settlement. Two hundred and forty-four plants classified as endangered,

threatened, rare, or extirpated (removed or destroyed completely) in Pennsylvania have been found in Bucks County. One hundred thirty-two of those have not been seen in over 50 years and are probably extirpated from the county. Of the 111 remaining listed plants, 39 species were observed at a single site, Delhaas Woods in Bristol Township.

**Table 15**  
**Plant Diversity**

	Native	Naturalized	Total
Aquatic plants	89	14	103
Ferns and other spore-bearing plants	77	2	79
Grasses, sedges, and rushes	311	78	389
Wildflowers and other herbaceous species	684	404	1,088
Trees, shrubs, and woody vines	229	115	344
<b>Total</b>	<b>1,390</b>	<b>613</b>	<b>2,003</b>

Source: *Natural Areas Inventory Update, 2011*

The deliberate or accidental introduction of non-native species has brought about significant changes in the natural landscapes of Bucks County. Introduced insects, such as the gypsy moth, non-native earthworms, and non-native, invasive plant species, such as purple loosestrife, multiflora rose, and lesser celandine, have created environmental problems. These non-native species directly impact native vegetation or pose significant competition with native plant species in certain habitats.

Several municipalities have adopted ordinances to control the introduction of invasive, non-native plant species. Required planting lists are limited to native plant species. Removal of non-native invasive species is often required in buffer yards and forests and wooded land.

Maintaining and enhancing natural species is challenging due to deer overabundance, which has resulted in the serious depletion of low growing vegetation including wild flowers, shrubs, tree seedlings, and saplings. Forest regeneration is threatened in heavily browsed forests, where no young trees can survive to replace aging canopy trees.

Overabundance of Canada geese can affect native aquatic vegetation. While Canada geese have adapted to eating agricultural crops and domestic grasses, they also feed on native submergent and emergent aquatic plants. The nutrients found in the droppings of geese can have a detrimental effect on water quality, resulting in algae blooms and excessive plant growth that destroy the health of waterbodies.

Diversity in the fauna of Bucks County is documented in the Natural Areas Inventory (NAI), which documents 125 species of breeding birds (plus 234 transients or occasional visitors), 44 species of reptiles and amphibians, 35 species of mammals, and several species of fish. Many species are considered endangered or threatened in Pennsylvania, and several species are under duress because of their dependence on declining habitats such as forest interiors, riparian areas, and grasslands. The bat

hibernaculum in the Durham Mine in northern Bucks County, once believed to be the second largest in Pennsylvania, has been affected by disease.

Municipalities, working with the county, can acquire land or conservation easements in critical natural areas. Acquisition of conservation interests in land should focus on priority “core reserves” and “natural corridors” identified in the NAI, particularly where large contiguous areas of natural habitat are threatened by potential fragmentation due to development pressures.

Municipalities can provide for restoration, maintenance, or enhancement of natural landscapes within development and infrastructure projects, to the greatest extent practicable, seeking to prevent destruction or fragmentation of notable/rare landscape features, and balancing unavoidable disturbance with enhancement of remaining landscape features, including stormwater management areas.

### ***Woodlands***

The largest woodlands<sup>4</sup> in Bucks County are associated with areas of steep slopes, extremely rocky land, floodplains, and wetlands associated with stream corridors and areas of diabase geology in Upper Bucks County. These forested areas and smaller wooded areas are found throughout Bucks County, covering 37 percent of the county’s land.

Trees and their understory protect biologic diversity by providing habitat for a multitude of plants, animals, invertebrates, and microorganisms. Wooded areas create buffers between the built environment, provide recreational opportunities, improve air quality, moderate temperatures, provide shade, promote infiltration and water quality benefits, reduce erosion, and aesthetically enhance the environment.

Trees are threatened by air pollution, soil compaction, heat stress, disease, drought, poor nutrition, inadequate maintenance, and development activity. Threats posed include fragmentation of greenspace, removing large specimen trees, and inadequate protection of remaining trees.

The objective of tree preservation is to have protection standards and regulations in place that are flexible enough to allow both environmental conservation and responsible economic growth. Woodlands in designated preservation areas (e.g., scenic districts and roads, historic sites, villages, park buffers, other special land use areas) and environmentally sensitive areas (e.g., floodplains, floodplain soils, steep slopes, wetlands, and lake or pond shorelines) should be protected to higher degree than woodlands in other areas.

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<sup>4</sup> A woodland is one-quarter acre or more of wooded land where the largest trees measure at least 6 inches diameter at breast height (dbh) or 4.5 feet from the ground. A woodland is measured from the dripline (the circumference of the outermost extension of branch tips and extended on the ground) of the outer trees. Groves of trees forming one canopy where 10 or more trees measure at least 10 inches diameter at breast height (dbh) can also be classified as woodlands.

A complete municipal woodland protection program would include minimum protection standards in addition to timber and forestry regulations, to prohibit clear-cutting in anticipation of development, protect trees during construction activity, and preserve large trees.

The majority of Bucks County municipalities have protection measures in place that protect woodland in sensitive areas. In addition, some municipalities have maximum building coverage requirements per lot and a percentage of wooded area allowed to be removed. Some municipalities have less stringent protection measures that permit a smaller percentage of protection in specific districts, such as agricultural districts. Most municipalities protect at least 50 percent of woodlands in all zoning districts. Hulmeville and Trumbauersville boroughs and Durham, East Rockhill, Milford and Richland townships provide more stringent protection and require 80 percent protection in all other districts. Some municipalities also require 80 percent protection with exceptions made for specific commercial districts. Community goals will result in flexibility in these requirements, to attain greater protection of agricultural lands, for example, or to accommodate industrial or commercial development.

Several Bucks County municipalities also have ordinance language that restricts the cutting of trees over a given size (e.g., mature trees with a diameter greater than 24 or 36 inches) in specific zoning districts.

In 2000, the MPC was amended to require municipalities to provide for timber/forestry uses in every district. Several municipalities have adopted regulations to eliminate the potential tree removal in anticipation of development by requiring tree replacement equal to the pre-development level. Many municipalities have tree protection regulations that are designed to make sure trees that must be preserved are not damaged or accidentally removed during the development process.

In addition to tree protection techniques, there are also ways to replenish tree stock. Tree replacement and forest renewal efforts can go a long way to foster a “no net loss of tree canopy”. Reforestation and afforestation<sup>5</sup> could be required of land developments and applied to specific districts, such as residential, commercial, extraction and industrial zones. A certain amount of forest cover, determined as a percentage or through a tree replacement formula, would be required to remain or to be newly established on a development site. Trees used in afforestation or reforestation should also be required to be native to the area in which the site is located.

Municipalities may establish tree commissions to promote and enhance protection standards for management of trees in urbanized areas. A community tree management program should include an inventory of public trees and wooded areas and a maintenance schedule prioritizing removal, pruning, and planting. For example, Doylestown Borough’s Shade Tree Commission established a comprehensive tree management program which includes replacement. East Rockhill Township prepared a tree management and reforestation plan in selected areas of the township.

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<sup>5</sup> Reforestation is the replenishment of trees in areas that have suffered deforestation, for example, logging and clear-cutting of trees. Afforestation is the act or process of establishing a forest on land not currently forested or has not been used as woodland for over 50 years.

### ***Significant Natural Areas***

Significant natural areas are resource areas which, by virtue of their unique or rare conditions, require special protection. These areas have distinctive combinations of biological, ecological, geological, or hydrological characteristics. The *1999 Natural Areas Inventory*, updated in 2011 identified and ranked the most significant natural areas in the county.

The inventory lists a total of 115 natural area sites categorized according to priority areas. The significance of each site was based on an evaluation of 13 criteria addressing biological, ecological, hydrological, and geological components. While all the sites contain natural features worthy of protection, they were assigned one of four levels of importance as follows:

**Priority 1** – Areas that have statewide or countywide significance based on uniqueness or exceptionally high quality of natural features (19 sites), such as Nockamixon Cliffs.

**Priority 2** – Areas that have statewide or countywide significance due to their overall quality and diversity and importance of the resources they contain (33 sites, such as Bristol Marsh located in Bristol Borough).

**Priority 3** – Areas that have local or countywide significance that may contain small or degraded resources (39 sites, such as Peace Valley Park located in New Britain Township).

**Priority 4** – Areas that have biological or ecological resources that are important at the local level (24 sites, such as a portion of Poquessing Creek located in Bensalem Township).

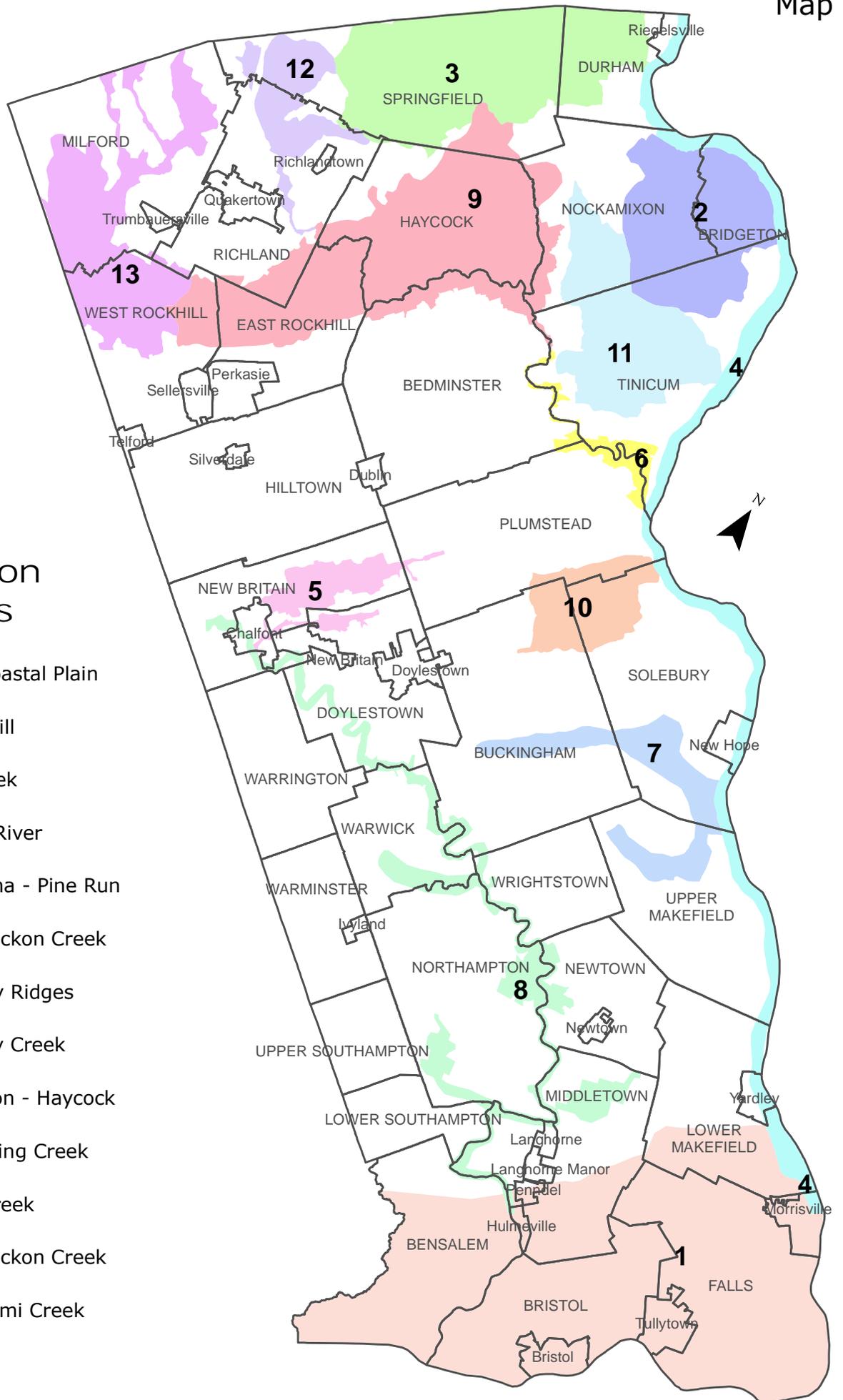
The 2011 NAI update identifies 13 conservation landscapes as shown on Map 6. The largest conservation landscapes are in upper and lower Bucks. All of the 19 highest priority sites from the 1999 NAI are included in whole or in part in the conservation landscapes. Specific direction is given in the update as to the manner in which the significant natural resources in the landscapes should be protected and managed to ensure the sustainability of critical habitats.

The conservation landscapes emerged as high priority areas for continued conservation and preservation efforts and in many cases, overlap with state, county and municipal open space, private conservation lands, and potential greenway corridors. Critical habitats found in these areas should be protected. Development intensity and density should be reduced and resource protection standards increased in these areas.

A total of 81,130 acres were identified in the 1999 NAI as priority sites to be protected. A total of 162,985 acres were identified in the 2011 NAI Update in designated landscape areas. Bucks County municipalities have preserved 6,956 acres of land categorized as priority areas in the 1999 NAI and 11,139 acres of land categorized as landscape areas in the 2011 NAI Update.

### Conservation Landscapes

- 1** Atlantic Coastal Plain
- 2** Coffman Hill
- 3** Cooks Creek
- 4** Delaware River
- 5** Lake Galena - Pine Run
- 6** Lower Tohickon Creek
- 7** Mid-county Ridges
- 8** Neshaminy Creek
- 9** Nockamixon - Haycock
- 10** Paunacussing Creek
- 11** Tincum Creek
- 12** Upper Tohickon Creek
- 13** Upper Unami Creek



Source: Bucks County Natural Areas Inventory, 2011

## Land Resources – Strategies and Actions

### Restrictive Geology

- Limit development activities in areas of carbonate geology.
- Protect against structural damage from sinkhole collapse or subsidence in carbonate valleys through design and construction guidelines and land use planning recommendations as outlined in *Conservation and Management Practices for Buckingham and Durham Carbonate Valleys (1994)*.

### Steep Slopes

- Municipalities can adopt steep slope protection standards that require at least 70 percent protection of undisturbed natural cover (not altered, cleared or built upon) on slopes of 15 to 25 percent grade and at least 80 percent undisturbed natural cover on slopes greater than 25 percent grade. A minimum of 40 percent protection should be provided for slopes of 8 to 15 percent grade, except where protection of prime agricultural is a priority.
- Promote site development practices that are sensitive to the natural topography and minimizes the disturbance of areas with less than 8 percent grade.

### Soils

- Ensure that soil conservation management is implemented to maintain the productive capability of the soil.

### Flora and Fauna

- Preserve and protect critical habitats that support rare, threatened and endangered plants and animals through recommendations contained in the NAI.
- Municipalities can restrict required plantings for land developments to native species; promote control and reduction of invasive species.

### Woodlands

- Municipalities can adopt woodland protection standards that require 80 percent protection of woodlands in environmental sensitive areas and 50 percent protection elsewhere, except for areas of municipalities (e.g., commercial and industrial district) that may require a reduced standard.
- Municipalities can adopt forestry regulations, reforestation and afforestation standards, woodland management requirements and tree protection standards.

### Significant Natural Areas

- Designate, acquire and manage significant natural features listed in and consistent with the recommendations of the county natural areas inventories.
- Protect critical habitats found in significant natural areas by reducing development intensity and density and increasing resource protection standards.
- Work with land conservations and other nonprofits to coordinate efforts to acquire property and easements to protect significant natural areas.

## **Water Resources**

Bucks County is endowed with water resources that support and enhance the quality of life. The numerous streams and tributaries in the county course through eight major watersheds<sup>6</sup> and these watercourses along with lakes and ponds endure as dynamic systems providing flood control, wildlife habitats, recreational and economic opportunities, and options for water supply. Critical groundwater resources supply 40 percent of the county residents' water needs. Coordination of planning and management of these multiple resources and the multiple, often conflicting, demands placed on them is necessary.

### ***Surface Water***

Surface water is rain water and snow melt or groundwater that discharges (in the form of springs or baseflow) to surface water bodies, such as streams, lakes, or ponds. The total quantity of surface water is dependent on numerous factors including storage capacity in lakes, ponds, wetlands, the permeability of the soil beneath these storage bodies, the runoff characteristics of the land in a watershed, and the timing of the precipitation and local evaporation rate, which are affected by weather and climate. Human activities can have an impact on these factors. For example, storage capacity can be increased by constructing impoundments and decreased by draining wetlands.

### **Streams**

The entire county is in the Delaware River watershed and the river itself forms the eastern and southern boundaries of the county. The entire length of the Delaware River is fed by 216 tributaries, the largest being the Schuylkill and Lehigh Rivers in Pennsylvania. The Neshaminy Creek is the largest tributary in Bucks County; its watershed drains portions of 26 municipalities in central and lower Bucks. Other major tributaries include Tohickon Creek, Tinicum Creek, and Cooks Creek that drain large portions of upper Bucks. The Unami Creek and the East Branch of the Perkiomen, both part of the Schuylkill River watershed which ultimately discharges to the Delaware River, drain the northwestern corner of the county.

Below the Fall Line at Morrisville, the river is part of the Delaware Estuary and is thus influenced by the tides. An estuary is a partly enclosed coastal body of water with one or more rivers or streams flowing into it, and with a free connection to the open sea (interface between fresh and salt water). The Delaware Estuary provides habitat for several rare animals. Specialized natural vegetation and fresh water tidal marshes occur in only a few rivers on the east coast: the Hudson, Delaware, Potomac, and James. Although some of the tidal marsh of the Delaware Estuary has been lost and species diversity has declined throughout, good examples remain in Bucks County's portion of the estuary.

Passage of the Coastal Zone Protection Act in the 1970s provides funding in nine areas. These include coastal wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management planning, ocean resource, energy and government facility siting and aquaculture.

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<sup>6</sup> A watershed is simply defined as an area of land that drains to a particular point along a stream, river, or lake. The topography of an area determines watershed boundaries.



Many Coastal Zone Management grants have been awarded to Bucks County municipalities and organizations. Projects range from preparing open space plans; repairing access areas along the Delaware River; marsh demonstration projects; implementation of a stormwater Best Management Practices Park; improvements to marinas; trail linkages; public watershed protection programs, watershed monitoring programs; restoration projects, public educational outreach, and trail linkages.

Environmental groups are working to establish the lower Delaware River that runs as a designated national recreation area. The proposed designation area would include the river's tidal estuary which stretches from Morrisville to the Delaware Bay (approximately 70 miles). At present, the portion of the river at the Delaware Water Gap has national recreation area designation. If the designation is granted, the entire river would fall under various federal guidelines. The majority of the river already has a wild and scenic designation.

Headwaters are the areas from which the water in streams and river originate. Healthy headwaters, including tributary streams, intermittent streams, and spring seeps, are essential to the health of stream and river ecosystems. Headwaters support biodiversity and supply food and nutrients to a host of organisms and species unique to this habitat, and keep sediment and pollutants out of the stream system's lower reaches. (Floodplains associated with streams and riparian buffers are discussed in the Land Water Interface Resource portion of this section.)

**Lakes and Ponds**

Lakes and ponds are defined as natural or artificial bodies of water 0.1 acre or larger that retain water year-round. These resources moderate stream flows during storms and flood events and provide habitat for aquatic life and water sources for wildlife. There are hundreds of small ponds throughout the county; the largest lakes include:

**Table 16  
Major Lakes**

Name of Lake	Municipal Location
Lake Nockamixon	Bedminster, East Rockhill, Haycock, and Nockamixon townships
Van Sciver Lake	Falls Township and Tullytown Borough
Lake Galena	New Britain Township
Warner Lake	Falls Township
Lake Luxembourg	Middletown Township
Pine Run Reservoir	Doylestown Township
Churchville Reservoir	Northampton Township
Lake Towhee	Haycock Township
Bradford Lake	Warrington Township
Silver Lake	Bristol Borough and Bristol Township

If not properly managed, lakes, reservoirs and impoundments can become repositories of upstream pollutants and sediment which can cause accelerated eutrophication (depletion of oxygen). Several impoundments have experienced high nutrient levels and some have already required dredging; proper lake management can improve such conditions.

Lakes, ponds, and their peripheral vegetation are critical habitats and are considered wetlands and require 100 percent protection. In addition, a buffer or setback from the wetland vegetation along the lake/pond shoreline should be protected as undisturbed natural cover. In most instances, municipalities provide for this protection. Protection of the lake/pond shoreline area should be in line with and considerate of riparian buffer standards.

### **Surface Water Quality**

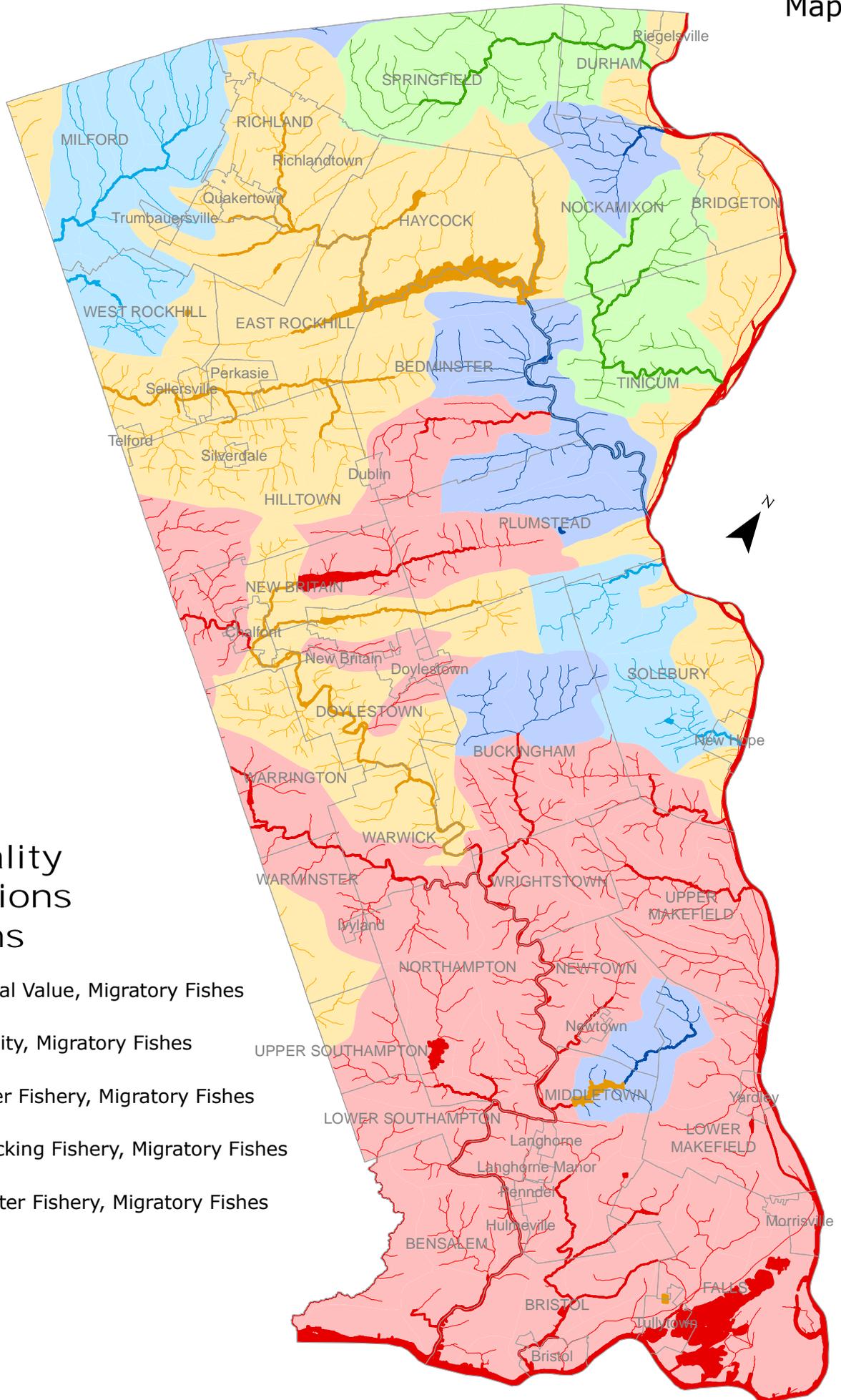
Surface water quality standards are established and enforced by the U.S. Environmental Protection Agency (EPA), PaDEP, and the Delaware River Basin Commission (DRBC). These standards are designed to safeguard streams, rivers, and lakes and consist of use designations (e.g., drinking, agriculture or recreation), criteria necessary to protect those uses from pollutants, and an antidegradation policy to maintain and protect existing uses and high quality waters.

Pennsylvania's antidegradation regulations provide special protection to waters of the highest quality, categorized as "High Quality" (HQ) and "Exceptional Value" (EV). These two special protection categories are given to protect all existing uses of the stream (i.e., by aquatic life and humans) and to safeguard the quality of its water. Exceptional Value streams in Bucks County include Tinicum Creek and Cooks Creek. High Quality streams in Bucks County include Unami Creek, Paunacussing Creek, Cuttalossa Creek, and Aquetong Creek.

As part of the water quality standards program, redesignation evaluations may also be conducted at the request of the Pennsylvania Fish and Boat Commission (PFBC). In addition, any person, agency, group, organization, municipality, or industry may submit a rulemaking petition to the Environmental Quality Board (EQB) to request a stream redesignation. Designations are not static and changes can occur based upon, for example, point source pollutants (like those from industrial or sewage discharges) and nonpoint source pollutants (like those from urban and agricultural runoff) entering a waterbody, development pressures on watercourses, or the improvement of a watercourse.

Several Bucks County streams have been petitioned for stream redesignation over the past 10 to 15 years (e.g., Unami Creek, Gallons Run, Tohickon Creek, Luxembourg Creek, Newtown Creek and Smithtown Creek). In most instances, stream redesignation petitions have not been granted. The exceptions include Newtown Creek, which was not originally assigned a designated use, and Lake Luxembourg, which was redesignated from Cold Water Fishes (CWF) and Migratory Fishes (MF) to Trout Stock Fishes (TSF) and Migratory Fishes (MF).

The National Pollutant Discharge Elimination System (NPDES) Program requires a permit for all point source discharges to water bodies (including municipal, commercial, and industrial wastewater discharges, discharges from large animal feeding operations, and municipal separate storm sewer systems). The permit specifies the pollutant limits on the discharge, which in turn dictates the level of treatment necessary. The program has achieved significant reductions in pollutant discharges to water bodies over the years and has resulted in improved quality of water resources.



### Water Quality Classifications for Streams

-  Exceptional Value, Migratory Fishes
-  High Quality, Migratory Fishes
-  Cold Water Fishery, Migratory Fishes
-  Trout Stocking Fishery, Migratory Fishes
-  Warm Water Fishery, Migratory Fishes

States are required to list all impaired waters not supporting their designated uses even after appropriate and required water pollution control technologies have been applied. States or the EPA must determine the conditions that would return the water to a state that meets water quality standards. As a follow-up to listing, the state or EPA must develop a Total Maximum Daily Load (TMDL) for each water body on the list. A TMDL identifies allowable pollutant loads to a water body from both point and non-point sources and is designed to reduce pollutant loads to impaired waters and enable these waters to meet water quality standards. In Bucks County, Neshaminy Creek, Lake Luxembourg, Southampton Creek and Levittown Lake may have to comply with TMDL regulations in the future.

The PaDEP has assessed 1,206 miles of streams in Bucks County, and 475 miles of the streams are classified as impaired waterways. An impaired waterway is a stream not attaining one of its four designated uses: aquatic fish, fish consumption, potable water, and recreation.

The Bucks County Conservation District has the enforcement powers to address the control of stormwater runoff, erosion, and sedimentation from construction sites that may impair water bodies. Municipal land use planning, establishment of septic system management programs, regulation of construction practices, and increased soil conservation measures can help reduce effects of non-point sources of pollution.

### ***Groundwater***

The availability and quality of groundwater is directly related to the source of recharge, soils, and underlying geologic formations that comprise an aquifer. Generally, natural filtering processes purify the groundwater; however, groundwater is highly susceptible to pollution. Aquifers take many years to cleanse themselves after being contaminated by pollutants. Groundwater is susceptible to pollution from sources that can infiltrate into aquifers, such as malfunctioning on-lot septic systems, leaking underground tanks that store gasoline or fuel oil, leaking landfills, excessively salted roads, fertilized fields or lawns, and toxic illegal dumps.

Groundwater resources should be considered from a water cycle perspective, which includes stormwater, wastewater, water usage, and land use planning to protect aquifers and to ensure high water quality. Federal and state regulations, coupled with additional resource management at the local level, can reduce the incidence of groundwater pollution.

Bucks County municipalities have a long-standing dedication to groundwater protection and management. Many Bucks County municipalities and municipal groups have conducted groundwater studies and have prepared reports to identify present conditions and to assist with water resources planning. For example, the Bridgeton-Nockamixon-Tinicum Groundwater Management Committee (BNT GWMC) is a three-municipal advisory committee that was formed in 1999 to conduct technical studies, provide information for residents, and recommend regulations for local water resources to the three townships.

(Principle 4 of this plan discusses groundwater protection in more detail as it is relevant to water supply, wastewater facilities and stormwater management.)

### ***Water Resources Planning***

Water resources planning addresses two primary factors: maintaining the supply of water and protecting its quality. The MPC directs municipalities to consider water facilities in municipal comprehensive plans, zoning ordinances and development review functions. Local planning should consider water budgets, placement of infrastructure, and pollution prevention in recharge areas. Decisions that affect land use, including wastewater facility extensions and water supply infrastructure, should be coordinated at the local and county land use planning level. (Further discussion of how to protect and manage the resource from a facility standpoint is provided in Water Supply and Infrastructure section of Part IV, Principle 4.)

An example of local multimunicipal efforts to plan for management of water resources is the *Penndel Water Resources Plan*. The Bucks County Planning Commission assisted the Penndel Area Coordinating Committee, comprised of members of eight municipalities, with preparation of this comprehensive water resources plan. The plan addresses the impacts on and threats to water in an area where there is ongoing development. The plan has resulted in the creation of an Intermunicipal Water Resources Committee, a public education and awareness program, a model water resources management ordinance for municipalities, a watershed monitoring program using stream gages, and a source water protection program endorsed by the six entities supplying water to the region.

Additional local water resources planning efforts conducted in the county by various entities include the completion of eleven rivers conservation plans and five river and creek assessment plans.

### **Rivers Conservation Planning and Plans**

The Pennsylvania Rivers Conservation Program was developed to conserve and enhance river resources through preparation and accomplishment of locally-initiated plans. The program provides technical and financial assistance to municipalities and river support groups to carry out planning, implementation, and acquisition and development activities. A registry has been developed to promote river conservation and recognize local river conservation efforts.

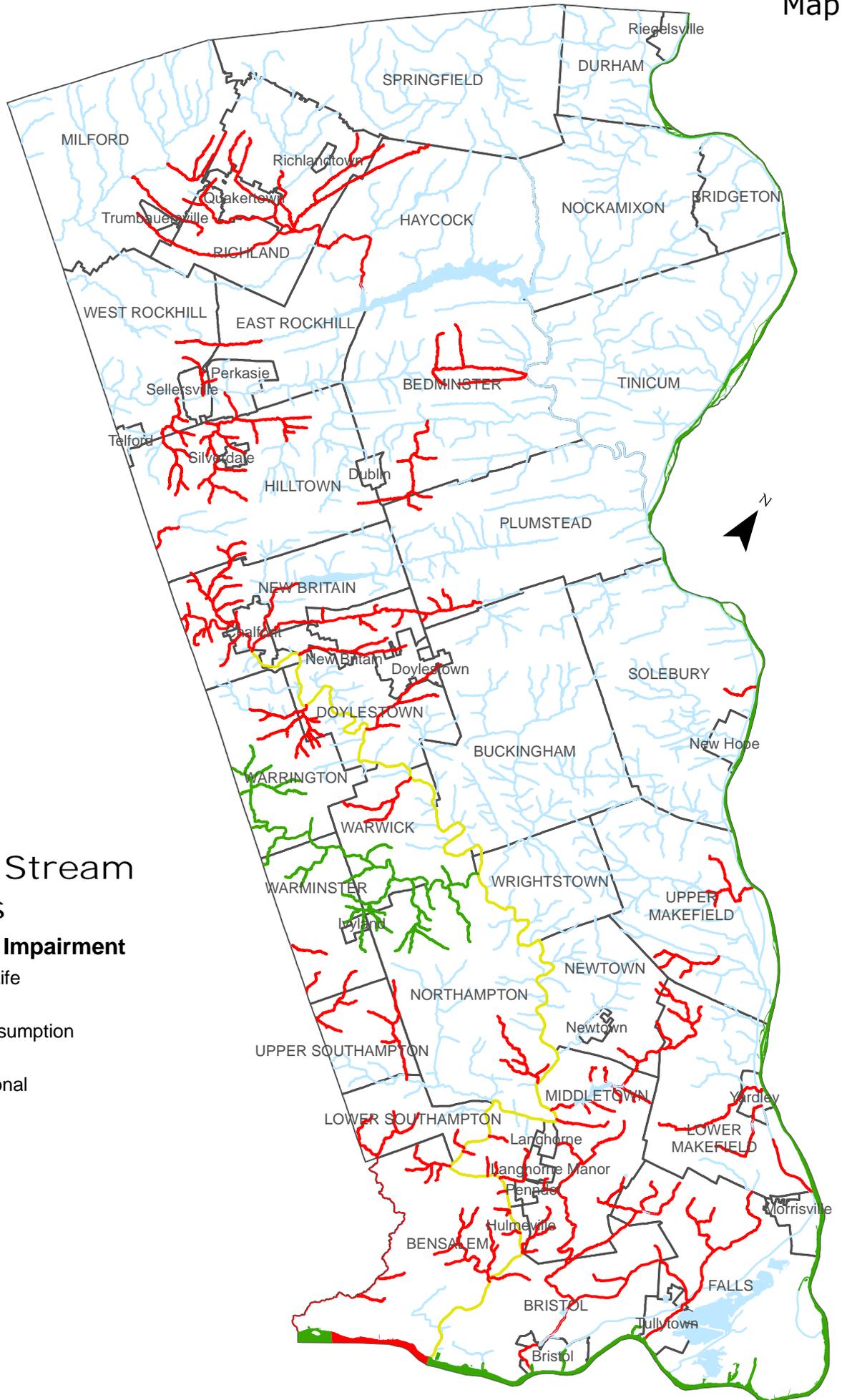
Each river conservation plan provides general recommendations pertaining to watersheds and land conservation. The following river conservation plans were developed for watersheds partially or completely contained in Bucks County. Goals are varied and recommendations from the plans should be implemented where applicable. Recommendations include, for example, reducing pollutant loadings and non-point source pollution; revisions to municipal ordinances that allow for more effective flood control through better stormwater management and land conservation practices; requiring the conservation of groundwater and surface water through proper wastewater facilities planning and water resources planning; effective erosion control measures, stormwater management techniques that recharge, and development standards and promotion of high quality site design.

- Neshaminy Creek Watershed Rivers Conservation Plan (1997)
- Lower Delaware River Conservation Plan (1999)
- The Tinicum Creek Watershed Conservation Plan (2000)
- Schuylkill Watershed Conservation Plan (2001)
- Upper Perkiomen Creek Watershed Conservation plan (2003)

# Impaired Stream Segments

## Designated Use Impairment

- Aquatic Life
- Fish Consumption
- Recreational



- Lower Tohickon Creek Watershed Conservation Plan (2003)
- Upper and Middle Neshaminy Creek Watershed Rivers Conservation Plan (2003)
- Middle Delaware River Conservation Plan (March 2004)
- Lower Neshaminy Creek Conservation Plan (October 2004)
- Upper Tohickon Rivers Conservation Plan (December 2005)
- Little Neshaminy Creek River Conservation Plan (2010)

### River and Creek Assessment Plans

The Bucks County Conservation District and numerous nonprofit entities have conducted five river and creek assessment plans:

- Paunacussing Creek Non-Point Source Pollution Assessment (2001-2002)
- Mill Creek (Otter Creek) Watershed Assessment (2002)
- Little Neshaminy Creek and Bradford Lake Watershed Assessment (2005)
- Cooks Run Watershed Assessment (2004)
- Little Neshaminy Watershed Assessment and Restoration (2003)

As part of river and creek assessments, a comprehensive watershed management plan is developed to improve and further protect the water quality of streams and lakes within a study area. The plan is developed using watershed-specific data and information, which are often compiled, analyzed, and mapped using GIS (Geographical Information System) software. Stream and lake data are collected and analyzed. Both hydrologic and pollutant (nutrients and sediment) budgets are typically determined for the watershed. These studies are particularly helpful to communities having impaired water systems and needing implementation measures to address pollution issues.

## **Water Resources – Strategies and Actions**

### **Surface Water Resources**

- Advocate the protection and restoration of headwater streams and their respective watersheds.
- Municipalities can adopt lake and pond protection standards that at a minimum require 100 percent protection of lake and ponds and a buffer or setback from the wetland vegetation along the lake/pond shoreline maintained as undisturbed natural cover.
- Review and comment on proposed stream redesignations to the PaDEP water quality standards.

### **Groundwater Resources**

- Support municipal initiatives to prepare groundwater studies and update municipal comprehensive plans and ordinances to incorporate findings.

### **Water Resources Planning**

- Cooperate with state, county, and municipal government officials to help implement appropriate recommendations of the Pennsylvania State Water Plan.

- Encourage appropriate implementation of river conservation plans and river and creek assessment plans.

### Land/Water Interface Resources

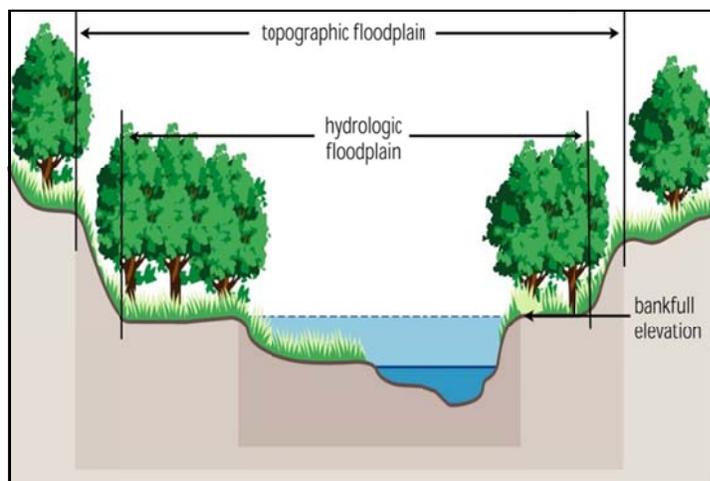
The land/water interface is where land resources meet and intermingle with water resources. Land/water interface resources are categorized for this plan as: floodplains, wetlands, and riparian areas.

#### ***Floodplains***

Floodplains are relatively flat or low-lying areas adjacent to surface waters that experience occasional or periodic flooding. Floodplains are comprised of the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which is the adjacent area covered by flood water but which does not experience the strong current as in the floodway.

Floodplains play a significant role in Bucks County by providing ecological, aesthetic and recreational benefits. The natural vegetation supported by floodplains helps trap sediment from upland surface runoff, stabilizes stream banks for erosion control, and provides shelter for wildlife and proper stream conditions for aquatic life. Primarily composed of loosely deposited sediments, floodplains allow for infiltration water that is slowly released into the stream, as well as aquifers. During periods of heavy rains and high stream flow, floodplains provide temporary storage for floodwaters, reducing flooding threats to adjacent areas, and providing a slower, more consistent flow of water. Development on floodplains deprives flooded rivers of the space they need for drainage, which causes flood waters to flow farther inland damaging communities and forcing more water downstream, creating problems for downstream communities.

**Figure 12**  
**Floodplains**



Severe flooding in 1955 prompted the construction of eight flood control dams (ten dams in total but only eight county-owned dams) in the Neshaminy Creek watershed by the county. While the county

flood control structures have provided significant flood prevention, there are areas that continue to be affected by flood events.

Floods have been and will continue to be a significant threat to the economic and social well-being of selected areas of the county. The main sources of flooding in the county, the Delaware River and its tributaries (e.g., Neshaminy Creek), have produced significant flooding several times in the past. The county has had 10 declared disasters since 1955, including significant events in 1996 and 1999.

Federal policy related to flood issues shifted in the mid-1960s to emphasize non-structural solutions, giving rise to the National Flood Insurance Program. The Pennsylvania Floodplain Management Act (Act 166 of 1978) requires that municipalities adopt regulations with NFIP standards as a minimum. It also encourages planning and development in floodplains that is consistent with sound land use practices. The intent of the act is to protect people and property in flood plains from the dangers and damage of floodwaters and from materials carried by floodwaters, and to preserve and restore the efficiency and carrying capacity of streams and floodplains.

Floodplain soils<sup>7</sup> may be indicators of flooding in areas where FEMA has not identified and calculated the floodway and flood fringe areas. A hydrological study would more accurately define and delineate the floodplain than floodplain soils and is the recommended approach to defining floodplains.

Municipalities are required to adopt zoning regulations to control development in floodplains in order to participate in the National Flood Insurance program. Recognizing federal and state laws and Supreme Court decisions still allow for development in the floodplain, the county recommends limiting development in and removing existing structures from floodplains to reduce risks to life and property. The land use and economic policies of certain municipalities with extensive existing development in the floodplain are also recognized as weighing heavily on the decision to continue to permit such development. Wherever possible, however, it makes sense to keep people and buildings out of harm's way by restricting development.

Certain uses that may be permitted in the floodplain-protected area include agricultural uses, recreation uses, open space required to support development outside the floodplain, utilities, and improvements such as bridges, streets, railroads, and pipelines.

### ***Wetlands***

Wetlands are areas that contain undrained, saturated soils (hydric soils) that support wetland vegetation where the water table is at or near the surface or where shallow water covers the area due to permanent or seasonal inundation of surface or groundwater. There are three basic wetland systems in Bucks County: the riverine system (for example, along the Delaware River shore including tidal marshes and mudflats in the coastal plain); the lacustrine system (surrounding lakes and ponds); and the plaustrine system (including upland marshes).

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<sup>7</sup> Areas subject to periodic flooding or listed in the Official Soil Survey provided by the U.S. Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/>), as soils having a flood frequency other than none.

Wetlands are beneficial because they store water during storms and floods and provide groundwater recharge areas. They also help to maintain and improve water quality by filtering out chemical and organic wastes and providing habitat for plants and animals.

Wetlands have decreased due to development and highway construction activities where dredging, draining and filling have occurred. The destruction of adjacent vegetation and the construction of impervious surfaces increase the amount of stormwater runoff and decrease the natural capacity of the wetland to handle water volumes, runoff speed, and pollutants. Stream channelizations and impoundments impede or redirect natural water flows and drain streamside wetlands. A change in topography, grading and development near wetlands can also deplete their hydrologic function and impact wildlife species.

Section 404 of the federal Clean Water Act (CWA) is the keystone legislation regarding wetland preservation. The U.S. Corps of Engineers has established uniform guidelines for delineating wetlands and regulating the dredging and filling of wetlands. The Corps requires a permit to fill wetlands greater than one acre in size. The Pennsylvania Department of Environmental Protection also regulates wetlands under Chapter 105 Rules and Regulations administered by the Bureau of Dams and Waterways Management. This program expands protection by requiring a permit for any activity that disturbs a wetland and special protection of exceptional value wetlands (i.e., provide critical habitat, stabilizing hydrogeologic functions, and natural recharge for water). State and federal agencies that permit wetlands disturbance may require that the loss of wetlands be mitigated by the creation of wetland areas elsewhere in an effort to foster “no net loss” in wetlands.

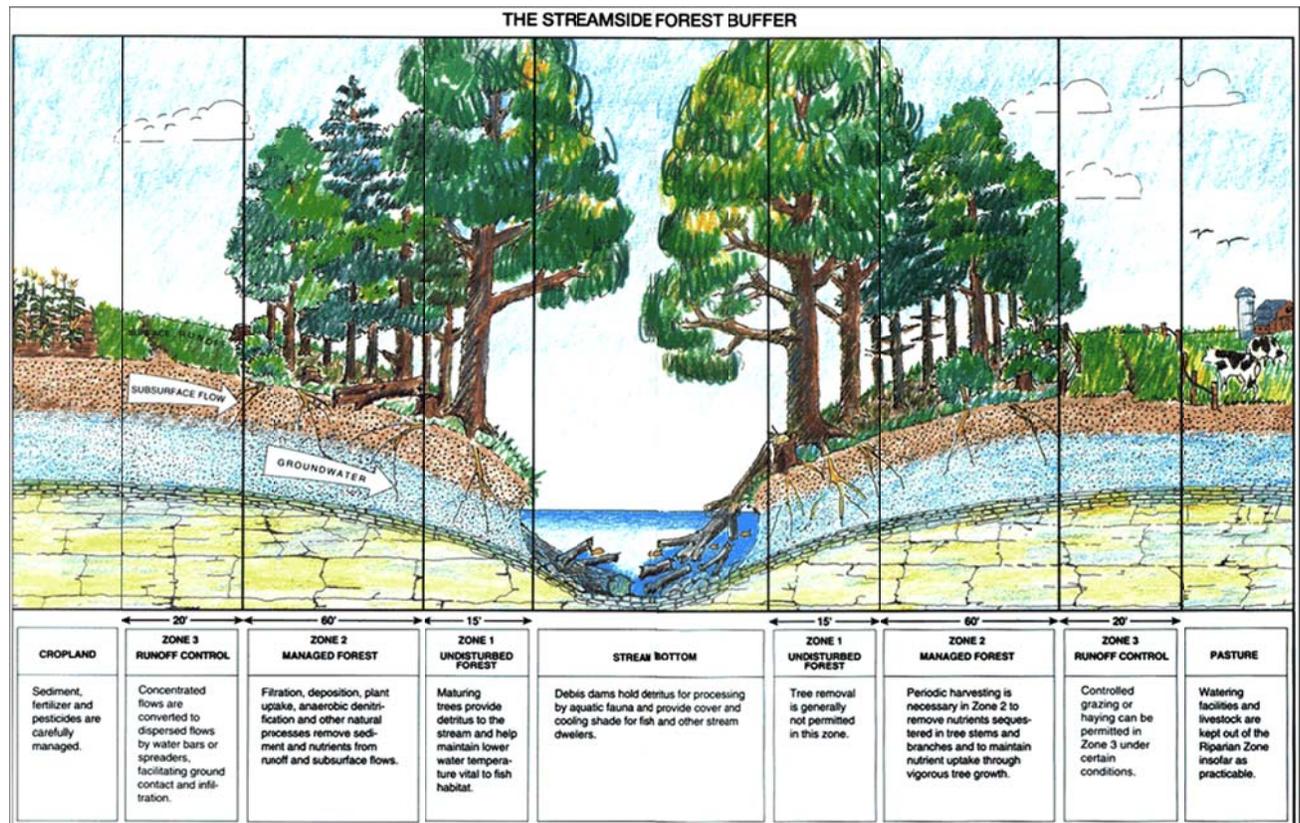
Given the ecological importance, wetlands should be preserved in 100 percent undisturbed natural cover, with a buffer or setback from the edge of the wetland maintained as undisturbed natural cover. Most municipalities recognize the importance of wetlands and have adopted policies, ordinance, and regulations designed to protect wetland and wetland margins. Many allow minor road crossings on wetlands in addition to intrusion allowed by the state and federal permits.

### ***Riparian Corridors***

Riparian corridors are vegetated areas (trees and other plant materials) that run along streams, lakes, and wetlands. Vegetation stabilizes banks and protects against erosion, which helps control flooding, filters sediments and pollutants, and prevents them from entering adjoining waterways. The vegetation also provides habitat for birds and animals and provides shade that cools the water and improves aquatic systems. Fish and other aquatic species are susceptible to overheated stream habitats.

Vegetative buffers composed primarily of native trees and shrubs provide ecological benefit and are recommended by Pennsylvania DEP’s Riparian Forest Buffer Guidance report (2009). The PaDEP promotes a forest buffer, as shown schematically in Figure 13, comprised of two zones (two on each side of the water body).

**Figure 13**  
**Riparian Forest Buffer Zone**



Pennsylvania’s General Assembly approved requirements<sup>8</sup> in 2010 for mandatory riparian forest buffers for earth disturbance projects requiring permits for erosion and sedimentation control or storm water management. Protection of land within 150 feet of an exceptional value or high quality perennial or intermittent river, stream, or creek, or lake, pond or reservoir is required.

Many Bucks County municipalities have adopted ordinances that include riparian buffer protection standards, conservation districts or zones that prohibit the removal of vegetation or the encroachment into the riparian buffer in specific areas. At times, there may be a potential overlap regarding required riparian buffers, wetland buffers and lake/pond shoreline buffers. Municipalities should ensure that these requirements are applied appropriately to any proposed disturbance activity.

## Land/Water Interface Resources – Strategies and Actions

### Floodplains

- Assist municipalities with updating floodplain requirements and ordinance language to comply with new FEMA floodplain maps.

<sup>8</sup> Amendments to 25 Pa Code Section 102.14 of Chapter 102 Erosion and Sediment Control.

- Encourage 100 percent protection of floodplains delineated by FEMA or detailed hydrological studies performed by registered engineers qualified to prepare such studies, where no FEMA mapping is available.
- Support municipal regulations and land use tools that prevent development in and remove existing structure from floodplains to reduce risks to life and property.
- Support the buy-out or elevation of floodprone properties and the return of these areas to a natural state.

### **Wetlands**

- Advocate adoption and update of wetland protection standards during municipal comprehensive plan and ordinance updates. Minimum protection for wetlands should be in 100 percent undisturbed natural cover and a buffer or setback from the edge of the wetland maintained as undisturbed natural cover.
- Support the acquisition of exceptional value wetlands for protection.

### **Riparian Corridors**

- Assist municipalities in preparing riparian buffer requirements.

### **Air Resources**

Air pollution impairs human health, plant life and water quality, buildings, and infrastructure. Air quality has significant effects on the environment. Poor air quality limits the growth and vitality of vegetation, degrades the water quality of lakes and streams, and decreases the ability of the upper atmosphere to filter incoming ultraviolet radiation from the sun. Ground-level ozone (smog) is a result of volatile organic compounds from vehicles and other sources, and nitrogen oxides from industrial sources, reacting with sunlight. Smog is primarily responsible for below-standard air quality (ozone alert) days experienced in urban areas.

Point source air pollution is the introduction of pollutants, such as chemicals, particulate matter, or biological materials, into the atmosphere from a single, identifiable, localized source that cause harm or discomfort to humans or other living organisms, or damage the natural environment. Area sources of air pollution include, for example, multiple flue gas stacks within a single industrial plant, open burning and forest fires, and the evaporation losses from large spills of volatile liquids. Mobile emissions are the exhaust from motor vehicles and small gasoline-powered equipment (e.g., lawn mowers) and are the principal cause of ozone and carbon monoxide pollution.

Acid rain occurs when emissions of sulfur dioxide and nitrogen oxides (combustion by-products) react in the atmosphere with water, oxygen, and oxidants (naturally occurring) to form acidic compounds. Acid rain is detrimental to water quality, contributes to fish kills and the encouragement of specific undesirable plant growth. The burning of leaves and household refuse and the use of wood and coal stoves in high density areas can cause locally unhealthy air quality conditions.

The EPA is responsible for the establishment of maximum air pollutant levels and PaDEP is responsible for administering the permit program regulating the acquisition, construction, alteration, or reactivation of any air pollution source. The PaDEP is also responsible for continuous ambient monitoring program which tracks air quality to regulate sulfur dioxide and nitrogen oxides. The overall air quality of most of Bucks County is adequate but the more developed municipalities, concentrated in Lower Bucks County, do not meet EPA air quality standards.

Relative to mobile source air pollution, transportation conformity is a federally mandated, systematic process through which Metropolitan Planning Organizations, such as Delaware Valley Regional Planning Commission (DVRPC), must demonstrate that the transportation investments, strategies and programs are in compliance with air quality guidelines contained in the State Air Quality Implementation Plan for achieving the National Ambient Air Quality Standards and that emissions do not exceed the targets for emissions from mobile sources.

### ***Greenhouse Gas Emissions***

In 2009, DVRPC undertook the task of establishing inventory of greenhouse gas emissions<sup>9</sup> in the region. This effort was initiated in support of regional efforts to quantify and reduce emissions. The inventory identifies local activities that generate greenhouse gases.

The Regional Greenhouse Gas Emissions Inventory supports local action in cities, boroughs, and townships across the region. This work was carried out in coordination with an advisory group made up of municipal, county, state, and federal officials.

Greenhouse gas emissions, measured in metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E), are calculated for energy used in the residential, commercial, and industrial uses, as well as transportation uses, which includes on-road transportation, passenger and freight rail, aviation, marine transportation, and off-road vehicles. Emissions resulting from waste management (solid waste and wastewater), agriculture processes (both animal and plant related), non-energy-related emissions from industrial processes, and fugitive emissions from fuel systems (natural gas systems and petroleum systems) are also included.

Within the DVRPC region, these uses resulted in emissions of 90.3 million MTCO<sub>2</sub>E in 2005. Over 91 percent of these emissions resulted from energy consumption, including stationary energy consumption by the residential, commercial, and industrial uses, and mobile energy consumption from transportation uses. Waste management and industrial processes each accounted for an additional 3 percent of total emissions.

Numerous tools are available to assist counties and local municipalities in their efforts to reduce greenhouse gas emissions. One such example is the Greenhouse Gas Toolkit<sup>10</sup> developed by the

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<sup>9</sup> Gases that trap heat in the atmosphere are often called greenhouse gases. Some greenhouse gases such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities.

<sup>10</sup> The DVRPC Greenhouse Gas Toolkit may be viewed at <http://www.dvrpc.org/EnergyClimate/>

DVRPC, which provides step-by-step guidance for identifying, prioritizing, and implementing cost-effective strategies to reduce energy demand and curtail greenhouse gas emissions in municipal operations. Municipal leaders can use the tool kit to scrutinize current energy use and identify where to conserve. The Toolkit draws on analysis carried out by the City of Philadelphia in developing and implementing Greenworks Philadelphia, the city’s sustainability framework, released in spring 2009.

### **Air Resources – Strategies and Actions**

- Consider the effects of development, traffic, and activities on air quality and incorporate these considerations into land use decision making in comprehensive plans
- Encourage municipalities to establish, enact, and enforce nuisance standards for airborne particulates generated by earth moving and construction or demolition.
- Municipalities should update ordinances to be compliant with Pennsylvania Department of Environmental Protection’s requirements for outdoor wood-fired boilers.
- County to continue efforts to reduce energy usage and become more energy-efficient.

### **Natural Resource Protection and Development**

There are land development techniques and measures that municipalities can use to preserve natural resources and accommodate development, consistent with the goal of sustainability. The purpose of the conservation development option is to preserve important natural resources, while still allowing responsible development. When determining the layout of this type of development, the environmental features to be preserved are delineated first, followed by dwelling locations and then the road layout. Easements are then placed on the natural areas to ensure that it will not be disturbed.

The total amount of disturbed area within a site is reduced by placing development away from environmentally sensitive areas (wetlands, steep slopes, etc.), future open spaces, tree preservation areas, future restoration areas, and forest buffer zones. At a subdivision or lot level, ground disturbance is confined to areas where structures, roads, and rights of way will exist after construction is complete. Limiting areas of disturbance reduces the potential for erosion and can be accomplished by prohibiting clearing and grading from all natural areas and environmentally sensitive areas.

Protecting existing vegetation and encouraging the use of native plants can reduce long-term maintenance burdens and the demand for significant amounts of fertilizer and watering.

Site Analysis and Resource Conservation Plan is a site planning and evaluation concept that combines elements from “standard” subdivision ordinance requirements with conservation design principles, both for natural resources and cultural features (e.g., historic resources, viewsheds). Such requirements do not affect the development potential of a site, but encourage better site planning. The analysis and plan would ensure that all development occurs in a manner that respects the natural environment and the cultural features that are important to the site, the surrounding area, and the municipality. Several municipalities have incorporated requirements for a site analysis and resource conservation plan in their subdivision and land development ordinances.

With such an analysis and plan, developers and municipal officials would have a solid understanding of the conditions around the site that provide the context for the proposed development. It is more useful than an environmental assessment or environmental impact statement in that it deals with the site before anything is built and addresses how valuable resources could be preserved. Environmental impact statements indicate what impacts would result after the development is built.

An existing resources inventory would be required to provide a comprehensive analysis of conditions on the proposed development site and areas within 500 feet, showing topography, natural drainage patterns, vegetative cover, soils and geology, historic buildings or sites, viewsheds or scenic views, pastureland and cropland, areas identified by the Pennsylvania Natural Diversity Inventory, solar access and orientation, and other features on and of the site. Narrative would be provided to indicate ways in which the developer would respect the existing valuable resources described in the site analysis.

The resource conservation plan would require that the layout of the lots or development occur so that the areas identified as being important in the site analysis are preserved and the areas of secondary importance are used for development. Limits on site disturbance, use of natural drainage patterns, preservation of historic areas and scenic views, preservation of solar access, protection of natural areas, and protection of groundwater resources would all be required considerations.

### **Natural Resource Protection and Development – Strategies and Actions**

- Encourage municipalities to designate and map environmentally sensitive and valuable areas for protection.
- Encourage municipalities to look at natural resource features for all planning and prepare comprehensive and open space plans that consider these features while addressing future growth.
- Foster land development compatible with natural resource protection standards and sensitive to natural site limitations.
- Encourage flexible and innovative approaches to site development, such as performance development, conservation design, and site analysis and resource conservation plans, that protect environmental features of a site, minimize impact on natural resources, and allow for development.



Bucks County, one of the three original counties in Pennsylvania, has a rich historic and cultural legacy. The historic buildings, sites, villages, covered bridges, and artifacts are material reminders of those who once lived here and the ways in which they lived, and a tangible way of transmitting cultural heritage from generation to generation.

The earliest recorded settlers in Bucks County were Native Americans of the hunter-gatherer, agricultural Leni Lenape Tribe (Unami Nation). They established an extensive trail system, which for early European settlers formed the framework for stagecoach routes, and then roads. Major village sites included locations near Point Pleasant, Lower Southampton, and Perkasié. But by 1775, the Lenape were gone from the Delaware Valley, many vanquished by imported diseases brought by European settlers, and the rest were forced to migrate west, eventually settling in Oklahoma and Ontario, Canada.

Swedes and Dutch came early to the region, establishing trading outposts, trapping, and mining industries in the 17<sup>th</sup> century. England succeeded in colonizing Pennsylvania, and King Charles II of England repaid a debt to William Penn's family in 1681 with a land grant of the Province of Pennsylvania, the largest in the American colonies.

Penn's vision for his estate was founded on religious freedom and town planning, envisioning Philadelphia as the center of a grid of prosperous, stable towns surrounded by farmland. English Quakers were joined in Bucks County first by German immigrants, followed by Scotch-Irish, and then by new waves of Irish and Germans.

Villages, crossroads, taverns, meetinghouses, covered bridges, mills and farmsteads defined place for early settlers and often formed the hub of communities that followed. When well-maintained and restored, they function as an anchor for our communities, providing visual references as to our rich heritage. Sources of architectural diversity and visual appeal, they contribute to the quality of daily life.

By their nature, historic resources are sustainable—the greenest buildings are those that exist. The upkeep and restoration of historic properties can be a linchpin of redevelopment in older communities, triggering private investment and resurgent neighborhood pride. Redevelopment, reinvestment and heritage-based tourism are sources, too, of economic benefits that flow from preservation efforts.

### **Issues Affecting Historic Preservation**

The cost of restoring, or even maintaining, historic properties often discourages their preservation. Buildings and structures are sometimes allowed to deteriorate to the point where it is physically and economically impossible to restore them to sound condition. Market conditions, changing consumer preferences or other factors may make it too costly to retain a building or structure in its original use and condition.

Construction and repair materials and techniques have changed over time, as have the type of systems and conveniences expected today. A consideration in restoring and maintaining historic properties is reconciling historic authenticity with provisions for modern amenities. A common concern is the impact

from the use of materials or construction techniques, other than the original, and the compromised appearance resulting from incompatible structural additions or alterations to exterior features. At the same time, advances in technology and manufacturing have resulted in materials that replicate the appearance of those originally used, often at lower cost and with greater durability and less needed maintenance.

Historic context, defined as the built and natural surroundings of historic structures, contributes significantly to the integrity and meaning of historic sites. Growth pressure in historic areas and their surroundings may threaten the visual and spatial integrity of historic resources. Even if the physical integrity of a historic structure or district is preserved, changes surrounding the historic resource may compromise its character and context.

Because of the increased value of land, the desirability of building in Bucks County, and changing consumer market preferences, existing historic buildings have been demolished and replaced by larger, more expensive and amenity-laden homes and nonresidential buildings. This phenomenon, referred to as “tear-downs,” challenges the economic and physical viability of older structures given modern demands, uses, spatial requirements, and preferences. It also erodes historic context.

Purchasing and renovating an older building can be more expensive than buying and maintaining a new one. Despite the demonstrated economic value and visual appeal of well-preserved historic neighborhoods and business districts, owners or developers may consider it too costly to invest in rehabilitation or conversion, rather than new construction. It can be difficult to convince people to choose the potentially more expensive, time consuming, and less profitable road of historic preservation.

Technical capacity is important in designing and implementing a program to protect historic resources. Communities may need professional guidance to supplement the efforts of municipal staff and volunteers in performing historic surveys, developing design guidelines, or advising on permit applications for changes to historic properties, among other things.

Two types of appointive advisory bodies are commonly used to help administer municipal historic preservation activities. A Historic Architectural Review Board (HARB), an advisory body authorized under state statute, is required to include members with certain types of relevant professional skills, and functions within a designated historic district. The other advisory body is the historic commission, which can advise planning commissions and elected officials on historic resource protection, review demolition applications, conduct research and public education, and maintain a historic resource map.

There remains the need for public education and information about the methods and benefits of historic preservation. Historic districting and other protection techniques are often misunderstood or viewed negatively.

Historic preservation is one competing element in a hierarchy of needs at the municipal level. Local officials must prioritize activities and spending, in the face of limited staff and funding. Historic preservation may compete with other planning goals, such as providing community services, making

road improvements, or maintaining other infrastructure, or be of lesser concern. Preservation may rank high among the priorities of a borough, for example, while holding less importance in a community of recent vintage with few potential historic resources.

### Methods of Evaluating Historic Significance

The universe of potential historic resources comprises structures, buildings, districts, sites and objects at least 50 years old. In rare cases, resources not that old may be considered significant.

The basic method for identifying significance is the historic survey. Surveys can be done at a variety of scopes and levels, ranging, for example, from an inventory to determine the likelihood of significant properties and the need for further evaluation, to a comprehensive resource survey geared toward documenting nominations to the National Register of Historic Places. The survey will include information on the location, ownership, appearance, materials, architectural style and historic significance of the resource. A survey can be used to find previously unknown or overlooked resources. It identifies historic buildings, sites, districts, structures and objects eligible to be classified and protected. Most municipalities in Bucks County have undertaken some form of historic survey. Map 10 shows the location of completed surveys. Since historic resources are not static, historic surveys should be updated periodically to reflect current conditions, including demolition of historic resources.

Preservation planning is an often underutilized, but valuable, technique. Survey information on identified and potential resources can serve as the foundation of a preservation plan. Such a plan is useful in prioritizing resources for protection and identifying the nature, order and staging of preservation activities, and who is responsible for implementing them.

The National Register of Historic Places is part of a nationwide program to coordinate and support public and private efforts to identify and protect resources of significance in American history, architecture, engineering, and culture. The National Park Service’s standards for evaluating the significance of properties were developed to recognize the accomplishments of all people who have made a significant contribution to our country’s history and heritage. The criteria are designed to guide state and local governments, federal agencies, and others in evaluating potential entries in the National Register.

<p><b>NATIONAL REGISTER EVALUATION CRITERIA</b></p> <p>The criteria applied to evaluate properties for the National Register include the quality of significance in American history, architecture, archaeology, engineering, and culture present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and</p> <ul style="list-style-type: none"> <li>• are associated with events that have made a significant contribution to the broad patterns of our history; or</li> <li>• are associated with the lives of persons significant in our past; or</li> <li>• embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or</li> <li>• have yielded or may be likely to yield, information important in prehistory or history.</li> </ul> <p>Source: <a href="http://www.cr.nps.gov/nr/listing.htm">http://www.cr.nps.gov/nr/listing.htm</a></p>
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Nominations for National Register listing are certified by and administered through the Pennsylvania Historical and Museum Commission. Listing restricts potential alteration or demolition of historic resources through activities involving the federal government, but does not abridge the rights of private property owners.

### **Historic Resources in Bucks County**

With countless historic properties of national and local importance, Bucks County has a wealth of historic resources.

The most significant places in American history are identified as National Historic Landmarks. These landmarks are cultural properties designated by the U.S. Secretary of the Interior as being *nationally* significant. They illustrate and commemorate our collective past and help us to understand our national identity. Historic properties of national significance that typify Bucks County's chronicled past include the following 11 National Historic Landmarks:

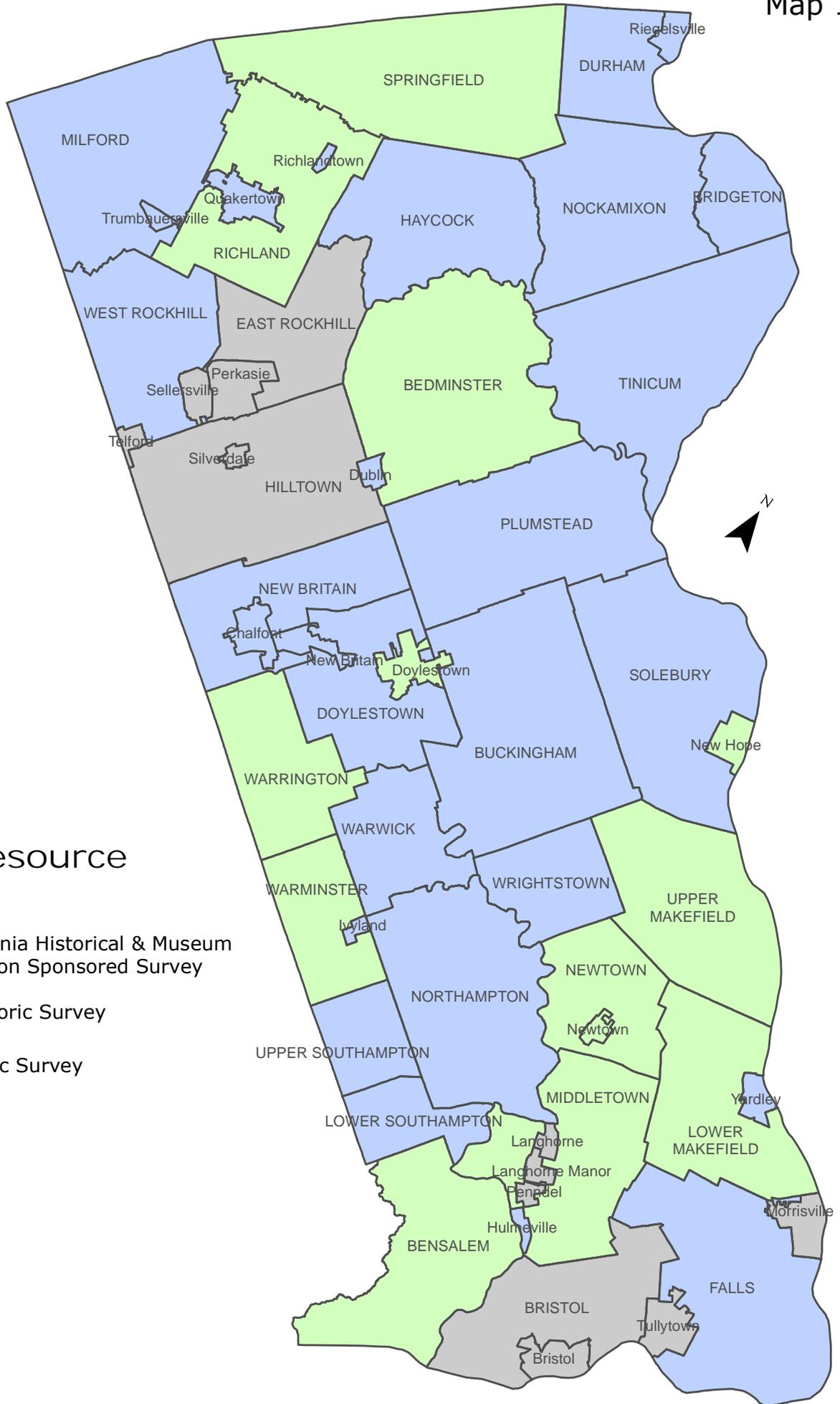
- Andalusia, Bensalem Township
- Buckingham Friends Meeting House, Buckingham Township
- Delaware Canal, extends generally parallel to the Delaware River from Riegelsville Borough to Bristol Borough
- Fonthill and Moravian Pottery and Tile Works, Doylestown Township
- Hayhurst Farm, Upper Makefield Township
- Honey Hollow Watershed, Solebury Township
- John Chapman House, Upper Makefield Township
- Pearl S. Buck House, Hilltown Township
- Mercer Museum, Doylestown Borough
- Summerseat, Morrisville Borough
- Washington Crossing State Park, Upper Makefield and Solebury townships

In addition to these 11 landmarks, there are other resources that are listed on the National Register of Historic Places—43 historic districts and 101 individual resources within Bucks County. Other resources, including 34 historic districts and 234 individual resources, have been determined to be National Register eligible, although not formally listed. Another resource category consists of locally significant properties. While these resources may not be eligible for National Register listing, they can be protected under municipal historic preservation regulations.

Map 11 illustrates the countywide distribution of historic resources of determined and potential significance. Included are National Historic Landmarks, properties listed on the National Register, and those eligible for register listing. Nearly all Bucks County municipalities have resources that are either listed or eligible for listing on the National Register.

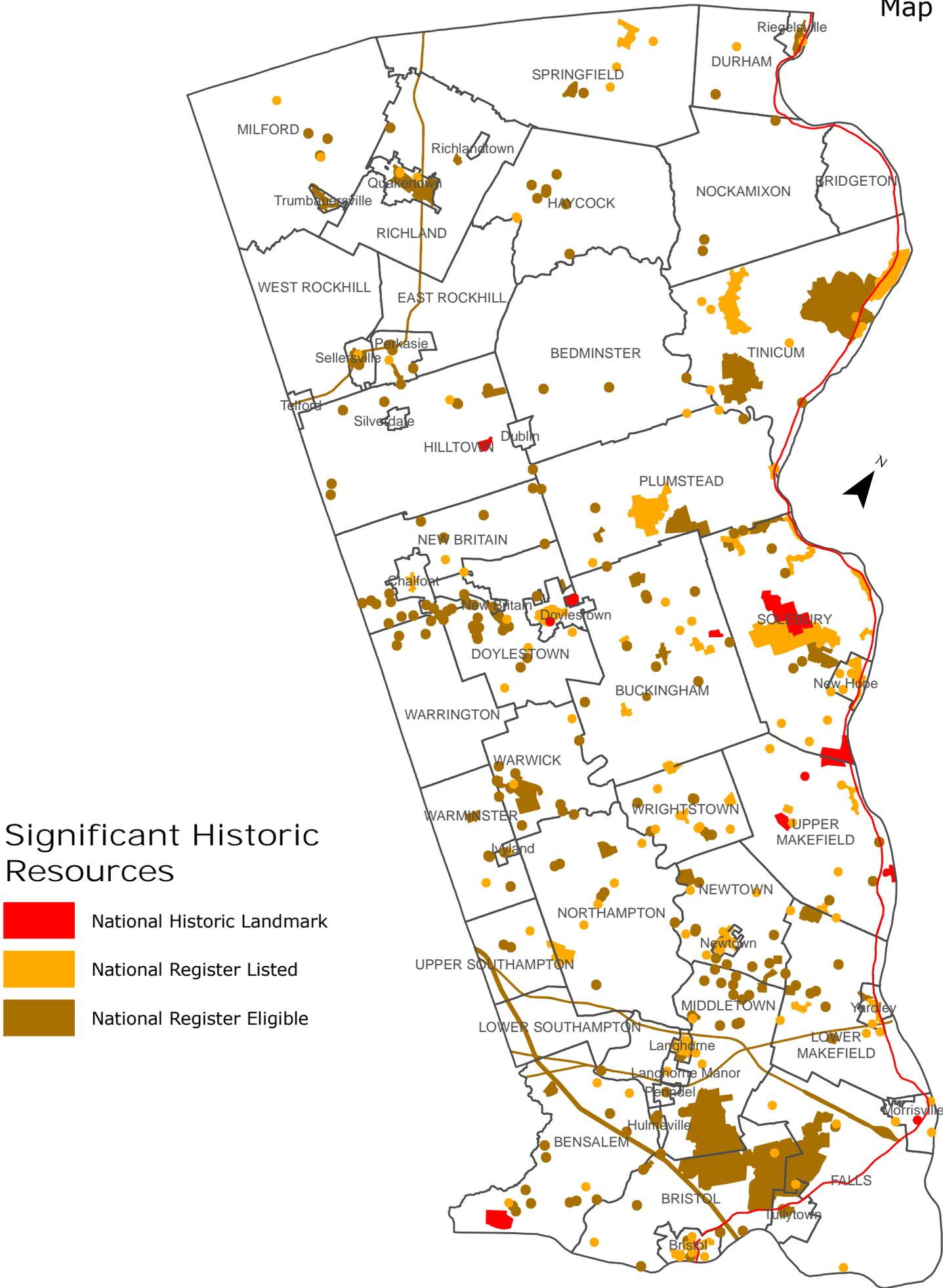
### ***Pennsylvania Historical Marker Program***

Established in 1946 by the Pennsylvania Historical and Museum Commission, the Pennsylvania Historical Marker Program has administered a program of roadside historical markers to that highlight



## Historic Resource Survey

- Pennsylvania Historical & Museum Commission Sponsored Survey
- Local Historic Survey
- No Historic Survey



people, places, and events that have affected the lives of Pennsylvanians over the centuries since William Penn founded his Commonwealth. Seventy-four markers are located throughout Bucks County.

**Historic Villages**

The over one hundred villages of Bucks County are an important part of the county’s heritage. These villages include hamlets, residential villages, and commercial villages.

- Hamlets are characterized as containing a few houses at a crossroads or in close proximity to each other. Examples include Uhlerstown, Fairhill, and Passer.
- Residential villages are predominantly residential but also contain community related services such as a church, post office or general store. Examples of residential villages are Carversville, Wycombe, and Blooming Glen.
- Commercial villages often began as residential villages but over time evolved to become characterized by commercial uses or services that draw on a broader region for support. Commercial uses might include gas stations, antique and furniture stores, inns and taverns, and offices and shops. Examples of commercial villages are Ottsville, Point Pleasant, Upper Black Eddy, and Springtown.

Historic in nature, these villages provide opportunities for learning about the county’s heritage, as well as providing the opportunity to explore the diversity of architectural styles in the county. The county’s villages are described in *The Villages of Bucks County, A Guidebook*.

**Covered Bridges**

Covered bridges in Bucks County are important and significant historic structures and are important in the history of bridge building. The town truss system, a system of timber diagonals with no verticals, was strictly used to construct covered bridges in the county. As a result, Bucks County contains the largest number of town truss bridges anywhere in Pennsylvania. Historic bridges are discussed in more detail in the Transportation and Mobility section in Part IV of the plan.

**Table 17  
Covered Bridges**

Covered Bridge	Location
South Perkasio Bridge	Perkasie Borough
Cabin Run Bridge	Plumstead Township
Pine Valley Bridge	New Britain Township
Sheard's Mill Bridge	East Rockhill and Haycock townships
Loux Bridge	Plumstead Township
Van Sant Bridge	Solebury Township
Knecht's Mill Bridge	Springfield Township
Uhlerstown Bridge	Tinicum Township
Erwinna Bridge	Tinicum Township
Frankenfield Bridge	Tinicum Township
Mood's Bridge	East Rockhill Township
Twining Ford/Schofield Ford Bridge	Newtown/Northampton Township

Bucks County at one time had more than 50 covered bridges. Today only 12 bridges are standing, ranking the county fifth among counties in Pennsylvania. Of the 12 remaining bridges, 10 are listed on the National Register of Historic Places.

### **Architecture**

Historic resources within the county represent a range of architectural styles spanning the 17<sup>th</sup> to 20<sup>th</sup> centuries. Many of the historic buildings standing today are evidence of the skilled workmanship and high quality of the building materials that typified construction of bygone years.

The earliest structures were in the Postmedieval English style (1680-1700), soon followed by the symmetry of Georgian (1700–1780) and Adams (1780-1820) architectural styles. Following the American Revolution, Federal, Greek, and Gothic Revival structures appeared in Bucks County towns and villages. Various forms of Victorian architecture flourished here by the late 19<sup>th</sup> century, giving way to Prairie, Craftsman, and Modern styles that characterized the eclectic architecture of the 20<sup>th</sup> century.

### **Tools and Techniques of Historic Preservation**

The Commonwealth of Pennsylvania has enacted laws that support historic preservation efforts at the municipal level and allow preservation protections to be enacted by ordinance. The state’s preservation enabling legislation has two distinct arms, but the regulatory measures afforded by each work well in concert.

The Pennsylvania Historic District Act (Act 167), enacted in 1961, enabled municipalities to designate historic districts and adopt ordinances crafted to protect them. The act provides for appointment of a local Historic Architectural Review Board (HARB) to advise the governing body on the appropriateness of proposed construction, renovations and demolitions within a historic district. The state historical commission lists a total of 17 historic districts in Bucks County established under Act 167.

Historic districts designated in accordance with Act 167 are not zoning districts. Regulations for the historic districts are contained in a different local ordinance from the zoning ordinance or the subdivision and land development ordinance. Historic district ordinances regulate changes to structures within a designated historic district by establishing a mechanism for reviewing exterior changes. The level of regulation a municipality may undertake through a historic district ordinance can extend from controls on the demolition of historic buildings to guidelines governing exterior alterations. These controls govern only those alterations that require a building permit and that are visible from a public street. Activities such as painting, interior renovations and minor repairs are not subject to HARB review.

Some municipalities with HARBs supplement their basic regulations with design guidelines. Guidelines illustrate architectural styles, features, or types of improvements that would be considered suitable for buildings in the historic district. Design guidelines can encourage retention, authenticity and visual appropriateness of scale, style, materials, colors and architectural features of structures that are restored or built in historic districts and individual properties.

About a dozen of the county's municipalities employ design guidelines in conjunction with other historic protections. Solebury Township's guidelines address authenticity in architectural style, materials and color in two historic village districts, and extend to tips on cleaning, hardware, and masonry repointing. Newtown Borough's guidelines apply to an extensive historic district, which covers more than half of the community, and provide specialized stylistic guidance tailored to each segment of the district.

The state Historical and Museum Commission maintains a program that designates as Certified Local Governments (CLGs) municipalities that have Act 167 historic districts and meet standards for professional qualification of HARB members, preservation ordinance enforcement and reporting of activities. The CLG designation enables the municipality to apply for grants for historic preservation activities that include resource surveys, public education, and technical assistance. The state historical commission lists five CLGs in Bucks County: Bristol, Chalfont, and Yardley boroughs, and Lower Makefield and Upper Makefield townships.

A complementary preservation pathway is through the zoning power granted municipalities by Act 247, the Pennsylvania Municipalities Planning Code (MPC). Amendments to the MPC enacted in 2000 authorize zoning ordinances to protect historic resources—Section 603(b)(5) was amended to allow zoning ordinances to protect historic resources, and a new Section 603(g)(2) requires that zoning ordinances “shall provide” for the protection of historic features and resources.

Zoning ordinances can include regulations that allow municipalities to control characteristics such as density of development, maximum building sizes and setbacks, or allow for special uses and redevelopment of historic properties.

Zoning powers authorized under the MPC can be used to protect areas or buildings of historic importance. This can be done under the authority of the Pennsylvania Municipalities Planning Code (Section 605 (2) (vi)), which allows for special classification and regulations of “places having unique historical, architectural or patriotic interest or value....” In Bucks County, useful zoning tools have been developed to accomplish this.

Additional Use Opportunities – Some zoning ordinances allow historic buildings to be used for a broader range of uses than would otherwise be permitted in a particular zoning district. In order to encourage the continued use and preservation of historic buildings and resources and to facilitate their appropriate reuse, ordinances can allow for the reuse of large historic homes as a bed and breakfast or office, for example. By allowing for additional uses, preservation of historic buildings is encouraged and older structures that might not remain practical for the purpose for which they were originally designed can become viable.

Adaptive reuse, which can be one result of the additional use opportunities approach, is a useful tool to promote preservation because it widens the range of potential uses and supports the economic and practical feasibility of saving or rehabilitating historic properties. Adaptive reuse is the conversion of a historic property for a purpose other than the one for which it was originally built, which typically

involves interior renovations that leave intact the building's exterior appearance, accompanied by a change of use.

Examples of adaptive reuse include multifamily residential or bed-and-breakfast conversions that favor the conservation of large older homes, conversions to small shops, cultural facilities or professional offices, and conversions of barns to non-agricultural uses such as offices or residences. Adaptive reuse may include special zoning provisions, but often the change is simply from one permitted use to another, particularly in zoning districts with concentrations of historic resources and regulations that encourage appropriate conversions. About one-third of the county's 54 municipalities include adaptive reuse provisions in their zoning ordinances, most typically as residential conversions in boroughs.

Historic barns are material reminders of Bucks County's rural heritage. Zoning provisions for barns can include the goal of retaining and maintaining these structures if they are not in active agricultural use. This may involve permitting residential, office, light commercial, cultural or institutional adaptive reuse of barns in agricultural or low-density residential districts.

*Bucks County Barns*, issued by the Bucks County Planning Commission in 2004, provides information and technical assistance on the identification, preservation and practical reuse of historic barns. Hilltown Township's zoning ordinance includes a section on adaptive reuse opportunities limited to barns built before 1920.

Historic Resources in the Development Process – Most historic resources are lost during the development process, when a large farm is subdivided and the original house or barns are removed to make way for new houses, or an old inn is demolished to make way for a pharmacy or service station. By preparing an inventory of historic resources and by requiring a developer to identify any resources proposed to be removed, municipal officials can work with applicants to preserve important sites. This can be accomplished by allowing lot averaging, setback reductions, or density considerations so that a developer can save the historic buildings without losing development potential.

Delay of Demolition Ordinances – These ordinances are employed to discourage the demolition of historic properties. The regulations typically set standards for demolition, the application and review process, and a waiting period before demolition can take place. The demolition permit procedure typically requires a review of applications to demolish historic structures and establishes a waiting period before demolition can take place. The delay period allows time to consider alternative uses or to photograph and document the building before it is razed.

Village Zoning – In Bucks County, historic resources often remain concentrated within villages. Village preservation and planning often consists of preserving the historic buildings as well as the surrounding areas that contribute to the context of historic villages. Special attention to setbacks, lot coverage, and lot size requirements for village areas is needed to recognize the uniqueness of the historic development patterns and to avoid forcing out older buildings in order to accommodate new uses. The areas at the edge of villages are equally important; most villages have a defined edge and are surrounded by open space. Cluster and conservation-based subdivisions and preservation of open space can be used to

preserve and enhance viewsheds—the open space around historic villages—if the requirements of the zoning ordinance are written with this goal in mind. Setbacks, open space, buffer yards and landscaping, singly or in combination, are tools for preserving or defining viewsheds. Viewshed protection techniques were employed in the *Blooming Glen Historic Village Plan (2004)* and the *Springtown Village Study (2000)* issued by the Bucks County Planning Commission.

## Agencies and Programs

A number of public and private agencies work to publicize and further historic preservation activities in Bucks County. HARBs and historic commissions are appointive public bodies that have specific roles in historic preservation at the municipal level. Private historic societies in many communities undertake educational and fundraising programs in support of historic preservation in general, or of specific resources. For example, the Heritage Conservancy is a nonprofit organization based in Doylestown Borough that conducts historic surveys and provides other forms of technical expertise in preservation and resource conservation.

Visit Bucks County, the county’s tourism promotion agency, integrates heritage tourism into its promotional activities. Heritage tourism is leisure travel to visit historic, cultural, scenic, natural attractions to learn about history and culture in an enjoyable way. The bureau runs a tourism grant program for nonprofit organizations and other bureau members. The program funds special festivals, capital projects and marketing plans designed to attract visitors through tourism, preservation of historic resources, enhancement of local attractions, or special events.

The Bucks County Open Space Program allocates funding to assist with preservation of historic properties. Other specialized programs exist to promote, enhance and restore the county’s historic attractions. They include:

**Landmark Towns** – This program is a cooperative venture among the boroughs of Bristol, Morrisville, Yardley, New Hope, and the Delaware and Lehigh National Heritage Corridor. It seeks to promote economic development and tourism growth in the downtown business districts of these four historic riverfront communities.

**Route 113 Heritage Corridor** – The Heritage Conservancy is coordinating efforts to preserve the rural and historic nature of this farming corridor spanning Bucks and Montgomery counties from the Delaware to the Schuylkill River.

**Liberty Bell Trail** – The state Department of Conservation and Natural Resources has provided a grant to create a recreational trail that follows the path of the Liberty Bell electric streetcar route that ran from Philadelphia to Allentown during the first half of the 20<sup>th</sup> century. The streetcar route parallels the route along Bethlehem Pike used to transport the Liberty Bell to a safe place in Allentown in 1777 during the British occupation of Philadelphia.

**Classic Towns** – This initiative sponsored by the Delaware Valley Regional Planning Commission seeks to spotlight the region’s older communities as good places in which to live, visit, and work.

**Community Development Block Grant** – Funding from a portion of this federal grant program may be applied to historic preservation activities where preservation will help to eliminate blight.

### Strategies and Actions

- Reinforce the character and ambience of historical and cultural areas through the preservation of historic and cultural resources.
- Strengthen efforts to identify, designate, interpret and protect significant archaeological and historic resources.
- Create and maintain a countywide database of historic preservation resources. Contents could include National Register listed districts and other resources, resources of confirmed or potential Register eligibility, ordinances, and completed historic surveys and preservation plans.
- Encourage municipalities to conduct surveys; and plan for and require historic preservation, providing technical assistance where feasible, including integrating preservation into comprehensive planning, ordinances and design.
- Promote rehabilitation and adaptive reuse of historic structures and properties, including barns, by allowing for additional use opportunities and encouraging
- Preserve the appearance of historic bridges, while addressing traffic and safety needs.
- Use delay of demolition ordinances so preservation options can be explored.
- Protect the context around historic buildings and in and around historic boroughs, villages and hamlets.
- Increase public awareness of the value and importance of the county's historic and cultural resources, and support historic preservation education efforts geared toward various audiences, including municipalities, the general public, developers, practitioners, and public officials.
- Ensure that subdivision and land development plans and ordinance amendments complement and respect historic resources.

The preservation of scenic resources reinforces a unique sense of place and helps to retain our cultural and natural heritage for generations to come. Scenic resources are characterized by natural and visual qualities, among them prominent historic structures and sites, pristine landscapes, villages, farmlands, geological formations, and combinations of resources such as river and stream valleys and wooded hillsides. The Delaware Canal, for example, is a National Historic Landmark that affords scenic vistas along its course from Upper to Lower Bucks County. River Road (Route 32 and portion of Route 611), a scenic roadway, winds its way along the Delaware River through historic villages, farm fields, and forested hillsides.

Many, but not all, scenic resources are created by nature. Built features such as rail fences, stone walls, covered bridges, other historic structures, and villages contribute to the visual impact of scenic places. For more detail on the value and preservation of built resources, see Historic Resources section of Part IV of the plan.

While threats to the integrity of scenic resources come from a variety of sources, scenic assets are lost, depleted, or overwhelmed primarily by insensitive development activities. Protection of scenic assets, in accordance with this plan's Principles and Foundations, furthers the objective of conserving our natural and historic heritage while promoting development that respects natural lands and historic resources.

### **Identification of Scenic Resources**

Views from roadways, bike paths, trails, rivers, lakes, and streams within picturesque settings are often memorable and visually appealing. Although identifying scenic resources and their inherent aesthetic value is a subjective process, certain defining qualities distinguish scenic areas.

Preserving all scenic resources in a municipality is often not practical or feasible. Consequently, criteria often used to designate scenic resources are limited to areas that are accessible to the public. While public areas can encompass a variety of settings (e.g., parks, preserved open space areas, trails, and roadways), from a regulatory standpoint, scenic resources are often classified as scenic roads and vistas.

There are 39 municipalities in Bucks County that identify scenic roads and vistas in their municipal open space and comprehensive plans. Scenic roads are roads or segments of roadway that contain natural, historic or cultural resources in proximity to or pass through a scenic vista. The defining characteristics of scenic roads are subjective and contingent upon the visual preferences of those who travel them. But some generally accepted features of scenic roads include a winding course, and views of water, historic villages or structures, farms, woodlands or other natural landscapes.

Scenic vistas are areas that can be seen along public ways (roads or trails) that have sweeping views of the landscape. Bucks County municipalities, for regulatory purposes, have generally limited the extent of scenic vistas to areas that can be seen from a public roadway.

### **Ways to Protect Scenic Resources**

The protection of scenic resources should begin with their identification in the development of the municipal comprehensive plan and during the early planning stage of subdivision and land development

proposals. Municipal officials should ensure that their zoning and subdivision ordinances provide regulatory protection of scenic, natural, and historic resources. Ordinance provisions should regulate development activity that would affect the entrances to historic villages, as well as scenic roadway vistas encompassing historic sites and structures, streams, valleys, fields, hillsides, and other natural features.

Thoughtfully crafted development standards can also control the scale of building within or adjoining scenic places. Such standards should regulate lot and building size to ensure compatibility in style and scale with existing structures and vistas.

As part of the subdivision and land development planning process, various municipalities require the applicant to prepare a site analysis and conservation plan that includes an analysis of existing conditions on a site, including the mapping of significant natural, cultural, and scenic resources. Generally, these areas are recommended for preservation (when feasible) during the design and layout of a site.

### ***Scenic Resource Ordinances***

Some municipalities have enacted scenic resource ordinances that employ planning and zoning techniques that focuses on preserving scenic resources. For instance,

- Solebury Township has a scenic resource ordinance which requires setbacks of 200 feet around historic villages and 150 feet from the right-of-way of identified scenic roadways. The ordinance also sets standards for buffering of scenic resources.
- Tincum Township has adopted a scenic roads and scenic corridors overlay district requiring that all substantial improvements proposed within the district be approved by conditional use. Building height, grading, and landscape buffering within the district are regulated.
- Springfield Township, likewise, has enacted a scenic overlay district. The zoning ordinance provisions for this overlay district require development applications to include a map of scenic resources, and analysis and sketches of viewsheds as they would appear before and after development. The ordinance also imposes performance standards intended to foster maximum possible preservation of resources and viewsheds.

Planning efforts by the National Park Service have created a comprehensive regional framework for protecting the scenic Delaware River corridor. A few of the county's Delaware River municipalities have adopted a scenic overlay district, as outlined in the *Lower Delaware River National Wild and Scenic River Study*, issued by the park service in 1997. This overlay district extends north to the Bridgeton Township line and south to the Plumstead Township line for a width of 1,100 feet inland from the western edge of River Road. It also includes the Tohickon, Tincum, Rapp, and Beaver creeks, and all tributaries, for a width of 1,100 feet.

The park service's *Lower Delaware River Management Plan* (1997) describes means of protecting areas within the proposed Wild and Scenic River designation area. At least two municipalities in Bucks County—Plumstead and Tincum townships—have adopted their own overlay districts, corresponding

to their portion of the Delaware riverfront, that limit building height and set buffering and other performance standards to maintain the natural appearance and vegetation of the river corridor.

Other Delaware River municipalities within the county have sought to protect the river frontage through zoning districts and development standards that take into account both the scenic and environmentally sensitive nature of this area and the existing level of development. To support protection of the entire river corridor, municipalities that have not adopted a riverfront overlay district should consider enacting one consistent with local conditions.

### ***Landscaping***

Landscaping is an essential feature of many scenic places. Existing vegetation or landscaping that frames village gateways, scenic vistas or country roads greatly enhances the visual appeal of these resources.

When preservation of all or an essential part of a scenic viewshed or corridor is not possible, planted buffers should be provided to screen out intrusive features. Tree lines along roadways should be preserved or created. Generally, native trees and shrubs should be planted in natural clusters rather than in a uniform planting scheme.

### ***Transfer of Development Rights***

A technique that is particularly suitable to curtail development in places where it would destroy or severely diminish the quality of natural or scenic resources is the use of transfer of development rights (TDR). Transfer of development rights may be used to redirect development away from scenic resources by shifting density of development to another, more suitable location. TDR has been in limited use in Bucks County, mainly to preserve farmland.

### ***Acquisition and Purchase of Development Rights***

Direct methods of shielding threatened scenic resources is through outright purchase of a property or development rights, and establishment of a conservation easement to preserve the land in perpetuity. The county open space and natural areas programs provide funding for these preservation efforts.

### ***Scenic Byways Program***

The Pennsylvania Scenic Byways Program, sponsored by the Pennsylvania Department of Transportation (PaDOT), encourages communities to collaborate in obtaining state scenic byway designation from the Pennsylvania Secretary of Transportation and also in pursuing a national scenic byway designation from the U.S. Secretary of Transportation. The state byways program parallels the federal Highway Administration's National Scenic Byway Program to:

- support local planning efforts to achieve scenic byway designations;
- protect and enhance the visual quality of designated routes;
- maintain scenic byway resource qualities along designated routes;
- educate residents and visitors about the history and culture of the Commonwealth; and
- promote tourism and enhance economic development potential on designated scenic byways.

Designated scenic byways may be eligible for funding for improvements, enhancement and protective measures. River Road in Bucks County has been proposed as a scenic byway. The Delaware and Lehigh National Heritage Corridor and the Heritage Conservancy have been providing technical assistance to municipalities along the Delaware River to establish a scenic byway for River Road extending from Bristol Borough north to the City of Easton in Northampton County.

### ***Billboard Restrictions***

Billboards should be forbidden along scenic roads, as should road improvements, such as straightening or widening that alter the character of the roadway and the view from it. Conversely, attractive, unobtrusive, historically compatible signage can be used to enhance scenic features.

### ***Adopt-a-Roadway Program***

Several statewide programs exist to enhance and preserve the qualities of scenic roadways. Under the “Adopt-a-Roadway” program of the PaDOT, civic groups can sign a two-year agreement to pick up litter along a two-mile stretch of state highway at least four times a year. The Great Pennsylvania Cleanup program, an affiliate of the nonprofit organization Keep America Beautiful, Inc., enlists communities and volunteers in conducting local cleanups to rid highways, trails, parks and neighborhoods of litter. A number of municipalities have developed similar “adopt a road” initiatives for locally owned roads, such as Plumstead and Warrington townships.

PaDOT’s turn-back program offers municipalities the option of returning certain roads from state to municipal ownership. This allows for more local control of roads and their scenic properties, although the municipality becomes responsible for maintenance and repair. The turn-back provides a one-time flat fee per mile to the municipality, as well as annual liquid fuels funds.

## **Strategies and Actions**

- Encourage municipalities to identify scenic resources using specific criteria and preserve them, providing technical assistance where feasible, including integrating scenic preservation into comprehensive planning, ordinances, and open space plans.
- Assist municipalities in preparing ordinance language aimed at preserving landscape vistas from the roadway where possible, protecting village viewsheds, and integrating significant landscape forms or buffering them from new development or redevelopment.
- Ensure road improvement projects and signage are consistent with scenic resource preservation.
- Monitor the status of Delaware River regulatory protections at the local level, assisting municipalities with preservation and protection measures upon request. Promote adoption of riverfront overlay districts by those municipalities that have not yet done so.
- Monitor the status of the River Road Scenic Byway designation.
- Encourage participation by municipalities and public and private organizations in PaDOT and other programs designed to beautify and maintain scenic roads.

Principle 2:

**Preserve and Expand Parks, Open Space,  
and Agricultural Resources**

Farmland, rural character and the county's park and recreation facilities are what residents like best about Bucks County according to the comprehensive plan survey. The use and enjoyment of these open space amenities depends upon the continued support and improvement of the overall county's greenway network.

The county's open space resources provide residents the opportunity to recreate close to home, allow for the exploration of nature, support the agrarian economy, and provide a diversity of crops. These resources include park and recreational lands and trails, farmland, and expansive areas of natural resources. Farmland, in particular, has shaped the county's development patterns and quality of life. Over the years the county has used numerous resources to protect farmland and preserve natural areas, including tax incentives, conservation easements, land acquisitions, and regulatory and landowner actions. To continue to preserve farmland and open space and meet the recreation and leisure needs of residents and visitors, a cooperative effort is required by municipal government, the county, land preservation boards and organizations, and private interests.

Open space is a term that includes not only park and recreational areas, but more broadly includes all parcels of land and water that are dedicated or reserved for public or private use or enjoyment. It includes active and passive recreational parks, recreational facilities, greenways, trails, agricultural lands, natural areas, as well as historic and cultural resource areas.

Open space is characterized as any land or water area in which the preservation in its present use would conserve and enhance natural or scenic resources; protect streams or water supply; promote conservation of soils, wetlands or tidal marshes; enhance recreation opportunities; or preserve historic sites.

Bucks County possesses an immense array of open space resources including natural areas, recreational amenities and historic and cultural resources that contribute to a high quality of life that is valued by residents and visitors. These resources, including the Delaware River, municipal, county, and state parks and game lands, and the diversity of cultural and historical sites all contribute to the network of open space that provide opportunities for recreation, contact with nature, and education.

Open space resources benefit each of us in Bucks County in the following ways:

<p><b>Economic</b></p> <ol style="list-style-type: none"> <li>1. Encourages tourism.</li> <li>2. Open space contributes to a high quality of life that attracts taxpaying businesses.</li> <li>3. Less expensive to protect resources than restoring.</li> <li>4. Preservation of farmland helps preserve farming jobs, and contributes more in revenue than it requires in public service costs.</li> </ol> <p><b>Educational</b></p> <ol style="list-style-type: none"> <li>1. Preservation of historical and cultural resources provides a myriad of educational opportunities.</li> <li>2. Presence of natural resources provides educational opportunities.</li> <li>3. Interaction with others of different abilities, ages, and ethnicities teaches cultural diversity, team play, and cooperation.</li> </ol> <p><b>Environmental</b></p> <ol style="list-style-type: none"> <li>1. Protects the quality of surface and groundwater resources.</li> <li>2. Riparian buffers slow down storm runoff and decrease the chance of flooding.</li> <li>3. Provides for plant and animal habitats.</li> </ol>	<ol style="list-style-type: none"> <li>4. Removes pollutants from stormwater runoff contributing to better water quality.</li> </ol> <p><b>Health</b></p> <ol style="list-style-type: none"> <li>1. Absorbs air pollution.</li> <li>2. Recreation promotes health and wellness.</li> </ol> <p><b>Societal</b></p> <ol style="list-style-type: none"> <li>1. Preservation of farmland provides fresh food.</li> <li>2. Open space helps contribute to the aesthetic preservation of the landscape.</li> <li>3. Strengthens communities and encourages volunteerism.</li> <li>4. Preservation of historic and cultural resources can help celebrate local traditions and serve as the focal point for community activities.</li> </ol> <p><b>Transportation</b></p> <ol style="list-style-type: none"> <li>1. Greenway corridors provide connections between origins and destinations such as work, schools, libraries, parks, and shopping areas.</li> <li>2. Greenways as alter native transportation corridors could serve to reduce traffic congestion, helping to improve local air quality.</li> </ol>
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## Open Space Preservation

The county's commitment to the protection of open space resources has a strong and established foundation to build upon, dating back to the adoption of the *Bucks County Park Plan* in 1974. Additional county planning documents that have established planning policy relative to the preservation of open space include the *Bucks County Park and Recreation Plan (1986)*, *Bucks County Comprehensive Plan (1993)*, *Bucks County Open Space Plan (1977)*, *Bucks County Open Space Plan (1997)*, and *Bucks County Open Space and Greenways Plan (2011)*.

These plans established general policies to guide the Bucks County Commissioners, who are responsible for authorizing the acquisition of park and recreational facilities, the Bucks County Park and Recreation Board, who are responsible for planning for county parks and recreational facilities, and the Bucks County Planning Commission, who are responsible for developing policies and assisting municipalities with park planning activities. The policies from these plans serve as the basis for the guidelines of the Bucks County Open Space Program. This funding program, established by voter-approved bond referendums, focuses on five program areas:

- **County Parks** – The Bucks County Parks and Recreation Board uses funds from the Bucks County Open Space Program to acquire additional parkland for the county park system. Parkland acquisition targets are developed based on consultations with municipalities and are designed to provide additional open space and recreational facilities, and to connect existing parklands with trails.
- **Municipal Open Space** – Provides local governments with financial assistance for open space planning and acquisition. In addition to a base allotment of \$200,000, each municipality is eligible to receive an adjusted share based on its percentage of overall county land area and population.
- **Delaware Riverfront** – The 17 municipalities bordering the Delaware River are eligible to participate in this competitive grant program. Consistent with the overriding guidelines of the Municipal Open Space Program, the mission of the Delaware Riverfront Program is to preserve and protect natural resources; encourage low-impact recreational use; and preserve lands that have significant scenic or agricultural value within the river corridor.
- **Natural Areas** – Offers funding to municipalities and nonprofit land conservation organizations for easement and fee-simple purchases to permanently protect the county’s most critical and unique natural features. The *Natural Areas Inventory of Bucks County (1999)* prioritized a list of 115 significant natural areas and serves as the primary means of establishing a site’s eligibility for funding through the program.
- **Farmland Preservation** – Bucks County decided early on to be an active participant in the statewide farmland preservation program and in 1989 developed the Bucks County Agricultural Land Preservation Program to help to slow the loss of prime agricultural land in Bucks County. This program uses funds from the state, county, and local governments to purchase agricultural conservation easements from owners of productive farmland.

The first bond referendum, approved in May 1997 for \$59 million, resulted in the preservation of almost 14,000 acres. Based on the success of the initial referendum, a second referendum was approved in November 2007 for \$87 million. This second referendum has resulted in the preservation of an additional 2,000+ acres to date and extends through 2017.

The 2007 bond referendum funding is ongoing with the farmland preservation program having a waiting list of over 60 farms totaling 4,000 acres and the Natural Areas Program having 25 applications totaling

1,000+ acres. Additionally, more than half of the county’s 54 municipalities have completed updates of their local open space plan, a prerequisite for Municipal Open Space Program funding.

In addition to new parkland and open space preserved and acquired via the Bucks County Open Space Program, 130 formerly private property parcels were acquired using Federal Emergency Management Agency (FEMA) funding, as part of a county floodplain property buyout program along the lower reaches of the Neshaminy Creek. The properties acquired are now part of the county parkland system.

**Table 18  
Open Space Funding**

	May 1997 Open Space Bond		November 2007 Open Space Bond	
	Funding (in millions)	Acres Preserved	Funding (in millions)	Acres Preserved
Farmland Preservation	\$13.5	7,908	\$25.0	1,426
County Parkland	\$16.5	1,038	\$18.0	None to date*
Municipal Open Space	\$20.0	2,577	\$26.0	59
Natural Areas	\$9.0	2,379	\$11.0	526
Delaware River Waterfront	---	---	\$7.0	None to date
<b>Total</b>	<b>\$59.0</b>	<b>13,902</b>	<b>\$87.0</b>	<b>2,011</b>

\*No park properties have been acquired to date using the 2007 bond funding, though 11 county parkland parcels have been purchased since 2007 using funds remaining from the 1997 bond referendum.

In addition to the previously mentioned Bucks County plans and the Municipal Open Space Program, three other county plans and documents were consulted in the development of this comprehensive plan:

- ***Bucks County Natural Areas Inventory (1999 and 2011)***  
Originally published in 1999, and subsequently updated in 2011, the inventory identified outstanding floral, faunal, and geologic features in Bucks County. The locations of these various features and conservation landscapes were used to help develop the county’s greenway network. The inventory serves as the guiding document for projects seeking funding under the Natural Areas Program of the Bucks County Open Space Program.
  
- ***Bucks County Waterfront Revitalization Plan (2005)***  
The *Bucks County Waterfront Revitalization Plan* provides a vision for the entire 30-mile Lower Bucks County Delaware Waterfront. It provides a framework for the enhancement of the riverfront and adjacent lands and outlines steps to reach the vision. The plan provides specific recommendations to improve the study area focusing on six themes as related to open space preservation:
  1. Enliven the river’s edge by increasing and improving public access to the Delaware River;
  2. Incorporate design with development;
  3. Enhance the economy by promoting the redevelopment of brownfield sites;
  4. Expand mobility and accessibility;
  5. Foster environmental sustainability;
  6. Reinforce our sense of place and identity.

- ***Bucks County Open Space and Greenways Plan (2011)***

The *Bucks County Open Space and Greenways Plan* was developed in response to the state greenway plan, *Pennsylvania Greenways: An Action Plan for Creating Connections (2001)*. This recently published plan identifies a proposed greenway network for Bucks County. It identifies proposed greenway corridors linking various destination points, natural resource features and parkland throughout the county.

## **Related Planning Efforts**

In addition to the roles of the various Bucks County agencies previously mentioned, open space and park and recreational planning, acquisition, and management must involve coordination and cooperation among a variety of partners and stakeholders.

**Federal** – The federal government provides various funding programs which can be used for parkland, open space, and recreation-related acquisition. In addition, the federal government also oversees the ongoing operation and maintenance of national park facilities and heritage areas, including the Delaware and Lehigh National Heritage Corridor.

**State** – At the state level, various agencies and departments are involved with open space planning, acquisition, funding, and management. The three primary entities include the Bureau of Recreation and Conservation, Bureau of State Parks, the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, the Pennsylvania Historical and Museum Commission, and the Pennsylvania Department of Community and Economic Development. This comprehensive plan was designed to incorporate the recommendations of both the state greenway plan and the state outdoor recreation plan:

- *Pennsylvania Greenways: An Action Plan for Creating Connections (2001)*
- *Pennsylvania Outdoors: The Keystone for Healthy Living - Statewide Comprehensive Outdoor Recreation Plan (2009)*

**Regional** – Protecting open space and planning for trails and recreational facilities on a multi-county regional basis has significant benefits that extend beyond the boundaries of the place protected, impacting the entire region. These benefits are varied and include protection of the region's water supply, ensuring wildlife and natural diversity by providing for wildlife migration corridors on a regional basis, preservation of scenic, historic, and rural character of the region's landscape, and providing an alternative transportation network that links destinations across multiple counties.

Recognizing the benefits of planning on a regional basis, this comprehensive plan incorporates analyses and inputs from the following regional and/or adjacent county plans:

- ***East Coast Greenway***

The East Coast Greenway is a proposed 3,000 mile long-distance, urban, shared-use trail system that would link 25 major cities along the eastern seaboard. In Bucks County, the

proposed trail will parallel the Delaware River through Bensalem Township, Bristol Township, and Bristol Borough, where it will connect to the existing Bristol Spurline Trail, and then follow the Delaware Canal through Falls Township into Morrisville Borough where it will cross the Delaware River at the Calhoun Street Bridge.

- ***Delaware Valley Regional Planning Commission – Connections: The Regional Plan for Sustainable Future (2009)***

The Delaware Valley Regional Planning Commission’s plan, *Connection 2035*, established a greenway vision for the DVRPC region based on the twin principles of protecting core natural areas and linking them with greenways. The *2035 Greenspace Network* includes large contiguous naturally-vegetated lands and existing regional parks, and weaves these into a seamless vision of greenspace that enhances ecological and recreational capacity, protects critical natural resources, and mitigates the impacts of sprawl. Of the 104 greenspace corridors identified, 16 are located in Bucks County:

Poquessing Creek	New Hope-Ivyland
Cross County Corridor	North Woods (PA Highlands)
Delaware Canal	Peace Valley – Deep Run
Delaware River	Paunacussing – Pine Run
Little Neshaminy Creek	Quakertown – Cooks Creek
Mill Creek	Tinicum – Nockamixon
Mill-Queen Anne Creek	Tohickon Creek
Neshaminy Creek	West Branch Neshaminy Creek

- ***Lehigh Valley Greenways Plan – A Regional Greenways Plan for Lehigh and Northampton Counties (2007)***

The *Lehigh Valley Greenways Plan* was consulted to help aid in the identification of potential greenway and trail connections, as well as in the identification of priority conservation areas including the Cooks Creek, Fry’s Run, and Pennsylvania Highlands Greenway areas.

- ***Montgomery County Comprehensive Plan – Open Space, Natural Features and Cultural Resources Plan (2005)***

Given the extensive border between Bucks and Montgomery counties, the *Montgomery County Comprehensive Plan – Open Space, Natural Features and Cultural Resources Plan*, was consulted to help identify potential trail linkages. Three potential linkages to the Montgomery County trail network were identified including the Route 202 Parkway Trail, the Liberty Bell Trail, and the Cross County Trail.

- ***Pennsylvania Highlands Trail Network (PHTN) Project***

A project of the Appalachian Mountain Club, the Pennsylvania Highlands Trail Network Project, is a proposed trail network that seeks to protect and connect the ecological and recreational assets of the Pennsylvania Highlands and to create close-to-home outdoor recreational opportunities. The PHTN will extend the Highlands Trail across the

Pennsylvania Highlands, roughly 1.9 million acres from south-central PA at the Maryland border to New Jersey, including the northern portion of Bucks County.

**Local Municipal Plans** – Recognizing that open space planning, implementation, acquisition, and development requires the support and involvement of municipalities, and that the coordination and cooperative use of facilities is needed, this update of the *Bucks County Comprehensive Plan* provides both a vision and guiding principles for municipalities as they update their open space and park and recreation plans in the future, while also taking into account the local municipalities current vision for their own municipal open space and how that fits within the broader county open space and greenway vision.

## Existing Conditions

### Open Space Resources

Bucks County has a diverse range of open space resources encompassing parks and recreational lands, farmland, historic and cultural resources and other greenway resources including trails and bike routes, water trails, and bird watching areas. These resources provide residents with the opportunity to recreate close to home, explore the natural resources of the county, learn more about the culture and history heritage of the county, and participate in a variety of other activities including boating, hiking, bicycling, and bird watching.

### Parkland and Other Open Space Resources

#### State Parks

There are five state parks spreading across nearly 8,100 acres within Bucks County. These parks are administered by the Pennsylvania Bureau of State Parks, part of the Department of Conservation and Natural Resources. The primary purpose of state parks is to provide opportunities for enjoying healthful outdoor recreation and serve as outdoor classrooms for environmental education. In meeting these purposes, the conservation of the natural, scenic, aesthetic, and historical values of parks are given first consideration. Stewardship responsibilities are carried out in a way that protects the natural outdoor experience for the enjoyment of current and future generations.

**Table 19**  
**State Parks**

Park	Location	Municipality	Acreage
Ralph Stover State Park	State Park Road and Stump Road	Tinicum Township	45
Neshaminy State Park	State Road	Bensalem Township	339
Delaware Canal State Park	Entire Length of the Delaware Canal	Bristol Borough to Riegelsville Borough	705
Tyler State Park	Swamp Road	Northampton and Newtown townships	1,711
Nockamixon State Park	Mountain View Drive	Haycock Township	5,283
<b>Total</b>			<b>8,083</b>

### State Game Lands

Created in 1895 as an independent state agency, the Pennsylvania Game Commission is responsible for conserving and managing all wild birds and mammals in the Commonwealth, including managing habitat on the 1.4 million acres of state game lands. Although the lands are managed primarily for their natural habitat value, activities such as hunting, fishing, and hiking are encouraged. There are four state game lands in Bucks County encompassing 4,366 acres including:

**Table 20**  
**State Game Lands**

Game Lands	Location	Acreage
State Game Lands #139	East Rockhill & Richland townships	261
State Game Lands #196	West Rockhill Township	358
State Game Lands #56	Bridgeton, Tinicum, Nockamixon townships	1,737
State Game Lands #157	Haycock Township	2,010
<b>Total</b>		<b>4,366</b>

### State Historic Sites

The Pennsylvania Historical and Museum Commission (PHMC) is the official history agency of the Commonwealth of Pennsylvania. Created in 1945, the commission is responsible for presenting and preserving historic sites, structures, and landscapes, as well as presenting educational programs, exhibits, and special events that broaden public understanding of these sites. The agency oversees the Pennsylvania State Archives, the State Museum of Pennsylvania, the Bureau of Historic Sites and Museums, the Pennsylvania Trails of History, the Bureau for Historic Preservation, and the Bureau of Management Services.

**Table 21**  
**State Historic Sites**

Park	Location	Municipality	Acreage
Pennsbury Manor	Pennsbury Memorial Road	Falls Township	43
Washington Crossing Historic Park	River Road	Upper Makefield Township	500
<b>Total</b>			<b>543</b>

### County Parks

The Bucks County Department of Parks and Recreation, the third largest in the Commonwealth of Pennsylvania, was established in 1953. The Department is responsible for the acquisition, development, and preservation of more than 8,600 acres of open space and regional parks. Most of this acreage is contained in 24 sites including developed parks and nature centers, historic and cultural properties, special-use parks, and undeveloped parks.

***Developed Parks and Nature Centers***

There are 13 developed parks, recreation sites and nature centers managed by the Bucks County Department of Parks and Recreation within the county. These sites include recreational sites focused on a specific activity such as tennis (e.g., Frosty Hollow); parks with a variety of recreational activities, such as Core Creek; as well as sites focusing on natural features such as Ringing Rocks. Three nature centers in the county focus on instilling an awareness and appreciation of the natural world in all people through education, and encouraging responsible environmental stewardship.

**Table 22**  
**County Parks and Nature Centers**

Park	Location	Municipality	Acreage
Frosty Hollow Tennis Center	New Falls Road	Middletown Township	95
Delaware River Access Area	Station Avenue	Bensalem Township	108
Tinicum Park	River Road	Tinicum Township	126
Playwicki Park	Maple Avenue	Middletown Township	138
Churchville Park & Nature Center	Churchville Lane	Northampton Township	172
Oxford Valley Pool & Golf Course	S. Oxford Valley Road (Golf Course) and Hood Boulevard (Pool)	Falls Township	220
Ringing Rocks Park	Ringing Rocks Road	Bridgeton Township	249
Queen Anne Park	Woodbourne Road	Bristol and Middletown townships	276
Silver Lake Park & Nature Center	Bath Road	Bristol Township	465
Lake Towhee Park	Old Bethlehem Pike	Haycock Township	549
Tohickon Valley Park & Pool	Cafferty Road	Tinicum Township	612
Core Creek Park & Tennis Center	East of Rt. 413 on Tollgate Road	Middletown Township	1,200
Peace Valley Park & Nature Center	Creek Road	New Britain Township	1,500
<b>Total</b>			<b>5,710</b>

***Historic and Cultural Properties***

There are two historic and cultural sites managed by the Bucks County Department of Parks and Recreation within the county. These sites include the Moravian Pottery and Tile Works, established by Henry C. Mercer, a leader in the turn-of-the-century Arts and Crafts movement, in an effort to recreate early Pennsylvania pottery manufacturing techniques, and Stover-Myers Mill, a gristmill/sawmill along the Tohickon Creek that produced flour and animal feed.

**Table 23**  
**County Historic and Cultural Properties**

Park	Location	Municipality	Acreage
Stover-Myers Mill	Dark Hollow Road	Bedminster Township	26
Moravian Pottery & Tile Works	Swamp Road	Doylestown Township	77
<b>Total</b>			<b>103</b>

**Special Use Parks**

The Bucks County Department of Parks and Recreation also owns and operates three special use parks which address the recreational needs of a variety of different residents, while also encouraging and promoting tourism in the county.

**Table 24  
County Special Use Parks**

Park	Location	Municipality	Acreage
Bucks County Horse Park	Easton Road	Nockamixon Township	125
Van Sant Airport	Cafferty Road	Tinicum Township	189
Weisel Hostel	Richlandtown Road	East Rockhill Township	8
<b>Total</b>			<b>322</b>

**Undeveloped Parks**

There are six county park facilities that are comprised primarily of woodlands and offer no recreational amenities, facilities or services. However, the open space and other natural resources they contain provide many valuable benefits including plant and animal habitats, clean air, flood control, protection of water resources, and educational opportunities.

**Table 25  
County Undeveloped Parks**

Park	Location	Municipality	Acreage
Fallsington Park	Tyburn and Trenton Roads	Falls Township	17
Hal H. Clark Park	River Road	Solebury Township	29
Prahl’s Island	Delaware River	Tinicum Township	88
Black Ditch Park	Mill Creek and Bloomsdale Road	Bristol Township	117
Falls of the Delaware Park	River Road	Lower Makefield Township	125
Dark Hollow Park	Linear park bordering Neshaminy Creek	Doylestown, Warwick, and Buckingham townships	770
<b>Total</b>			<b>1,146</b>

**Other County Parkland**

In addition to the named park and recreational sites the Bucks County Parks and Recreation department oversees an additional 1,700+ acres of undeveloped land in the form of land being held for potential future parks, dams such as Bradford Dam, property that the county has purchased using Federal Emergency Management Agency in areas that were subject to flooding, as well as other properties purchased with Department of Community and Economic Development (DCED) and Community Development Block Grants (CDBG) funding. The county also owns parkland that it leases to municipalities.

## Usage of and Satisfaction with Bucks County Parks

A survey was conducted in August and September of 2009 to gain an understanding into people's usage and satisfaction with Bucks County parks, as well as to gain input into future county park and greenway planning priorities. The results specific to current usage and satisfaction with the existing conditions of Bucks County parks system are presented below. Results related to future planning priorities will be presented in the assessment of needs section.

### Survey Results

#### Bucks County Park Usage

- Almost 70 percent of respondents reported visiting a Bucks County park monthly. Similarly 33 percent reported visiting some park on a weekly basis while 10 percent visit a park on a daily basis.
- Larger, more centrally located, regional parks such as Peace Valley and Core Creek received greater visitation versus smaller, geographically dispersed parks.
- Undeveloped and specialty parks such as Black Ditch, Hal Clark, Bucks County Horse Park and Weisel Hostel, received lower usage.
- The primary reason respondents gave for not utilizing the parks more often was a lack of time; only 15 percent responded that other variables such as parks being too crowded, or a lack of interconnected trails to get to the parks also played a role.

#### Bucks County Parks Information

- Fifty-three percent of respondents indicated that they were aware of sources of information relative to Bucks County parks. However, only 41 percent of respondents indicated that they have adequate information on Bucks County parks.
- Thirty-five percent of respondents indicated that they don't know the location of county parks.

#### Bucks County Parks Satisfaction

- Over 65 percent of respondents rated maintenance in Bucks County parks either good or very good.
- Similarly, almost 60 percent of respondents rated trails as either good or very good.
- Nearly 70 percent of respondents rated park facilities as either good or very good.
- Only about 50 percent of survey respondents indicated that they take advantage of the educational programs offered by the parks. However, of the 50 percent who have taken advantage of the programs and events, 70 percent of them rated the programs as either good or very good.

## Municipal Parkland and Open Space

Municipal open space and parkland can be found in all 54 Bucks County municipalities, encompassing almost 13,500 acres. Municipal open space and parkland is used for a variety of purposes and activities including parks with a focus on active recreation such as athletic fields, hardscape surface sports (tennis and basketball), and playgrounds. Other parkland and open space is designed for passive recreational activities such as walking, or serve to protect sensitive open space and natural resource features.

All but six municipalities have developed municipal parks featuring various recreational amenities. There are 280 named parks encompassing some 5,043 acres. These parks range in size from 1/10<sup>th</sup> of an acre, such as Ferry Landing and Randolph Street Park in New Hope Borough, to very large parks with over 200 acres such as Warminster Community Park (243 acres), Five Mile Woods Nature Preserve in Lower Makefield Township (285 acres), and Falls Township Community Park (226 acres). In addition to dedicated parkland, municipalities own and manage approximately 8,500 acres of open space. This includes land being held for future municipal purposes as well as open space found in developments that was deeded to the municipality.

### **Other Open Space Resources**

More than 31,000 acres of other open space resources are found throughout the county, making this the largest segment of parkland and open space resources in the county. These 31,000+ acres are of two types—protected open space and unprotected open space.

**Protected Open Space** – Protected open space resources are comprised of properties where individual owners who have placed conservation easements on their properties and preserved land that is owned by private conservation organizations.

Conservation easements are either voluntarily donated or sold by the landowner and constitute a legally binding agreement that limits certain types of uses or prevents development from taking place on the land in perpetuity while the land remains in private hands. Properties held under conservation easements typically do not include the right to public access. However, properties on which county open space funds have been spent, with the exception of agricultural parcels, are encouraged to provide some form of public access.

The private conservation organizations that hold the rights to the conservation easement also protect and conserve open space and natural resources by acquisition. By owning the land, the conservation organization is better able to implement land management strategy techniques that will help preserve these resources in their natural state, while limiting invasive plant growth. Properties owned by land conservation organizations often will include some degree of public access provided that sensitive natural features are respected. Public access is encouraged on properties purchased with county open space program funds, with the exception of agricultural properties.

Properties that are owned or conserved by land trust organizations, such as Heritage Conservancy, Bedminster Regional Land Conservancy, Cooks Creek Conservancy, Natural Lands Trust, and Tincum Conservancy, are distributed throughout the county.

Homeowners' association property is generally part of a land development project with the land being reserved for use by the owners of the properties within the development, not the general public. Some of this property may be in the form of basins, utility easements, or required buffer areas while other property may contain valuable natural resource features including woodlands, stream corridors, or steep slopes. Although the majority of these properties have deed restrictions that prevent further development, others do not. However, for those properties without deed restrictions, it is unlikely that

the homeowners of the development would permit the development of land previously set aside for their communal use and enjoyment, thereby making these properties eligible for inclusion in the category of protected open space.

**Unprotected Open Space** – In addition to protected open space, there are additional areas of unprotected open space that contribute to the county’s open space resources. These properties are generally in the form of schools, colleges, cemeteries, campgrounds, and utility transmission corridors.

- School properties are often used by athletic organizations. Additionally, school properties are often popular walking areas given their proximity to neighborhoods.
- Utility transmission corridors, owned by the utility companies, provide an opportunity to connect open space sites of all types. The three predominant utility-owned transmission corridors in Bucks County include the PECO line running from Hilltown Township to New Hope Borough, the PECO line running from Warrington Township to New Hope Borough, and the PECO line running from Buckingham Township south to the Route 1/Interstate 95 interchange. Although there are also underground gas line corridors, these would require securing easements with a variety of property owners as these gas line corridors are predominantly in the form of easements across private property.

### **Preserved Farmland**

Although farmland as a form of open space is generally not accessible to the public, farmland compliments the county’s open space network by providing scenic views, protection of natural resources, and creation of wildlife habitat corridors. Since its inception, the Bucks County Agricultural Land Preservation Program has preserved 144 farms, encompassing over 12,200 acres. This program preserves properties through the use of agricultural conservation easements that allow the landowner to continue to own the land and to farm it, but restricts the right to develop for non-agricultural purposes. An additional 2,300+ acres have been preserved through other farmland preservation programs of land trusts and municipal farmland preservation programs such as those in Buckingham and Solebury Townships. More details on farmland preservation can be found in the Agricultural Resources section of Part IV of this plan.

### **Natural Resource Areas**

Natural resource areas provide not only ecological benefits, but also play an important part in the county’s open space system. These undisturbed resources provide the opportunity to experience nature first-hand by exploring the many forests, meadows, wetlands, unspoiled streams, and rock formations. Natural resource areas may be located within existing county parks, for example Silver Lake Nature Center and Tohickon Valley Park, or they may be individually owned county sites such as the Forks of the Neshaminy and Buckwampum Mountain. Other natural areas may be incorporated into municipal open space such as Five Mile Woods in Lower Makefield Township, or preserved and protected by private conservation organizations such as the Durham Bat Mine held by Heritage Conservancy.

The 1999 *Natural Areas Inventory of Bucks County, Pennsylvania* identified and ranked the 115 most significant natural areas remaining in Bucks County based upon 13 criteria addressing biological, ecological, hydrological, and geological components. The Natural Areas Inventory was updated in 2011 to reflect broader conservation landscape areas rather than specific sites. These broader conservation areas recognize that in order to help ensure that natural areas remain intact and protected, it is important to protect surrounding lands as well to help buffer the site. It also recognizes the need to create connected natural resource systems consisting of greenway corridors and natural areas.

## Historic and Cultural Resources

Bucks County is known for its many historic villages, structures, and sites, as well as its diverse and thriving cultural scene. Historic sites, structures, and places connect the past to the present and provide perspectives on who we were and who we are as individuals, diverse communities and as a society. Historic resources in Bucks County include 12 covered bridges, 74 historic markers, 11 National Historic Landmarks, and 144 other places listed on the National Register of Historic Places. More details on historic resources can be found in the Historic Resources section of Part IV of this plan.

## Cultural Resources

In addition to the vast historic resources, there are also a number of important modern cultural and community resources that contribute to Bucks County’s uniqueness and high quality of life. Such resources include museums and performing arts venues. A short list of key modern cultural resources in Bucks County includes:

Museums	Performing Arts Centers
Delaware Canal Locktender’s House	Bristol Riverside Theater
James Michener Art Museum	Bucks County Performing Arts Center
Johnsville Centrifuge & Science Museum	Langhorne Players Theater
Margaret Grundy Museum	New Hope Arts Center
Parry Mansion Museum	Sellersville Theater
Sellersville Museum	Town & Country Players Theater

## Greenway Resources

In addition to the parkland, natural resource areas, preserved farmland, and historic and cultural resources, there are other varied resources that contribute to the overall open space network within Bucks County. These are varied and include trails of various types, as well as water access points and bird watching areas.

## Trails and Bike Routes

Trails offer many advantages for county residents. Trails provide safe recreational activities that are enjoyed by people of all ages. In addition to recreation, trails offer an alternate means of transportation for short, local trips, foster conservation and protection of the environment as trails are often created along greenway corridors, and can aid in community revitalization and economic development by encouraging tourism and creating new or expanded businesses that provide trail-related services. There are almost 500 miles of existing, and an additional 20 miles of proposed trails and bike routes in Bucks County.

**Table 26**  
**Trails and Bike Routes**

	Multi-Use Trails	Hiking Trails	Equestrian Trails	Water Trails	On Road Bike Routes	Total
<b>Existing</b>						
State	75.0	46.7	23.0	62.0	39.0	245.7
County	10.3	20.4	25.0	-	-	55.7
Municipal	166.8	5.4	-		2.0	174.2
<b>Total Existing</b>	<b>252.1</b>	<b>72.5</b>	<b>48.0</b>	<b>62.0</b>	<b>41.0</b>	<b>475.6</b>
<b>Proposed (All Regional)</b>						
East Coast Greenway	15.4					15.4
Route 202 Parkway	4.8					4.8
PA Highlands		TBD				
<b>Total Proposed</b>	<b>20.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>20.2</b>
<b>Total</b>	<b>272.3</b>	<b>72.5</b>	<b>48.0</b>	<b>62.0</b>	<b>41.0</b>	<b>495.8</b>

The most well known trail within Bucks County is the tow path that follows the Delaware Canal. This multi-use trail is ideal for all forms of non-motorized use including bicycling, walking, running, and in certain sections, cross-country skiing and horseback riding. Several local municipalities such as Doylestown, Lower Makefield, and Buckingham townships, and Doylestown, Sellersville and Perkasie boroughs have extensive multi-use trail networks that are utilized by a variety of users. Hiking trails and equestrian trails are found within several state and county parks.

***Water Access Points***

There are 29 water access points located throughout the county providing access to the major waterbodies in the county including Lake Nockamixon, Lake Galena, the Delaware River, and the Neshaminy Creek. Some of these are located at private marinas while others are maintained by the Bucks County Park and Recreation Department or the Pennsylvania Fish and Boat Commission. These sites are important in that they provide access to water for the enjoyment of boaters of various types.

***Bird Watching Areas***

Based on information assembled from the Delaware Valley Ornithological Club, the Bucks County Audubon Society, and the Pennsylvania Game Commission, there are 13 top birding locations throughout Bucks County. According to the Pennsylvania Game Commission, more than 430 species of birds have been reported in Pennsylvania, nearly half of the total known from North America. The Lower Delaware River is a major migratory route for raptors, waterfowl, and songbirds. The mixed hardwood forests throughout the county, composed of oaks, maples and walnuts, are great habitat for forest birds like warblers, tanagers, thrushes and vireos. Along the tidal portion of the Delaware River, freshwater tidal marshes provide important feeding areas for migratory birds, especially red-winged blackbirds, waterfowl such as pintails, black ducks, mallards, and blue-winged teal; and wading birds.

Three of these locations, Peace Valley Park, Quakertown Swamp, and Unami Creek Valley are designated as Important Bird Areas (IBAs) by the Audubon Society. These are sites that provide

essential habitat for one or more species of bird. IBAs include sites for breeding, wintering, and migrating birds. IBAs may be a few acres or thousands of acres, but usually they are discrete sites that stand out from the surrounding landscape.

### **Parks, Open Space, and Recreation Vision**

Bucks County has a well developed parks, recreation and open space system that encompasses the many resources outlined previously. The existing system is well maintained and reflects the commitment that Bucks County has to continuing to improve its open space resources, and therefore the quality of life for its residents. To continue this commitment, part of the survey conducted in 2009 was used to gain input into future county park and greenway planning priorities in order to help establish strategies for the county's future open space requirements. Key findings from this survey include:

- **Park Amenities** – Restrooms, drinking water, trail signage and additional canoe and kayak launch sites were the park amenities cited most frequently as being needed in Bucks County parks.
- **Park Facilities Needed** – Trails and on-road bike lanes were the facilities most requested with almost 65 percent of survey users requesting these. Fifty percent or more of survey respondents also expressed a need for more nature centers, community gardens, outdoor ice skating areas, and river/water access points.
- **Trails** – Fifty percent or more of survey respondents expressed a need for more off-road bicycle paths, on-road bicycle paths, hiking trails, multi-use trails, and nature/wildlife trails.
- **Open Space Resource Priorities** – The top three open space priorities identified were:
  1. Protection of water resources such as wetlands, rivers and streams
  2. Protection of animal, plant, and wildlife habitats
  3. Development of a regional trail system
- **Greenways and Trails Priorities** – Specific to greenways and trails, the top three priorities identified included:
  1. Establish trail connections between existing trails
  2. Maintenance of existing trails
  3. Acquisition of land for public trails

### **Bucks County Parks and Recreation Planning Priorities**

In response to the public input collected, the county has identified five top planning priorities for the county. These include:

1. Continue to secure parkland along the Neshaminy Creek to protect natural resources, mitigate the impacts of flooding, provide recreational opportunities, and increase water access.
2. Continue to expand county parkland via both the expansion of existing parks and acquiring land for future parks, particularly in rapidly developing portions of the county.

3. Continue to implement recommendations made in the *Bucks County Waterfront Revitalization Plan (2005)*.
4. Improve trail and bicycling facilities throughout the county.
5. Establish a countywide greenway network as part of a linked open space network designed to connect the many open space features throughout the county.

### ***Neshaminy Creek Parkland Acquisition***

Financing the buyouts of flood-prone structures in the lower reaches of the Neshaminy Creek watershed is an important tool in providing additional open space and parkland, supporting the proposed county greenway system, offering opportunities to provide more river access for canoeing and fishing, while reducing property loss due to flooding. As part of the ongoing efforts to stop the effects of flooding in our area, Bucks County, in conjunction with the Federal Emergency Management Association (FEMA) and the Natural Resources Conservation Service (NRCS) have enacted a highly successful buyout program along the Neshaminy Creek watershed, under which over 160 properties have been purchased, and where applicable, homes have been razed, and converted to open space.

### ***Expand County Parkland***

Although the county is fortunate to have over 35,000 acres of parkland, demand for parkland is anticipated to continue to increase as the population of the county continues to grow. To assess the need for additional parkland in the future, an analysis was done utilizing standards of the National Recreation and Park Association. Although these standards have evolved over time, they are useful in serving as guidelines. Based on this analysis, and forecasted population growth, it is anticipated that there will be more than adequate amounts of municipal parkland and open space in 2030, but potentially a slight deficit in regional parkland. Although a slight deficit in regional parkland is projected, it should be noted that these standards are only one barometer of the amount and future type of parkland needed. Demographic changes such as the aging of the population, fewer children per households, and the need for close-to-home recreation will also dictate the amounts and types of future parkland needed.

The *Bucks County Park and Recreation Plan (1986)*, established parkland acquisition priorities the county. These proposed acquisitions total almost 1,200 additional acres of parkland to be acquired and include both regional parks as well as closer-to-home parks. The additional acreage to be acquired may also be to aid in the protection of existing sensitive natural resource features adjacent to existing parks.

	2030 Projected Population (000) (Based on High Projection)	Current Parkland Acreage	Future Parkland Needs (Acres) per 1,000 Population Municipal = 10.5 acres Regional = 20.0 acres	Projected Parkland (Deficit)/ Surplus (Acres) in 2030
<b>Municipal Parkland</b>	692.4	13,450	7,270	6,180
<b>Regional</b> <i>(Includes developed County Parks, State Parks, and State Historic Sites of 200 acres and which are designed for regular recreational use)</i>	692.4	13,609	13,848	(239)

In addition to expanding acreage within existing county parks, the county will continue to assess the need for additional county parks by analyzing both projected population growth, distance to existing county parks, available land, and other factors including demand at other nearby existing county parks.

**Table 27**  
**Open Space Acquisition Goals**

Park	Present Acreage	Goal	Remaining Acreage to be Acquired
Falls of the Delaware	125	175	50
Hal Clark	29	88	59
Playwicki	138	200	62
Lake Towhee	549	621	72
Tohickon Valley	612	775	163
Ringing Rocks	249	581	332
Churchville	172	594	422
<b>Total</b>	<b>1,874</b>	<b>3,034</b>	<b>1,160</b>

***Implement Recommendations of the Bucks County Waterfront Revitalization Plan (2005)***

The *Bucks County Waterfront Revitalization Plan* highlights the importance of the lower Delaware River to Lower Bucks County emphasizing its importance as a vast natural resource that supports natural habitat and provides recreational pursuits. The plan provided numerous recommendations, most of which align with the goals and objectives of the county’s open space network. The recommendations and themes specific to the county’s open space system include:

1. Enlivening the river’s edge by increasing and improving public access to the Delaware River
2. Expanding mobility and access
3. Fostering environmental sustainability

***Improve trail and bicycling facilities throughout the county***

Bucks County is committed to making continued progress in the development of bicycling and trail facilities throughout the county. This has been demonstrated most recently through the establishment of Bike Advisory Task Force in 2008 and the recent development of the *Bucks County Bicycle Plan*. The bicycle plan will be instrumental in:

1. Helping to identify where bicycle-related improvements are needed in the county which will assist Bucks County municipalities in having a basis for asking the Pennsylvania Department of Transportation to provide bicycle facilities when roads are rebuilt.
2. Strengthening a municipality’s position in being considered for federal and state funds for bicycle facilities by showing their relation to the *Bucks County Bicycle Plan*.

3. Satisfying the requirements of Title 23 of the United States Code (U.S.C.) §217 (g) (1) which requires that, “Bicyclists and pedestrians shall be given due consideration in the comprehensive transportation plans...”

In addition to the development of a countywide bicycle plan, the county will continue to seek to close existing trail gaps and establish new trails. One of the key priority trail gap closures that the county is working on is the completion of the trail around Lake Galena within Peace Valley Park, as well as working with the adjacent municipalities on a project called Destination Peace Valley which seeks to connect the trail system at Peace Valley with the Doylestown Bike and Hike system and the proposed Tri-Municipal Trail system under development in Chalfont and New Britain Townships and New Britain Borough.

The county will continue to partner with other organization on the development of regional trail efforts such as the East Coast Greenway Project, as well as the proposed Pennsylvania Highlands Trail project being coordinated by the Appalachian Mountain Club. Additionally, the county, via the *Bucks County Open Space and Greenway Plan*, has developed a proposed trail network for the county outlining potential trail corridors. However, additional work is required to assess the feasibility of these proposed trail locations in terms of land and right-of-way acquisition, easements required, physical barriers, and cost.

### ***Establish a countywide greenway network***

The idea for the establishment of a countywide greenway network stems back to both the 1974 *Bucks County Park Plan* and the 1986 *Bucks County Park and Recreation Plan*, both of which recommended the establishment of link parks. These parks were envisioned as linear parks along stream valleys and other natural corridors within the county. The link park concept has since evolved into the concept of greenway network comprised of various components including hubs, nodes, points of interest and greenways:

- **Hubs** – Large centers of extensive human activity.
- **Nodes** – Include natural, recreational, cultural, and historical places of interest, origin, or destination. Nodes are smaller destinations than hubs.
- **Points of Interest** – Includes sites listed on the National Register of Historic Places (including covered bridges), National Historic Landmarks, historic village, cultural and historic sites, water access points, and bird watching areas.
- **Greenways** – Linear connections and corridors that act as linkages between the hubs and nodes of the county. These are similar in nature to the link parks identified in prior park and recreation plans. Greenway corridors can be classified into four types:
  - **Conservation** – Preserve open space and protect natural resource features. As these are designed to protect existing resources, these typically do not include recreational trails.
  - **Cultural** – Link cultural/historical sites via heritage corridors.
  - **Recreational** – Serve solely as recreational corridors and would include bike paths, water trails, and trails along utility corridors.

- Multi-Use – These overlay recreational uses with areas where conservation of natural resources is also an objective, while minimizing impacts.

The *Bucks County Parks and Greenway Plan (2011)* proposes 27 greenways as shown on Map 12. Details regarding these greenways can be found in the greenway plan.

## Strategies and Actions

### Park and Recreation

- Continue to expand county parkland via both the expansion of existing parks and the acquisition of land for future parks in accordance with established acquisition priorities.
- Adopt, implement, and periodically review comprehensive planning strategies for park and recreational facilities and services.
- Provide for active and passive recreational areas to promote the health and well being of residents of all ages and physical abilities.
- Encourage municipalities to develop their own park and recreation plans consistent with the county's park and recreation plan.
- Encourage the community use of school district recreational facilities during non-school hours to supplement recreational opportunities at the local level.
- Coordinate with local municipalities and state agencies to ensure that county facilities augment, but do not duplicate, facilities provided at the local and state level.
- Provide planning assistance and guidance to municipalities in the development of municipal park and recreation and open space plans.
- Secure parkland along key stream corridors including the Neshaminy Creek to provide recreational opportunities including trails and water access.
- Support implementation activities of the *Bucks County Waterfront Revitalization Plan*.
- Continue to implement maintenance measures at county park facilities, while also ensuring that adequate resources and funding are available for the improvement of parks.
- Ensure that parks are safe and sensitive to the rights of neighbors.
- Promote the public's awareness and increased utilization of recreational lands, facilities, programs, and other park services available in the county.

### Open Space and Farmland

- Promote the preservation of open space and farmland.
- Continue the Bucks County Agricultural Preservation and Open Space Preservation programs.
- Encourage landowners, land conservancies and others to cooperate in the acquisition, preservation, and management of open space.

- Continue the Bucks Natural Areas Program and implement the recommendations of the *Bucks County, Pennsylvania – Natural Areas Inventory Update (2011)*.
- Work to preserve contiguous farmland to assure that agriculture remains a viable and permanent land use.
- Promote the acquisition of significant natural feature sites.

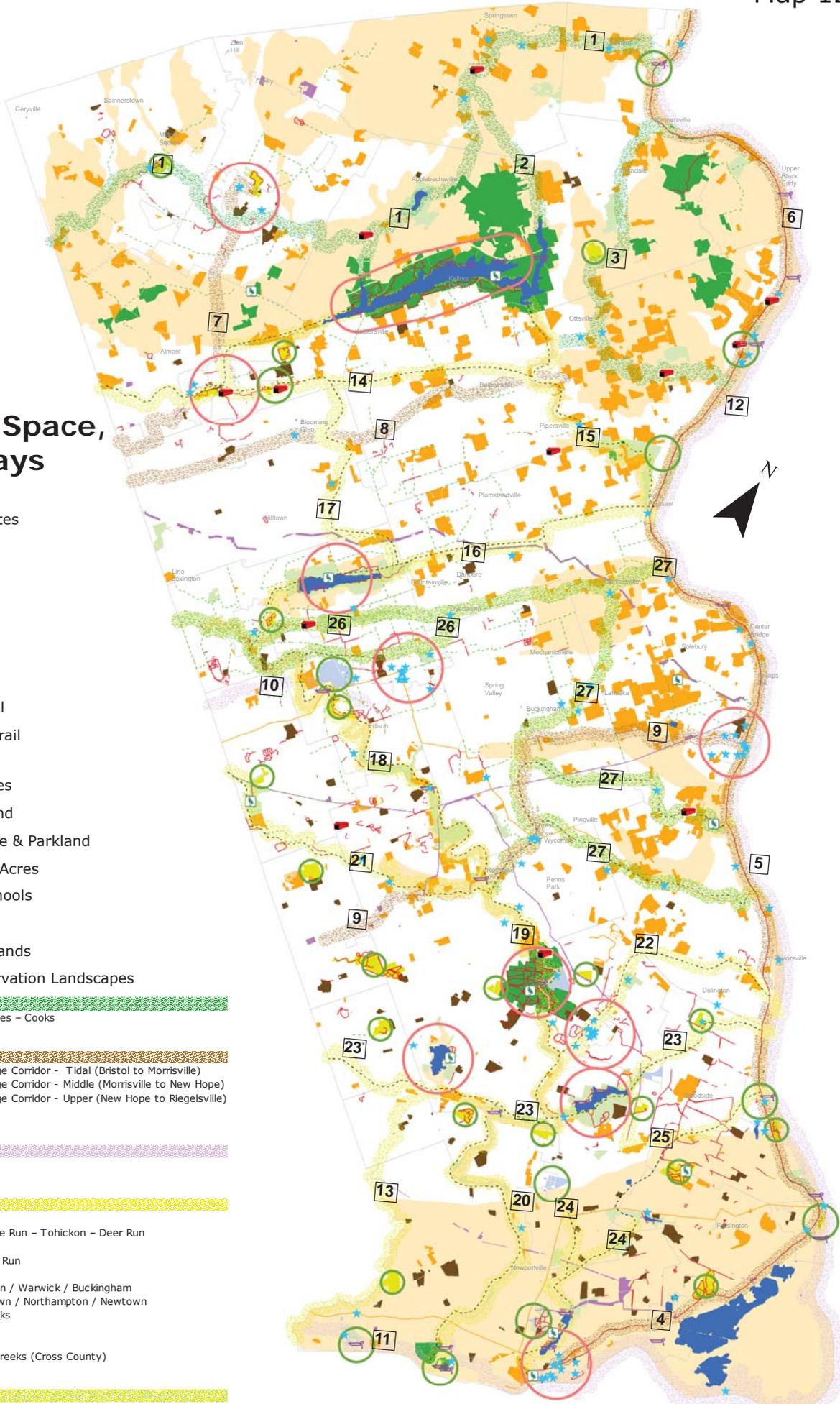
### **Greenways and Trails**

- Implement the recommendations contained in the *Bucks County Open Space and Greenways Plan*.
- Improve trail and bicycling facilities, particularly through implementation of the *Bucks County Bicycle Plan*.
- Promote the management and distribution of recreational activities according to the ability of the greenway to support these activities without causing adverse environmental impacts.
- Protect and enhance stream corridors as part of greenways to provide for healthy aquatic ecosystems and to serve as wildlife habitats and migration corridors.
- Foster the long-term viability of the county’s biological diversity by maintaining, enhancing and restoring habitats for species of concern and by providing greenway connections between them.
- Reinforce the character and ambience of historical and cultural areas through open space and greenway preservation.
- Prepare a model ordinance for municipalities that require developers to incorporate trails and open space links in their development plans.
- Continue to support the development of regional trail planning initiatives such as the East Coast Greenway and the Appalachian Mountain Club’s Pennsylvania Highlands Trail.
- Support municipal greenway and trail acquisition and development projects.
- Develop a planning, management, and acquisition strategy for the establishment and maintenance of a countywide greenway and trails network.
- Ensure that any trails developed as part of the county’s greenway system are safe and respectful of adjacent property owners.
- Establish appropriate buffer standards for properties situated along greenway corridors.

# Parks, Open Space, and Greenways

- Water Access Points
- Historic & Cultural Sites
- Bird Watching Areas
- Covered Bridges
- Hubs
- Nodes
- Existing Trail
- On Road Bike Routes
- Proposed County Trail
- Proposed Municipal Trail
- Waterbodies
- Colleges & Universities
- Bucks County Parkland
- Protected Open Space & Parkland
- Municipal Parks 40+ Acres
- Libraries & Public Schools
- Powerline Corridors
- State Parks & Gamelands
- Bucks County Conservation Landscapes

Conservation Greenways	
1	Unami - Beaver - Tohickon - Kimples - Cooks
2	Haycock Creek
3	Gallows Run - Rapp - Tinicum
Cultural Greenways	
4	Delaware & Lehigh National Heritage Corridor - Tidal (Bristol to Morrisville)
5	Delaware & Lehigh National Heritage Corridor - Middle (Morrisville to New Hope)
6	Delaware & Lehigh National Heritage Corridor - Upper (New Hope to Riegelsville)
7	Liberty Bell Trail
8	Route 113 Heritage Corridor
9	New Hope - Ivyland Railroad
Recreational Greenways	
10	Route 202 Parkway
11	East Coast Greenway
12	Delaware River Water Trail
Multi-Use Greenways	
13	Poquessing Creek
14	East Branch Perkiomen - Three Mile Run - Tohickon - Deer Run
15	Tohickon Creek
16	North Branch Neshaminy - Geddes Run
17	Morris Run
18	Neshaminy Main Stem - Doylestown / Warwick / Buckingham
19	Neshaminy Main Stem - Wrightstown / Northampton / Newtown
20	Neshaminy Main Stem - Lower Bucks
21	Little Neshaminy Creek
22	Hough's - Newtown Creek
23	Mill - Neshaminy - Core - Dyers Creeks (Cross County)
24	Mill (Otter) - Queen Anne Creek
25	Brock Creek
Combination Greenways	
26	West Branch - Pine Run - Paunacussing (Multi-Use & Conservation)
27	Paunacussing - Lahaska - Mill - Jericho - Pidcock Creeks (Multi-Use & Conservation)



Source: Bucks County Planning Commission, 2011

## **Agriculture's Role in Bucks County**

Bucks County's agrarian history has shaped today's landscape and connects us with our heritage. Farms provide jobs, produce a commodity for consumption, generate tax revenues, and provide valued open space. Pastoral landscapes are important for attracting visitors and for keeping the quality of life high for local citizens. Many of the farms in the county provide recreation and education benefits such as seasonal festivals, farmer's markets, 4-H youth programs, nutrition and health classes and stewardship of soil and water resources. Properly maintained farmland also provides benefits to the environment.

Over the years, much of Bucks County farmland has been converted to other land uses due to the county's ideal setting in the Delaware Valley, adjacent to the City of Philadelphia and the Delaware River. As the county continues to lose farmland, it loses a major asset contributing to the area's quality of life. It is important to protect farmland because productive agricultural land is a finite and irreplaceable natural resource. Excessive loss of cropland to development reduces production of local food and fiber as well as rural character.

The preservation of agricultural lands contains the inherent values of stewardship and sustainability, protecting resources for future generations, while providing for the social, environmental, and economic needs of the present generation. In the county's 2010 Comprehensive Plan Community Survey, public opinion results affirm the value of farming activities and the agricultural industry locally. When asked, "What do you like most about Bucks County?" 76 percent responded farmland, rural character, and natural beauty. When asked, "What is the most important issue facing Bucks County?" 55 percent of the respondents indicated open space/farmland preservation.

## **Agricultural Resources and Characteristics**

As illustrated on Map 13, prime farmland soils and farmland soils of statewide importance<sup>11</sup> are found throughout the county and cover about 50 percent of its area. In the southern portion of the county much of the farmland soils have been displaced by urban soils as the suburbs around the city of Philadelphia were developed. Much of the land in central and upper Bucks is still covered by agricultural soils, which are generally well-drained and also suitable for development. More than 10,000 acres of prime agricultural soils cover Bedminster, Buckingham, Hilltown, Milford, Plumstead, Solebury, Springfield, and Tinticum townships, and more than 70 percent of Upper Makefield, Warwick, and Wrightstown townships contain prime agricultural soils.

While 50 percent of the county comprises prime farmland soils and farmland soils of statewide importance, significantly less area is used for agricultural activities. In 2007, the National Agricultural Statistics Service (NASS) reported that only 19 percent of the county is in agricultural use. The county

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<sup>11</sup> Prime agricultural soils are classified by the Natural Resource Conservation Service (NRCS) and consist of soil capability classes 1 through 4, grouped into two classifications: "Prime Farmland" and "Farmland of Statewide Importance." Prime Farmland has the best combination of physical and chemical characteristics for producing feed, forage, fiber, and oilseed crops, and is also available for these uses. Farmland of Statewide Importance generally includes those lands that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods.

GIS land use data indicate that as of 2009 agricultural uses make up about 16 percent of the county’s land area. The difference can be attributed to the varying methods of identifying agricultural lands and different time-frames of the data sources. According to the 2009 GIS land use data, Bedminster, Buckingham, and Springfield townships comprise more than a third of the agricultural acreage in the county, with Bedminster containing the most with more than 8,700 acres in agricultural land use.

Over the past 50 years, Bucks County has lost close to 80 percent of its farmland acreage. In 1960 there were 4,069 farms totaling 394,880 acres in the county. In 2007, there were only 934 farms totaling 75,883 acres remaining. However, according to the NASS data, there were 17 more farms in Bucks County in 2007 than there were in 2002. The small increase in the number of agricultural establishments may be due in part to the state, county, and local preservation initiatives, as well as a greater number of people entering part-time farming. According to the NASS data, a slight decrease in the amount of land dedicated to farming and in the average size of a farm was experienced between 2002 and 2007. The rate of decrease was significantly less than that experienced in recent decades, with only a 4 percent decline in overall farmland acreage. Again, this relatively level retention of farm operations and agricultural land may point to the overall success of local agricultural initiatives and preservation programs.

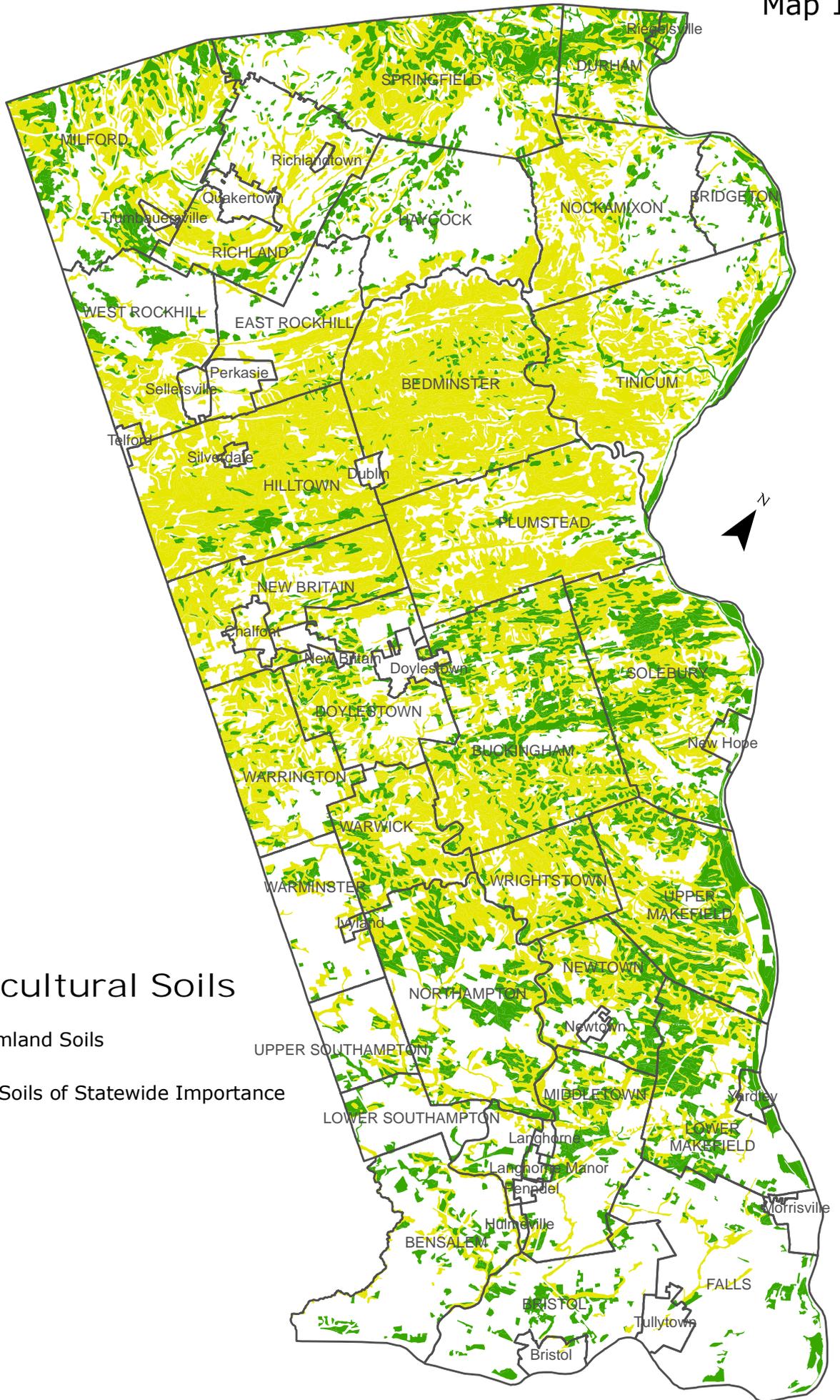
According to the NASS, agriculture is the leading industry in the Commonwealth of Pennsylvania and an important component of Bucks County’s economy. In 2007, the value of the county’s agricultural production was estimated at \$70.5 million.<sup>12</sup> The tables below provide selected NASS data for Bucks County farms as an overview of our agricultural industry.

**Table 28**  
**Farm Characteristics, 2002 and 2007**

	2007	2002	Percent Change
Number of Farms	934	917	+2
Land in Farms	75,883 acres	76,831 acres	-1
Average Size of Farm	81 acres	84 acres	-4
Market Value of Products Sold	\$70,573,000	\$61,640,000	+14
Crop Sales \$53,905,000 (76 percent)			
Livestock Sales \$16,668,000 (24 percent)			
Average Per Farm	\$75,560	\$67,219	+12
Government Payments	\$713,000	\$773,000	-8
Average Per Farm Receiving Payments	\$4,574	\$6,784	-33

Source: National Agricultural Statistical Service

<sup>12</sup> The 2007 Census of Agriculture was conducted by the USDA's National Agricultural Statistics Service to obtain agricultural statistics for each county, State, and the Nation. The census definition of a farm is any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year.



### Prime Agricultural Soils

-  Prime Farmland Soils
-  Farmland Soils of Statewide Importance

**Table 29**  
**Top Commodity Groups, 2007**

Agricultural Product	Per \$1,000	State Rank	U.S. Rank
Nursery, greenhouse, floriculture, sod	36,856	3	92
Horses, ponies, mules, donkeys	not disclosed	5	--
Forage (hay, haylage, grass silage, greenchop)	17,386	44	--
Corn for grain	15,263	25	1,033
Grains, oilseeds, and dry beans	8,799	21	1,287
Milk and other dairy products	7,644	43	579
Fruits, tree nuts, and berries	2,881	9	245
Vegetables, melons, potatoes	2,944	17	468
Nursery stock	2,332	2	32

Source: National Agricultural Statistical Service

Trends in Bucks County farming have changed over the years. In 1975 the dairy industry was the top income producer followed by the sale of poultry products. In terms of total sales, vegetables were at the bottom of the list. At that time, increases in sales of horticultural specialties, including greenhouse and nursery operations, began to rise. By 2007 this segment had the highest value of sales. Four of the county's agricultural products ranked in the top 10 counties of the state in 2007, including nursery stock, greenhouse and sod, horses, and fruits, nuts, and berries. Nursery stock and greenhouse products ranked in the top 100 for the entire nation, while the county's dairy industry ranked only 43<sup>rd</sup> in the state.

### Challenges to Farming

Prime agricultural soils are a rapidly disappearing natural resource and, according to the American Farmland Trust, the United States is losing two acres of farmland every minute to new development. Farmland tends to be flat- to moderately-sloped and well drained, thus very suitable for development, and generally more profitable to developers than farmers. Family-scale farms struggle to make a living today solely by farming and face both financial hardships and challenges from nature. To survive, most farmers need to have a secondary business, often on the farm, or need to work a second job or rely on a spouse with a non-farm job.

Challenges to sustaining farm communities include preserving fertile farmland soil and attracting new farmers. In 2007, the average age of a farmer in Bucks County was 57.2 years old, and very few young people are choosing agriculture for their lifetime vocation. The costs of acquiring a farm have made it extremely difficult for young people to get into farming. Most young farmers have inherited their land, machinery and buildings, whereas those new to farming must capitalize their farms with new investment. The price of agricultural land, the cost of equipment, and the availability of capital at reasonable rates are all factors that affect the viability of farming as a vocation. If the price of farmland and cost of production becomes too high relative to the value of commodities produced, the insufficient return on investment will force discontinuation of most traditional family farms.

Fragmentation of farms and services has been occurring over several decades in the Delaware Valley region as new development radiates out beyond the suburbs of Philadelphia into the countryside. Development of rural areas requires remaining farmers to travel farther to work leased farmland, as there are fewer opportunities to increase production locally. Farmers must also travel farther for product processing and equipment services, which increases farming costs as well. Bucks County's proximity to the city intensifies development demand, which in turn inflates the development value of its farmland. Farms without preferential tax assessment face rising taxes and land costs. Market prices for products continue to fluctuate while feed and fuel costs have increased significantly this past decade, providing a low return on production.

Conflicts between farmers and residents sometimes arise due to proximity between farming operations and new residential developments. New residents often complain about noise, odors, and dust associated with normal farming activities, while farmers often experience trespassing, illegal hunting, crop destruction, and vandalism to buildings and equipment. As the rural landscape changes, damage to farm crops from wildlife, such as from deer and geese, also add costs to farming operations.

Farmers are required to manage their agricultural lands to meet federal and state laws aimed at protecting natural resources. Misuse of fertilizers, mishandled livestock wastes, pesticide runoff, soil erosion and sedimentation can severely degrade the quality of food and both surface and groundwater, which not only affects fish, wildlife, and other ecologically beneficial species, but also water supply sources for domestic use and consumption. Well-managed farms reduce the risk of environmental degradation and food contamination.

### **Expanding and Emerging Agricultural Opportunities**

The diversification of agricultural crops, including the development of vegetable and specialty crops, has expanded and strengthened the locally-grown food supply. Niche and specialty markets have emerged from the traditional farm stand and increases have been seen in the number of farmer's markets throughout the county. Places in Bristol, Doylestown, New Hope, and Quakertown boroughs and Plumstead, Lower Makefield, Warrington, and Wrightstown townships hold community farmer markets to provide fresh produce and goods directly to the consumer. Local restaurants also purchase local farm produce to use as ingredients in their retail products. Local farm retail stores such as Tanners, Bolton's, Snipes, Solly Brothers, Shady Brook Farm, and None Such Farms have existed in the county for years, but in the past few years there has been an increasing number of new establishments and expansions to existing farm stores and increasing amount of locally-grown produce in retail grocery stores.

Penn State Cooperative Extension has a marketing website and promotes farming through its newsletter and annual *Fresh from Bucks County Farms* brochure. Farm outlets including Community Supported Agriculture (CSA) farm opportunities have been gaining popularity among residents because of the growing demand for fresh, locally grown crops. CSA members pre-pay for a weekly share of produce to support the farmer's upfront costs for planting. Members later receive fruit and vegetables during the harvesting season, typically May through October or November. CSAs have expanded throughout the county with locations in Bedminster, Hilltown, Falls, and Wrightstown townships to name a few.

More farmers are also becoming engaged in operating farm-based businesses which provide special and unique products, services and entertainment to local and regional patrons, who often are not able to experience the “pleasures of rural life” where they live. Pick your own produce, seasonal hayrides, corn mazes and other agritourism and agritainment enterprises are part of the local farm market trend to keep farms profitable.

Another emerging regional farm trend is the demand for agricultural crops that are used in the production of alternative energy sources such as ethanol. Although the demand for crops such as corn, soybeans, and switchgrass for the use in energy production may help farmers growing these types of crops, it has inflated the price of feed which has hurt livestock producers in the county who are heavily dependent on corn prices to determine feeding cost ratios.

Other alternative energy facilities associated with farm uses include accessory wind turbines and solar panels that help meet on-site electricity needs to operate the farm. The development of anaerobic digesters on farms, which capture methane gas from cow manure to create electricity, also have been used to supplement the Commonwealth’s mandate for utility companies to provide a portion of power from renewable energy sources.

## **Farmland Preservation**

The protection of agricultural land is not only a concern in Bucks County, but also throughout the Commonwealth and the nation. Many federal and state programs have made farmland protection a land use priority. One of the most significant Federal laws dealing with the protection of agriculture is the Farm Bill. Every four to seven years, Congress authorizes or re-authorizes a variety of farm and food laws through a multi-year omnibus law, the Farm Bill. Over the years the farm bill has been established to support efforts of farmers to improve stewardship of local waters, wildlife habitat, soils and other natural resources, as well as efforts to preserve farmland and increase farm profitability.

The U.S. Farm Bill includes the following key objectives: ensuring food security, promoting homegrown renewable energy, reforming farm programs, and protecting the environment. Most relevant to Bucks County were the increases provided in funding for the Farm and Ranch Lands Protection Program that helps farmers keep their land in agriculture by providing matching funds to state, local and non-governmental organizations to purchase conservation easements. Many farms in the county have also received assistance through conservation programs administered by the Bucks County Conservation District. Farmers have also benefitted from an array of farm commodity programs and crop insurance. Continued strong advocacy for the programs outlined in the Farm Bill will be necessary to realize all the benefits of the legislation.

## **Preferential Assessment**

Tools used by the Commonwealth to promote agricultural land use include preferential assessment programs (also known as current use assessment or farm use valuation). Preferential assessments help promote the economic viability of farming operations by reducing farmer's tax burden. Act 319 Lands (Pennsylvania Farmland & Forest Land Assessment Act of 1974), also known as the “Clean and Green Act,” is available to landowners for the following uses: agricultural use, agricultural preserve, and forest

preserve. Under this program, soil classification and yield per acre determine a property's individual assessment. Enrollment in this program is continuous unless dissolved by the landowner or eligibility requirements are not met. Savings through preferential property tax assessment is an incentive to maintain land in agricultural use or forest.

Although Act 319 lands are not considered protected,<sup>13</sup> employment of this Act shows the desire of landowners to maintain their properties as agricultural or woodlands. Commitment into the Act 319 program is an example of a local grassroots action that should be considered in an overall farmland protection planning process. In 2009, 3,179 parcels were covenanted under Act 319 which comprised 8 percent of the county's land area. Bedminster contained the most land covenanted under Act 319 with more than 9,000 acres, followed by Springfield containing about 7,500 acres, and Buckingham with nearly 7,000 acres. Milford, Plumstead, Solebury and Tinicum townships all have more than 5,000 acres of land covenanted under Act 319.

### **Open Space Financing**

Municipalities are authorized to acquire land for public purposes and to purchase conservation easements on properties to preserve farmland and open space. Referendums to issue a bond or increase the earned income tax to fund municipal farmland and open space initiatives have been approved by voters in twenty-one municipalities in the county, including Bedminster, East Rockhill, Hilltown, New Britain, Richland, Springfield, Tinicum, and, West Rockhill townships.

The county, municipalities, and school districts also may opt to freeze the millage rate on properties that contain an easement held by a local government unit or under the state's Agricultural Security Area Law. This tax legislation does not freeze the actual amount of taxes paid by the farmer, but rather allows for exemptions to millage increases on specified farm and open space categories. All three taxing bodies—the county, municipality, and school district—must vote for the millage freeze for it to go into effect.

### **Agricultural Security Area (ASA)**

The Agricultural Security Area (ASA) program was created by the Agricultural Security Area Law (Act 43 of 1981) to protect the agricultural industry from increasing development pressure. ASAs are intended to promote more permanent and viable farming operations by strengthening the farmers' right to farm. Enrollment into an ASA indicates a commitment by property owners for ongoing farmland preservation.

The creation of an ASA protects agricultural operations from municipal nuisance ordinances; private nuisance suits; governmental acquisitions of land through condemnation or eminent domain (such actions must be approved by Agricultural Lands Condemnation Approval Board); and consideration in the county's easement purchase program (property must be in ASA for purchase). To establish a local ASA, the area must contain an aggregate of properties that total at least 250 acres and the zoning of each parcel must permit agricultural uses. A stand alone parcel must be at least 10 acres and contain a

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<sup>13</sup> Property owners have the right to terminate the agreement at any time. When the agreement is terminated the property owner must pay a penalty in the form of rollback taxes (i.e., the difference between the preferential assessment value and the full assessed value) and accumulated interest for 7 years.

minimum of 50 percent Class 1-4 soils. Any landowner desiring to be included in an ASA must submit an application to, and be approved by, the local municipality. County review of ASA inclusion is also required. In Bucks County 25 municipalities contain parcels in ASAs, with Bedminster and Solebury townships each containing more than 5,000 acres in their ASA. Buckingham, Hilltown, Milford, Plumstead, Springfield, and Tinicum townships all have more than 3,000 acres in their respective ASAs.

### **Act 38, the Agriculture, Communities, and Rural Environment (ACRE)**

Act 38, the Agriculture, Communities, and Rural Environment (ACRE) legislation took effect in 2005 and is important for farms because it helps to balance the legitimate business interests of agriculture with the environmental concerns of the local citizens and elected leaders. ACRE is intended to resolve some of the conflicts that occur when the nonfarm community addresses production agriculture. Specifically, ACRE revised the Nutrient Management and Concentrated Animal Feeding Operation regulations to better protect the environment, including water and air quality and at the same time prohibits local governments from adopting ordinances that restrict normal farming operations if those restrictions are in conflict with state law.

### **Agricultural Preservation Programs**

In 1987 Pennsylvanians voted by more than a 2-to-1 ratio in favor of a referendum allowing the Commonwealth to sell \$100 million in bonds to finance the Pennsylvania Agricultural Conservation Easement Purchase Program. This bond was approved by a 2-to-1 margin in Bucks County as an effort to stem the rapid conversion of agricultural land to other uses. Pennsylvania Act 149 of 1988 amended the ASA law to create and provide the funding mechanism for the purchase of development rights on selected farms throughout the Commonwealth that meet specific criteria. Land on which development rights have been purchased may be protected by a deed restriction or contain on conservation easement that preserves it in perpetuity. Land can be sold but no development is permitted.

In 1989, the Bucks County Agricultural Land Preservation Board was formed and empowered to administer the Bucks County Agricultural Land Preservation Easement Purchase Program. Funded by the state's Agricultural Conservation Easement Purchase Program, the purpose of the county program is to protect and preserve viable agricultural lands by acquiring agricultural conservation easements<sup>14</sup> that prevent the development or improvement of the land for any purpose other than agricultural production. Criteria and factors considered by the program when selecting a farm include: operational, location, and environmental factors of the farmland tract, soil capabilities, owner involvement, and location in significant agricultural areas. All agricultural land uses are permitted by the easement.

In 1997, the county's first Open Space Bond referendum for \$59 million (\$13.5 million reserved for the farmland preservation) was approved by 70 percent of the voters. Another \$25 million was reserved for the farmland preservation program in 2007 as part of an \$87 million Open Space Bond. The 2007 referendum was approved with 74 percent of the vote, and it passed in every voting district in the

<sup>14</sup> An agricultural conservation easement is a legal covenant establishing a less than fee simple interest that runs with the land, allowing a landowner the ability to protect his or her farmland for agricultural use while retaining ownership. A landowner who donates an easement or sells it for less than fair market value may be entitled to a federal income tax deduction under Section 170(h) of the Internal Revenue Code.

county. The approval of these open space bond referendums by voters highlights the priority for farmland preservation.

Since the inception of the Bucks County Agricultural Land Preservation Program, nearly 144 farms throughout the county have been preserved, totaling more than 12,000 acres. At the time of this document's preparation, 29 farms in Bedminster Township have been preserved comprising more than 2,300 acres. Buckingham, Plumstead, and Springfield townships have also preserved more than 1,200 acres of farmland each through the county's agricultural preservation program. The purchase of development rights program is highly competitive and not every farm that applies can be enrolled due to limited funding, leaving approximately 50 to 60 farmers on the waiting list each year.

State law was changed for Bucks County to allow county, state and local money to go into preserving farms through partnerships. Local open space programs have been created to pool resources to preserve properties, and many municipalities have passed local referendums to preserve farmland and open space. Through the county municipal open space program 1,000-plus acres of farmland have been preserved and an additional 2,700 acres have been preserved through other local preservations programs and agencies, such as Bedminster Land Conservancy, Natural Lands Trust, and Heritage Conservancy. This has resulted in approximately 4.2 percent of the county's land being permanently preserved for farming. Much of the land preserved through local initiatives lies in Bedminster, Buckingham, Hilltown, Solebury, and Upper and Lower Makefield townships.

These preservation efforts have relied heavily on state, county, and local funding and grants. Continued funding and building upon existing partnerships will be necessary to ensure the future success of the farmland preservation program.

### **Planning and Zoning Tools**

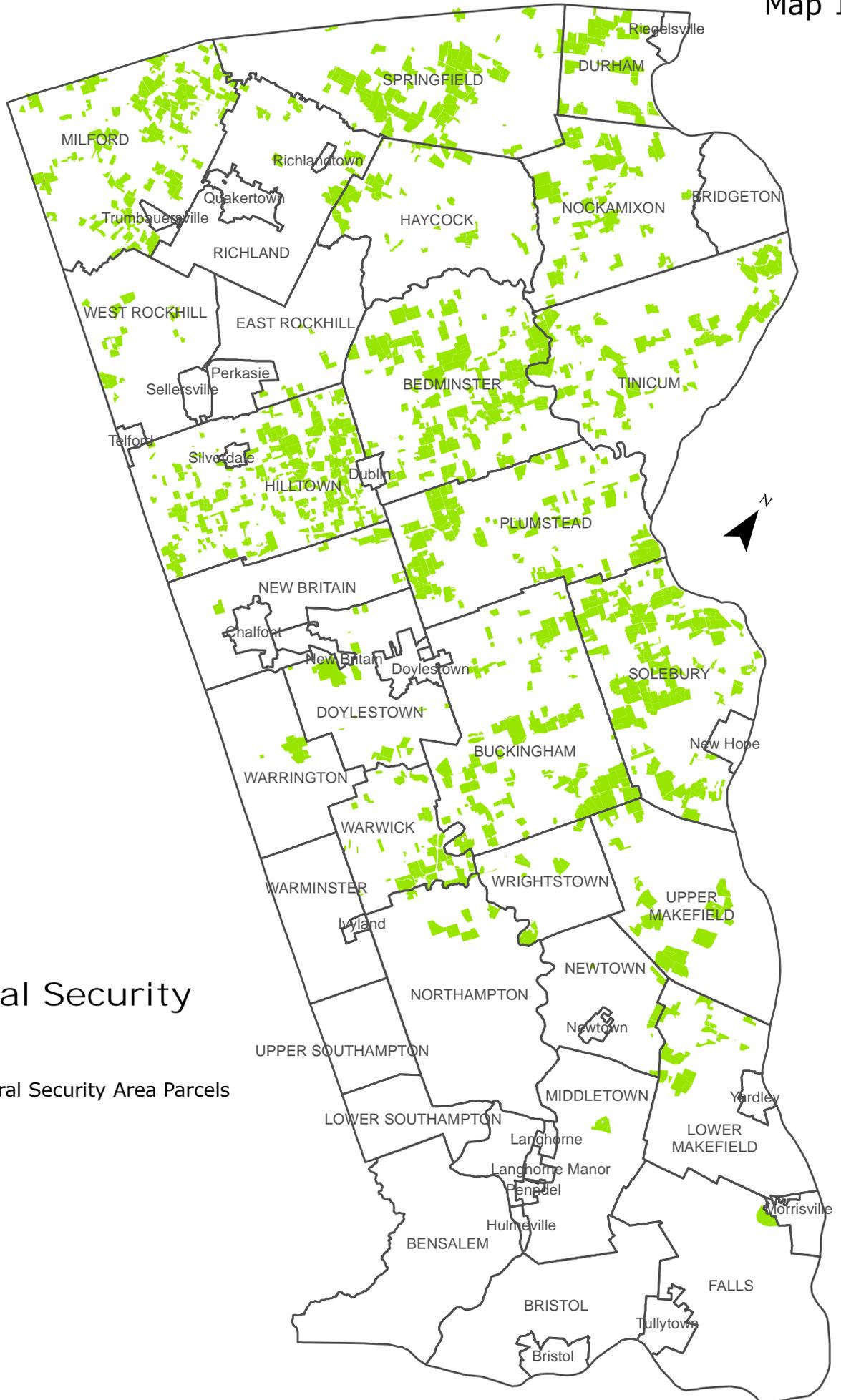
The Pennsylvania Municipalities Planning Code (MPC) gives specific authority to counties and municipalities to develop and adopt comprehensive plans and zoning regulations as the framework for protecting and preserving agricultural resources. Section 301(a)(2) of the MPC states that municipal, multi-municipal, and county comprehensive plan may include provisions for the preservation of prime agricultural lands. Section 301(a)(7) states that a county comprehensive plan shall identify a plan for the preservation and enhancement of prime agricultural land and encourage the compatibility of land use regulations with existing agricultural operations. In addition, Section 603 g.(1) of the MPC states that zoning ordinances shall protect prime agricultural land. The following provides a summary of regulatory techniques that have worked in preserving farmland to varying levels of success in Bucks.

### ***Agricultural Protection Zoning***

Agricultural protection zoning (APZ) refers to municipal zoning aimed at stabilizing the agricultural land base. Unlike voluntary Agricultural Security Areas, APZ is a regulatory, zoning tool. APZ designates areas within a municipality, based on the underlying policies and objectives identified in the municipal comprehensive plan, where agriculture is the desired land use. Such designation is usually based on soil quality, proliferation of existing farm uses, and other location factors consistent with the comprehensive plan's land use policies. APZ is a proactive way to encourage agribusiness away from areas intended to

# Agricultural Security Areas

 Agricultural Security Area Parcels



accommodate growth which reduces fragmentation of farms and the incidence of farmer-homeowner nuisance issues.

Zoning for the express purpose of preserving farmland and agriculture has been upheld by the Pennsylvania Supreme Court.<sup>15</sup> APZ ordinances vary from municipality to municipality, but generally all ordinances discourage nonagricultural uses that are incompatible with commercial farming. APZ is used by many municipalities to conserve a "critical mass" of agricultural land within their localized jurisdiction to prevent individual farm fragmentation within areas of urban development. Maintaining a critical mass of agricultural land can help ensure that there will be enough farms to economically support and sustain agricultural service businesses over the long term. Many APZ ordinances include local right-to-farm provisions and place restrictions on residential densities and set site design criteria. Several municipalities in the county utilize a form of APZ to encourage and protect their agricultural resources including the townships of Bedminster, Buckingham, East Rockhill, Haycock, Springfield, and Tinicum.

### ***Agricultural Use and Dimensional Requirements***

Many municipalities have zoning regulations that consider the needs of farm operations and permit farms, farm product processing and farm support businesses. Standards for appropriate signage, setbacks and buffer protection can reduce the obstacles faced by many farmers when trying to comply with regulations designed for residential development instead of farm units. The use of buffers can aid in easing land use conflicts and improving the relationship of agricultural uses and new residents. Buffers need to be sufficiently wide to protect the farming operation from lawn fertilizers, playing children, and other conflicts; however, they should not require excessive land commitments from property owners. A "no-disturb" native plant buffer zone can be effective when provided between residential properties and farm fields.

### ***Transfer of Development Rights***

Transfer of Development Rights (TDR) is a technique that can be used to transfer development potential out of a designated "sending area," such as an area intended for agricultural preservation, and relocate it into a "receiving" area, such as a designated growth area. The transfer of development potential or density is a voluntary agreement between a buyer (e.g., developer) and seller (e.g., farmer). The buyer is permitted an increase in the intensity of development in the designated receiving area. The seller receives compensation from the sale of his development rights and retains ownership of the land that is deed restricted from further development. Where TDR are used for agricultural preservation purposes, the farmland is deed restricted with a conservation easement to allow only agricultural uses.

TDRs rely on market forces and sufficient demand for local development markets must exist to entice developers to buy transferrable rights to increase development density over that already permitted by the base zoning within the designated "receiving" area. If sufficient market conditions exist or are likely to exist in the future, TDRs may protect existing farms and agricultural resources, such as prime farmland-designated soils, by shifting development pressure from agricultural areas to areas designated for growth. Factors such as steady growth and the political will to maintain strong zoning ordinances are needed to

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<sup>15</sup> C&M Developers, Inc. v. Bedminster Township Zoning Hearing Board, 820 A.2d 143 (pa. 2002). Agricultural soils protection is valid and rationally related to interest in preserving its agricultural lands.

preserve important agricultural lands. Bedminster, Buckingham, Haycock, and New Britain townships all have TDR provisions in their zoning ordinance to preserve farmland.

### ***Conservation or “Cluster” Developments***

Conservation or “Cluster” Developments provide for a denser concentration of development in a limited area, with little or no increase in the overall density of the site to preserve a large area of open space. This development technique can be used to protect natural resource or agricultural areas on a site and is most effective when applied regionally as a component of the local land use planning strategy; however, the technique can be effectively applied on a single parcel of land. It can be implemented on a voluntary or mandatory basis through the land use regulations in zoning ordinances.

Typically, in voluntary situations, development incentives are provided in the zoning ordinance to encourage the use of clustering instead of conventional large-lot zoning. Cluster Development should be accompanied by land use policy that ensures that the most productive farmland is preserved while accommodating development on marginal land. Lower Makefield Township was the first municipality in the county to use this land use technique to preserve land for farming. Many townships have followed suit and allow cluster development as a building option to protect various natural resources, including prime agricultural soils.

### **Partnerships and Education**

Protection and preservation of agricultural land, as well as the agricultural industry, should include partnerships with other entities and promotion of education. Working together to achieve a common agricultural preservation goal is advantageous to making progress in a timely manner. Educated public officials are able to make more informed land use planning decisions, while a knowledgeable general public may be more likely to support local farming and less likely to complain about nuisances associated with farming. The Pennsylvania Department of Agricultural encourages, protects and promotes agriculture and related industries throughout the Commonwealth while providing consumer protection through inspection services that impact the health and financial security of Pennsylvania's citizens. Bucks County is also fortunate to have a plethora of local groups and organizations that offer a broad range of educational programs that focus on agriculture. These include county agencies, Penn State Cooperative Extension-Bucks County, Delaware Valley College, and the Bucks County Farm Bureau.

The Farm Bureau promotes and looks after the interests of agriculture and offers programs and services geared to assist farm and rural families in increasing net farm income and enhance the welfare of farms and rural communities in the Commonwealth. The Bucks County Conservation District promotes conservation practices in the agricultural community by assisting farmers with improvement of agriculture, conservation and nutrient management activities, administering and publicizing financial assistance opportunities for conservation planning and implementation, administering and disseminating information regarding the Nutrient Management Law (Act 38), and promoting and assisting in educational events pertaining to agriculture conservation.

Penn State Cooperative Extension gives local residents easy access to the resources and expertise of the Pennsylvania State University. Through educational programs, publications, and events, cooperative extension agents deliver unbiased, research-based information to Bucks County citizens on a wide array of topics.

### **The Future of Agriculture in Bucks County**

Agriculture existence is dependent upon a stable land base. Open and available land is essential for the vast majority of agricultural production. Without continued efforts to manage growth and protect agricultural land, the loss of valuable agricultural land and soils will likely persist. Although it is understood that non-agricultural development cannot be excluded in rural areas, it should be regulated and restricted to achieve a viable concentration of farmland. Bucks County municipalities have seen positive results from the use of various agricultural preservation tools and techniques as a means of preserving farmland and the agricultural community. If strides continue to be made in implementing the array of agricultural protection and preservation tools, and if continuing funding is made available for the purchase of conservation easements, there is every reason to believe that large concentrations of important farmland will be available well into the future. The task that lies ahead is not one to be carried out by a single individual or agency, but rather one that requires a cooperative effort from a host of local government boards, organizations, and interests.

## **Strategies and Actions**

### **Preservation Programming**

- Recognize the economic importance of the agriculture industry as a commodity, for employment opportunities, and its contribution to county tourism.
- Continue providing technical and financial resources to support the county agricultural land preservation program.
- Continue to support tax abatement programs for agricultural land uses.
- Encourage municipal commitment of funding for farmland and open space initiatives when feasible.
- Encourage millage freeze efforts.

### **Preservation Planning and Regulation**

- Inventory agricultural and farm support services and monitor farm operation needs throughout the county.
- Develop and engage in multi-municipal planning efforts to best designate regional agricultural areas to implement land use and farmland preservation approaches on a larger scale to protect agricultural soils.
- Assist municipalities in strengthening and updating their land use policies and regulations to ensure that productive farmland is preserved and development is directed to designated growth areas

- Develop a model ordinance for municipalities facing agricultural land use issues such as farm operation, agricultural soil, and support services retention and expansion, allowance for agritainment/agritourism and other accessory businesses and uses, accessory energy facilities (e.g., wind, solar, digesters) and associated design, sign and buffer standards.
- Promote the use of available land use tools to mitigate the impact of growth and development on agricultural soils, such as but not limited to, Transfer of Development Rights (TDR) and Conservation (Cluster) Development techniques.
- Encourage agriculture-friendly zoning in designated farming or rural areas including permitted farmbased accessory uses and farm-related uses, (e.g., farm stands, direct outlet markets, agritainment, processing facilities and farm equipment repair), and appropriate buffer, design and signage standards.
- Encourage municipalities to allow community supported agriculture, niche farming, the production of specialty products, farming markets, and direct marketing to residents, restaurants, and businesses.
- Support the development, maintenance, and extension of Agricultural Security Areas (ASA), review ASA applications for consistency with state criteria, and encourage municipalities to update ASAs listings periodically as changes occur.
- Promote the implementation of agricultural best management practices and the development of nutrient management and integrated pest management plans through partnerships with the Conservation District.
- Promote the many beneficial agricultural educational resources provided by Penn State Cooperative Extension and Delaware Valley College.
- Support exploration of innovative practices to promote the financial viability of agriculture.

### **Agricultural Marketing**

- Continue to inform and educate local citizens about the county's long-term agrarian heritage.
- Distribute educational materials (i.e., on county websites and in county offices, etc.) about the nature of rural life and farmland protection and its benefits to build relationships between rural and growth areas.
- Continue to inform municipalities about farm programs and grant opportunities and continue to recognize individuals that manage exceptional farm operations.
- Distribute marketing materials to encourage the local agricultural marketplace and residents to patronize local food producers.

### Principle 3:

#### **Promote Energy Conservation and Efficiency**

Bucks County is committed to reducing energy demand and greenhouse gas emissions. Improving energy efficiency, raising community awareness of the importance of energy conservation, and transitioning to renewable sources of energy and green technology in the areas of transportation, land use and buildings, will lead to a decrease in the utilization of non-renewable and consumptive sources of energy.

The supply and demand for energy affects how we plan for Bucks County's future. Energy heats and cools homes, fuels factories and vehicles, powers computers and appliances, and helps residents maintain the standard of living they enjoy. Decisions such as where to live, how to travel to work, how to heat and cool buildings, or where to locate a business can be related to energy availability and cost. The generation and transmission of energy need to be considered in future planning for the county.

Energy sustainability means using energy sources in a manner that meets the needs of the present without compromising the ability of future generations to meet their needs. It means becoming more energy efficient and developing other energy sources that are plentiful and renewable.

### **Energy Legislation and Regulation**

Legislation and regulation of the energy industry range from federal policies to local ordinances. Large-scale federal intervention into America's energy markets began in the 1930s, escalated during the energy crisis of the 1970s, and continues today. Several pieces of legislation have resulted in regulations designed to control energy prices, regulate electric and gas utilities, limit imports, require car makers to meet fuel efficiency standards, and establish oversight of energy production.

The county has no regulatory authority over the production and transmission of energy. The county's role is limited to:

- assuring that its own operations are carried out as efficiently as possible and
- encouraging local governments to accommodate, through its local land use laws, new types of energy generation and energy-efficient land use patterns.

### **County Energy Efficiency Efforts**

Energy efficiency efforts for Bucks County facilities were initiated when the Bucks County Commissioners established the Bucks County Employees Green Initiative (BEGIN) Committee in April, 2007. The goal of the committee is to protect the environmental quality of Bucks County by improving energy efficiency of Bucks County government operations and serving as a model for others. BEGIN Committee objectives are:

- Advise the Bucks County Commissioners on green issues;
- Guide county employees toward greener workplace activities;
- Implement greener Bucks County government operations; and
- Promote policies and practices of environmental sustainability throughout Bucks County.

The committee is comprised of county employees from numerous departments focusing on county government operations. The county commissioners adopted the Sierra Club's Cool Counties Resolution in 2008, making Bucks the first county in Pennsylvania to embrace the policies of benchmarking and working to reduce greenhouse gas emissions by the year 2050 and to work with other governments and policy makers to reach this goal. The goals of the county's BEGIN committee fall into seven major areas.

### **Recycling**

- Expand recycling programs in county offices.
- Expand countywide recycling efforts to reach Pennsylvania's 35 percent recycling goal.

### **Grants**

- Research funding opportunities to implement work programs and tasks to support projects.
- Assist with implementing the \$3.9 million Energy Efficiency and Conservation Block Grant (EECBG) for retrofit of the county courthouse campus.

### **Information Technology**

- Purchase energy-efficient equipment.
- Promote energy conservation and cost savings by turning off or turning down systems that use energy, such as computers.

### **Employee Education**

- Provide employee education and institute policies to reduce energy consumption.

### **Landscaping**

- Implement low-mow/no-mow areas on county grounds.
- Use stormwater Best Management Practices to control runoff.

### **Transportation Fleet**

- Inventory and upgrade county vehicle fleet, to increase efficiency and reduce expenditures on fuel.
- Review which staff/departments utilize county vehicles on a regular basis to determine whether shorter routes or the combining of tasks can conserve fuel.
- Expand county vehicle pool to make vehicles available to employees for county business.

### **Energy/Green Building**

- Implement lighting upgrades and retrofits in county buildings to conserve energy and reduce costs.
- Design new buildings, and upgrade existing facilities, to reduce county energy usage.

## **County Government and Facilities – Strategies and Actions**

- Continue the BEGIN green initiative to promote green practices including farmland/open space preservation; building energy conservation, and recycling initiatives in county-owned facilities.
- Design and construct new and renovated county facilities to be energy efficient and incorporate green building elements.

## **Transportation**

The use of energy for transportation includes fuel used by vehicles in transporting goods and services as well as the energy required for vehicle manufacture and maintenance, building of roads, bridges, bus terminals, airports, and ports, and maintenance of the transportation system. Energy sustainability

requires a reduction in energy demand in the transportation sector through reducing vehicle miles traveled, improving energy efficiency, using more renewable fuels, and expanding travel options.

### ***Reducing Vehicle Miles Traveled***

Between 1982 and 2006, vehicles miles traveled in the U.S. increased by 47 percent per person, from an average of 6,800 miles per year to almost 10,000 miles per year.

The growth in vehicle miles traveled has been experienced in Bucks County. From 1980 to 2005, the total number of vehicles miles traveled increased over 45 percent from 3.3 billion miles to 4.8 billion miles as the result of population growth and a 14 percent increase in vehicle miles travelled per capita.

Land use and planning decisions can affect vehicle usage in several ways.

- By planning for development close to existing development, the need for more and longer trips to shopping, schools, services, or jobs can be reduced.
- By planning for compact and efficient development in areas served by public transportation, residents have the option of using cars or transit. Public transportation can only function in areas where there is sufficient development to support it. Planning for transit services requires land use patterns that make it feasible.
- By planning for streets that accommodate walkers and bicyclists, as well as cars, vehicle trips can be reduced. Pennsylvania's Department of Transportation estimated that trips could be reduced by 20 percent in many communities if walking were a good and safe travel option.

### ***Improving Energy Efficiency***

Improving the energy efficiency of vehicles is beyond the control of either county or municipal government and will be determined by the established Corporate Average Fuel Economy (CAFE) standards for passenger cars and light trucks, set by the Energy Policy Conservation Act of 1975. The Energy Policy and Conservation Act was amended in 2010 to incorporate new CAFE standards of 35.5 miles per gallon by 2016.

To ensure energy efficiency in the county vehicle fleet, the county services and maintains all vehicles internally to improve efficiency and reduce costs.

### ***Transitioning to Renewable Resources***

Reducing the use of petroleum-based fuels can be achieved by increasing the use of renewable and alternative fuels for transportation. The Energy Policy Act of 1992 defined the following types of fuels as alternative fuels, all of which may become cost-effective and feasible in the next decade.

- |                       |                                   |
|-----------------------|-----------------------------------|
| - Biodiesel           | - Methanol                        |
| - Electricity         | - Natural Gas                     |
| - Ethanol             | - Propane/Liquefied Petroleum Gas |
| - Hydrogen/Fuel Cells |                                   |

The potential for alternative fuels for vehicles has implications for planning. Within the next ten years, communities will need to plan for compressed natural gas fueling stations and plug-in facilities for electric-powered cars, for example.

### ***Changing Physical Components of the Transportation Network***

Converting to alternative fuel types, increasing the energy efficiency of vehicles, and reducing vehicle miles traveled will cumulatively lead to reductions in energy use. Changing physical components of the transportation network can also lead to reductions in energy use and increased efficiency. Examples of techniques include:

- Improved traffic signalization and closed loop systems are designed to get the greatest number of vehicles through the system with less idling.
- The use of roundabouts eliminates the idling of vehicles at traffic signals. Studies show that where roundabouts replace stop-controlled intersections there is a significant decrease in vehicle idling, reduced fuel consumption, reductions in vehicle emissions, fewer crashes, reduced number of crashes involving injuries, and reduced fatal crashes. In Bucks County, the roundabout located in Richland Township at the intersection of Station Road and Old Bethlehem Pike was completed in 2004.
- Retrofitting street lights and traffic signals with Light Emitting Diode (LED) lights will over time result in significant energy savings, as up to 60 percent of a municipal government's energy spending can go to lighting.
- The use of recycled materials in road building helps reduce the amount of waste material going into landfills and reduce the amount of raw materials used. To assist municipalities in the usage of these materials, the Pennsylvania Department of Transportation has developed a Strategic Recycling Program as a tool to systematically identify, evaluate and implement recycling opportunities.

### **Transportation – Strategies and Actions**

- Reduce vehicle miles traveled by: planning for development near existing infrastructure and existing communities; promoting mixed-use, compact development; locating development near public transportation routes; and accommodating alternative forms of transportation such as walking, bicycling, and carpooling.
- Increase overall energy efficiency by purchasing fuel-efficient vehicles and practicing optimum maintenance of vehicles.
- Support transportation planning and system design that helps with energy efficiency.

### **Land Use**

Municipalities can adopt land use planning approaches and encourage development patterns that advance energy efficiency. Advances in technology and the desire of residents and businesses to use alternative forms of energy to meet their needs have led to changes in municipal plans and ordinances.

The Pennsylvania Municipalities Planning Code contains ample mention of this topic in the planning law.

With this authority granted to them, municipalities can include in their plans, zoning ordinances, subdivision and land development ordinances, and local regulations provisions to accommodate energy efficiency land use planning techniques. The three ways in which municipalities can accomplish this are:

1. Make energy efficiency a goal in the comprehensive plan.
2. Allow for land use planning approaches and site design that are more energy efficient.
3. Encourage new energy technologies in local codes and ordinances.

### ***Zoning and Subdivision/Land Development Ordinances***

Some land use planning techniques that could be incorporated into municipal comprehensive plans, zoning ordinances, and subdivision/land development ordinances are:

**Development Districts** – Locating new development in or adjacent to areas of existing development where infrastructure already exists will reduce vehicle miles traveled, allow for more walking and biking, and allow for the best use of transit systems.

**Redevelopment of Brownfields and Greyfields** – The redevelopment and remediation of brownfields (former industrial sites) and greyfields (underutilized or abandoned commercial sites and shopping centers) can yield energy benefits by investing in the cleanup of older properties instead of abandoning these in favor of developing green spaces and farmland. An increase in density and a mix of uses on these sites can reduce vehicle miles traveled due to shorter work trips, shorter shopping trips, and higher non-auto means of travel. The remediation and redevelopment of facilities also promotes the recycling and reuse of existing buildings and infrastructure (plumbing, parking, materials, etc.).

**Cluster Development** – Development techniques such as cluster development concentrate development in a smaller area while protecting environmentally sensitive or other open space areas. Reducing the length of roads, infrastructure, and the amount of impervious surface decreases the amount of materials and energy.

**Site Location and Building Design to accommodate Solar Access** – Energy savings can be realized through energy-efficient design practices. The impact of site design may be maximized by considering energy use during site selection, the site plan development process, and building design and orientation. Lots and roads can be oriented to minimize building exposure to the east and west. Buildings that employ passive solar design place windows, walls, awnings, porches, and trees in locations to maximize shade during the summer while maximizing solar gain in the winter. Municipal ordinances can set standards to protect solar access and to require site design that maximizes energy savings.

**Establish Wind Barriers** – To help reduce heating costs, construction designs should incorporate barriers against the wind. This can be achieved by building structures close together,

adding buffers, and designing streets and lots to take advantage of summer breezes and avoid winter winds.

**Landscaping** – Preserving or installing shade trees can reduce cooling costs by up to 25 percent and have an impact on heating costs. Deciduous trees work best because they shade buildings in the summer but allow the sun to heat buildings in winter.

**Geothermal Heating and Cooling Systems** – Geothermal heating and cooling systems are not regulated through zoning or subdivision/land development ordinances but are licensed by the Bucks County Health Department as part of their well drilling regulations.

Approaches used in Bucks County zoning ordinances to address emerging energy sources and energy efficiency include the following:

- Recognize and allow for wind energy systems, solar energy systems, and wood-fired boilers by defining these by ordinance and setting appropriate standards for location, size, and setbacks.
- Set parking requirements that favor smaller and more efficient cars.
- Incorporate electric car plug-in stations and alternate fuel filling stations as permitted uses and facilities.

### **Land Use – Strategies and Actions**

- Promote utilization of renewable energy resources and energy efficient techniques by accommodating new energy sources, such as solar and wind, and by addressing location of new development, site design, setback requirements, landscaping, and access to renewable energy.
- Provide incentives for the redevelopment of greyfield and brownfield sites by adopting a land use pattern that reinforces development centers and reuse of resources.
- Encourage the location of new development near current infrastructure and public transit.

### **Green Buildings**

Green building is the practice of creating or renovating structures using systems and materials that are environmentally responsible and resource-efficient throughout a building's life-cycle. Green buildings aim to reduce the environmental impact of buildings by taking advantage of renewable resources, implementing good site design, improving energy, water and material usage, improving air quality, optimizing operations and maintenance, and reducing waste.

Although initial building costs may be greater with green buildings, the upfront investment pays off through lower utility bills, maintenance costs, and higher occupant satisfaction due to increased natural light and improved air quality.

Green building design components include:

- The location of the building should be placed near current infrastructure and linked to public transit.
- Energy should be used efficiently and alternative energy utilized when possible.
- The building should be oriented for solar access, and gain winter sun/summer shade for seasonal heating and cooling. The landscape should be planted with native vegetation maximize the amount of permeable surfaces.
- A “white roof” coats the rooftop with a reflecting coating. A “blue roof” uses photovoltaic solar (PV). A “green roof” places an engineered soil medium on the roof that grows vegetation.
- Install greywater systems and conserve water through low-flow plumbing fixtures.
- Incorporate renewable materials, purchase materials that are produced in close proximity to the building site, and seek to reduce the waste generated from the site by recycling unused materials.
- Use products with low or non-volatile organic compounds (VOC’s) and incorporate a good ventilation system.

Growth in green building has been caused by consumer demand for green construction, government initiatives, and improvements in sustainable materials.

Municipalities can provide incentives for green building through the municipal permit process. Doylestown Borough promotes a voluntary Green Building Incentive Program in which builders and renovators can reduce permit costs by utilizing green building methods and materials to conserve energy and resources. The program awards Green Points, with each point counting as a one-percent reduction in permit fees, up to a maximum of 50 percent off the cost on building permits.

### **Green Buildings – Strategies and Actions**

- Promote green building technologies and energy efficient standards, such as Leadership in Energy and Environmental Design (LEED) and Energy Star certification for buildings, properties and neighborhoods in land development, construction rehabilitation and restoration.
- Encourage local governments to provide incentives that reduced permit fees through a “green points” program.
- All levels of government should minimize energy consumption in municipal buildings by identifying energy conservation opportunities and using conservation and energy efficiency practices.



## Principle 4:

### **Protect Water Resources and Reduce Waste**

Providing sound water infrastructure and treating wastewater, stormwater, and solid waste as a resource rather than a disposal problem will achieve the protection of water and the natural environment. In addition, integrating comprehensive water resources planning and integrative waste management combined with thoughtful land use planning will protect the quality and quantity of our water and environmental resources.

Providing safe drinking water, controlling stormwater runoff, and meeting wastewater and solid waste disposal needs are essential services which every community must supply in order to protect the public's health and the county's water resources. Water supply planning comprises water use, distribution systems and their related water quality issues. Stormwater management focuses on the control of stormwater runoff and its impact on the natural and built environment. Wastewater planning addresses the management of private and public sewer systems. Solid waste planning deals with issues related to the collection, processing, and disposal of different types of waste. To adequately provide these services the following are needed; comprehensive management strategies to ensure the proper location of infrastructure in relation to development patterns, the promotion of waste reduction and recycling, and the use of infiltration and water quality protection practices.

Planning for a sufficient amount of safe water is important to meeting future community and business needs. Water supply and infrastructure planning must focus on how water resources, both surface water and groundwater, are used by individuals and public water suppliers, so that there is an adequate supply of water and good water quality.

The county promotes a comprehensive water supply planning process that:

- Ensures adequate and safe drinking water is available to all citizens;
- Encourages, promotes, and protects all other beneficial uses of Bucks County's water resources, such as recreation and wildlife habitat;
- Protects and enhances the quantity and quality of surface water and groundwater resources;
- Encourages, promotes, and develops incentives for alternative water supply solution strategies including, for example, structural improvements, systems upgrades, new source development and management solutions such as coordination with other entities; and
- Fosters integration of water supply, wastewater facilities, stormwater management, and land use planning.

### **Water Resources and Supply Regulation**

There are federal, state, and regional regulations in effect to protect the county's water resources and ensure the delivery of safe drinking water by overseeing withdrawals in groundwater resource protection areas, source water protection. The following summarizes some of the major regulations associated with water resources and water supply.

Together, the federal Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA) govern water pollution and address the quality of drinking water and its sources (rivers, lakes, reservoirs, springs, and groundwater wells). The acts authorize the Environmental Protection Agency (EPA) to implement pollution control programs, such as setting water quality standards, standards for drinking water quality to prohibit exceeding maximum contaminant levels, and overseeing the states, localities, and water suppliers who implement those standards.

The state Safe Drinking Water Act (PaSDWA) designates the Pennsylvania Department of Environmental Protection (PaDEP) as the principal authority for regulating safe drinking water in the state. The PaDEP issues permits and imposes limitations on proposals for source water and groundwater withdrawals and applies standards to every public water supplier. The PaDEP monitors public water supply treatment, operations and corrective actions so that water quality is maintained.

In conjunction with the federal SDWA, PaSDWA established the Source Water Assessment and Protection Program (SWAP) to assess drinking water sources for susceptibility to pollution and to build voluntary, community-based protections against drinking water contamination. The PaDEP established guidelines that apply to all local, state and federal agencies and programs with drinking water resource quality monitoring responsibilities. The SWAP also details the approach the state will take to promote

and support development of voluntary local Source Water Protection Programs (SWPP). Components of a SWPP include:

- Source Water Protection Area (SWPA) and Groundwater and Surface Water Protection Areas delineation
- Potential Sources of Contamination (PSOCs) inventory and ranking of these sources according to the threat posed to surface and groundwater supplies
- Susceptibility Analysis of Drinking Water, Groundwater and Surface Water Sources to Contamination.

The Wellhead Protection Program is the cornerstone of source water protection and is designed to protect the quality of public drinking water supplies and to prevent contamination of groundwater. Activities include outreach efforts, incentive grants, formulating a wellhead protection area delineation strategy, and the establishment of regulations.

The wellhead protection area is the surface and subsurface area surrounding a water well or wellfield supplying a public water system, through which contaminants may move. The PaDEP recommends three zones of protection:

- Zone 1 – Protective Zone (400 feet radius) around a well;
- Zone 2 – A 10-Year Time-of-Travel Capture Zone around a public water supply well;
- Zone 3 – Zone of Contribution – Land surface providing a recharge area to sustain the yield of a protected public water supply well.

Water suppliers and municipalities can work together to develop plans. Recharge areas for the wells and springs are identified, and measures are put into place to protect those areas from the introduction of contaminants into the groundwater system. Management approaches for protective measures, implementation and monitoring of the control measures, and contingency plans is the responsibility of the municipalities served by the water supply.

The State Water Plan (Act 220) was signed into law in 2002 and updates the 1938 state water plan. The Act is intended to achieve a balance between competing demands for groundwater and surface water and the plan includes the following:

- An inventory and assessment of current/future water use demands/trends;
- An analysis of problems and needs associated with water usage, resource management alternatives, and methods of implementing recommended actions;
- Analyses of problems and needs associated with water resource usage (e.g., navigation, stormwater management, and flood control);

- Mandates for registration and reporting of water withdrawals of greater than 10,000 gallons of water per day in any 30-day period and for water withdrawals from public water suppliers regardless of amount of water used; and
- A formal program to promote voluntary water conservation.

In addition, a primary objective of the plan is to identify Critical Water Planning Areas as planning boundaries for the creation of more detailed plans for areas where the demand for water exceeds, or is projected to exceed, available supplies. The Upper Neshaminy Creek, which includes the Little Neshaminy Creek, Park Creek, Mill Creek, and Pine Run, has been recommended as a critical water planning areas.

The Pennsylvania Public Utilities Commission (PUC) regulates the rates and services of public utilities such as a water company or a municipality servicing consumers in another municipality without an intermunicipal agreement.

The Delaware River Basin Commission (DRBC) administers programs within the basin related to water supply allocation and water conservation, regulatory review and permitting, watershed planning, drought management, flood mitigation and loss reduction, and fisheries management. DRBC oversees and issues permits for groundwater withdrawals including those in the groundwater protected area in the basin. More stringent regulations apply to groundwater withdrawals in the groundwater protected area than they do in the rest of the basin to protect the interests and rights of lawful users of the same water source, and balance and reconcile alternative and conflicting uses of limited water resources in the region. The groundwater protected area encompasses 1,200 square miles and includes 127 municipalities; 34 municipalities are located in Bucks County as shown on Map 15.

Groundwater withdrawals in excess of 10,000 gallons per day (gpd), within this special groundwater protection area, require the approval of the DRBC and issuance of a permit. Water users must also register with PaDEP and report annual water usage amounts. Water withdrawal applications must be of demonstrable need and withdrawals must not interfere with the performance of existing supply wells, or exceed the safe yield of the source aquifer. In addition, monitoring of groundwater withdrawals of less than 10,000 gpd is encouraged at the municipal level. The DRBC regulations also establish numerical groundwater withdrawal limits for subbasins, or watersheds, in the groundwater protected area.

The Bucks County Department of Health (BCDH) is the PaDEP-designated agency for water quality and health-related concerns within the county. The Health Department has regulatory authority regarding water supply, specifically well specifications and construction. Prior to constructing a new well or modifying an existing well, the property owner must file an application and must comply with construction specifications, such as well location and isolation distances from designated facilities and potential pollution sources.

The department is also responsible for overseeing drilling which includes on-site observation of the installation of the well casing and grouting.

Well drillers must be licensed by the Pennsylvania Department of Natural Resources (DCNR) to construct individual residential water supply wells. Following completion of construction and installation of the pumping equipment, or alteration of a well, a pump test is required and will continue until the water discharge is clear. The pump test is used to determine the depth of the well, the pump intake and static water level, and the measured water level after pumping. The well and distribution system must be disinfected according to PaDEP disinfection procedures.

A water analysis of the completed new well must be conducted by a PaDEP Certified Drinking Water Laboratory to determine water quality. The water analysis must include determination of the presence of the primary PaDEP regulated contaminants. If any parameter tested exceeds the maximum contaminant level established by PaDEP, treatment is recommended.

Upon completion of the well or alteration, an application must be submitted to the PaDEP for approval to operate the individual residential water supply and a certificate to operate must be received from BCDH. A permit must be obtained prior to abandoning all wells.

The Pennsylvania Municipalities Planning Code permits local governing bodies to regulate the use of land, watercourses, and bodies of water not only by area requirements and lot sizes, but also by the determination of densities and the location and amount of open space. The MPC also directs counties and municipalities to consider water supply facilities in municipal comprehensive plans, zoning ordinances, and land development review functions. Article III, Section 301(b) states:

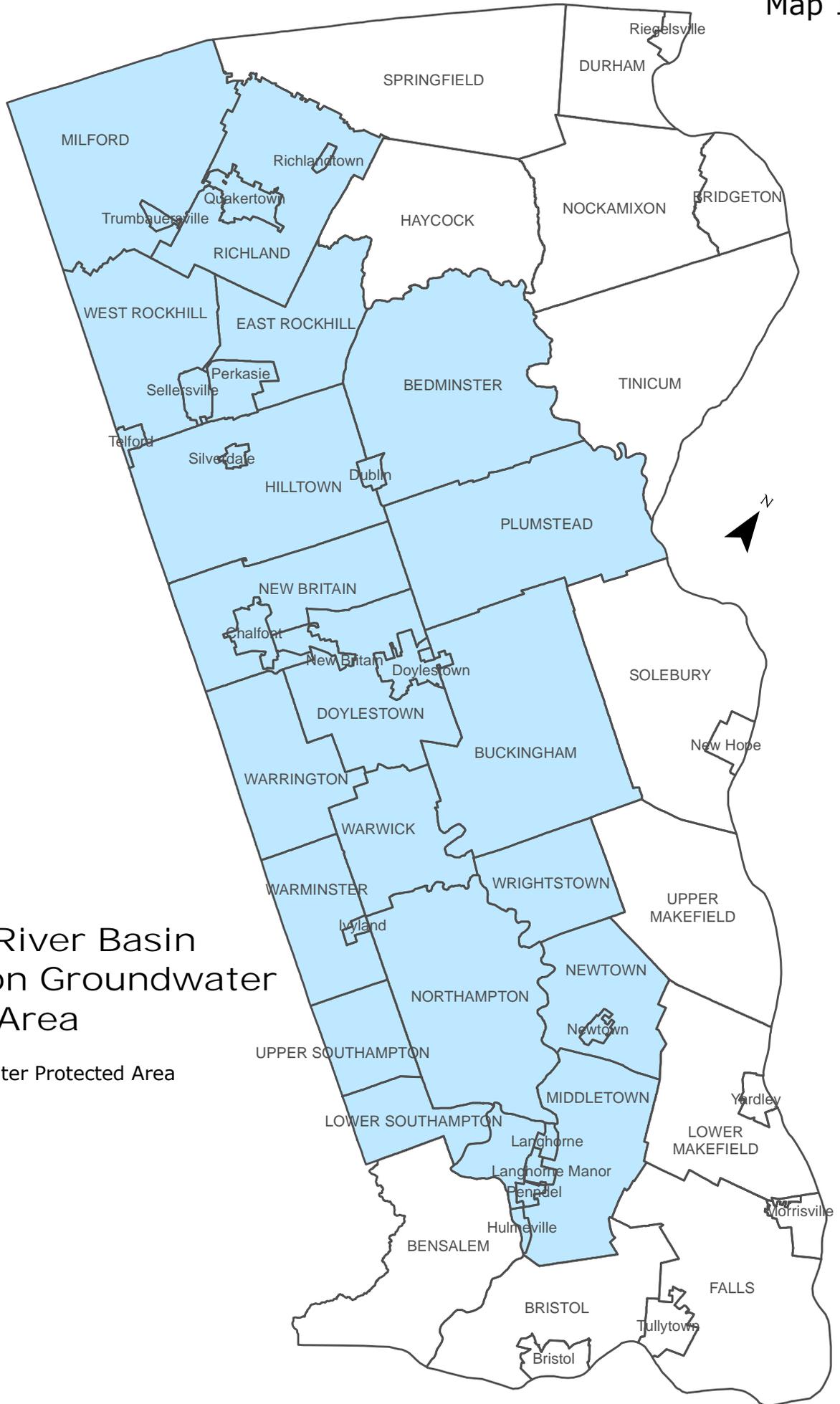
*“...the comprehensive plan shall include a plan for the reliable supply of water which considers current and future water resource availability, uses and limitations, including provisions adequate to protect water supply sources. Any such plan should be generally consistent with the State Water Plan and any applicable water resources plan adopted by a river basin commission.”*

### **Water Resources**

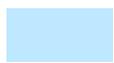
The two general sources of water supply are groundwater and surface water. Groundwater is obtained for water supply from wells and springs. Although the greatest amount of groundwater obtained in Bucks County is from wells, some water supply systems (e.g., Riegelsville Borough and Springfield Township) use springs as significant sources of their water.

Each geologic formation in Bucks County has unique groundwater yield capabilities directly related to its particular structure; however, such a relationship does not ensure a uniform supply of groundwater from all points within a formation. The available yields from these formations vary and consequently affect the available water supply in all areas of the county; well yields can show a considerable deviation from anticipated averages.

Wells supplying groundwater to users in Bucks County typically penetrate the Stockton sandstone, Brunswick shales, Lockatong argillite, or Coastal Plain unconsolidated sand and gravel geologic formations. In general, the Lockatong and Brunswick formations only yield moderate amounts of groundwater. The Stockton and unconsolidated sand and gravel formations generally yield higher



### Delaware River Basin Commission Groundwater Protected Area

 Groundwater Protected Area

amounts of groundwater, but the sand and gravel formations can be vulnerable to severe, widespread groundwater contamination

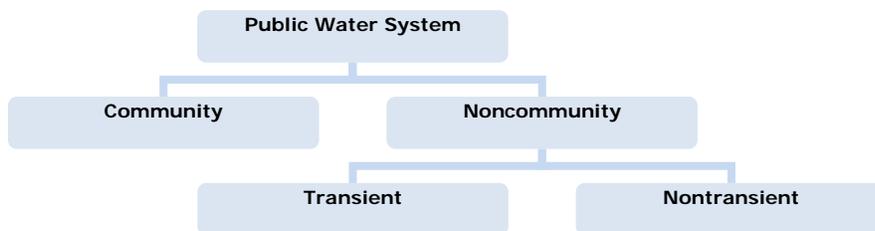
Other restrictive geologic formations in Bucks County have limited waterbearing supplies or potential susceptibility to contamination. Diabase formations, which are located in the upper part of the county, are very limited water-bearing areas. Carbonate geology occurs in two areas of the county (Durham Valley and Buckingham Valley) and consist of both limestone and dolomite. Carbonate geology is generally an abundant source of groundwater, but it can be soluble and susceptible to sinkholes and solution channels formations.

Many county residents are dependent on groundwater (both public and private) for their household water supply needs. Recent construction and expansions of the Forest Park Treatment Plant and the construction of the Point Pleasant Pumping Station have increased surface water withdrawals and the number of residents who drink surface water. Protection of groundwater resources is a goal supported by county residents, as expressed during meetings and surveys.

### Water Supply and Service Systems

A public water system is defined by PaDEP as a system, publicly or privately owned and maintained, that provides water to the public for human consumption, and that has at least fifteen service connections or regularly serves at least 25 people daily for at least 60 days per year. These systems typically include all collection, treatment, storage, and distribution facilities which are under the control of a system operator. Figure 14 shows the relationship of different types of public water systems.

**Figure 14**  
**Categories of Public Water Systems**



Public water supplies are categorized as either community or noncommunity water systems. A community water system is a public water system that has at least 15 service connections used by year-round residents or regularly serves at least 25 individuals year-round residents. These can include major systems (municipal authorities and departments) and smaller, minor community water systems (associations, mobile home parks, and apartments).

There are two types of non-community public water systems. A *non-transient* non-community public water system serves at least 25 of the same nonresident individuals every day for more than 6 months per year (e.g., school facilities, shopping and industrial complexes). A *transient* non-community public water system includes facilities such public eating and drinking establishments, camps/campgrounds, public bathing places, recreation areas, pre-schools and retail food stores that have individual wells.

Approximately 82 percent of the households in Bucks County rely on public water supply. In Bucks County there are over 80 community water suppliers that utilize 239 public wells and 8 water filtration plants. These community suppliers include 32 major community water suppliers, developer owned suppliers, homeowners associations, apartment systems, mobile home parks, long-term nursing facilities, long-term personal care facilities, and children's homes. There are also two bulk water haulers and a vended water system in Bucks County.

Much of the public water service in Bucks County is provided by major community water suppliers comprised of three different entities: private water companies, municipal water departments, water supply authorities. These suppliers serve portions of 47 of the 54 municipalities in the county; only Bridgeton, Durham, Haycock, Nockamixon, Tinicum, Upper Makefield, and Wrightstown townships contain no major community water supply systems. The Table 30 on the next page shows which municipalities are served by the various major community water suppliers.

Specific responsibility of community water supply entities includes assuring a continuous supply of safe and potable water to the consumer that meets or exceeds state and federal standards for both appearance and safety. They are responsible for the acquisition, financing, construction and operation of the public water treatment plants and conveyance facilities. In general, Bucks County residents find their water systems to be satisfactory. Over 80 percent of the survey respondents indicated they thought public water service was adequate. Only 63 percent of the Upper Bucks survey respondents, however, thought public water service was adequate.

Private individual residence water systems that are not part of public water supply systems are largely unregulated other than their initial construction. According to the Bucks County Health Department, approximately 18 percent of households in the county rely on private water supplies, the vast majority of which are wells. Private wells are typically safe, dependable sources of water if sited wisely, constructed properly, and maintained adequately. Private water supplies are owned and maintained by individual property owners so the protection and maintenance is largely the responsibility of the individual homeowner.

### **Water Supply Impacts, Issues, and Management**

The quantity and quality of surface water and groundwater are affected by the amount, type, and by-products of development. The county is faced with challenges in addressing potential water supply problems resulting from contamination, over withdrawal, and diminishing groundwater recharge.

### **Contamination and Overuse**

Drinking water can become contaminated at the original water source, during treatment, or during distribution to the home. If surface water is used, it can be exposed to acid rain, stormwater runoff, pesticide runoff, and industrial waste. This water is cleansed somewhat by exposure to sunlight, aeration, and micro-organisms in the water. Groundwater (private wells and some public water suppliers) is less easily contaminated, but the natural cleansing process also may take longer. Groundwater moves slowly and is not exposed to sunlight, aeration, or aerobic (requiring oxygen) micro-organisms.

**Table 30**  
**Major Community Water Suppliers**

<b>Company</b>	<b>Municipalities Served</b>
Aqua PA	Bristol, Chalfont, New Britain boroughs, Bensalem, Bristol, New Britain, Solebury townships
Newtown Artesian Water Company	Newtown Borough, Middletown, Newtown townships
PA American Water Company	Yardley Borough, Falls, Lower Makefield townships
<b><u>Municipal Water Departments</u></b>	
<b>Department</b>	<b>Municipalities Served</b>
Bristol Township Water Department	Bristol Township
Buckingham Township Water & Wastewater Department	Buckingham Township
Doylestown Borough Water Department	Doylestown Borough, Buckingham, Doylestown townships
Dublin Borough Water Department	Dublin Borough
Falls Township Water & Sewer Department	Bristol, Falls, Middletown townships
Plumstead Township	Plumstead Township
Quakertown Water Department	Quakertown Borough, Milford, Richland townships
Richland Township Water & Sewer Department	Milford and Richland townships
Richlandtown Municipal Waterworks	Richlandtown Borough
Riegelsville Waterworks	Riegelsville Borough
Trumbauersville Borough Municipal Waterworks	Milford Township, Trumbauersville Borough
Warrington Township Water & Sewer Department	Warrington, Warwick townships
<b><u>Municipal, Joint Municipal, and County Authorities</u></b>	
<b>Authority</b>	<b>Municipalities Served</b>
Bedminster Municipal Authority	Bedminster Township
Bucks County Water & Sewer Authority	Hulmeville, Langhorne, Langhorne Manor, New Hope, Pennel boroughs, Lower Southampton, Middletown, Solebury, Springfield townships
Doylestown Township Municipal Authority	New Britain Borough, Buckingham, Doylestown, New Britain, Plumstead, Warrington townships
Hilltown Township Water & Sewer Authority	Hilltown Township, Silverdale Borough
Hulmeville Municipal Authority	Hulmeville Borough
Lower Bucks County Joint Municipal Authority	Tullytown Borough, Bristol, Falls, Middletown townships
Milford Township Water Authority	Milford Township
Morrisville Municipal Authority	Morrisville Borough, Falls, Lower Makefield townships
North Penn Water Authority	Sellersville Borough, East Rockhill, Hilltown, New Britain, West Rockhill townships
North Wales Water Authority	New Britain Township
Northampton Bucks County Municipal Authority	Northampton Township
Perkasie Borough Authority	Perkasie Borough, East Rockhill, Hilltown, West Rockhill townships
Springfield Water Authority	Springfield Township
Telford Borough Authority	Telford Borough, Hilltown and West Rockhill townships
Upper Southampton Authority	Northampton, Upper Southampton, Warminster townships
Warminster Township Municipal Authority	Ivyland Borough, Warminster, Warwick townships
Warwick Township Water & Sewer Authority	Warwick Township

Potential sources of contamination are those facilities, sites, and activities that can contaminate the underlying groundwater aquifers or surface waters. Groundwater can be contaminated by disease-producing pathogens, leachate from landfills and septic systems, careless disposal of hazardous household products, agricultural chemicals, and leaking underground storage tanks. Pollutants from human activity can result in water quality problems by the increase of salinity, minerals, and other pollutants in groundwater supplies.

Several Bucks County municipalities have experienced the spread of toxins in drinking water supplies. The following chemicals have been found in some public and private water supplies:

- TCE = Trichloroethylene, a chlorinated hydrocarbon commonly used as an industrial solvent for degreasing;
- PCE = Perchloroethylene, a chlorocarbon widely used as dry-cleaning fluid;
- MTBE = Methyl tertiary-butyl ether (gasoline additive)

Other contamination issues (e.g., arsenic, turbidity) for public water suppliers are monitored by PaDEP. The BCDH conducts initial well testing at installation and provides recommendations to PaDEP for treatment or alternative solutions when a well is found to be contaminated.

Development pressures caused by population growth and a rise in the standard of living increase demand for potable water sources, increase the land area needed for public water supply service and infrastructure (treatment plants, pump stations, storage tanks, and distribution systems), and decrease the land available for groundwater recharge. Over-development of water wells can disrupt the natural balance between recharge rates and discharge rates within the hydrologic cycle. The potential effects of over-pumping or over-withdrawing water from groundwater resources could include:

- Low stream baseflow
- Warmer streams
- Less aquatic habitat
- High storm or peak flows in streams due to increased runoff
- Induced contamination because of over-pumping

Most public water systems must treat their water in order to provide safe, reliable drinking water to the communities they serve. The amount and types of treatment varies depending on the size of the system, whether the system uses groundwater or surface water, and the quality of the water source used. Many systems using groundwater can satisfy all federal requirements without applying any treatment, while others need to add chlorine or additional treatment. Because surface water systems are exposed to direct wet weather runoff and the atmosphere and are therefore more easily contaminated, federal and state regulations require that these systems treat their water.

To meet water quality standards, water suppliers use a variety of treatment processes to remove contaminants. Public water supplies are required to be disinfected, most commonly through the use of chlorination.

## Monitoring and Testing

Public water suppliers monitor for contaminants to verify that the water meets all federal and state standards. Water systems are monitored for a number of contaminants that are currently not regulated. This monitoring of data provides the basis for identifying contaminants to be regulated in the future. EPA's consumer confidence rule requires public water suppliers (community water systems) to provide Consumer Confidence Reports to their customers (also known as annual water quality reports or drinking water quality reports). The report summarizes information regarding sources used, any detected contaminants, compliance performance, and educational information. The reports are due to customers by July 1<sup>st</sup> of each year.

Public water suppliers test for chemicals, naturally occurring contaminants, physical characteristics and microbial pathogens. The type of testing and the frequency may be dependent upon the population served, source water type or public water supply type. State regulations provide a detailed list of contaminants that are tested in public water supplies.

## Maintenance and Interconnection

Water suppliers face challenges in maintaining and replacing pipes, treatment plants, and other critical infrastructure. Costs to operate a water treatment facility include capital costs (land purchase and development, infrastructure, piping, pumping stations, storage facilities, and chemicals), energy, and personnel costs.

The interconnection of water facilities provides alternative sources of supply in case of catastrophic contaminations events and strengthens the reliability of all included systems. Interconnection is important in that it also provides redundancy of supply and the ability to address water emergencies rapidly and efficiently across water supply districts, should they occur. Not only is interconnection a less costly option to increasing supply or facility expansion, but it also reduces stresses placed on supply sources and is a prudent trend toward a more comprehensive planning approach of managing water supply sources.

## Water Conservation

Water conservation strategies are used to manage water supply and meet future water needs. Water conservation and water use efficiency are the most reliable and least expensive way to preserve the county's water resources. The Delaware River Basin Commission and the mandatory statewide Pennsylvania building code both require water-saving devices.

Public water conservation measures coupled with technical and economic measures can be applied to reduce consumption and to increase awareness of potential water scarcity.

## Water Supply Planning

Planning for water resources requires an understanding of the potential for supply, the potential for demand, and the limits of what can be done to manage resources. The question has been asked, "How much development can we support with the water resources available to us in Bucks County?" The answer is not simple. Quantifying the groundwater resources and the capacity to provide for water

supplies is not a simple process and requires speculation on the potential yield of aquifers. Because surface water is also available, and the limits on that are even less predictable and less restricted, the goal of balancing water resources and development potential has been elusive. What we do know is that using water conservatively and wisely is a prudent approach. And being prudent about water resources means that we must look at the entire water cycle: how we consume water supplies, how we dispose of wastewater, and how we handle runoff and stormwater.

### ***Water Quality Protection***

The county prepared the *Bucks County Water Supply and Wellhead Protection Study* in 1997 to introduce the wellhead protection approach for public water supplies. The Wellhead Protection portion of the study includes a description of planning and wellhead protection case studies for seven municipalities. The case studies show how to define a Wellhead Protection Area, how to identify the types of potential contamination sources, and suggests management strategies. The main recommendation of the study is to encourage public water suppliers to implement measures to protect groundwater resources through wellhead protection, which can include keeping potential contamination sources away from wells and requiring setbacks around water source points.

Several water suppliers (authorities and municipal water departments) have conducted source water protection plans which include steps to protect their wellheads and other actions that will help to ensure good water quality.

### ***Water Resource Studies and Integrated Resources Plans***

The Delaware River Basin Commission has provided guidelines for municipalities to develop integrated resource plans to evaluate withdrawal limits, establish local recommendations for ensuring sufficient water resources to support existing and future development, and protecting local stream flows and habitats.

Integrated Resources Plans consider water supply, resource protection, water quality, stormwater and sewage facilities planning, and related areas such as land use and economic impacts. These plans also propose a comprehensive stream and riparian corridor restoration strategy. The plans are designed to restore and protect designated uses of the waters and its riparian areas, and are based on physical, chemical and biological assessments. Two plans have been completed in the region, one for Chester County and one for a watershed in Montgomery County.

In Bucks County, the communities in the Pennridge area cooperated on a water resources study with the goal of accommodating for the Pennridge area's fair share of development while providing for the long-term availability of water resources. The plan addresses the impacts on and threats to water in an area where there has been significant development. The study provides in-depth information on water resources, the relationship among components of the water cycle, and has sparked other actions to protect water resources. Ordinance changes requiring a water budget analysis, and preservation of the water resources, have been adopted that are applied on a development-by-development basis.

## Strategies and Actions

### Water Resources

- Review and update, as necessary, municipal ordinance language related to water resource protection.
- Protect water resources, natural resources and riparian areas.
- Establish wellhead protection areas/overlay zones, source water protection areas, stream corridor protection areas and conservation management districts.
- Prohibit incompatible uses near surface water and preserve and manage groundwater recharge areas to ensure a sustainable water supply.
- Cooperate with state, county, and municipal government officials to help implement appropriate recommendations of the Pennsylvania State Water Plan (Act 220).
- Monitor the progress of the State Water Plan and its implications regarding critical water planning areas in Bucks County.

### Water Service

- Protect water resources to meet peak and emergency demands.
- Promote interconnection of water supply systems to foster emergency preparedness.
- Encourage the provision of water service that is consistent with growth management.
- Use municipal comprehensive plans, zoning, and well regulations to coordinate land use goals with water resource considerations.

### Water Supply Planning

- Use aquifer yield potential to help assure that development in groundwater-dependent areas does not exceed the capability of underlying aquifers. Plan development location and intensities with consideration of available water resources.
- Encourage the coordination of efforts of agencies (government, private and nonprofit) responsible for the planning and management of water resources quality and quantity.
- Encourage municipalities and water suppliers to coordinate efforts in developing source water protection and wellhead delineation plans to protect water sources from over-withdrawal and potential sources of contamination.
- Coordinate with the Delaware River Basin Commission and PaDEP on water supply planning and drought emergency management.
- Participate in PaDEP's source water protection grant program.
- Encourage integrated water resources planning through use of land development, water supply, stormwater, and wastewater techniques that maintain natural functions of the hydrologic cycle.
- Assist municipalities on integrating water resource protection standards with land use regulations, wastewater facilities, stormwater management, natural resources, and open space planning.



Planning for wastewater treatment and disposal facilities is linked to the protection of public health, protection of water resources, and comprehensive growth and development plans in each community. The location of wastewater systems is a determinant of land use patterns. Likewise, the timing and location of future extensions or new systems influences the location and rate of growth in a community. For this reason, effective planning requires strong coordination between future utility plans and future land use plans.

### **Wastewater Facilities Legislation and Regulation**

There is a significant amount of legislation and regulation related to, and entities involved in, the planning, construction, and operation of wastewater facilities. These include numerous federal, regional, state and local requirements. Many of the pieces of legislation pertain to the overall protection of water quality. Key pieces of legislation pertaining to wastewater facilities and entities involved in the regulation of wastewater include:

#### **Federal Clean Water Act**

The most significant federal legislation pertaining to water quality is the 1972 Clean Water Act. The five key provisions of the Clean Water Act that apply to wastewater include:

- **National Pollutant Discharge Elimination System** – A permit program to control water pollution by regulating point sources that discharge pollutants into Waters of the United States.
- **Total Maximum Daily Load (TMDL)** – A program requiring states to identify all impaired waterbodies and establish the amounts that various pollutants need to be reduced to meet water quality standards.
- **National Pretreatment Program** – Requires standards designed to control pollutants from industrial users which may pass through or interfere with publicly-owned treatment works treatment processes or which may contaminate sewage sludge.
- **Biosolids Program** – Establishes requirements for the final use or disposal of sewage sludge biosolids and creates incentives for the beneficial use of biosolids for agriculture, horticulture, forest crops, and vegetation.
- **Water Quality Management Plan** – Directs states to develop areawide wastewater management plans for areas identified as having water quality problems. In 1980, the Delaware Valley Regional Planning Commission completed such a plan for southeastern Pennsylvania titled *COWAMP/208*.

#### **State**

**Pennsylvania Clean Streams Law (1937)** – Regulates the discharge of sewage, industrial waste and other substances that contribute to water pollution.

**Pennsylvania Municipal Authorities Act (1945)** – Authorizes municipalities to create a municipal authority for the purposes of acquiring, constructing and operating various types of projects, including sewage treatment facilities.

**Pennsylvania Sewage Facilities Act (Act 537 of 1966)** – Requires municipalities to develop and implement official sewage facilities plans designed to ensure adequate sewage service for existing needs and future growth.

**Pennsylvania Department of Environmental Protection** – Reviews and approves official sewage facilities plans to ensure compliance with regulations; administers the NPDES permit program, and issues Water Quality Permits for wastewater facilities.

### Regional

**Delaware River Basin Commission (DRBC)** – The Delaware River Basin Commission (DRBC) reviews and has the authority to approve or deny projects that are defined as having a substantial effect on the water resources of the Delaware River Basin. Relative to wastewater this includes plants discharging greater than 50,000 gallons per day (gpd) into the basin. Additionally, the DRBC has the authority to establish wasteload allocation limits specifying the amount of pollutants that can be discharged by individual plants.

### County

The county has no regulatory authority as related to wastewater systems; however, three county agencies are involved indirectly in wastewater planning and provision of service:

- Bucks County Planning Commission – reviews proposed revisions and amendments to official Act 537 sewage facilities plans and planning module applications for individual developments.
- Bucks County Department of Health – conducts inspections of municipal and industrial treatment plants, as well as some single residence sewage treatment plants, permits and inspects proposed repairs to existing facilities, and inspects septage and biosolids hauling vehicles.
- Bucks County Water and Sewer Authority – is an operations agency responsible for collecting and treating wastewater in parts of Bucks County.

### Local

Municipal sewer departments and municipal authorities are responsible for the daily operation and maintenance of public wastewater treatment plants and conveyance facilities. As Table 31 indicates Bucks County has 3 municipal sewer departments and 22 municipal authorities providing sewage collection or treatment. Municipal governing bodies are responsible for developing, adopting, and implementing official sewage facilities plans (Act 537 plans) as required by the Pennsylvania Sewage Facilities Act.

**Table 31  
Municipal Sewer Departments and Municipal Authorities**

Municipal Sewer Departments	
Buckingham Township	
Dublin Borough	
East Rockhill Township	
Warrington Township	
Quakertown Borough	
Municipal Authorities	
Bedminster Municipal	Morrisville Borough Municipal
Bristol Borough Sewer	Newtown Bucks County Joint Municipal
Bristol Township	Northampton Bucks County Joint Municipal
Bucks County Water and Sewer	Pennridge Wastewater Treatment
Chalfont - New Britain Township Joint Sewage	Telford Borough
Hilltown Township Water and Sewer	Township of Falls
Hulmeville Municipal	Upper Southampton Sewer
Lower Bucks County Joint Municipal	Warminster Township Sewer
Lower Makefield Township Municipal Sewer	Warwick Township Water and Sewer
Milford - Trumbauersville Area Sewer	Yardley Borough Sewer

**Wastewater Facilities Planning**

In response to passage of Act 537, the first wastewater facilities plan in Bucks County, the *Bucks County Sewerage Facilities Plan* (1970), served as a precursor to individual municipal wastewater facilities plans as required by Act 537. The plan was adopted by 52 of the 54 county municipalities and served initially as their official sewage facilities plan. The *Bucks County Sewerage Facilities Plan Update* (1977) served as an update to the 1970 Plan and addressed changes in wastewater facilities planning and emphasized the need to evaluate a variety of options, rather than just promoting the expansion of existing centralized sewerage systems.

Subsequent to the 1970 and 1977 county wastewater facilities plans, municipalities developed their own official Act 537 plans. Many are more than 30 years old, 13 have plans between 20 and 30 years old, and another 10 have plans between 10 and 20 years old, indicating a need to update these plans. A few municipalities are currently updating their plans.

Municipal Act 537 plans, in conjunction with zoning and comprehensive plans, determine where future growth is located and the type of development allowed. As such, coordination between these various plans is important to ensuring that development is directed in the manner desired by the community. A lack of coordination can result in unintended growth due to the extension of public sewers into non-designated growth or rural areas. The lack of coordination at the state level of land use laws and sewage facilities laws makes it difficult for communities to ensure that wastewater facilities and land use decisions are consistent.

The development district concept is designed to attract growth to designated development areas to help protect natural resource features outside of the development district, and to allow for the cost-efficient

provision of municipal services such as wastewater and other utilities in a concentrated area. The provision of public sewer service with centralized treatment facilities is part of the development district concept in that it can help guide development to the area with service availability. Historically, centralized facilities were advocated based on the belief that these types of facilities offered more cost effective construction, more manageable oversight, and because these facilities have a proven record. Similarly, when development does occur outside of the development district, the use of on-lot and/or community systems should be the preferred alternatives.

### Wastewater Facilities Selection

The design and selection of appropriate wastewater facilities involves an analysis and comparison of all feasible alternatives for the collection, conveyance, treatment and disposal of wastewater.

The four general categories of wastewater systems include:

1. **Centralized systems** – Wastewater is collected from many households, businesses and institutions and transported to a centralized off-site facility for treatment and effluent disposal;
2. **Individual On-Lot systems** – Wastewater for an individual residence or business is collected, treated and disposed of or reused at or near the point of generation;
3. **Community systems** – Community systems collect, treat and dispose of wastewater generated by multiple residences and/or businesses of an are, single development, or multiple developments.
4. **Industrial systems** (or pretreatment facilities) – Industrial systems are designed to treat water or liquid that carries wastes from industrial operations. The purpose of treating industrial wastewater is to make it acceptable for discharge into a receiving water body such as a river, stream or lake, or into a municipal treatment plant (pretreatment).

Wastewater systems are typically comprised of three basic components:

1. **Collection and conveyance** – Collection and conveyance systems are comprised of a system of pipes and pumps used to collect and convey wastewater from individual sources to treatment facilities. These systems are often gravity sewers, but may also include vacuum sewers, low-pressure (force main) sewers, or small diameter gravity sewers.
2. **Treatment** – Treatment options vary based on the type of wastewater system. Some treatment options such as lagoons and constructed wetlands are common to both centralized treatment facilities and on-lot systems, while other treatment options are unique to one type of system. For example, septic tanks, small aerobic treatment units, and recirculating sand filters are unique to on-lot systems. Similarly, traditional municipal treatment plants are unique to centralized systems, although smaller versions of these systems known as package treatment plants can be incorporated as part of a community system.

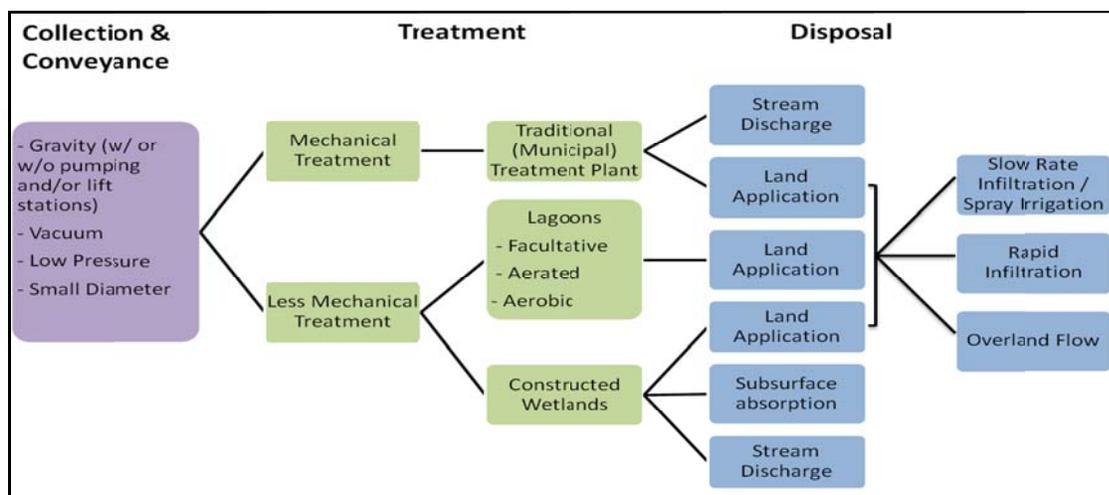
3. **Disposal** – As with collection/conveyance and treatment, there are a variety of wastewater disposal techniques. The predominant forms of wastewater effluent disposal in Bucks County include:
- **Stream discharge** – The primary form of treated effluent disposal for centralized and community systems, this method releases treated effluent into a surface water body such as a stream. Although required to meet discharge requirements under the NPDES, potential problems can arise that can have serious negative environmental consequences on high quality and exceptional value streams.
  - **Land application** – Primarily used for centralized and community systems, and increasingly for individual on-lot systems, this involves the controlled application of wastewater effluent to soil where various processes treat the effluent as it passes through the soil. Land application of wastewater effluent has advantages over other means of disposal because the wastewater recharges the groundwater system, increases base flow in streams, and has reduced potential for negative environmental impacts. Buckingham Township is the only municipal authority or department using land application techniques in the county.
  - **Subsurface discharge to absorption field** – A subsurface absorption field is designed to receive liquid effluent from treatment facility and distribute it over an absorption area where it is allowed to seep into the soil where soil filtering and bacterial actions treat the harmful material in the effluent, completing the treatment process so that the water is recycled to the surface or groundwater source.
  - **Elevated sand mound** – Certain soil conditions do not allow for conventional subsurface discharge due to limiting zones such as bedrock, impervious soil layers, a high water table, or a seasonal high water table. In such areas, elevated sand mounds can be used for effluent disposal by using a special blend of sandy fill material and gravel placed on top of the natural soil.

The interchangeable, mix-and-match nature of the various types of collection, treatment and disposal options, combined with the variety of wastewater systems, allows for a range of choices for municipalities and property owners. Municipalities develop a hierarchy or prioritized list of alternatives, which is incorporated into the municipality's Official Sewage Facilities Plan (Act 537 Plan) that meets municipal goals. The list of alternatives should be evaluated and established based on a variety of factors including:

- **Regulation** – Wastewater facilities are subject to a variety of regulation. Pennsylvania Code Chapter 73 specifies certain site requirements for on-site wastewater disposal systems. Additionally, all wastewater facilities planning needs to meet mandated requirements, and also be consistent with the municipality's Act 537 Plan.

- **Physical Factors** – Physical obstacles such as geology, soil, topography, lot size or shape, the characteristics of the wastewater, or other physical constraints, may limit the type of wastewater components available for a particular site.
- **Environmental Factors** – Designing wastewater facilities needs to consider the potential impact to the environment such as the potential for groundwater contamination resulting from sewage overflows and leaking septic tanks and lines; the impact to natural resources stemming from new development associated with the extension of public sewer lines; and air and water quality impacts stemming from odor, chemical and particulate emissions from treatment facilities and sludge incinerators.
- **Financial Factors** – The evaluation and selection of wastewater systems need to take into consideration both the initial capital costs, which can vary widely based on a variety of different costs including the cost of land; the cost of various system components; trenching and excavation costs, and permit fees, as well as the ongoing operation and maintenance costs associated with the system.
- **Health Concerns** – Health concerns need to be given consideration; inadequately treated sewage carries the risk of infectious bacteria, viruses, parasites and toxic chemicals. These risks pose a threat to groundwater and can result in groundwater contamination from a variety of sources including broken, leaking, or overloaded pipes that allow untreated and/or inadequately treated sewage to be released directly into the environment. Another health concern stems from unused medications being improperly disposed of by flushing them down sinks or toilets. Drugs and chemicals entering our wastewater systems can result in these drugs showing up in both surface and groundwater since most treatment methods do not remove all drug and chemical residues.

**Figure 15**  
**Wastewater System Options**



Traditional wastewater facilities selection and planning advocated the use of stream discharge systems for municipal treatment plants, and septic tanks and elevated sand mound systems for on-lot systems, as

these techniques have been tried and proven and has often been more cost-effective as compared to other systems. However, the emergence of new wastewater technologies has resulted in many worthy and sustainable alternatives to these traditional systems. Sustainable wastewater technologies focus on wastewater being an asset versus a liability. These technologies advocate returning water to the area from which it was drawn, resulting in no waste disposal into water bodies. This is particularly important in areas which lie within the Delaware River Basin Commission's designated groundwater protection area. Land application technologies such as those in use in Buckingham Township are representative of this type of sustainable wastewater system.

## **Wastewater Facilities Capacity, Operation, and Maintenance**

Proper operation and maintenance of on-lot, community and municipal wastewater treatment facilities is essential to the protection of public health and natural resources. Failing on-lot systems and overloaded municipal treatment plants can pose both health and environmental concerns.

### **Municipal Facilities**

The two capacity related problems afflicting municipal treatment plants within Bucks County are overloads, both hydraulic and organic, and future reserve capacity. Hydraulic overloads occur when the monthly average flow entering a plant exceeds the monthly average flow capacity upon which the permit and the plant design are based during a consecutive three month period, or when the flow in any portion of the system exceeds its hydraulic carrying capacity. Organic overloads occur when the monthly average organic load exceeds the organic load capacity upon which the permit and the plant design are based.

In addition to overload issues, future reserve capacity issues can be problematic. Capacity issues may be the result of the entire plant being at capacity and in need of an expansion, or may be the result of one (or more) municipality utilizing its (their) allotted space at a plant. When either of these conditions occur, a sewer moratorium can be put into place to prevent further connections to the system until corrective actions have been taken to address the issue.

To monitor overload and future capacity issues, Chapter 94 of the PA Code requires owners of sewerage facilities to properly plan, manage and maintain their facilities, and to submit an annual Chapter 94 Wasteload Management Report to the PaDEP.

Chapter 94 Reports are then reviewed for consistency with Act 537 Official Plans and used to monitor and regulate sewage facilities. Proposed Act 537 Plan revisions associated with proposed land developments and subdivisions are disapproved when:

- Facilities are overloaded, and an acceptable plan and schedule for reducing overloads has not been submitted; or
- Facilities have allocations beyond available reserve capacity, and an acceptable plan and schedule for reducing overloads has not been submitted.

Continuous supervision, operator training and funding from user charges can help minimize operational and maintenance problems associated with municipal treatment facilities. However, problems can still occur by industries discharging untreated or improperly treated industrial wastes into the wastewater system, which can upset the treatment processes of the municipal plant. Additionally, failure to maintain conveyance systems can result in infiltration and inflow (I&I), which leads to hydraulic overload problems.

### **On-Lot Disposal Systems**

On-lot disposal systems require minimal routine maintenance. However, problems with on-lot systems can originate from a variety of sources including the natural aging of the system components, too much wastewater entering the system, poor maintenance of the system, adverse site conditions, septic tanks that are not watertight, absorption fields that are paved or parked on, or toxic cleaners and chemicals or foreign objects entering the system.

Often the solution to alleviate malfunctioning on-lot systems has resulted in the extension of expensive public sewer facilities to the affected area with little or no effort given to trying to rehabilitate the existing system. In addition to the expense involved in the extension of public sewer facilities, such extensions often result in additional development pressures due to the availability of sewer facilities and abandonment of functioning systems, as all homeowners along the path of the extension are generally required to connect to the system.

Holding tanks have also been used as a substitute for failing on-lot system. Wastewater is collected and stored on-site and eventually transported to another site, typically a municipal treatment plant, for treatment and disposal. The use of holding tanks is typically considered only as a short-term temporary solution. Dependent on the size of the tank and the quantity of the flow, holding tanks may require frequent pumping resulting in holding tanks being expensive for individual homeowners. Based on the expense involved, and the need to transport the wastewater elsewhere for treatment, the PaDEP discourages the use of holding tanks.

To help avoid the malfunction of on-lot systems, several municipalities have adopted On-Lot Disposal Systems management programs designed to provide for the ongoing maintenance and inspection of on-lot systems in an effort to reduce failures of these systems. Some municipalities, or PaDEP, require that replacement absorption areas for failed systems be identified in the system design in case of the need for rehabilitation of the system in the future.

These programs include requirements for:

- Frequency of septic tank pumping;
- Required Operation and Maintenance manuals for certain on-lot systems such as individual residential spray irrigation systems;
- Water conservation requirements;
- Use and permitting of holding tanks;

- Septage handling requirements, including collection, transport, and disposal;
- Need for small flow treatment facilities to connect to public sewer should it become available;
- A hierarchy of available alternatives for the repair or replacement of existing failed systems.

### **Community and Industrial Wastewater Facilities**

As the maintenance and operation of community facilities are typically the responsibility of homeowners' associations or the owner of the facility generating the industrial waste, problems with these systems arise from a variety of factors including inadequate funding, insufficient operator training, or a lack of properly trained operators. To help minimize the potential for operational and maintenance issues of community and industrial wastewater facilities, PaDEP has required that municipalities be co-permittees so that funding is available to correct problems that may arise.

### **Biosolids and Septage**

In addition to treated wastewater effluent, biosolids (residual organic materials produced during wastewater treatment) also need to be managed. Options for managing wastewater biosolids include:

- Land Application – Biosolids can be applied to land as a soil conditioner or fertilizer.
- Incineration – De-watered solids can be burned at very high temperatures to reduce the organic residuals to an ash that can be disposed of or reused.
- Beneficial Use Products – A variety of beneficial use products can be derived from biosolids including pellets that are used as a fertilizer for lawn care, turf production, and vegetable production, and a composted peat-like product for use in the production of soil additives for revegetation of topsoil depleted areas.

Septage, the partially treated waste pumped out of a septic tank, can be transported to wastewater treatment facilities, used by farmers for fertilizer, or stored in large septage storage facilities for later treatment or use on crops. Most septage generated in Bucks County is from residential sources. Non-residential sources include wastewater from commercial/industrial development, grease interceptors at food establishments, portable toilets, and RV or boat wastes disposal facilities. Because septage is periodically removed (with a frequency depending on tank capacity, system efficiency, and usage level, and municipal management programs), a significant amount is generated and its collection, transport, and disposal must be properly managed.

## **Strategies and Actions**

### **Wastewater Facilities – Planning**

- Update the wastewater facility (Act 537) plans for municipalities with plans greater than 20 years old or when determined outdated.

- Develop better ways to coordinate wastewater facilities planning, land use planning, and comprehensive planning, in light of the conflicting state laws governing wastewater and land use.
- Use centralized wastewater systems in designated growth/development areas and the allocation of sufficient capacity wastewater treatment plants intended to serve these areas.
- Encourage the use of community on-lot systems over extension of public sewer for areas experiencing on-lot disposal system malfunctions and for new community developments outside of designated growth areas/development areas.

### **Wastewater Facilities – Selection, Capacity, Operation and Maintenance**

- Support efforts to upgrade treatment capacity and treatment processes of municipal treatment plants that are experiencing hydraulic and organic overloads or future reserve capacity issues.
- Work with municipalities to develop educational programs designed to inform the public of the need for on-lot disposal system maintenance and management programs.
- Require detailed wastewater facilities alternatives analyses for proposed extensions of public sewer outside of designated growth areas.
- Advocate the use of community wastewater systems that minimize environmental impacts and promote land disposal of treated wastewater to enable groundwater recharge.
- Discourage the use stream discharge systems, particularly into streams designated as high quality of exceptional value waters.
- Continue to work with responsible agencies to encourage the enforcement of industrial wastewater pretreatment standards for all municipal wastewater systems.
- Review and update as needed municipal ordinances and regulations to be consistent with Bucks County Department of Health and PaDEP regulations and municipal Act 537 plans.

Stormwater runoff is the term for rainwater that moves over the ground during and immediately following rainfall. The area or land through which groundwater travels and stormwater runoff drains is a watershed. In a watershed undergoing land development and urban expansion, the amount of stormwater runoff following a rainfall event can increase dramatically. This is due to the amount of impervious land created by development and the accompanying reduction of natural grassy or wooded areas. Impervious surfaces are created when the natural landscape is covered by solid pavement, rooftops, buildings and other surfaces that do not allow stormwater runoff to penetrate. Rather than soaking into the ground (or infiltrating), stormwater rapidly flows over it and picks up debris, sediment and dissolved pollutants.

Management of stormwater runoff in the 19<sup>th</sup> and 20<sup>th</sup> centuries consisted primarily of drainage networks and underground pipes which collected stormwater and discharged it directly into the nearest receiving water body. While this method may have worked effectively to remove excess stormwater runoff from small communities, as development spread and impervious surfaces increased throughout Bucks County, runoff from developed areas combined to produce large volumes of fast-moving, contaminated water which eventually flowed toward downstream areas and into waterbodies. Failure to properly manage runoff has resulted in stormwater problems throughout the county, such as flooding, greater stream channel erosion, water quality impairments, and a reduction in groundwater recharge. Solutions to these problems require both on-site and watershed-wide management strategies.

More recently, stormwater management practitioners have developed better methods to manage stormwater. Drainage systems are now designed to treat stormwater as a natural resource, not a nuisance, and aim to keep the stormwater on-site. Through the use of Best Management Practices (BMPs), stormwater runoff is infiltrated, stored, evaporated, or filtered. The goal of these practices is to mimic the natural hydrologic cycle and to restore the flow of runoff to be what it would have been before development.

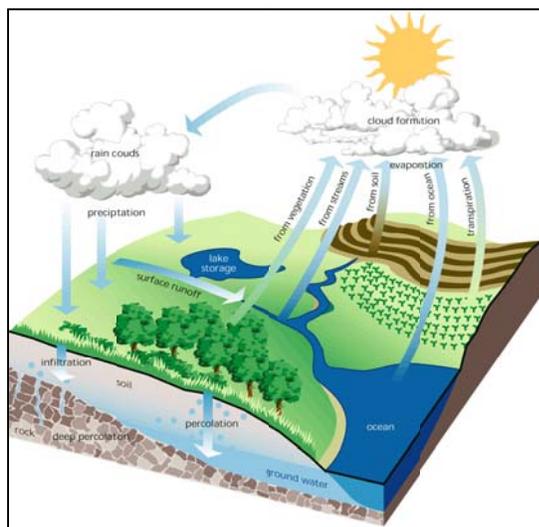
Bucks County has been on the forefront of stormwater management planning. Watershed management plans and regulations in the county require the incorporation of volume- (quantity) and rate- (speed) reducing BMPs for all new development. Stormwater regulations have been in place for a number of years, and great strides have been made in avoiding new stormwater problems. But because much of Bucks County was developed before stormwater controls were put in place, and because the techniques to managing runoff are continually improving, there remain areas where flooding and polluted runoff exist. Residents responding to the comprehensive plan survey ranked stormwater management as the most inadequate of all the services provided by their communities. Through this plan and stormwater programs that control the amount of runoff and the flow of pollutants into streams, the county continues to improve stormwater management practices to protect the public and the county's natural water resources.

## Purposes of Stormwater Management

### *Protect the Hydrologic Cycle*

The primary goal of stormwater management is to restore the natural hydrologic cycle to what it would be before development. Treating stormwater as a natural resource involves modeling systems after the physical processes that occur naturally in the water cycle. The hydrologic cycle schematic in Figure 16 illustrates the continuous movement of water above, on and beneath the surface of the Earth.

**Figure 16**  
**Hydrologic Cycle**



Source: <http://www.sylvansource.com/hydrologic.html>

The quantity of water moving through the hydrologic cycle is calculated through what is known as a water budget. A water budget estimates the relative distribution of rainfall movement and generally it is assumed that precipitation moves through the watershed in three ways: through evapotranspiration, groundwater recharge, and runoff.

Based on available records, the average annual rainfall in Bucks County is 45 inches. The following generalization can be made about the water balance for Bucks County in its natural state: 60 percent of the annual rainfall is returned to the atmosphere through evapotranspiration from surface vegetation and trees, 26 percent of the annual rainfall moves through the soil horizon vertically until it reaches the zone of saturation or the water table, and 14 percent of annual rainfall runs off into streams or waterbodies. When stormwater is properly managed, the percentage of water leaving a site through infiltration, evapotranspiration and runoff should be similar, if not the same, as these percentage values.<sup>16</sup>

<sup>16</sup> The water balance is based on the following studies; *Relation Between Ground Water and Surface Water in the Brandywine Creek Basin Pennsylvania* (USGS, 1962), *Water Budgets for Selected Watersheds in the Delaware River Basin, Eastern Pennsylvania and Western New Jersey* (USGS, 2005) and *the Neshaminy Creek Watershed Stormwater Management Plan* (BCPC, 1992)

### ***Prevent Increased Floodwaters***

The need for proper stormwater management becomes more evident when stormwater causes increased flooding, which not only causes property damage but puts the public's health and safety at risk. Flooding is a natural occurrence and takes place because the rate of rainfall exceeds the rate of infiltration. But because many older communities were built lacking proper stormwater controls, the problem of flooding has been exacerbated throughout many watersheds. As runoff in these developments is pushed off-site as quickly as possible, streams become inundated, reach capacity, crest their banks, and flow onto surrounding streets and properties.

Applying controls to manage the rate of stormwater runoff assists in reducing flooding problems. Peak-rate controls involve detaining stormwater longer on site, commonly in basins, to reduce the amount of water flowing through storm sewer systems and watercourses. This allows runoff to move through both manmade and natural watercourses over a longer timeframe and keeps large volumes of runoff from converging in the main stem of a stream at one time.

### ***Protect Water Quality***

When stormwater runs over land affected by human activities such as farming, manufacturing, land excavation and grading, and impervious surfaces, it picks up and carries sediments, oil, debris and pollutants into the streams and lakes of Bucks County. Excess sediment and nutrients, such as phosphorous and nitrogen, affect stream clarity and chemistry and can be detrimental to aquatic life. Pollutants can be traced either to a specific source (point of discharge) or can be from any number of unknown activities (non-point sources). Approximately 25 percent of the impairments in Bucks County streams are caused by urban runoff<sup>17</sup> from impervious surfaces into storm sewers and receiving waters.

The Pennsylvania Department of Environmental Protection (PaDEP) has assessed 1,206 miles of streams in Bucks County and 475 miles of the streams are classified as impaired waterways. An impaired waterway is a stream not attaining one of its four designated uses: aquatic fish, fish consumption, potable water, and recreation.

The quality of stormwater runoff can be improved by reducing both the source and quantity of pollutants entering streams as well as protecting natural features (stream buffers, vegetation, and the natural soil mantle) that are able to filter and remove pollutants. BMPs utilize natural processes to control stormwater volume that are effective at keeping stormwater on the site longer to allow sediments to filter out, or to facilitate infiltration and use the soil profile and vegetation to remove pollutants.

### ***Protect Stream Channels from Erosion***

Stream channels naturally adjust as the result of increased stream flows. However, when development increases the frequency and duration of runoff events flowing through a stream channel, streambank

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<sup>17</sup> Urban runoff is referred to as runoff from any area with impervious surfaces or land uses with storm sewer infrastructure. "Urban" in this context, does not necessarily refer to an area of high density development.

erosion becomes accelerated and alters the stream's natural ecosystem. Increased stream flows also remove protective vegetation and increase sedimentation.

The establishment and restoration of riparian buffers along lakes, streams, and wetlands help to stabilize streambanks to prevent erosion. In addition, when stormwater runoff volume controls are in place, the frequency that a stream reaches the tops of its banks significantly decreases, and the amount of sediment flowing into a stream is reduced.

### ***Promote Groundwater Recharge***

Groundwater seepage into stream channels is called base flow. During most of the year, stream flow is composed of both base flow and land surface runoff. However, during dry periods, base flow is totally dependent on groundwater discharge. When stormwater is not properly managed and runoff discharges directly to our surface waters without the opportunity to infiltrate, groundwater supplies are diminished. Diminished groundwater supplies can be detrimental in two ways: a reduction in base flow compromises a stream's ability to maintain cooler temperatures and balance its chemistry, and a reduction of an aquifer's water level can decrease drinking water supplies. BMPs which manage runoff by infiltrating it through the soil profile assist in recharging groundwater to preserve stream ecosystems and to protect future water supply sources.

### **Stormwater Planning and Regulation**

Both the state and federal government require local governments to implement stormwater management regulations. In Pennsylvania, the state requires municipalities to adopt stormwater management regulations that are consistent with stormwater management watershed plans. Throughout the country, the federal government mandates that municipalities of a certain size obtain permits for stormwater discharges under the National Pollution Discharge Elimination System (NPDES) program.

### ***Pennsylvania's Stormwater Management Act, Act 167***

Unlike other natural resources, water is more challenging to manage because water moves freely and crosses man-made boundaries. The most effective way to regulate water is to manage it within water's own natural boundary, a watershed. In the mid 1970's the state of Pennsylvania recognized that stormwater had been inadequately managed and had resulted in increased flooding and degradation of water quality. Therefore, the state enacted Act 167 of 1978, the Stormwater Management Act, to require stormwater to be regulated within the context of watershed boundaries. Act 167 requires the PaDEP to designate watersheds and establish guidelines for the preparation of stormwater management plans for the state's watersheds. Counties are responsible for preparing the plans and developing ordinance language for municipalities to use when enacting stormwater management ordinances.

The ten PaDEP designated watersheds in Bucks County conform with the primary watersheds shown on Map 7 in the Natural Resources section in Part IV of the plan. Six of these ten cover most of the county and each has an approved stormwater management plan. The following table lists the plans and approval dates.

**Table 32**  
**Stormwater Management Plans and PaDEP Approval Dates**

Watershed	Date of Approval
Tohickon Creek Watershed	January 16, 2002
Delaware River North Watershed	January 16, 2002
East Branch Perkiomen Watershed	September 2004
Delaware River South Watershed	November 16, 2004
Neshaminy Creek Watershed (includes Little Neshaminy Creek)	November 23, 2010

The next phase in stormwater management planning in the county is to develop a county-wide stormwater management plan to update all the plans written before 2005 with the most recent stormwater standards and criteria. Since 2005, PaDEP has adjusted the water quality standards throughout the state and all plans now must be in compliance with the new standards.

Municipalities are required to adopt stormwater ordinances that are consistent with the stormwater management watershed plans within their municipal boundaries. Consistency is achieved when the municipality has incorporated the plan's performance standards into their municipal ordinance. The performance standards require that permanent controls be put in place on a development site to manage the stormwater runoff volume (amount) and the rate (speed) the stormwater is leaving the site. When controls are implemented, stormwater systems are constructed which reduce the quantity of runoff, either through systems which infiltrate or evapotranspire the stormwater, or slow the rate of runoff, typically through systems which retain or detain.

The activities regulated by the ordinance typically include land development, subdivisions, new construction activities, and redevelopment. The size of the site, the location in the watershed, and the proposed area of impervious surface determine how the runoff needs to be managed. For example, larger development projects, like a subdivision of ten homes, require a number of permanent engineered stormwater facilities. Typical facilities for a project this size include naturalized stormwater detention basins, wetland areas and bio-swales designed to control the rate at which stormwater leaves the development and to treat the stormwater before it runs off the site. For smaller projects, like a home addition or a residential detached garage, small stormwater measures such as disconnecting roof drains from the storm sewer and directing it to lawn or a landscaped area (such as a rain garden) would need to be designed to keep at least the first two inches of runoff on site.

### ***Implementation of Act 167 Plan Requirements***

Although stormwater runoff is required to be controlled by the standards and criteria set in the PaDEP approved stormwater management plans, the plans only regulate activities associated with new development or redevelopment. Act 167 plans do not solve existing flooding or runoff problems. They do identify existing problems for future correction and assure that the problems do not get worse. Existing runoff problems will remain until municipalities or individual property owners remediate these drainage problems, or until properties are redeveloped using required stormwater management measures.

Although the performance standards in the stormwater management plans are designed to control runoff watershed-wide, enforcement is local. Municipalities are required to adopt standards which are consistent with the plans; however, they have the freedom to structure and enforce their ordinance as they see fit. Therefore, it is possible to have two adjacent municipalities in a watershed with the same standards, yet different stormwater management procedures. Even if a municipality reviews how a development will comprehensively affect stormwater runoff flow, the scope of review rarely extends beyond their own municipal boundaries. Also, municipalities sometimes waive stormwater requirements on a situation-by-situation basis. Waivers are sometimes unavoidable because of site constraints. However, when the practice becomes common, the cumulative effect of projects not abiding by the regulations exacerbates stormwater problems instead of preventing them. Exempting projects from stormwater regulations diminishes the purpose of establishing watershed-wide stormwater controls.

Through the stormwater management planning process, municipalities develop and agree upon a level of required runoff control throughout the watershed in the stormwater regulations. Once the plans are approved and adopted, more planning coordination needs to occur among municipalities to continue the multi-municipal stormwater planning process. There are efforts municipalities can make to continue this process, such as considering development occurring in other municipalities within the watershed. Municipalities can also attempt to limit the number of discretionary stormwater regulatory waivers permitted. The county and participating municipalities can discuss how to effectively enforce regulations from the watershed plans after the plans are adopted and implemented.

### ***National Pollution Discharge Elimination System (NPDES)***

The Federal Clean Water Act of 1972 regulates point and non-point sources that discharge pollutants into waters of the United States through the National Pollution Discharge Elimination System (NPDES) permit program. There are two NPDES permits in Pennsylvania that regulate stormwater: one permit that regulates erosion and sedimentation during construction activities; the second permit requires qualifying municipalities (populations with 10,000 or more) to comply with standards for all municipal-owned separate storm sewer systems (MS4). The latter permit requires municipal governments to fulfill six minimum control measures which involve education, public involvement, illicit discharge detection and elimination, construction and post-construction runoff control requirements, and pollution prevention.

There is a need to improve the way two of the control measures—education and public involvement—are facilitated. The permit requires municipalities to develop a program to reach target audiences (i.e., residents, businesses, schools) with publications and materials and to solicit public participation with the municipal stormwater management planning and implementation. Because most permits are submitted individually, these initiatives are completed independently. Instead of municipalities attempting to get the word out about proper stormwater management on their own, a more corporate approach could be taken county-wide. One idea generated at the comprehensive plan stakeholders meetings was creating partnership agreements among the county, local engineering firms, the conservation district, or watershed non-profits to assist municipalities with educating their residents on good stormwater management techniques and why it is important.

Illicit discharge detection and elimination is included in the permit because it is one of the most effective ways to prevent water pollution. An illicit discharge is any substance considered to be a contributor to polluting the waters of the Commonwealth.<sup>18</sup> Typical sources of illicit discharges are illegal dumping, broken sanitary sewer lines, sewer overflow, and failing septic tanks. Municipalities must plan and implement a program to address illicit discharge.

Procedures must be in place to identify, screen, assess potential impact, inspect, and remove illicit discharges from the municipal-owned storm sewer systems. Implementing a program can include activities such as: locate, map and inspect storm sewer outfalls (40 percent of illicit discharges can be detected by inspecting outfalls); create a hotline for the public to report illicit discharge; and develop a system to track, report and follow-up on illicit discharge incidences. Although this may entail a significant amount of time and staff resources, the actions taken can make a considerable difference in the ecological health of the local waterways.

Other control measures require municipalities to implement and enforce stormwater management regulations which require the control of erosion and sediment during construction and the control of runoff with permanent BMPs post-construction. Every municipality in Bucks County has stormwater management regulations in place as a stand-alone ordinance or in their subdivision and land development ordinances. Municipalities must implement good housekeeping procedures to prevent pollutants from washing off municipal property into the storm sewers during activities such as vehicle maintenance, snow removal, and lawn and grounds care. A municipality must also ensure adequate long-term operation and maintenance of municipal-owned post-construction stormwater BMPs.

The county must fulfill the NPDES permit requirements for all county-owned stormwater facilities. The requirements are the same as those for a municipality; however, the permit applies differently because the county does not implement or enforce local stormwater management regulations. The county continues to meet the permit requirements.

## **Facilities Management, Operation, and Maintenance**

Stormwater management practices have evolved since the passage of the Clean Water Act in 1972. Some of the newest methods combine site design techniques such as Low Impact Development with engineered structured facilities. These newer facilities need to be monitored and maintained on a regular basis to ensure they are operating as originally intended. The design, operation and maintenance do not come without a cost, and local governments need to budget for stormwater as they do for other services.

### ***Best Management Practices***

The common practice for managing runoff in the recent past was stormwater detention. In this practice, runoff is stored in large basins and held for a period of time before being discharged into the streams. Detention basins slow the flow of runoff throughout the watershed and keep the stormwater from

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<sup>18</sup> Any discharge that isn't one of the following is considered prohibited; discharges from fire fighting, potable water sources, irrigation drainage, air conditioning condensation, springs, water from crawl spaces, flows from wetlands, lawn watering, de-chlorinated swimming pool, uncontaminated groundwater, individual residential car washing, routine external building wash down.

reaching watercourses at the same time. This prevents runoff from causing the stream volume to overflow the stream banks.

Because of their proliferation in the 1970s, 1980s, and 1990s, detention basins are the most common stormwater facility seen throughout Bucks County. While basins are effective at slowing down the rate of runoff to prevent flooding and allow some pollutants to settle during larger storms, the practice presents some challenges. Most often the basins are lined with turf grass which provides little to no infiltration or evapotranspiration. They are commonly designed with concrete low-flow channels down the center which provide no opportunity for sediment to settle during small storm events. And if not properly maintained, standing water can accumulate and breed mosquitoes.

The newest movement within the field of stormwater has moved away from the use of engineered solutions, such as detention basins and piped conveyance systems, and instead aims to treat stormwater as a water resource and use practices which protect the runoff quality. Land planners and stormwater practitioners are now doing more at the start of project development by incorporating Low Impact Development techniques. Professionals are also including innovative BMPs which utilize natural processes in new projects and during redevelopment or stormwater retrofits.

Low impact development consider stormwater management early in the design process and utilize the natural landscape as much as possible to prevent and control runoff. Site design techniques can be used to minimize grading and site disturbance to create a hydrologically balanced development site. This can be applied at many development scales to encourage infiltration and utilize the natural landscape. Municipal ordinances already contain many of the elements needed to allow for low impact design, such as open space requirements and impervious surface limits. The following table, Table 33, lists a number of preventative strategies which helps to protect stormwater runoff quality without building engineered structures.

**Table 33  
Non-Structural Stormwater Best Management Practices**

<b>Non-Structural BMP Type</b>	<b>Description</b>
Protect Natural Resources	Avoid disturbance upon areas which assist with natural hydrologic flow (wetlands, floodplains, riparian areas, wooded areas, and natural flow pathways).
Preserve Open Space	Preserve open space for infiltration opportunity. Design techniques such as clustering can be used to decrease impervious surfaces and increase available open space.
Minimize Soil Disturbance/Grading	Minimize damage to soil quality by reducing disturbance and the removal of vegetation during land development.
Reduce Impervious Surfaces	Minimize street widths and lengths and reduce curbing to allow infiltration.
Disconnect Impervious Surfaces	Disconnect roof leaders and parking lots/driveways from draining into the stormwater collection system and direct runoff to vegetative areas.

A good example of one project is Brayton Gardens, a residential community in Richland Township, which preserved existing woodlands and riparian areas in the site design. These natural areas, combined

with constructed wetlands and retention basins, serve to slow down the flow of stormwater to allow for infiltration, the uptake of runoff by plants, and to filter out pollutants and sediment.

Once stormwater prevention has been maximized through site design, most sites will still need some amount of stormwater peak and volume control to be managed through structural solutions. There are also development scenarios where structural BMPs are the only option. The most effective structural BMPs incorporate natural processes such as infiltration and evapotranspiration that often include vegetation and soil mechanisms as a part of their functioning. Table 34 lists examples of a number of these BMPs. The following BMPs are appropriate for new development, redevelopment, or even BMP retrofits.

**Table 34  
Structural Stormwater Best Management Practices**

Structural BMP Types	Description
Porous Pavement	A permeable pavement surface with a stone reservoir underneath which infiltrates runoff into the subsoil.
Naturalized Basin	Constructed wetland basins which incorporate wetland vegetation, soils, and the associated microorganisms to treat runoff and improve water quality.
Infiltration Trench	A perforated pipe at a minimum slope in a stone-filled trench. Runoff is stored between the stones and infiltrates through the bottom of the facility into the soil matrix.
Rain Garden	A planted shallow depression designed to capture and filter rainfall runoff.
Green Roof	A layer of vegetation grown on and completely covering an otherwise conventional flat or pitched roof. The roof is designed to capture and evapotranspire rain water.
Rain Barrel/Water Cistern	Large containers that collect drainage from roof leaders and temporarily store water to water lawns, gardens, and other landscaped areas after the rainfall has ended.

Like most areas of the Delaware Valley Region, Bucks County has a lot of aging stormwater infrastructure. The main concerns with aging infrastructure are whether it is still properly functioning and was it built with water quality control mechanisms. During the comprehensive planning process, the county heard from many stakeholders that there is a great need to improve infiltration and groundwater recharge in the stormwater facilities of their communities. In order to upgrade aging infrastructure, the county and municipalities can either spearhead stormwater retrofit projects or require stormwater improvements during redevelopment. There have been examples of both initiatives in Bucks County including the following are descriptions of some of those projects.

- Pennswood Village, an older retirement community in Middletown Township, expanded and retrofitted an area with an aging stormwater detention basin into a naturalized stormwater system. The system now is composed of four major elements: a sedimentation basin, a series of

bioretention basins, swales, and a treatment wetland. The system is interconnected, allowing overflow into vegetated swales. On either side of the swales is a broad flat meadow graded and designed to function in a manner similar to a riparian corridor or stream floodplain. The careful selection of native grasses, shrubs, and trees planted throughout the system assists in reducing the velocity of the runoff, biofiltering pollutants, and creates opportunities for groundwater recharge.

- As a part of a development agreement with Buckingham Township, a local construction company agreed to create one acre of wetlands to offset wetlands being built upon at another development site. The site chosen was the detention basin behind the township building. The older basin was removed to create a wetland pool and a gravel filter was installed to filter sediments. Native herbaceous species were planted to assist in the uptake of pollutants. The wetland area now serves as an outdoor ecological education center with signage and a walking path for residents and students in the adjacent elementary school.
  
- The Bucks County Commissioners adopted a resolution in 2002 to permit the stormwater from the Stone Manor Corporate Center to discharge into the adjoining county-owned stormwater basin on the Neshaminy Manor property. The original basin was only functioning as a temporary sedimentation basin and was highly eroded with barren slopes. In lieu of building a basin on the Stone Manor property, the developer converted the basin into a naturalized permanent detention basin to handle the runoff from properties. Runoff now meanders through meadow grasses, trees, and wetland plants. The county has resumed operation and maintenance responsibilities which include mowing once a year, removing invasive and exotic plant species, removing silt from the forebays, and removing trash from the sand filter and replacing filter media, if necessary.

In all stormwater BMP design, standards must ensure that facilities are safely integrated into the landscape and that facility design respects the physical constraints of any given property. Such standards should include placing the facility where the bedrock or the water table is at least two feet below the surface of the ground. The soil infiltration rate at the stormwater facility location should be a minimum of 0.2 in/hr. Soils in Bucks County have variable infiltration rates; some regions of the county have great infiltration while other areas are very poor. Stormwater practitioners must test soil infiltration rates to ensure the right type of facility is being planned for a site.

### ***Operation and Maintenance***

Municipalities that are required to comply with the NPDES Phase II permit are required to implement an operation, maintenance, inspection and repair program for all municipally-owned BMPs. Good operation and maintenance plans include the details of regularly scheduled inspections and maintenance. Inspections include checking structural integrity of the facility, health of vegetation, sediment accumulation, and collection, storage and release of runoff over time. Maintenance includes removal of debris and examining and testing the BMP to be sure that it is functioning according to its design. A plan helps municipalities to detect problems, decreases repair and replacement costs, and prevents facility malfunctions.

One of the more challenging aspects to stormwater management is regulating stormwater facilities that are not publicly owned. Privately-owned BMPs are required to meet stormwater ordinance standards when constructed and are inspected to ensure they are properly performing; however, the operation and maintenance is handled by the private landowner who may not fulfill responsibilities.

Municipalities do have options to prevent this. Within the stormwater regulations, private landowners can be required to sign a maintenance agreement for all stormwater BMPs on the property. This agreement transfers with the property ownership. If the property owner fails to fulfill the O&M agreement, the municipality can include in the agreement the permission to perform the services required and charge the owner a fee. The municipality may also take enforcement actions against an owner for any failure to satisfy the provisions of the municipal stormwater ordinance.

## Funding

There are a number of ways municipalities fund stormwater management programs and projects. Municipalities can budget stormwater maintenance and improvements as a line item in the budget or borrow funds for a capital improvement project. Municipalities can collect fees for stormwater management services such as review of stormwater site plans to ensure consistency with the local regulations. If a municipality is taking over the responsibility of a stormwater facility in a subdivision, a developer fee can be collected for the future operation and maintenance of the facility.

Other sources of funding, although limited, are grants from federal, state or private agencies. Municipalities in Bucks County have received funding for stormwater retrofit projects from either the state's Pennsylvania Department of Environmental Protection (PaDEP), the Department of Conservation and Natural Resources (DCNR), the Environmental Protection Agency (EPA), or PennVEST, Pennsylvania's Infrastructure Investment Authority. Some of these municipalities include;

- Upper Makefield Township – received funding from DCNR to create a master plan for Brownsburg Park which includes plans to infiltrate 100 percent of the stormwater generated from the site.
- Plumstead Township – received funding from the EPA and assistance from the Pennsylvania Association of Conservation Districts to build a rain garden at the township building.
- Lower Southampton Township – received funding from PaDEP for the riparian buffer project at Sweetwater Farms.

Funding stormwater management is challenging because the costs of stormwater infrastructure repair and its expanding needs often outpace traditional stormwater funding streams. In many of the older developed areas of the county there is an ever-increasing need for newer installations or to retrofit aging infrastructure. Funds are diminishing from both the state and federal governments. Therefore, many other infrastructure projects end up taking precedence to stormwater problems.

## Strategies and Actions

### Stormwater Planning and Regulation

- Prepare and maintain a countywide stormwater management plan to provide consistency across all of Bucks County's watersheds.
- Encourage municipalities to effectively enforce current stormwater ordinances by ensuring all stormwater management regulations are consistent, requiring new development to achieve pre-development hydrologic conditions to minimize flooding events, and to include volume controls to protect water quality, promote groundwater recharge, and protect streambank erosion.
- Require redevelopment properties to address previously unaddressed stormwater control issues.
- Assist with multi-municipal stormwater planning by encouraging municipalities to reduce the number of regulatory waivers, to consider development outside municipal boundaries during the review process, and to communicate with other municipalities to ensure regulatory consistency.
- Fulfill the County's NPDES II (MS4) permit requirements and assist municipalities in fulfilling their NPDES permit requirements.
- Work to achieve a reduction of pollutant discharges associated with stormwater runoff.

### Management, Operation, and Maintenance

- Promote the maximum use of stormwater runoff as a water resource and practices that attempt to restore the natural water cycle.
- Promote the use of Low Impact Development design and Best Management Practices (BMPs) to infiltrate, evapotranspire, or capture and reuse as much stormwater runoff on-site as reasonably possible and amend development policies, growth management plans, and municipal stormwater ordinances to require the use of BMPs.
- Eliminate unnecessary requirements for impervious coverage in subdivision and land development regulations (i.e. oversized parking facilities) and encourage the removal of needless impervious coverage and replace with landscaping or other pervious materials.
- Include soil infiltration test requirements in municipal ordinances to ensure the right type of facility is being planned for a site.
- Provide educational seminars and publications for municipal officials and the public on how to manage stormwater as a resource and properly operate and maintain stormwater facilities. Partner with other organizations (conservation district, engineering firms) to help facilitate county-wide educational initiatives.
- Encourage municipalities to develop operation and maintenance plans for municipal-owned or operated stormwater facilities.
- Monitor funding options to adequately fund municipal stormwater management programs; fix existing stormwater problems, and to retrofit aging facilities.

The management of solid waste involves the storage, collection, transport, processing, and disposal of household and commercial waste at landfills, transfer stations, material recovery and recycling facilities, composting areas, and waste-to-energy facilities. Increased waste generation led to legislation regulating waste management, as well as grassroots efforts to recycle and recapture useful elements in the waste stream. Reducing waste is a primary component of this plan's Principles.

### **Planning and Regulation**

Prior to 1980, most solid waste planning activities were carried out under Pennsylvania state legislation, giving counties authority over solid waste disposal. Bucks County adopted its first *Refuse Collection and Disposal Plan* in 1962. Legislation also gave first and second-class townships and boroughs powers regarding collection and disposal.

The Pennsylvania Solid Waste Management Act (Act 97) was passed in 1980 to require planning and regulation of solid waste storage, collection, transport, processing, treatment and disposal. Counties and municipalities were required to plan for the collection and disposal of municipal solid waste generated within their borders. Pennsylvania Department of Environmental Protection (PaDEP) and municipalities were charged with enforcing the standards and regulations and issuing permits for facilities.

Act 101, the Municipal Waste Planning, Recycling, and Waste Reduction Act, was passed in 1988 to address recycling, planning, permitting, and operation of processing and disposal facilities for municipal waste. Counties, instead of townships and boroughs, were specifically given the responsibility of municipal waste planning and disposal.

Act 97 and Act 101 authorize PaDEP to comprehensively plan for and regulate solid waste management via county waste management plans. Solid waste management plans prepared by counties and approved by PaDEP assign roles and responsibilities to government and the private sector for implementing the plan. Plans must provide a recommended course of action to accomplish the safe and adequate processing and disposal of solid waste generated within the county.

The *Bucks County Municipal Waste Management Plan* was adopted in June 1990, after it was ratified by a majority of the municipalities and approved by PaDEP. Its purpose was to develop an integrated countywide waste management system consisting of strategies for waste reduction, recycling, volume reduction and resource recovery through incineration and landfilling. In order to give municipalities the impetus to take control of waste generated within municipal borders, Bucks County enacted a waste control ordinance. The ordinance required each municipality to license haulers and designate disposal sites (chosen from a list identified in the county's municipal waste management plan). In addition, the Bucks County Waste Documentation Program requires haulers to report the amount of waste collected, the ultimate disposal site(s), the percentage of waste delivered to each site, and the municipality of origin. The program provided PaDEP and other agencies with information needed for state-wide planning and management of waste.

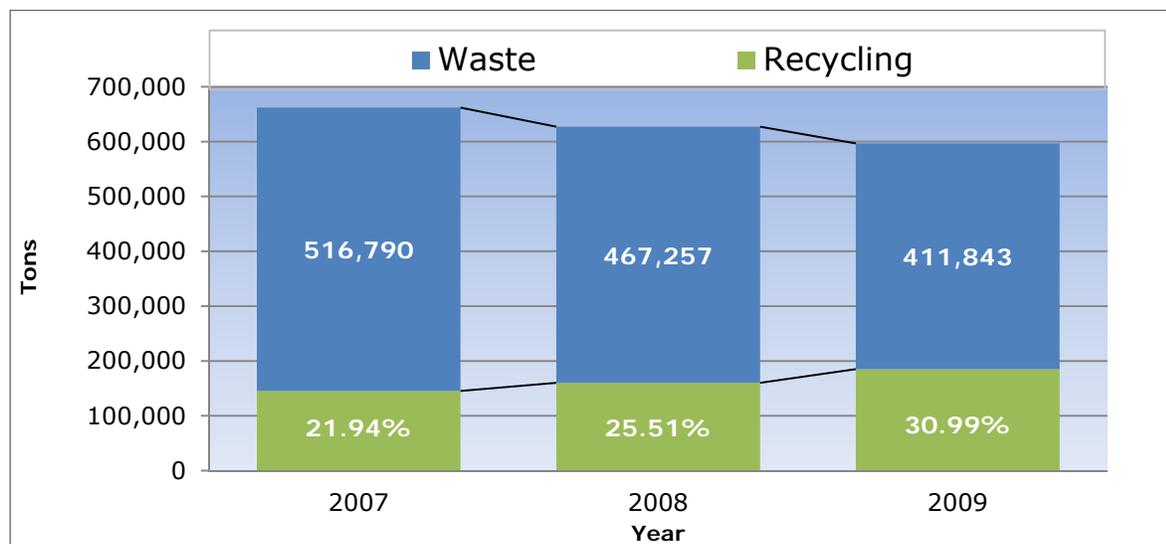
Three plan updates, including the current *2006 Bucks County Municipal Waste Management Plan*, have remained consistent, with minor changes to reflect changes in the law and the waste industry. The current plan was revised to reflect new waste hauler licensing requirements and the impact of these requirements on the county waste control ordinance.

Although the licensing system had worked well for many years, the Waste Transportation Safety Act of 2002 removed waste hauler registration from the municipal level and made it a PaDEP and PaDOT function. That law and some other judicial rulings have made it much more difficult to collect data and administer an effective program.

### Existing Conditions

The estimated total waste generation rate for Bucks County is 1.25 tons per capita per year based on total tons disposed and recycled. The disposal rate for all Bucks County material disposed at a municipal waste landfill is 0.99 tons per capita per year. Bucks County has the lowest total generation rate and the lowest disposal rate in Southeastern Pennsylvania.

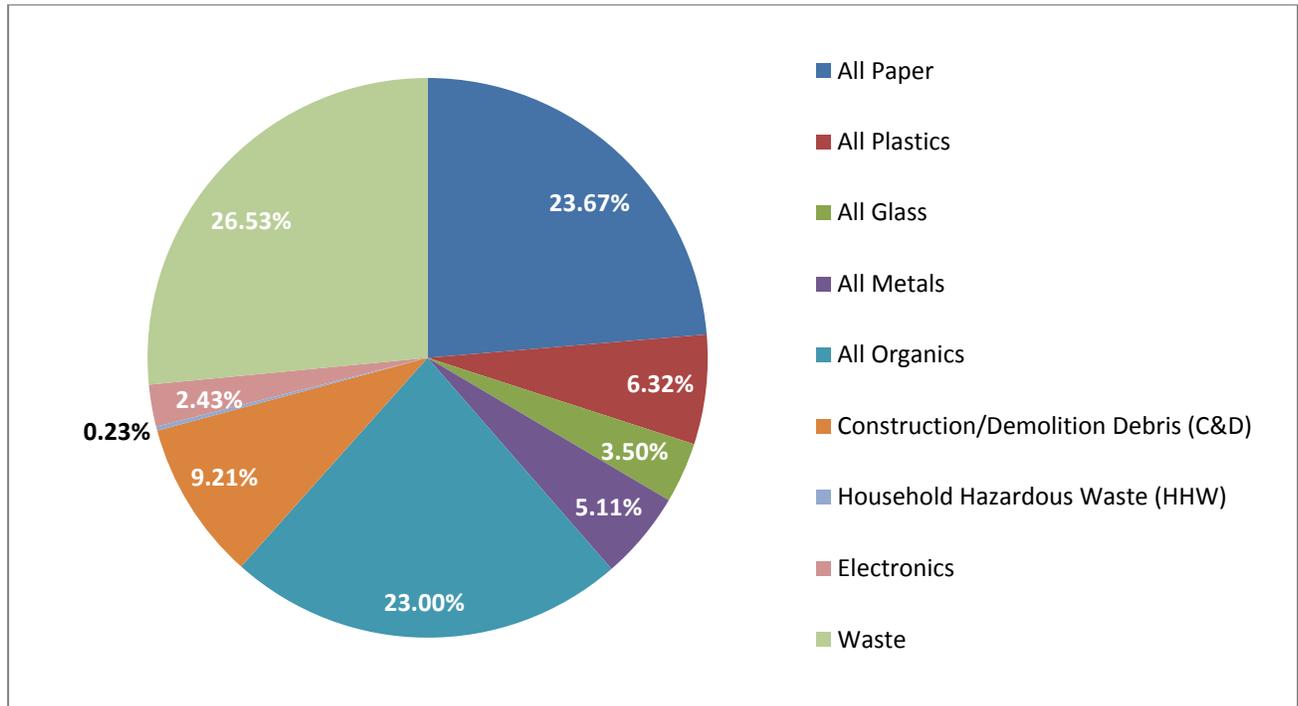
**Figure 17**  
**Total Recycling**



\*Data collected by the Bucks County Planning Commission per the annual waste reporting requirement.

While waste is the major component of trash being discarded in Bucks County, there is still a significant amount of paper and organics being landfilled, in addition to other items that have the potential to be recycled. Various types of plastics, glass, and metals in addition to less common items like construction and demolition debris (C&D), household hazardous waste (HHW), and electronic devices all have the potential to be reduced or eliminated from the waste stream (see Figure 18).

**Figure 18**  
**2000 PaDEP Waste Composition Study**



Source: 2000 PaDEP Waste Characterization Study

In 2009, 1,905 tons of infectious and chemotherapeutic waste was generated in Bucks County. This is an average of six pounds per person for the year. This waste type represents only 0.3 percent of the waste stream disposed in municipal waste landfills.

Bucks County also generates residual waste at the rate of around 54,290 tons per year. Residual wastes (including sludges) are generated by industrial, mining, agriculture, or water supply treatment facilities. Bucks County does not manage residual waste disposal, which annually represents about 9 percent of the total tonnage of municipal waste originating from Bucks County.

### **Disposal Sites and Waste Processing Facilities**

There is a trend toward the disposal of less waste at Pennsylvania facilities, attributable to less material being consumed and more material being recycled. Waste is processed and disposed of in several facilities both in and outside Bucks County.

#### **Landfills**

The modern landfill grew out of concerns of widespread illegal dumping of potentially harmful toxins. Landfill operators are required to line the bottom of each new trash disposal cell with several layers of impervious material, as well as install groundwater monitoring and recovery systems. The following five landfill facilities each received more than two percent of the county waste over the years; two are located

in Bucks County. There are 12 other landfills throughout Pennsylvania that collectively received less than 2 percent of waste generated in Bucks County.

**GROWS Landfill**, located in Falls Township, is owned and operated by Waste Management Disposal Services of Pennsylvania. GROWS is permitted by PaDEP to receive an average daily volume of 10,000 tons. GROWS receives the single largest amount of Bucks County waste (36.2 percent) being landfilled. Almost 91 percent of the waste that GROWS received was from out-of-county or out-of-state sources. The facility meets Resource Conservation and Recovery Act (RCRA) and Pennsylvania requirements. Capacity has increased by the permitting of an expansion, known as “GROWS North,” on adjacent land. A third landfill is being developed to meet the shortfall that will be created by the closure of the Tullytown Resource Recovery Facility.

**Tullytown Resource Recovery Facility (TRRF)** is located in Tullytown Borough. It is owned and operated by Waste Management of Pennsylvania. The facility is permitted to receive an average daily volume of 8,333 tons. In 2007, 43,146 tons of municipal waste generated in Bucks County was sent to TRRF, 8.2 percent of the waste disposed of from Bucks County. In 2003, the facility estimated that it had 4.5 years of remaining capacity based on current waste receipts. A small area of additional land is proposed to be converted to landfill space.

**IESI PA Bethlehem landfill** is a municipal waste landfill located in Lower Saucon Township, Northampton County. The facility is permitted to receive an average daily volume of 750 tons. In December 2010, the facility reported that it had 7 years left of remaining capacity based on current waste receipts. This facility has received up to 7 percent of Bucks County waste in a given year, or as much as 28,000 tons.

**Chrin Brothers Sanitary Landfill** is located in Williams Township, Northampton County. The Chrin Brothers Landfill is permitted to accept an average daily volume of 1,200 tons. In December 2010, the facility estimated that it had 5 years of capacity remaining based on current waste receipts. This facility has received up to 5 percent of Bucks County waste in a given year, or as much as 22,500 tons.

**Modern Landfill** is located in Lower Windsor Township, York County. The facility is permitted to receive an average daily volume of 4,333 tons per day. The facility is estimated to have 5.4 years of remaining capacity, based on 4,333 tons per day. This facility has received at most 2 percent of Bucks County waste in any given year, or approximately 8,000 tons.

### ***Waste-to-Energy Facilities***

There are six permitted waste-to-energy (WTE) facilities in the state of Pennsylvania. In 2008, three of these facilities collectively received 48.2 percent of the disposed waste generated in Bucks County. Nearly all of this waste was disposed at the Wheelabrator Falls facility located in Bucks County. When Bucks County’s original plan was submitted in 1991, no waste generated in Bucks County was being sent to WTE facilities. At that time, the Wheelabrator Falls Resource Recovery Facility was proposed, as was the Technochem facility, also to be located in Falls Township. The Wheelabrator Falls Facility was constructed, but the Technochem facility, which was only to have a capacity of 70 tons per day, was not.

The Wheelabrator Falls WTE began operation in 1994 and is owned and operated by Wheelabrator Technologies. The facility is permitted to process an average daily volume of 1,600 tons per day. It generates electricity, which is sold to the local utility. At full capacity, the facility generates enough electricity to meet the needs of 42,000 homes. In 2010, the Wheelabrator Falls WTE facility received the most municipal waste generated in Bucks County of all of the facilities to receive waste from the county.

Approximately one percent of the waste disposed of in Bucks County was sent to the Montenay WTE facility in Montgomery County and the Lancaster County Solid Waste Management Authority's WTE facility in Lancaster County.

### ***Material Recovery Facilities (MRFs)***

When the original *Bucks County Municipal Waste Management Plan* was submitted in 1991, Bucks County's recyclables were being processed at five facilities. Today, there are only three operating MRF facilities in Bucks County.

Waste Management of Pennsylvania operates a MRF at the Wheelabrator Falls WTE plant in Falls Township. The facility accepts county program recyclables, including mixed fiber, and commingled containers. Approximately 95 percent of the materials received at the facility are from residential sources, and 5 percent are from commercial. The facility serves Bucks County and parts of New Jersey, covering a 50-mile radius. Although the facility was constructed to be expandable, currently the recyclables are being transfer to a new single stream facility.

In exchange for agreeing to deliver all collected recyclables to the facility, Waste Management guarantees that Bucks County municipalities will not be charged for disposal of recyclables and has a profit sharing plan that has been a source of revenue for the member municipalities. It is the responsibility of the member municipality to ensure delivery of these materials.

The agreement with Waste Management has the option to allow member municipalities to engage in single-stream recycling. Single-stream is a collection method that allows all paper and cardboard to be mixed with bottles and cans in the same collection container and vehicle.

**BFI** owns and operates a transfer facility for recyclables in New Britain Township. The facility accepts program recyclables, including mixed fiber and commingled containers. The facility accepts some commercial materials, but primarily serves residential programs in Bucks County. The facility receives almost 100 tons per day. Materials accepted include aluminum cans, mixed glass, #1 and #2 plastic bottles, steel cans, newspaper, and office paper.

Containers are generally received commingled, and newspaper is separate from other paper. BFI estimates that approximately 70 percent of the materials received are generated in Bucks County, and the remainder is from Montgomery County. Although there are no plans to expand or upgrade the facility, some examination of the viability of transferring single-stream material at this facility has occurred.

**Delaware Valley Scrap Recycling** facility is located on Beaver Dam Road in Bristol Township. The facility accepts ferrous metals, nonferrous metals, and cardboard. It receives materials primarily from Lower Bucks County and parts of New Jersey.

Other MRFs located in the southeastern region indicating that they receive recyclable materials from Bucks County or that are cited by Bucks County municipalities as receiving recyclables include:

- BFI Recyclery, King of Prussia
- Accurate Recycling
- The Forge, Philadelphia (Waste Management)
- Rapid Recycling Oaks
- Blue Mountain Recycling, Montgomeryville and Spring Garden-Philadelphia

### ***Construction and Demolition Debris (C&D) Landfills and Recycling***

There are no known construction and demolition landfills located in Bucks County; however, two C&D landfills located relatively close to Bucks County receive C&D waste generated in the county.

**Bethayres Reclamation** is located in Lower Moreland Township, Montgomery County. The facility is a C&D landfill, not a recycling facility; but metals delivered to the facility are recovered. Approximately 21,256 tons, or 21 percent, of the waste received in 2009 was generated in Bucks County. Since 1997, Bucks County has supplied the facility with an average of 33 percent of their incoming materials.

**Onyx C&D landfill** in Mount Joy Township, Lancaster County, was formerly the Milton Grove Landfill. The facility does not have data prior to mid-April 2003, but based on the quantity of materials received since that time, the facility will expect to receive approximately 19,336 tons of C&D waste generated in Bucks County. The landfill reports that it receives waste from several Counties in central and southern Pennsylvania, as well as from Delaware and New Jersey.

**Construction and Demolition Recycling (CDR)** owns and operates a transfer station for construction and demolition debris on Industrial Boulevard in Southampton, Bucks County. The facility management estimates that they receive 35,000 tons of material from Bucks County per year. This comprises roughly 85 percent of the total amount of debris the facility receives each year, based on 2001 figures.

Some materials are then sent to C&D landfills, and other materials such as concrete, metal, brush, and wood, are recovered. For the most part, the debris and recovered materials are delivered to facilities outside of the county. The facility manager estimates that 30–40 percent of the materials delivered to the transfer station is recovered. The facility is permitted by PaDEP to receive a maximum of 300 tons per day, and they are seeking to double that amount.

Facility management indicates that recovered materials are sent to the following processing facilities:

- S.D. Richmond & Sons (steel recovery), Philadelphia
- Kurtz Metals, (metal recovery)

- R.G. Paper, (cardboard)
- Zwicky (recovered wood)

### ***Transfer Stations***

In 1991, there were two transfer stations operating in the county. One was the Alderfer & Frank Transfer Station, in Hilltown Township, and the other was the Bristol Recycling facility, in Bristol Township, which was operated by Northeast Disposal, Inc. The Bristol Recycling Facility is no longer operational, and the Alderfer & Frank Transfer Station is now owned and operated by Waste Management of Indian Valley. The transfer station is located on Progress Drive in Hilltown Township and is permitted by PaDEP to accept up to 1,200 tons per day. This is the only municipal waste transfer station permitted in Bucks County at this time.

Three additional transfer stations were proposed in 1991. BFI proposed the construction of a transfer station in Plumstead Township, which was not constructed, and Tri-State Transfer, Inc. proposed the development of a transfer station in Tinicum Township, which did not come to fruition.

### ***Composting Facilities***

In the *1991 Bucks County Municipal Waste Management Plan*, there was no mention of composting facilities. Twenty years later, there are several composting facilities in Bucks County, both private and municipal.

Waste Management of Pennsylvania owns and operates a composting facility at the Tullytown Landfill site on Bordentown Road. The facility accepts leaf and yard waste, wood waste, and shrubbery from haulers and private landscaping companies. The facility is permitted to process up to 30,000 tons per year, and is operating at full capacity and the compost produced is sold.

Several municipalities are involved with leaf collection, leaf composting, mulch processing, and yard waste collection or processing. Some municipalities have drop-off sites for leaves, Christmas trees, and other yard waste. State regulations that limit the disposal of yard waste in landfills will result in more widespread collection and recycling or composting of leaves, trees, and organic waste.

### ***Recycling Programs***

A recycling goal of 35 percent was set by the state recycling law (Act 101) for communities to reach by 2003. The goal is derived by dividing the weight of materials recycled by the weight of municipal solid waste plus recyclables collected. PaDEP follows EPA Guidelines in determining what materials are considered to be municipal solid waste and what materials are to be considered “EPA-Standard Recyclables.” Bucks County has made significant strides toward reaching this goal in the past 15 years, but still has fallen a few percentage points short. This may be due to not fully capturing all the recycling activity in the county. Improving on the recycling rate can be accomplished in three ways: by improving recycling data collection, by increasing the amount of materials collected for recycling, and by expanding the types of materials that can be collected and recycled.

### ***Appliance Recycling***

Appliance recycling is handled in the county, for the most part, through private haulers and scrap recyclers. In most cases, private haulers will allow residents to set out bulky items, including appliances, on a weekly basis. Many haulers charge an extra fee for the service, or require residents to call in advance to schedule a pick-up. Perkasio Borough, which does its own hauling, offers the service on a monthly basis. There are several private scrap recyclers located in the county; therefore, the infrastructure is in place and is adequate. Accurate reporting and mandatory recycling requirements will make appliance recycling a larger percentage of the overall program.

### ***Leaf/Yard Waste Collection and Processing Programs***

Leaves are collected curbside in 31 Bucks County municipalities. This service is most frequently provided by private haulers, who collect bagged leaves at the curb, or by municipal or private leaf vacuum services. Ten municipalities indicate that they have a leaf vacuum program. Morrisville Borough does not have curbside collection of leaves but allows residents to drop leaves off at their composting site. In most cases collection of yard waste other than leaves is provided by the same entity that collects leaf waste in the jurisdiction, unless curbside leaf vacuum service is provided. In that case, brushy waste cannot be vacuumed, and residents must bag or bundle their yard waste. In some communities, particularly the rural areas, on-site composting of leaves is common. Burning of leaf and yard waste is still a common practice in rural areas, and 21 municipalities still allow burning.

Once yard waste is collected, it can either be mulched (brushy waste, wood waste, limbs, Christmas trees, and leaves) or composted (primarily leaves and some ground wood waste). Several communities indicate that they have arrangements with farms to deliver leaf waste to the farms. The leaves are tilled into the soil for soil amendment. Warwick Township has an arrangement with a farm that allows residents to deliver their yard waste directly to the farm for processing. Alternatively, leaves may be composted at a municipal site, or at a private composting facility, such as the large compost operation at the Tullytown Landfill. Some landscaping and gardening businesses also provide that service. Several municipalities in the county own chippers and will chip brushy waste and wood that is delivered to them.

### ***Voluntary vs. Mandatory Programs***

Municipalities with populations greater than 5,000 and a population density of greater than 300 residents per square mile have to implement a series of recycling requirements. A source-separation and curbside collection program for recyclable materials and leaf waste in their community, a litter prevention program, a special materials collection program, and educational outreach are all components of this requirement. In addition, Act 101 gives mandated communities the opportunity to adopt local ordinances requiring residents and businesses to recycle at least three materials deemed appropriate by the municipality and to separate leaf waste from other waste. In addition, people must separate high grade office paper, aluminum, corrugated paper and leaf waste as well as other materials deemed appropriate at commercial, institutional, municipal establishments located in the mandated municipalities.

As of 2011, 35 municipalities in Bucks County have implemented mandatory recycling. Some of those municipalities are not yet required under Act 101 to be a mandated community, and some may be added as mandated communities when they exceed their population and density thresholds.

***Household Hazardous Waste and Electronics Recycling Programs***

Chester, Delaware, Montgomery, Philadelphia, and Bucks counties have joined forces to form the Southeastern Pennsylvania Household Hazard Waste (HHW) Drop-Off Program. Because of their collaborative efforts, residents of any of the participating counties may attend a HHW/electronics collection event in any of the other counties. The regional program has been implemented for six years. All of the Bucks and Montgomery County events and most of the Philadelphia events accept computer-related electronics, at no charge to the residents.

Bucks County holds five collection events annually throughout the county. Municipalities advertise and promote the events via signs, municipal newsletters, flyers, and municipal web sites.

**Table 35  
Materials Accepted at Southeastern Pennsylvania  
Household Hazardous Waste Collection Events**

Pesticides	Aerosols
Oil-based paints	Computer equipment
Solvents	• Scanners
Cleaning products	• Monitors/portable TVs
Weed killers	• CPUs
Automotive batteries	• Peripherals
Household batteries	• Laptops
Propane	• Keyboards
Antifreeze	• Printers

Residents may bring up to 25 gallons or 220 pounds to a single HHW event. The HHW events are not open to industry, commercial entities, or institutions.

Contractors are hired to properly dispose of or to recycle and process hazardous waste and electronic waste. The program is funded by PaDEP grants, local municipalities, corporate funds contributed by Wheelabrator and Waste Management, and county funds. Volunteers from the Bucks County Planning Commission, the Bucks County Adult Probation Community Service Program, the Retired Senior Volunteers Program and others assist with traffic control, administering surveys, and distributing educational materials.

**Education**

Bucks County’s role as educator is primarily to “get the word out” regarding how to recycle materials. The planning commission staff members respond daily to inquiries from municipalities, individuals, businesses, and institutions regarding how to recycle materials and reduce the generation of waste. Staff can also tell residents how to manage materials that they may not know how to dispose of, such as

materials not accepted at HHW collection events. Specific outreach measures that the county undertakes include:

- Working with the Pennsylvania Resource Council to print information in Verizon telephone books to inform citizens about recycling opportunities.
- Writing about waste/recycling issues and maintaining information on the county's web site, and issuing press releases to newspapers, radio, and cable television regarding HHW/electronics collection events.

County staff and officials also serve as coordinators and resources for municipalities, as well as for commercial and institutional entities. In this role, the county regularly conducts the following types of education and outreach activities:

- Speak publicly, such as at a club function or on a cable television spot, about a topic of interest, such as the importance of recycling computers.
- Meet with a school administrator to discuss how a recycling program in a school might be improved.
- Meet with representatives from local jurisdictions to discuss how they might improve their multifamily housing recycling program.

### **Future Solid Waste Management in Bucks County**

Future solid waste management planning must ensure that the county meets its legislative mandate of securing disposal capacity for all municipal waste generated and creates the fair, open, and competitive marketplace required by the Commonwealth's policy. Planning must also recognize that no single solution or program exists that would solve every municipality's waste and recycling issue. There is no "one size fits all" solution. Future legislation and innovation will dramatically change how waste is managed in the next 10 to 20 years.

The county plans to maintain the current solid waste management structure with both public and private entities providing collection services, and the private sector responsible for providing solid waste management facilities. Since the adoption of Act 90 in 2002, only PaDEP may license waste haulers. The Act precludes municipalities from continuing to license haulers or initiating any new licensing programs.

Maintaining the current system is based on the following:

- **Fulfillment of Public Goals** – The system in place now has fulfilled the needs of Bucks County residents throughout the previous planning period and will continue during the coming decade. The open market for collection/disposal services will encourage some level of competition for waste collection/disposal services, which should help to keep the cost of these services reasonable.

- **Efficiency** – Materials are currently flowing efficiently from points of generation to disposal or recycling sites with little or no difficulty.
- **Cost-Effectiveness** – With the potential for the county to rely upon numerous disposal facilities, disposal is expected to remain cost-competitive, which will serve to keep tipping fees reasonable. Availability of local recyclers to manage some non-Act 101 materials provide low or no-cost options for residents to recycle items such as white goods, tires, and used oil at a reasonable cost.
- **Sufficient Capacity** – The system currently has more than adequate capacity to manage all waste and recyclables generated in Bucks County. There is no immediate need to seek additional facilities or consider other management options unless substantial changes occur in waste generation and composition or in costs associated with management options. However, the county must ensure that the selected system provides the required capacity needed to properly process/dispose of all municipal waste generated within its boundaries for the next 10 years. Court decisions at the federal and state level, and a change in the state policy on flow-control, have put counties in a position where it is difficult for them to enforce flow control requirements directing waste to a single facility.

### **Future Recycling Efforts**

There are alternatives available inside and outside the county for the processing and marketing of recyclables. Haulers, businesses, institutions, and individuals may choose to deliver materials to any facility that processes materials for recycling or composting. Any of these entities may choose to haul recyclables to any processor or market if the economics of doing so are in their favor. A statewide list of recycling markets is available from the PaDEP, and most county recycling coordinators keep lists of all processors and markets for their own counties. While the current system is effectively meeting the solid waste management needs of Bucks County, the *Bucks County Municipal Waste Management Plan* promotes recycling objectives of (1) improved reporting; (2) increased participation; and (3) more business recycling.

#### ***Improve Reporting***

Bucks County surveys municipalities to quantify materials recycled, and the municipalities receive information on recycling quantities from the waste haulers, who receive the information from the processing facility. If a municipality has a contract with a waste hauler for recycling, they may receive this information from the hauler. Communities that do not require their haulers to provide this information do not always receive it. For communities without a collection contract, reporting the quantity of recyclables collected curbside is extremely difficult. It has been reported that unlicensed haulers are collecting recyclables, as well as refuse, within Bucks County and not reporting these quantities to the municipality or the county.

For communities served by haulers that do not deliver recyclables to a cooperating Recycling Facility, the county may prioritize its targeted outreach effort to work with these communities first.

To address unlicensed haulers, the county may implement the following initiatives:

- Promote licensed haulers to businesses and residents through activities such as placing an advertisement in the yellow pages that indicates haulers who are licensed in the Commonwealth of Pennsylvania.
- Work with municipalities to enhance their ordinance language on hauler regulations and penalties.
- Conduct periodic inspections in the field and the landfills to identify unlicensed haulers.

### ***Increase Participation Rates***

Bucks County has promoted waste reduction and recycling alternatives, but success is limited due to the size of the county, population, and number of local governments. Increasing participation in recycling will require an understanding of the obstacles to recycling and targeting specific communities with a recycling campaign. This could involve focus groups, committees, and educational campaigns. Students in grades K-12 can be an effective way of expanding recycling. They become strong advocates for recycling and will ensure that recycling is taking place in their homes. School districts should assess their recycling programs to determine what improvements could be made.

### ***Increase Business Recycling***

To increase recycling in the business community, a business waste reduction program could be implemented that would include targeting businesses by the type of waste generated and sponsoring programs for specific types of businesses that would emphasize the cost-savings of recycling waste. Chambers of commerce could assist in these efforts.

### ***Increase the Diversion of Organics***

Progress has been made in the collection of leaves, but very few communities indicate that other yard waste, such as grass clippings and other yard material, are collected separately. This may be due to the limited number of composting facilities located in Bucks County or the cost of collection, which will have to be explored in order to develop a program to divert organics from the landfill stream.

### ***Construction and Demolition Management***

Bucks County relies on privately-owned and operated facilities for managing the disposal of C&D waste. Because C&D landfills do not have the same reporting requirements as municipal waste landfills, the quantity of C&D waste that is generated and disposed in non-municipal waste landfills or that is recovered, is difficult to quantify. Adding to the complexity is the fact that some C&D materials are processed at a transfer station, and the potential exists to “double count” this waste—once at the transfer station and once at the point of processing or disposal.

- **Metals** – Metals separation is assumed to be already taking place, based on the low percentage of metals found in C&D waste. Exactly which metals and how much is removed are probably determined by market value.

- **Wood** – Some wood could be diverted for composting or manufacturing of mulch. Using wood for either of these purposes would require processing to separate contaminated or otherwise treated wood from “clean” wood.
- **Concrete, Brick, Dirt, and Asphalt** – Some of this material could be crushed and marketed as aggregate substitutes, though the ability to do this is highly dependent on economics and the availability of what are considered to be better aggregates. Asphalt can be reclaimed and used in road building and maintenance. In the absence of specific markets, these materials can be diverted from sanitary landfills to be used as clean fill in a manner consistent with PaDEP’s policies and regulations.

### ***Home Demolition Waste***

Home demolition waste generated during remodeling, roof or shingle/siding replacement, home additions, or flooring replacement often ends up in illegal dumps, to avoid the cost of disposal. Generally, haulers will not accept this material as part of their regular residential routes, and customers are required to rent a roll-off container for the collection and disposal of these materials, even though the municipal waste facilities where the county’s waste is disposed are permitted to accept C&D waste. When it is a burden for homeowners to haul this material to a disposal facility, or when a contractor who has agreed to dispose of the material decides to avoid the cost of disposal, some of this waste may be dumped illegally.

Options for the safe disposal of small volumes of C&D waste such as those described above should be investigated, including, but not limited to:

- Educating citizens about the availability of safe and legal opportunities to dispose of these materials.
- Educating residents about the option to rent dumpsters or roll off containers for collection and disposal of wastes created during remodeling projects.
- Providing a drop-off site for these materials; enforcing the county’s municipal waste ordinance as it applies to illegal dumping.

### **Inappropriate Methods of Disposal**

Every county in Pennsylvania has had to address problems that result from irresponsible waste disposal. This section addresses the most common inappropriate disposal practices.

#### ***Illegal Dumping***

Illegal dumping issues tend to be more problematic in rural areas and involve items that are difficult or costly to dispose of, such as waste tires, furniture, and appliances. Illegal dumps create significant concerns for public health and safety, property values, and the general quality of life. When they are ignored, these sites often become chronic dumping areas. Preventing illegal dumping requires enforcement, education, and providing access to safe collection and disposal options for bulk items.

### ***Waste Burning***

It is the responsibility of municipalities to determine rules for any waste burning that takes place within their borders. Bucks County does not specifically prohibit burning of waste and there is no clear guidance from the Commonwealth. Some municipalities permit some types of open burning.

Burning is not a preferred method of waste disposal because of environmental problems that result. Burning waste at home in a barrel or pile results in an incomplete burning because of low temperatures. It causes heavy concentrations of smoke at ground level, with high concentrations of toxic materials that are easily inhaled. This smoke can affect the health of people by causing eye irritation, asthma, restricted breathing, or chronic diseases such as emphysema. Children are more at risk than adults, because they breathe more quickly than adults and absorb up to six times the contamination that adults do breathing the same air. Other health risks occur when particles deposited on soil and crops are ingested.

No type of home burning is entirely safe. While many are concerned about plastics, even materials such as paper, wood and yard waste can cause problems. Bleached papers (such as those used to manufacture bakery and pizza boxes and lightweight cardboard) release carbon compounds with chlorine and fluorine. Papers with synthetic inks release heavy metals when burned. Both are considered possible causes of disease. Absorbing heavy metals through the lungs has a more pronounced effect than absorption through the stomach. During dry seasons, the potential for wildfires is also a threat.

## **Strategies and Actions**

### **Solid Waste Management**

- Maintain the current solid waste management structure where public and private entities provide collection services.
- Encourage a competitive system that fulfills the public need while maximizing the efficiency and cost-effectiveness of disposal and recycling.
- Promote strategies that maintain the available disposal capacity for waste generated in Bucks County.
- Continue to implement the portions of the *2006 Bucks County Solid Waste Management Plan* that improve reporting, increase participation, and enhance business recycling.
- Encourage businesses and residents to patronize only licensed waste haulers.
- Work with municipalities to enhance their ordinance language for managing waste collection, recycling, and disposal practices.
- Encourage a standard common level of waste and recycling services among haulers.
- Continue county commitment to the Household Hazardous Waste Collection Program.

### **Recycling**

- Increase recycling through education, inclusion of additional items to the recycling stream, and expansion of single stream recycling programs.

- Advocate for recycling in all municipalities and at all businesses, school districts, and institutions.
- Create a model waste management, minimization, and recycling ordinance and promote its countywide adoption.
- Encourage municipalities to improve business recycling through legal requirements, education, chambers of commerce, and targeting key industries.
- Implement and expand recommendations that increase the diversion of organic wastes (leaf waste, food waste, biosolids, and compost) to beneficial use.
- Remind mandated communities of their obligations while encouraging others to see organic waste diversion (leaf waste, food waste, and compost)
- Explore and promote alternative organic waste management programs (e.g., biofuels, digesters, etc.) that treat waste as a resource, not just a disposal problem.
- Propose ordinance revisions that can regulate organic waste management (leaf waste, food waste, and compost) more effectively.

### **Waste Minimization**

- Encourage reducing raw material consumption by establishing a stated position on producer responsibility initiatives.
- Expand existing and encourage new exchange programs (e.g., Freecycle, thrift shops, and used office exchanges).
- Minimize the generation, increase the recycling of, and reduced disposal of hazardous waste through the strategies outlined in the *2006 Bucks County Solid Waste Management Plan*.



## Principle 5:

### **Mitigate Hazards to Life and Property**

Assessing the county's vulnerability to hazards and developing mitigation actions as part of a prioritized implementation strategy will reduce the risk from potential hazards. Preventing new development from contributing to flooding problems, controlling development in the floodplain, and making changes in repetitive flooding areas are examples of needed actions.

Hazard mitigation is any action taken to reduce or eliminate long-term risks to people and their property from the effects of natural and man-made hazards. Natural hazards are those events that may occur with or without human involvement. For example, human activities, like development in a floodplain, may make a natural disaster worse, but the disaster itself is still a natural event. Man-made hazards include transportation accidents, chemical spills, and the majority of structural failures.

Hazard mitigation planning evaluates measures to lessen or mitigate the impacts of future disasters and selects those measures which can most effectively meet the needs of the community. The emergency management community, citizens, elected officials and other stakeholders in Bucks County recognize the impact of these hazards on their community and support efforts to reduce such impacts.

After suffering the effects of floods, tornadoes, winter storms, and other natural hazards, Bucks County moved forward with the development of a long-term approach to reduce the county's vulnerability to hazards. In 2005, Bucks County began an ongoing hazard mitigation planning process to identify strategies to reduce damage from disasters. The 2005 plan, although utilized and frequently referenced, underwent a formal update in 2011. The updated *Bucks County Hazard Mitigation Plan (2011)* is a pre-disaster, multi-hazard mitigation plan that will guide the county toward greater disaster resistance.

Emergency management staff at the county and municipal levels are prepared to take actions to prevent or minimize the long-term risks to life and property from hazards. Pre-disaster mitigation actions must be taken in advance of a hazard event and are essential to breaking the disaster cycle of damage, reconstruction, and repeated damage. With careful selection, mitigation actions can be a long-term, cost-effective means of reducing the risk of loss.

A core assumption of hazard mitigation planning is that current dollars invested in mitigation practices will significantly reduce the demand for future dollars by lessening the amount needed for recovery, repair, and reconstruction. These mitigation practices also enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the economy back on track sooner and with less interruption. Bucks County has already implemented mitigation projects on more than 230 properties, making the county a leader in hazard mitigation planning in Pennsylvania.

### **Authority and Purpose**

Authority for hazard mitigation planning originates from the following federal and state sources:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, as amended;
- Code of Federal Regulations (CFR), Title 44, Parts 201 and 206; and
- Disaster Mitigation Act of 2000, Public Law 106-390, as amended.
- National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 *et seq.*
- Pennsylvania Emergency Management Services Code. Title 35, Pa C.S. Section 101.

- Pennsylvania Municipalities Planning Code of 1968, Act 247 as reenacted and amended by Act 170 of 1988.
- Pennsylvania Stormwater Management Act of October 4, 1978. P.L. 864, No. 167.

The most significant piece of legislation related to hazard mitigation is the Disaster Mitigation Act of 2000 that requires local governments (counties and municipalities), as a condition of receiving federal disaster mitigation funds, to have a mitigation plan that identifies hazards, creates a risk assessment and vulnerability analysis, identifies and prioritizes mitigation strategies, and develops an implementation schedule for the county and municipalities.

### **Hazard Mitigation Planning Process**

The 2011 plan follows an outline developed by Pennsylvania Emergency Management Agency (PEMA) in 2009 which provides a standardized format for all local hazard mitigation plans in the state. The plan update was developed for the purpose of:

- Providing a blueprint for reducing property damage and saving lives from the effects of future natural and man-made disasters in Bucks County;
- Qualifying the county for pre-disaster and post-disaster grant funding;
- Complying with state and federal legislative requirements related to local hazard mitigation planning;
- Demonstrating a firm local commitment to hazard mitigation principles; and
- Improving community resiliency following a disaster event.

The plan identifies hazards that affect the county, assesses potential damages from those hazard events, selects actions to address the county's vulnerability to such hazards, and develops an implementation strategy/action plan to mitigate potential losses.

Each municipality was given multiple opportunities to participate in the planning process through invitation to meetings, review of risk assessment results and mitigation actions, and an opportunity to comment on the draft plan.

### **Hazard Risk Assessment**

While the occurrence of a past hazard event in the county provides an indication of future possible incidence, the fact that a hazard event has not previously occurred does not exclude the hazard from further investigation. Similarly, occasional past occurrences of hazard events does not solely warrant a hazard's inclusion in mitigation planning. Based on a risk assessment of the importance or perceived

potential impact of each hazard, 18 potential hazards were selected for inclusion in the *Bucks County Hazard Mitigation Plan (2011)*:

<b><u>Natural Hazards</u></b>	<b><u>Man-Made Hazards</u></b>
Drought	Dam Failure
Earthquake	Structure Collapse
Environmental Hazards	Transportation Accidents
Extreme Temperature	Urban Fire and Explosion
Flood, Flash Flood, Ice Jam	Utility Interruption
Hailstorm	
Hurricane, Tropical Storm, Nor'easter	
Landslide	
Lightning Strike	
Subsidence, Sinkhole	
Tornado, Wind Storm	
Wildfire	
Winter Storm	

Since 1955 there have been 49 Presidential Disaster and Emergency Declarations in Pennsylvania, 16 of which affected Bucks County. Of the 16 Presidential Disaster and Emergency Declarations in Bucks County, 12 were related to flooding, hurricanes and tropical storms. In addition, there have been 18 Gubernatorial Proclamations of Disaster Emergency in the county since 1954. Bucks County has also received Small Business Administration Disaster Assistance for a number of disaster events. A Small Business Administration Disaster Declaration qualifies communities for affordable, timely, and accessible financial assistance.

A unique Presidential Emergency Declaration was issued in September 2005 that declared a state of emergency in the Commonwealth of Pennsylvania and ordered federal aid to supplement Commonwealth and local response efforts to help people evacuated from their homes due to Hurricane Katrina. All counties within Pennsylvania, including Bucks County, were indirectly affected by Hurricane Katrina as a result of evacuee assistance.

The future occurrence of floods in Bucks County can be characterized as highly likely. Bucks County has a long history of flooding events. Records indicate that 18 major floods have occurred since 1933. Eleven of the 16 Presidential Disaster Declarations affecting Bucks County have stemmed from floods and flash floods, including flooding induced by coastal storms. According to the *Pennsylvania State Hazard Mitigation Plan*, there were 790 repetitive loss properties in Bucks County. One of the most serious floods was in 1961. Hurricane Connie hit the Mid-Atlantic August 12-13, dropping significant rainfall across eastern Pennsylvania and flooding along the Perkiomen Creek. Then, just five days later, Hurricane Diane brought heavy rains to an already soaked region. Damages from this flood were estimated at \$10.6 million, in July 1961 prices.

## **Hazard Vulnerability and Potential Loss**

Ranking hazards helps communities set goals and priorities for mitigation based on their vulnerabilities. A Risk Factor is a tool used to measure the degree of risk for identified hazards in a particular planning area. Hazards are ranked against one another; the higher the risk factor, or RF, numerical value, the greater the hazard risk.

Risk Factors were calculated for each of the 18 potential hazards identified in the *Bucks County Hazard Mitigation Plan (2011)*. Because individuals or municipalities may feel that a hazard merits a higher score and attention, weighted scores were used to represent the fairest assessment of the greatest risks facing Bucks County. Based on this assessment, four high risk hazards, seven moderate risk hazards and seven low risk hazards were identified for Bucks County as shown in Table 36.

**Table 36**  
**Hazard Risk Factors**

HAZARD RISK	HAZARD NATURAL (N) or MAN-MADE (M)	RISK ASSESSMENT CATEGORY					RISK FACTOR
		PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
HIGH	Flood, Flash Flood, Ice Jam (N)	4	3	3	2	3	3.2
	Winter Storm (N)	4	2	4	1	3	3.0
	Environmental Hazards (M)	4	2	2	4	2	2.8
	Hurricane, Tropical Storm, Nor'easter (N)	2	3	4	1	3	2.7
MODERATE	Transportation Accidents (M)	4	2	1	4	1	2.5
	Urban Fire & Explosion (M)	4	2	1	4	1	2.5
	Extreme Temperature (N)	2	2	4	1	3	2.4
	Wildfire (N)	3	2	1	4	1	2.2
	Drought (N)	2	1	4	1	3	2.1
	Tornado, Wind Storm (N)	2	2	2	4	1	2.1
	Lightning Strike (N)	4	1	1	2	1	2.0
LOW	Structure Collapse (M)	2	1	1	4	4	1.9
	Dam Failure (M)	1	2	2	4	2	1.9
	Utility Interruption (M)	2	1	3	3	1	1.9
	Earthquake (N)	1	1	2	4	1	1.5
	Hailstorm (N)	1	1	3	2	1	1.5
	Landslide (N)	1	1	1	4	1	1.3
	Subsidence, Sinkhole (N)	1	1	1	4	1	1.3

Based on various kinds of available data, potential financial loss can be estimated for properties affected by hazards. Potential loss estimates have four basic components, including:

- **Replacement Value:** Current cost of returning an asset to its pre-damaged condition, using present-day cost of labor and materials.
- **Content Loss:** Value of building's contents, typically measured as a percentage of the building replacement value.
- **Functional Loss:** The value of a building's use or function that would be lost if it were damaged or closed.
- **Displacement Cost:** The dollar amount required for relocation of the function (business or service) to another structure following a hazard event.

The 2011 county hazard mitigation plan contains potential loss estimates for flood, flash flood, ice jam, tornado, windstorms, drought, lightning strike, wildfires, extreme temperature, and winter storms. The individual property parcel data used in the plan includes building values provided in the county tax assessment database. Since the values are representative of replacement value alone, content loss, functional loss, and displacement cost are not included in the plan. The 227,718 parcels in Bucks County have a cumulative assessed value of over \$6.5 billion.

Using FEMA's standardized loss estimation software program, known as *HAZUS-MH*, total building-related losses for the 1 percent annual-chance flood event is estimated to be \$1.25 billion. Approximately 54 percent of the assumed building-related losses would be incurred by residential occupancies; an additional 27 percent of building-related losses would be incurred by commercial properties. The model also estimates that 912 structures, most of which are residential, would be completely destroyed in the 1 percent-annual-chance flood, and approximately 8,300 households would be displaced due to the event. The most significant potential economic losses would occur along the lower reaches of the Neshaminy Creek.

For the remaining hazards where loss estimates could be determined, the estimates are generalized based on the historical impact of the hazard and past data on the actual cost. For example, it is commonly acknowledged that in a drought event, losses are expected to be largely agricultural; as a result, losses are expected to be some portion of the county's \$70.6 million in agricultural production, depending on the size and duration of the event.

## Hazard Mitigation Techniques

Hazard mitigation techniques or actions fall into the following six categories. They include techniques that organizations, municipalities, and property owners can take to mitigate hazards. These categories were considered in development of the actions the county will take in implementing the Mitigation Action Plan in the *Bucks County Hazard Mitigation Plan (2011)*.

- **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning, zoning, building codes, subdivision regulations, hazard specific regulations (such as floodplain regulations), capital improvement programs, and open space preservation and stormwater regulations.
- **Property Protection:** Actions that involve modifying or removing existing buildings or infrastructure to protect them from a hazard. Examples include the acquisition, elevation and relocation of structures, structural retrofits, flood-proofing, storm shutters, and shatter-resistant glass. Most of these property protection techniques are considered to involve “sticks and bricks”; however, this category also includes insurance.
- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include hazard mapping, outreach projects, library materials dissemination, real estate disclosures, the creation of hazard information centers, and education programs.

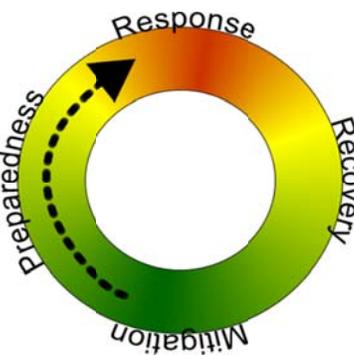
- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, forest and vegetation management, wetlands restoration or preservation, slope stabilization, and historic property and archeological site preservation.
- **Structural Project Implementation:** Mitigation projects intended to lessen the impact of a hazard by using structures to modify the environment. Structures include stormwater controls (culverts), dams, dikes, levees, and safe rooms.
- **Emergency Services:** Actions that typically are not considered mitigation techniques but reduce the impacts of a hazard event on people and property. These actions are often taken prior to, during, or in response to an emergency or disaster. Examples include warning systems, evacuation planning and management, emergency response training and exercises, and emergency flood protection procedures.

### Existing Capability

Bucks County has a number of resources it can access to implement hazard mitigation initiatives including emergency response measures, local planning and regulatory tools, administrative assistance and technical expertise, fiscal capabilities, and participation in local, regional, state, and federal programs. The presence of these resources enables community resiliency through actions taken before, during, and after a hazard event.

The Bucks County Emergency Management Agency coordinates countywide emergency management efforts. Each municipality also has a designated local emergency management coordinator who possesses knowledge of the impact hazards have on their community. County and municipal emergency management agencies and coordinators work along with various federal, state, and municipal programs and regulations to achieve maximum benefits for emergency preparedness and response, disaster recovery, and hazard mitigation. The categories of capabilities (described below) include: 1) Planning and Regulatory; 2) Administrative and Technical; and 3) Fiscal.

#### The Four Phases of Emergency Management



### Planning and Regulatory

Some of the most important planning and regulatory capabilities that can be utilized for hazard mitigation include comprehensive plans, building codes, floodplain ordinances, subdivision and land development ordinances, and zoning ordinances. These tools provide mechanisms for the implementation of adopted mitigation strategies.

Zoning ordinances allow municipalities to regulate the use of land in order to protect the property and safety of the general public. Zoning ordinances can be designed to address unique conditions or concerns within a given community. They may be used to create buffers between structures and high-

risk areas, limit the type or density of development, and require land development to consider specific hazard vulnerabilities.

Most of Bucks County municipalities are participants in the National Flood Insurance Program (NFIP). The program is managed by local municipalities participating in the program through ordinance adoption and floodplain regulation. Pennsylvania uses a model floodplain ordinance which contains minimum regulations that municipalities must adopt.

All the municipalities participating in the NFIP will need to amend floodplain ordinances to address the most recent floodplain mapping prepared by FEMA.

### ***Administrative and Technical***

Administrative capability relates to the adequacy of departmental and personnel resources to implement mitigation-related activities. Technical capability relates to an adequacy of knowledge and technical expertise of local government employees or the ability to effectively execute mitigation activities.

Organizations that could act as partners with municipalities to increase administrative and technical abilities include the Bucks County Conservation District, the Penn State Cooperative Extension, county economic development agencies, environmental advocacy groups, and watershed associations.

State agencies that can provide technical assistance for mitigation activities include, but are not limited:

- Pennsylvania Department of Community and Economic Development (PaDCED)
- Pennsylvania Department of Conservation and Natural Resources (PaDCNR)
- Pennsylvania Department of Environmental Protection (PaDEP)

Federal agencies which can provide technical assistance for mitigation activities include, but are not limited to:

- Army Corp of Engineers
- Department of Housing and Urban Development
- Department of Agriculture
- Economic Development Administration
- Emergency Management Institute
- Environmental Protection Agency
- FEMA
- Small Business Administration

### ***Fiscal Capability***

The decision and capacity to implement mitigation-related activities is often dependent on local financial resources. While some mitigation actions are less costly than others, funding needs to be available locally to implement policies and projects. Based on survey results from the *Bucks County Hazard Mitigation Plan (2011)*, most municipalities within the county perceive fiscal capability to be limited.

State programs which may provide financial support for mitigation activities include, but are not limited to:

- Community Conservation Partnerships Program
- Community Revitalization Program
- Floodplain Land Use Assistance Program
- Keystone Grant Program
- Local Government Capital Projects Loan Program
- Pennsylvania Heritage Areas Program
- Pennsylvania Recreational Trails Program
- Shared Municipal Services
- Technical Assistance Program

Federal programs which may provide financial support for mitigation activities include, but are not limited to:

- Community Development Block Grants (CDBG)
- Disaster Housing Program
- Emergency Conservation Program
- Emergency Management Performance Grants (EMPG)
- Emergency Watershed Protection Program
- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance Program
- Non-insured Crop Disaster Assistance Program
- Pre-Disaster Mitigation Program
- Repetitive Flood Claims Program (RFC)
- Section 108 Loan Guarantee Programs
- Severe Repetitive Loss Grant Program (SRL)
- Weatherization Assistance Program

### ***Capability Challenge***

Bucks County's greatest hazard mitigation challenge is that approximately 64 miles of the Delaware River border the county. Though the Delaware River provides the county with natural resources, scenic beauty, and recreational activity, the river and its tributaries have contributed to 85 floods since 1993. Bucks County and its municipalities are working hard to mitigate the negative impacts of the Delaware River. There is strong planning and regulatory capability between the municipalities and the county government. Multi-county/multi-state mitigation planning has also been done through the auspices of the Delaware River Basin Commission's *Delaware River Flood Task Force* and Bucks County's Flood Task Force, made up of 17 riverfront municipalities.

Bucks County has made significant progress in hazard mitigation by acquiring and elevating properties within the floodplain. FEMA mitigation grant funding through PEMA has resulted in 90 mitigated

properties. Funding through the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) resulted in 148 mitigated properties along the Neshaminy Creek.

Efforts to continue acquisition, elevation, and other flood mitigation projects continue in the 2011 plan. The strength of existing plans and planning mechanisms within Bucks County combined with commitments made show promise for continued mitigation success in Bucks County. Planning related to mitigation, flooding, watersheds, and stormwater management, along with comprehensive planning, should decrease the county's vulnerability to flooding, as well as other hazards, in the future.

### **Plan Maintenance and Updating**

Ensuring effective implementation of mitigation activities paves the way for continued momentum in the planning process and gives direction for the future. The 2011 plan contains a recommendation for a plan review within 30 days of a disaster event, in addition to continuing the recommended annual plan evaluation. The Plan also defines the municipalities' role in updating and evaluating the plan. Finally, the Plan elaborates upon continued public involvement and how the plan may be integrated into other planning mechanisms in the county.

The Bucks County Hazard Mitigation Planning Committee established for the 2011 plan is designated to administer the plan maintenance processes of monitoring, evaluation and updating with support and representation from all participating municipalities. The Executive Director from Bucks County Planning Commission and a senior representative from Bucks County Emergency Management Agency, in coordination with colleagues from their respective departments, will lead the committee in plan maintenance requirements, including annual reviews. The committee will coordinate maintenance efforts, but the input needed for effective periodic evaluations will come from community representatives, local emergency management coordinators and planners, the general public, and other important stakeholders.

The committee will oversee the progress made on the implementation of action items identified in the *Bucks County Hazard Mitigation Plan (2011)* and modify actions, as needed, to reflect changing conditions. Should a significant disaster occur within the county, the committee will reconvene within 30 days of the disaster to review and update the plan as necessary and appropriate. Meetings will be summarized in annual reports and progress reports that will be incorporated into the next plan update.

The county hazard mitigation plan will be updated every five years, as required by the Disaster Mitigation Act of 2000, or following a disaster event. Future plan updates will account for any new hazard vulnerabilities, special circumstances, or new information that becomes available. During the five-year review process, the following questions will be considered as criteria for assessing the effectiveness of 2011 plan.

- Has the nature or magnitude of hazards affecting the county changed?
- Are there new hazards that have the potential to impact the county?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?

- Has the implementation of identified mitigation actions resulted in expected outcomes?
- Are current resources adequate to implement the Plan?
- Should additional local resources be committed to address identified hazards?

### **Strategies and Actions**

In addition to maintaining and updating the *Bucks County Hazard Mitigation Plan (2011)*, the county Comprehensive Plan fully supports the hazard mitigation strategies and actions in the plan. The following mitigations strategies and actions are a generalization of those found in the 2011 hazard mitigation plan. For complete details of the goals, objectives, and actions of the plan's refer to the Mitigation Action Plan at [www.buckshmp.com](http://www.buckshmp.com).

### **Preparedness to Reduce Potential Damage**

- Identify by municipality and evaluate protection of existing critical facilities with the highest relative vulnerability in the 1 percent annual chance floodplain.
- Identify and evaluate strategies for repetitive-loss properties.
- Provide public outreach/education regarding strategies (e.g., floodproofing) for property owners in the 1 percent annual chance floodplain.
- Address identified data limitations regarding lack of detailed information about individual structures located in the 1 percent annual chance floodplain.
- Identify and evaluate protection for hazardous material storage in floodplain.
- Obtain detailed flood studies and FIRMs (including 0.2 percent annual chance flood) for areas with the greatest potential damage and threat to residents.
- Identify the most vulnerable and critical existing structures and infrastructure due to the effects of severe weather.
- Utilize available county level datasets with characteristics of individual structures for improved hazard planning and outreach.
- Identify and prioritize funding for transportation infrastructure projects that will reduce impact of hazards.

### **Disaster-Resistant Future Development**

- Encourage and facilitate the development or revision of zoning/land-use ordinances to limit development in high-hazard areas.
- Provide adequate and consistent enforcement of ordinances and codes within and between jurisdictions.

### **Hazard Mitigation as a Public Value**

- Provide public education to increase awareness of hazards and opportunities for mitigation.
- Promote partnerships between the municipalities and the county to continue to develop a county-wide approach to identifying and implementing mitigation actions.

## **Response and Recovery Capabilities**

- Increase awareness by residents (i.e., through public outreach/education) of actions to take during an emergency.
- Enhance response capability of county and municipal fire, police, and emergency medical services personnel to special populations.
- Continue and increase coordination between critical facilities and emergency responders.



Principle 6:

**Provide Adequate Community Facilities and Services**

Continuing to promote proactive, cost-effective and efficient community facilities and services will keep pace with and fulfill the changing needs of our citizenry. Bucks County's exceptional community services and facilities, such as excellent schools, libraries, medical care, fire and police protection, enhance the county's appeal as a desirable place to live and work.

Community services and facilities provided by the county, municipalities and private organizations address health, education and public safety needs of Bucks County residents. Community facilities and services evaluated for this comprehensive plan are:

- County Facilities
- Public Libraries
- Educational Facilities
- Emergency Services
- Emergency Health Services
- Fire Protection
- Public Safety
- Health Care
- Telecommunication Facilities

The service responsibility and authority for community facilities is divided among many entities, each with its own resources and sources of funding. Consequently, the county's control over community facilities and services has been limited to agencies which are part of county government, or to those facilities and services the county is mandated to fund or oversee as required through state or federal regulations.

Bucks County is known as a good place to live because of the quality of services and facilities provided. As the population of the county has grown over the past decades, the demand for community services and facilities has increased. The events of September 11, 2001 brought new responsibilities and new focus to public safety and services and additional funding from the federal government. The poor economy of recent years, however, has led to program cuts and layoffs. And while county-wide service demands have grown rapidly, state and federal support has diminished.

Both the federal and state governments have withdrawn or limited their involvement and funding for programs supporting many community services (e.g., education, health care, libraries). As a result, service providers have been compelled to rely increasingly on local sources (private or public) to generate a greater share of funding to support and maintain services. The declines in federal and state participation have been further compounded by a number of other factors including: continued mandates and regulations without accompanying funding; revenue bases affected by the business cycle; resistance to new taxes; and a disparity between revenues and expenditures of local governments. Services and facilities face issues related to staffing, funding, training, and others which must be addressed to ensure effective services.

With increased growth, community service problems may arise. They may become greatest in communities which traditionally have not provided a significant number of services, and in communities still trying to address and cope with demand from previous population growth. Many municipalities, unable to properly address the lack of certain types of services, are likely to look to the county for guidance and resources.

Bucks County residents expressed opinions about community facilities through the comprehensive plan survey and at stakeholder meetings as part of the comprehensive planning process. The community facilities and services were viewed as being very satisfactory, with many other issues, like traffic, growth management, and open space ranking higher as issues facing the county. Residents ranked improving community services and public safety and security 11<sup>th</sup> and 12<sup>th</sup> out of 13 on a list of important issues in the survey. This response may reflect the fact that community facilities are generally adequate and that there are other issues more pressing at this time but it does not suggest that community facilities are not important. Stakeholders expressed support for specific facilities and services. Through this plan and the work of the county, municipalities, and private organizations, community facilities and services will be improved through effective administration, staffing and other means to further enhance quality of life in the county.

### County Facilities

The county fulfills many functions to meet the needs of residents, some of which are mandated by the state, and others have been assumed over time. Bucks County is specifically mandated to serve as an agent of the state for law enforcement, judicial administration, and the conduct of elections. The county is also responsible for the property assessment function<sup>19</sup>.

The county owns 548 acres of land for administration and operations and 8,862 acres for parks and recreation. There are 167 county-owned facilities that serve the needs of county departments and agencies. Fifty-six additional properties are rented for county use. The county government space is distributed across the following operating divisions:

Community Services	Corrections	Emergency Services
Finance and Administration	Human Services	Public information
General Services		

The majority of the county administration facilities are concentrated in Doylestown Borough and at the Neshaminy Manor Center in Doylestown Township.

Facilities in Doylestown Borough include the county administration and courthouse buildings, parking garage and several other office buildings. The Neshaminy Manor Center complex in Doylestown Township contains the prison, general services and warehouse, nursing home, emergency services training facilities and rehabilitation centers, and other county offices. There are two government service centers—one in upper Bucks (Quakertown Borough) and a second in lower Bucks (Bristol Township). An additional office building, the Atrium, and the morgue and forensics lab are located in Warminster Township. The Emergency Operation Center is located in Ivyland Borough. County parks are located throughout the county with the park administrative office in Core Creek Park (Middletown Township).

The county operates 20 magisterial district courts that are located throughout the county. The jurisdiction areas are based on population and new district boundaries may be established after the

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<sup>19</sup> The Pennsylvania Manual, Pennsylvania Department of General Services 2009 p.6-4

results of the 2010 census are determined. The county also owns and maintains 115 bridges, including 12 covered bridges and many stone arch bridges. A number of these bridges are more than 100 years old. The county does not own or maintain roads.

The county's buildings and infrastructure are aging and becoming more expensive to maintain. Some of the county's facilities are more than 150 years old. Some of these older and historic facilities are built of stone, brick and wood-framing, requiring periodic, specific care to maintain them in order to avoid expensive restoration.

A new justice center will be built in Doylestown Borough and is estimated to be completed in 2013. This facility will accommodate the courts. A new county parking garage was completed in July 2010 to replace the existing county garage which is the site of the new justice center. These facilities were planned to accommodate existing demand and allow for future growth.

With the completion of the new justice center, space will be available in the old courthouse and administration building. This presents an opportunity to determine which department or departments would achieve maximal benefit of relocation to this central location. Space needs of all county departments are being evaluated to ensure that buildings are being used most effectively.

New county facilities have been constructed in existing development areas, such as the satellite fire training facility located in Bristol Township and the emergency operations center in Ivyland Borough. This promotes concentration of facilities where water and sewer services are already available and where county facilities can serve nearby population centers.

### ***Capital Improvements***

The county is responsible for care and maintenance of existing buildings, infrastructure, and lands that it owns. It also has responsibility for making long-term improvements to county facilities with the addition or expansion of buildings, parks, and major equipment. The county endeavors to pay for short-term maintenance through current revenues but spreads the cost of long-term, permanent improvements over time, so that all beneficiaries of the long-term improvements will share in the cost. This is accomplished by borrowing money and paying it back over 20 or 30 years.

Because the county has limited financial resources to meet the public service needs of county residents, capital improvements are planned through capital improvements programming, which is part of the annual county budget process.

A capital improvements program is the multiyear scheduling of public physical improvements. The scheduling is predicated on the availability of fiscal resources and the selection of specific improvements to be constructed over a span of 5 to 6 years into the future.

## County Facilities – Strategies and Actions

- Complete assessment of county space needs and availability in conjunction with of the justice center.
- Ensure that the location of county facilities encourages reuse of existing structures, construction of infill sites, and new construction in development districts.
- Program capital improvements to fund repair and maintenance of older assets.

### Libraries

Libraries serve important functions in the community, providing educational resources for students and lifelong learning opportunities for all county residents. They also provide entertainment and promote citizenship. No longer just static repositories of books and reference materials, libraries have become community centers providing a broad range of services, access to the internet, and meeting areas for community groups. Many of the county's libraries are centrally located within boroughs or existing neighborhoods, and several occupy historic buildings. The county's libraries are well used: 48 percent of county residents hold library cards.

The county is served by the Bucks County Library Network, which is a cooperative effort of the seven branches of the Bucks County Free Library system, eleven community public libraries and the Bucks County Community College Library. The Bucks County Free Library provides administrative and funding support, interlibrary loan, cataloging, purchasing services, program support, reference resources and professional training to the community public libraries throughout the county. More than half the funding for the free library system is from county General Fund tax dollars. Other funding includes state library aid, fines and fees, donations and endowments, and grants. The combined library collections of the Bucks County Free Library branches and the community public libraries exceed the state library standard<sup>20</sup> for the population served.

The Bucks County Free Library branches are located in Bensalem Township, Doylestown Borough, Langhorne Borough, Levittown (Middletown Township), Perkasio Borough, Quakertown Borough and Lower Makefield Township. The Bucks County Library Center in Doylestown Borough serves as a repository for materials available to all other county libraries.

Several libraries in the county offer electronic access to resources and provide additional electronic services. The county library system provides an electronic catalog as well as book hold and renewal on the web. Library patrons with internet access may view the library catalog on-line. Many branch libraries offer free desktop workstation and wireless (Wi-Fi) internet access. The Community College library offers camera and laptop computer rental and a multimedia lab to students. The Doylestown Library offers self check-out.

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<sup>20</sup> Pennsylvania Department of Education, Bureau of the State Library utilizes a standard of 1.5 currently useful items per person served by the library system to determine the adequacy of a library's collection.

The community public libraries are governed independently by their own boards and funded by the local municipality or other sponsors. The Bucks County Free Library and community public libraries share a catalog and library materials and issue a library card that may be used at all locations. The community public libraries are located in the following communities: Bristol Borough, Fallsington, Feasterville, Morrisville Borough, New Hope Borough, Richboro (Northampton Township), Pipersville, Riegelsville Borough, Southampton, Warminster Township and Wrightstown Township.

A facilities analysis will be undertaken in 2011 to evaluate the facilities and services of the Bucks County Free Library system. The Free Library Strategic Plan will determine the issues facing the system and how to best meet the needs of residents. Participants in the comprehensive plan stakeholder meeting indicated that libraries have become community centers in addition to their traditional function and that the county should take a greater role in funding their operations.

Because of their important public function, libraries should be located in a central walkable location to facilitate access and contribute to the vitality of communities.

### **Libraries – Strategies and Actions**

- Promote location of libraries within centrally located areas.

### **Educational Facilities**

Educational facilities are provided by both public and private schools, and higher education is available at two colleges and four universities. School districts are mandated by state law to provide education to students up to age 16. They require significant funding, which on average makes up more than 70 percent of the local real estate tax bill.

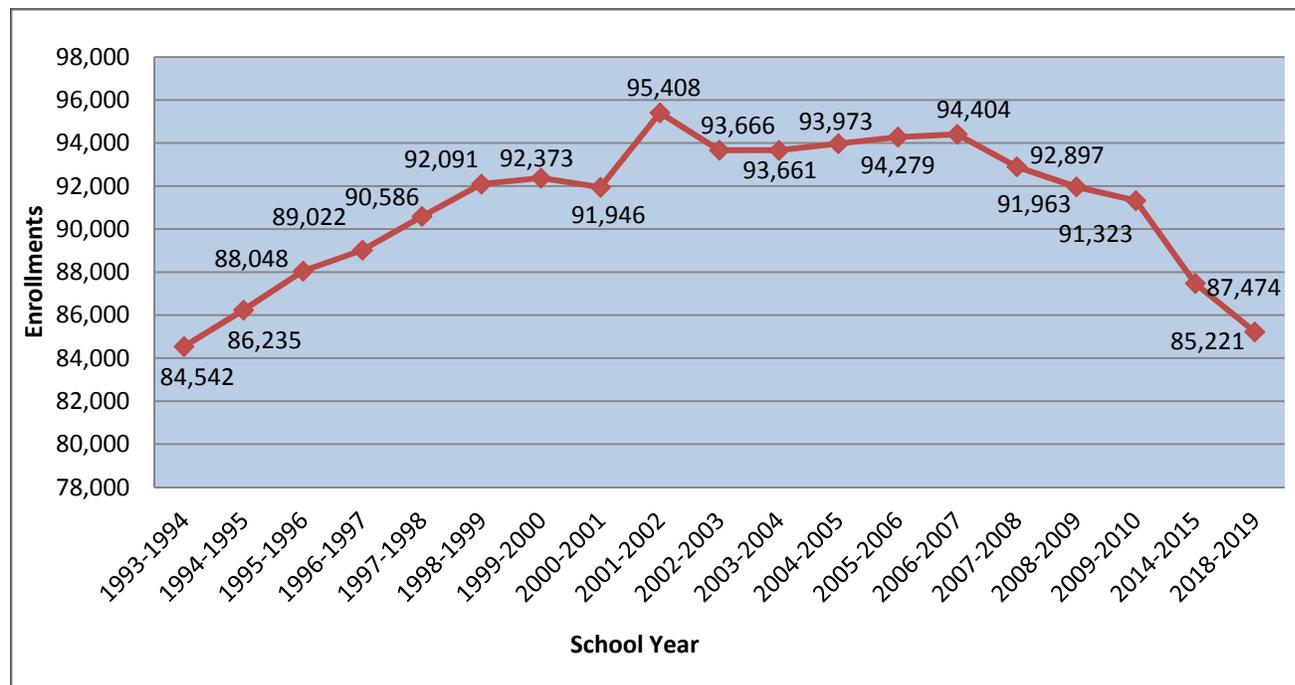
#### ***Public Schools***

Public education (K-12) in Bucks is provided by 13 school districts and two outside districts. There are over 91,000 students in Bucks County's public schools. Currently, students in Riegelsville Borough are enrolled in the Easton School District and Telford Borough students are enrolled in the Souderton School District. Parents of Riegelsville school children have undertaken efforts to include Riegelsville Borough within the Palisades School District.

The Bucks County Intermediate Unit provides programs and services on a regional basis and promotes coordination among school districts. The Intermediate Unit offers business services, educational services and special education services to the students and schools of Bucks County.

Student enrollments in public schools county-wide have trended downward from 94,279 in 2005 to 91,323 in 2010. Projections by the Pennsylvania Department of Education indicate that this trend will continue with a further enrollment decline of approximately 7 percent by 2019 (see Figure 19). The projected enrollment decline reflects the slowing of the county's population growth and aging population.

**Figure 19**  
**Public School Enrollments, 1993–2019**



Source: Pennsylvania Department of Education

To accommodate growth and changing student populations, new schools and additions have been constructed in Bucks County between 2000 and 2010. New high schools have been built in the Central Bucks and Council Rock school districts. Some districts have closed schools and redrawn attendance maps to best utilize school facilities.

Scholastic achievement in Bucks County is on average higher than that of the state average. However, the achievement scores within the county vary.

**Private Schools and Home Schooling**

Private schools (elementary and high school) in Bucks County, which include both secular and faith-based schools, serve approximately 15,400 students. Private school enrollments have decreased from 19,844 in 2000-2001 to 15,356 in 2008-2009, a 22 percent decline.

The Archdiocese of Philadelphia operates 29 schools. The county has several charter schools which provide alternative programs. Special schools, such as the Easter Seal School, and Woods Services School, serve special needs students or provide vocational programs.

Parents provided home schooling to 740 students in the county in 2006-2007. The number of home schooled students has declined from 1999-2000, when there were 926 home schooled students.

Homeschooled students receive instruction at home, although state regulations permit home schooled students to participate in public school activities.

### ***Colleges and Universities***

Higher education is provided at the following colleges and universities, which also provide libraries and entertainment open to residents:

- Bucks County Community College (Campuses in Newtown, Bristol, and East Rockhill townships)
- Delaware Valley College (Doylestown Township)
- Holy Family University (satellite campus in Newtown Township)
- LaSalle University (satellite campus in Newtown Township)
- Philadelphia Biblical University (Langhorne Manor Borough)
- The University of Phoenix – Lower Bucks County Learning Center (Middletown Township)

The Bucks County Community College (BCCC) is operated by the Bucks County Community College Authority, which is charged with acquiring, maintaining and operating, owning, and leasing all facilities necessary for furthering post-secondary education and training at the county community college. The county commissioners appoint the members of the Authority. The BCCC receives funding from the county and state.

The fall 2011 enrollment is 10,710 students. While this is a decrease from the 2010 enrollment, the BCCC has grown by nearly 20 percent since 2001. Improvements at the Upper Bucks and Lower Bucks campuses have contributed to the increased enrollments. Credits earned at BCCC may be transferred to other colleges and universities for credit towards baccalaureate programs. The college also offers certification training in many fields.

### ***Educational Service Issues***

Public schools have been faced with reduced funding from the state and with more demanding federal requirements for student performance. Economic conditions and property reassessments in recent years have lead to lower tax revenue for local school districts. Approximately 70 cents of every dollar collected for local real estate taxes is for the local school district.

The population of school age children in all communities is cyclical. Communities of mostly young adult households have an increasing school-age population, while empty-nester household communities have a shrinking school-age population. Thus, in some communities there is a need for the construction of new school buildings, while in others the declining school enrollment requires the closing of schools. Consideration of future reuse of school buildings during the building design phase may expand opportunities for future use of school buildings if they need to be closed. Expansion and construction projects should be promoted in areas that have increasing school-age population, provided that the need is financially justifiable and not the result of temporary demographic trends.

The school-age population projections for Bucks County show that it will continue to decline over the next ten years. Some school districts have closed schools. The feasibility of leasing school buildings designated for closing for other uses should be explored. For example, the Maple Point Middle School in the Neshaminy School District was leased to the Educational Testing Service in the 1980s when enrollments declined, and then reopened as a school when the school-age population increased.

Schools are a central part of community life, serving children during the day and the community in the evenings and weekends. To enhance the vitality of a community, schools should be located in a central walkable location. Building new schools in areas of existing development saves money, reduces transportation costs, avoids the need to extend water and wastewater facilities, and discourages sprawl. Schools located outside of developed areas require bus transportation and extensions of public water and sewer, which often fosters suburban sprawl.

### **Educational Service – Strategies and Actions**

- Promote the location of new facilities within existing neighborhoods and development areas.
- Encourage reuse of existing facilities before building new ones.
- Encourage leasing of used facilities rather than selling to retain potential reuse.
- Promote sidewalks and bicycle paths that connect schools with neighborhoods.

### **Emergency Services**

#### ***Emergency Medical Services***

Emergency medical service response is an essential component in the provision of adequate public health care. These services are funded by insurance reimbursements, taxes, direct payments, and donations. Emergency medical service (EMS) is offered by 27 private nonprofit organizations. The Pennsylvania Department of Health defined levels of emergency services which are provided in Bucks County by the following types of squads:

- **Advance Life Support** (ALS) – provides cardiac arrest and trauma care
- **Basic Life Support** (BLS) – provides first aid and transport
- **Quick Response Service** (QRS) – provides quick response first aid, but does not transport patients

There are two hospital affiliated rescue squads—St Luke’s Hospital in Quakertown and Grandview Hospital in West Rockhill Township. Two squads in adjacent counties, the Souderton Community Ambulance in Montgomery County and the Lambertville-New Hope Ambulance in Hunterdon County, New Jersey provide primary service to the Hilltown and New Hope areas of Bucks County.

The Bucks County Emergency Health Services Department is responsible for training, personnel certification, quality assurance, licensing of EMS and overseeing Quick Response Services.

Most of the county has adequate ambulance service response coverage, but some portions of Bucks County have longer response times due to low densities in rural areas.

Most ambulance squads are buying equipment and supplies individually and have vehicles serviced locally. Mutual purchasing of vehicles, equipment and supplies through a common source may save money.

### ***Fire Protection***

Municipal governments are required to provide fire protection service. In Bucks County, this responsibility is delegated to local fire companies. To provide adequate service and coverage, a fire company must not only have the necessary manpower and equipment, but also the ability to respond in sufficient time. Adequate fire protection service also ensures affordable fire insurance costs.

The coverage area of each company is determined by the municipal government and the fire company chief. Within Bucks County there are 62 fire companies, 62 stations and 16 substations. Volunteer fire companies provide 24/7 fire protection except for Bensalem, Bristol, Newtown and Northampton townships, where paid daytime weekday service is provided.

Bucks County's role in fire protection consists of the duties of the county Fire Marshal and fire protection training. The Fire Marshal's office investigates fires that cause injuries, death or significant property loss. The training center with facilities in Doylestown and Bristol townships trains county and visiting firefighters. The new facility in Bristol Township was constructed to meet training needs in Bucks County.

Fire company operations are funded by taxes, donations and fundraising. Fundraising often requires significant time and effort throughout the year. The major issues regarding fire protection are inadequate volunteer staffing and funding. Fire company squads are staffed primarily by volunteers who are often difficult to recruit due to family obligations and the time demands for training and firefighting. Volunteers are often not available during the day, so fewer firefighters are available to respond to calls. Some volunteer fire companies offer incentives for service such as payments per call and a pension benefits through a Length of Service Program. Some municipalities allow their employees to respond to emergencies during the work day. Participants in the comprehensive plan stakeholder meeting believe that recruitment and retention of personnel is a challenge that has to be addressed for effective emergency services.

Costs are high due to the number of companies and over capacity of equipment and facilities. Each company has equipment to meet its needs, but countywide there may be a duplication of some specialized equipment.

### ***Public Safety***

Enforcement of laws for preserving the peace, safety, and good order within our communities is provided by either municipal police departments or the Pennsylvania State Police within the county. Police departments are funded by municipal taxes and account for upwards of 50 percent of the

municipal budget. Municipal police enforce both local and state law, whereas the Pennsylvania State Police enforces only state law.

Bucks County has 42 municipal and regional police departments. The regional police departments within the county include: the Newtown Township Police Department, which also provides police protection for Wrightstown Township; the Perkasio Police Department, which also serves Sellersville; and the Pennridge Regional Police Department, which serves East Rockhill and West Rockhill townships. The municipalities of Doylestown Borough and Township, New Britain Borough and Township and Plumstead Township are evaluating the benefits of consolidation. The Pennsylvania State Police have barracks in Dublin and Treiose. State Police based in Dublin Borough barracks provide police protection to the boroughs of Riegelsville and Trumbauersville and the townships of Bridgeton, Durham, Haycock, Milford, and Nockamixon.

The municipal and regional police departments coordinate as a regional force in two capacities: the Major Incident Response Team and Special Response Team. The Major Incident Response Team (MIRT) is a county-wide team, which is composed of 21 participating police departments and is divided into upper, central, and lower teams. The members of this team respond if needed to natural disasters, riots, major events, such as presidential visits or protests, and are trained to respond to chemical/biological incidents, as well as terrorist attacks. K-9 (police dog) and HAZMAT (hazardous materials) teams are proposed in the future also.

The Central Bucks Special Response Team (CB-SRT), is a multi-jurisdictional agency that responds to high-risk incidents in central and upper Bucks County. The CB-SRT members are specially trained in the areas of tactics, weapons and special incident response.

The county's responsibility in ensuring public safety is fulfilled by the Bucks County Sheriffs, Park Rangers, and District Attorney. The sheriffs transport prisoners, administer property sales, process weapons permits and serve warrants. The park rangers enforce county regulations in county parks. The Bucks County District Attorney's office works with local, state, and federal law enforcement officers to ensure that civil and criminal laws are upheld and citizens are protected. The district attorney's office also offers detectives to assist local departments with criminal investigations.

The county provides police training at the Public Safety/Police Training Center in Doylestown Township. Montgomery County Community College offers public safety training but the Bucks County Facility is the only county government operated facility in Southeastern Pennsylvania. The facility provides police training and firearms certification in addition to fire and emergency services training. Training grant assistance is offered at the center along with the opportunity to meet people from other departments. Training is essential to maintain professional departments responsive to new forms of crime and the needs of local municipalities.

The level of service provided by local police departments is based on community preference, and adequacy of police services, which is often subjective. Due to technical, equipment and training needs, police services are expensive. In addition, small municipalities often lack the police staff and needed

resources for special emergencies, such as civil unrest and natural disasters. Participants in the comprehensive plan stakeholder meeting expressed support for consolidation of services among municipalities where practical. Consolidation of police services of two or more municipalities may cost more in the short term due to the expense involved in uniting two or more departments, but in the long term savings can be realized and services expanded.

### ***Emergency Management Agency***

The Emergency Management Agency, headquartered in Ivyland, is the disaster response and abatement staff to the county during a major disaster. The agency is also responsible for assisting in the development of mitigation plans to abate the impact of disasters. The agency maintains an organization of government, industrial and volunteer agencies in a state of readiness and training to take immediate countermeasures to save lives, property and alleviate human hardship and suffering under major disaster conditions. The events of September 11, 2001, brought additional funding and responsibility for county and municipal provision of emergency services. The agency received federal Department of Homeland Security grant funds in the past decade which allowed them to invest in enhanced equipment and capabilities to deal with emergencies.

Technological changes also require periodic upgrades such as the county's radio equipment upgrade that is required to meet new Federal Communication Commission (FCC) requirements to change bandwidth usage. To provide more effective use of the radio wave spectrum and greater spectrum access for public safety and land mobile radio systems, the FCC now requires that these users shift to a different frequency. The shift to "narrowbanding" allows for the creation of greater channel capacity with the same spectrum of radio waves to permit more public and commercial users.

The Bucks County Emergency Communications Department operates the 9-1-1 system which coordinates emergency response services throughout the county. Emergency calls are received and the appropriate emergency response is dispatched to the scene of the emergency.

### **Emergency Services – Strategies and Actions**

- Update radio communication and radios to meet federal narrowbanding mandate by 2013.
- Support shared service, and coordination among emergency service providers to reduce costs and improve response capabilities where practical.
- Monitor space needs for county emergency services and public safety training.

### **Health Care**

For the most part, health care in Bucks County is provided by the private sector in hospitals, clinics, nursing homes and by private physicians. Bucks County agencies provide direct and indirect public health care services to county residents, but the county has no administrative or other control over private health care facilities.

Bucks County provides care for the elderly and chronically ill at the Neshaminy Manor Nursing Home. The Bucks County Department of Health administers programs in environmental health and personal health. The department also administers the Bucks County Medical Reserve Corps, which is a group of medical, public health, and non-medical volunteers that assist in emergency preparedness drills as well as volunteer training and community outreach. The corps volunteers are an essential component of the county's response to major events such as pandemic immunization drills. The county departments of Health, Mental Health and Developmental Programs, and Area Agency on Aging provide programs for and assistance to specific populations.

Bucks County has six general hospitals that provide acute care. The hospitals are located in all the county's population centers. These hospitals and the communities in which they are located are listed below:

- St. Mary Medical Center (Middletown Township) – contains a regional Trauma Center
- St. Luke's Hospital (Quakertown Borough)
- Doylestown Hospital (Doylestown Township)
- Lower Bucks Hospital (Bristol Township) – contains a mental health facility
- Aria Health Bucks County Campus (Falls Township)
- Grandview Hospital (West Rockhill Township)

Three specialty hospitals focus on specific health issues. The following facilities provide inpatient care for specific conditions:

- Foundations Behavioral Health (New Britain Borough)
- Barix Clinics of Pennsylvania (Middletown Township)
- Rothman Specialty Hospital (Bensalem Township)

Bucks County also has a number of ambulatory surgery centers which provide specialty or multispecialty outpatient surgical treatment on a regular basis.

The health care environment has changed in recent years. The closing of state hospitals, increased dependence on prescribed medications, and the new Patient Protection and Affordable Care Act have changed, and will continue to change, the landscape of health care.

Hospitals in Bucks County and adjacent counties have established stand alone care centers that offer testing and outpatient services. New technologies offered at these centers provide health care once offered only at hospitals. These smaller facilities are located in commercial areas convenient to residents. The Health and Wellness Center in Warrington Township is an example of such a care facility.

### **Health Care – Strategies and Actions**

- Monitor health care needs and the changing health care environment.

- Ensure that local land use ordinances permit the full range of health care facilities where they are needed.
- Direct county, state and federal health care dollars to meet local needs and gaps.

### **Telecommunication Facilities**

Telecommunication is the transmission of voice, video, or data between two points. The growth of the telecommunications industry is driven by increasing advancement of technology and greater business and consumer demand. New fiber optic cables, new antennae and new towers are being installed to meet increasing demand for telephone, television and internet. Telecommunications has become an integral part of the municipal infrastructure as it provides for public safety and economic development.

A 2009 National Health Interview Survey indicated that one of every four American homes (24.5 percent) had only wireless (cellular) telephones. In addition, one of every seven American homes (14.9 percent) had a landline, yet received all or almost all calls on wireless telephones.

Wireless telecommunications include cellular and microwave technology. Cellular telephone technology provides for wireless telephone and internet access. The technology relies on antennae which send and receive calls and are connected to the land-based telephone network. Data may also be transmitted and received by microwave antenna. Wireless data transmission rates are rising and devices are portable, but signal interference and availability may be problematic. Wireless telecommunications equipment may be placed almost anywhere, but to minimize construction of new towers, antennae can be placed on existing buildings. Distributed antenna systems use a greater density of antenna located on shorter utility poles to serve smaller areas such as neighborhoods and can provide better services than systems using fewer but taller cell towers.

Fiber optic cables also transmit data and are located on utility poles or underground. These cables transmit information via glass fiber. Underground installation is impervious to weather and interference, but it is costly.

The Telecommunications Act of 1996 was adopted by Congress to create competition among telecommunication providers for lower prices, better choice, new products, and to encourage more investment in the network. The Telecommunications Act permits municipalities to regulate the design and placement of telecommunication facilities through reasonable zoning standards, but they may not restrict wireless services or deny construction of facilities based on radio frequency emissions.

Planning for telecommunications promotes management of the right-of-way, and public assets, universal service, economic development and enhanced quality of life. To promote effective service, municipalities should encourage their location in public rights of way such as antennae on public buildings and structures and cables under the street. Location in the right of way also allows for greater control.

Wireless coverage gaps exist in portions of upper Bucks near the Delaware River. Fiber optic cable has not been installed in all municipalities. These gaps hinder emergency response and may discourage location of businesses that utilizes telecommunication technology. Storms can topple utility poles and disable the telephone network. Wireless and underground communication facilities are more weather resistant in most cases.

Municipal telecommunications planning can help to maximize services and encourage technology driven businesses. Planning may also minimize intrusions, such as unwanted towers. Promoting locations for facilities encourages service where a community wants it rather than having facilities where they are not wanted.

Zoning may provide standards for telecommunications facilities by encouraging use of existing buildings and structures for new antennae by allowing them by right and requiring conditional use approval for new towers. Collocation or the sharing of telecommunication towers can be encouraged. Camouflage or stealth treatment can be required for new towers and antennae to improve their appearance. Promoting the use of antenna systems can provide better services with fewer tall cell towers.

### **Telecommunications – Strategies and Actions**

- Continue county maintenance and acquisition of towers to meet emergency services telecommunications needs.
- Promote municipal planning and improve zoning standards for telecommunication facilities to address siting, collocation, and stealth treatments.

Principle 7:

**Enhance Transportation Mobility**

To effectively manage traffic congestion, the county's transportation system should be multi-modal and be designed to improve safety, provide a well-functioning public transit system and promote non-motorized means of travel (e.g., biking, walking). A well-developed transportation system also allows for an efficient movement of goods, maintains air travel, and strengthens the transportation/land use connection.

Bucks County's transportation network has had an enormous impact on the economic, cultural, and social characteristics of the county. Therefore, it is essential that the transportation network sustains the existing community infrastructure, supports the mobility of all segments of the population, and facilitates the type of development that enhances, rather than detracts from, the county's character.

Bucks County contains an assortment of transportation modes that serve the county's residents, workers, and visitors. This variety of transportation modes allows people to get to where they want or need to go. The county's well-developed highway network supports extensive private car and commercial traffic and is the dominant form of transportation in the county. Bucks County's existing transportation network, including all modes of transportation, fit the character of different parts of the county, but planning must be done to ensure that this will still be the case in the future.

The transportation issues facing Bucks County range from local needs to regional priorities. Previous transportation planning efforts revolved around the theory of moving as many cars as possible in the least amount of time possible. Today's transportation planning efforts understand the function and impacts of transportation. Transportation planning must encompass all facets of mobility, including highway safety, pedestrian mobility, cyclists, goods movement and aviation. An integrated transportation system is essential to support the needs of the residents of Bucks County.

While Bucks County owns over 100 bridges, it does not own any roads. All road ownership is either by Pennsylvania Department of Transportation (PaDOT) or the local municipalities. Funding of the repair of these roadways is done through federal, state and local dollars. The amount of funding dedicated to transportation projects has been decreasing, while the cost of projects has been increasing. Due to age of the county's infrastructure and limited funds, most of the money dedicated to transportation is spent on repairing or maintaining our infrastructure, to keep it in a state of good repair.

The philosophy of providing for good repair at the expense of providing for extra capacity will continue for many years. Scarce resources will be used on projects that ensure more efficient and effective operation of the county's transportation facilities. More facilities need to be provided for pedestrians and bikers, and on ensuring that the county's public transportation needs are met. Many projects that have been "in the pipeline" for years also need to be revisited to determine if they are still warranted and if so, how they can be funded and completed in a timely manner.

Participants in the comprehensive plan stakeholder meetings felt transportation funding is one of the most important issues facing the county and that alternative funding sources should be investigated and funds managed more efficiently. The use of alternative funding sources to fund "in the pipeline" projects should be investigated as a means of funding "legacy" projects.

### **Transportation Characteristics**

The *2009 National Household Travel Survey* (NHTS) provides information to assist transportation planners and policy makers who need comprehensive data on travel and transportation patterns in the United States. According to the NHTS, congestion across the nation continues to worsen. In general, driving

times continue to increase and midday travel has increased dramatically. In addition, a significant portion of non-work related travel is occurring during peak commuting hours.

The safety of commuting public is also of concern. The percentage of older Americans driving is growing. The American vehicle fleet is also aging, with older drivers being more likely to drive the older vehicles than younger drivers.

While the persons per household rate has decreased over the past 40 years, the vehicles per household has grown over 60 percent. The vehicles per licensed driver and vehicles per worker have grown over 40 percent. These rates are further proof that the nation's focus has been on driving and not on other methods of travel.

According to the U.S. Census, *American Community Survey, 2005-2009*, 90.9 percent of all Bucks County workers drove to work. This figure is higher than the state average of 85.9 percent. The use of public transportation in the county is nearly half of the state average of 5.4 percent. Less than 2 percent of county workers walked to work. These figures support the long held belief that an overwhelming majority of county workers utilize their personal vehicles to travel to and from work.

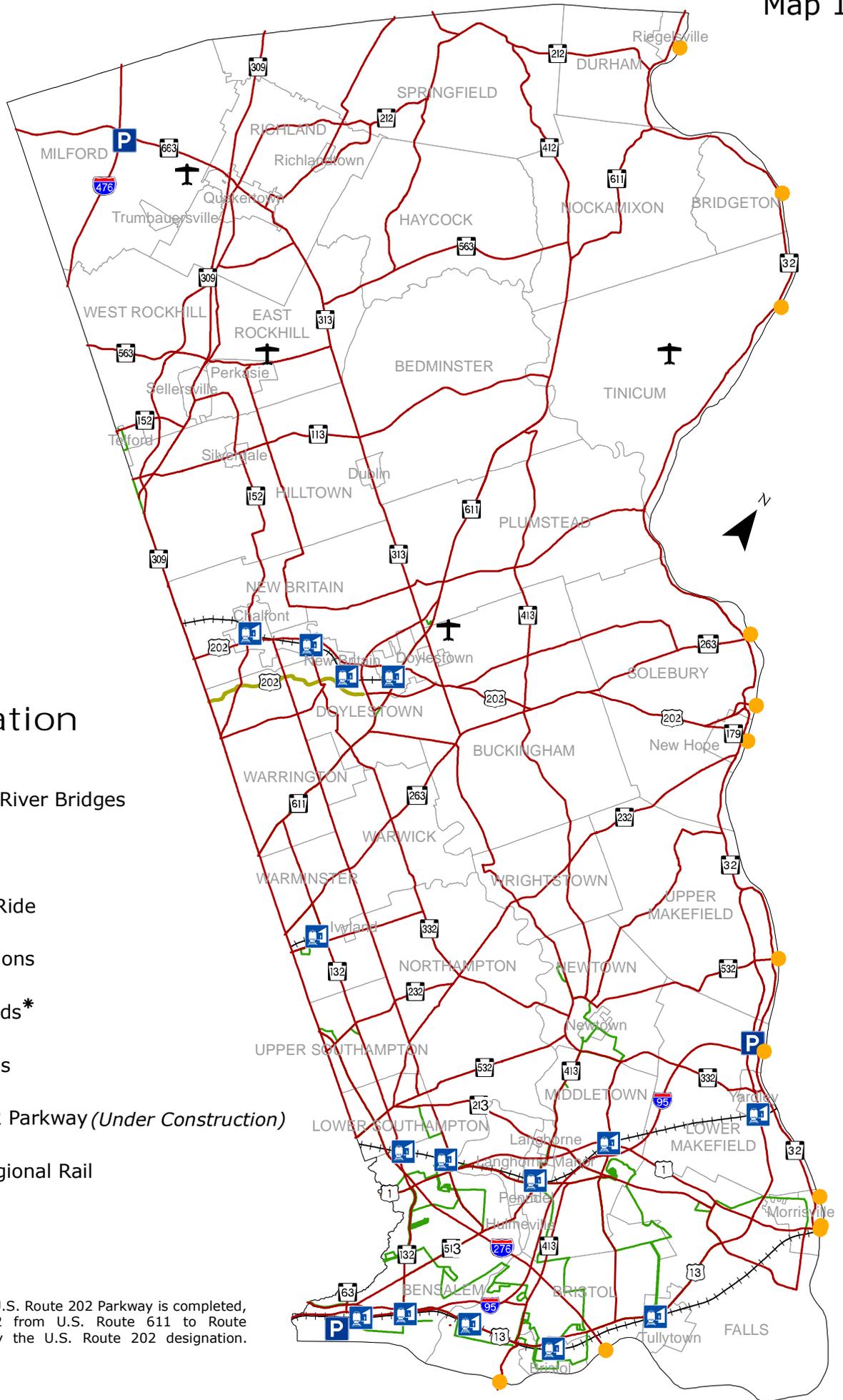
In 2000, approximately 55 percent of county residents worked within the county; nearly 16 percent of the workers commuted to Montgomery County. Nearly 13 percent of the county's workers commuted to New Jersey and 10 percent commuted to the City of Philadelphia. About 40 percent of county residents have a commute longer than 30 minutes to work. The mean travel time to work for county residents in 2009 was 28.1 minutes, which is slightly longer than the statewide average of 25.4 minutes.

Statistics indicate that Bucks County residents continue to rely upon single-occupancy vehicles, at a rate even higher than the state average, for their daily commute. The use of public transportation continues to fall below statewide averages, even though, compared to most areas of the state, the county enjoys a fairly robust public transportation system. These factors complicate the transportation planning process since county residents continue to make a conscious decision to utilize their personal vehicles even though public transportation options may be available to them.

## **Highway Transportation**

Highway transportation remains the most dominant mode of transportation in Bucks County. Most people traveling through or within the county use the county's extensive highway network to reach their destinations. The county also occupies an important place in the region's highway network since several major road facilities traverse the county.

Bucks County's highway network conveys people to a range of destinations within the county and also to major regional destinations such as Philadelphia, Washington, New Jersey, and New York. Major highways, such as Interstate 95, U.S. Routes 1, 13 and 202, Pennsylvania State Routes 309, 413 and 611, and the Pennsylvania Turnpike (Interstates 276 and 476), have helped make Bucks County a key transportation focal point in the northeastern United States. However, these roads comprise only a small



## Major Transportation Facilities

- Delaware River Bridges
- Airports
- P Park and Ride
- Train Stations
- Major Roads\*
- Bus Routes
- Route 202 Parkway (Under Construction)
- SEPTA Regional Rail

\* Once construction of the U.S. Route 202 Parkway is completed, existing U.S. Route 202 from U.S. Route 611 to Route 309 will no longer carry the U.S. Route 202 designation.

percentage of the overall highway network in the county. Other state and municipal roads play an important role for regional and local traffic.

Bucks County's highway network is comprised of a hierarchy of expressways and interstates, principal and minor arterials, collectors and local access roads. Each road type serves a particular mobility function. For example, Interstate 95 provides interregional travel for the northeast region, while a local residential street provides access to a homeowner's driveway. Preserving the intended purpose of each roadway type is critical to providing a safe and efficient road network.

According to PaDOT's functional classification system, there are 102 lane-miles of interstates or expressways in the county. In addition, there are approximately 600 lane-miles of principal and minor arterials and another 480 lane-miles of collector roads in the county. There are also over 3,200 miles of locally-owned roadways in the county not owned or maintained by PaDOT.

### ***Bridges***

According to PaDOT, there are 643 state-owned bridges with spans over twenty feet in length in the county. There are also 112 bridges owned by Bucks County and 53 municipally-owned bridges in the county. In addition, the Delaware River Joint Toll Bridge Commission owns 9 non-toll bridges and 3 toll bridges, all of which span the Delaware River. The Burlington-Bristol Bridge is another toll-supported bridge which spans the Delaware River and is owned and maintained by the Burlington County Bridge Commission.

The Scudder Falls Bridge is one of the non-toll bridges owned by the Delaware River Joint Toll Bridge Commission. The Scudder Falls Bridge consists of two travel lanes in each direction, separated by a concrete median barrier. The bridge lacks shoulders and breakdown lanes and does not meet current highway design standards. Heavy congestion exists at the bridge on a daily basis. This congestion is exacerbated not only by the narrow bridge, but also by the proximity of the adjoining interchanges with ramps merging onto Interstate 95 near the bridge. The Delaware River Joint Toll Bridge Commission has determined that the existing bridge must be replaced to meet future traffic and public safety needs. The commission is designing a new bridge that will consist of five northbound lanes and four southbound lanes. In addition to the new bridge, Interstate 95 will be widened to six lanes from the new bridge to the Route 332 exit in Newtown Township. The new bridge will be a tolled facility.

State bridges are inspected every two years. In addition, federal law requires that local and county bridges with a span of over 20 feet be inspected every two years. National Bridge Inspection Standards provide ratings to describe an existing bridge or culvert compared with its condition if it were new. Bridges are rated from 0 (failed condition) to 9 (excellent) on their "general" condition and on the condition of their primary components. A condition rating of 4 or less on one of these items classifies a bridge as structurally deficient. According to a 2008 study by the American Association of State Highway and Transportation Officials, 44 percent of all Pennsylvania's bridges were considered to be deficient. In 2010, the figure had been reduced to 23 percent being structurally deficient, which is still higher than the nationwide average of 11 percent. At the same time, 25 percent of state owned bridges and 43 percent of non-state owned bridges in Bucks County were considered structurally deficient.

Bridge reconstruction has become a major priority statewide due to the serious consequences of bridge closures. In recent years, bridge collapses have made national news and reinforced the need for dedicated bridge funding. Bridges posted with weight limits are commonplace and some have been completely closed to traffic until adequate funding can be found to reconstruct them.

Weight limits on bridges can interrupt commercial and agricultural transport and force vehicles to travel longer distances to reach their destination. Weight limits on bridges can also delay emergency response times. Bucks County's economic livelihood relies on a safe and efficient system of roads and bridges. Deficient bridges can harm a region's economic development by reducing access, particularly for large commercial vehicles, which are critical to business productivity.

### ***Historic and Covered Bridges***

Since Pennsylvania is one of the oldest states, it is hardly a surprise that it possesses many bridges which could be deemed "historic." Bridges can be classified as historic for many reasons, including whether or not they have integrity of workmanship, how they were designed, and what types of materials were used for their construction. Bucks County contains many of these historic bridges. While these bridges add to the county's beauty and attractiveness, they present special challenges when they no longer meet the requirements of vehicles using these roads.

Early bridges were often constructed using wood, especially where wood was a plentiful resource. Wooden bridges tend to deteriorate rapidly from exposure to the elements. To overcome this problem, bridge builders began building structures over the bridge to protect them from the weather. Covering these wooden bridges protected their structural members, thus extending their lifespan.

Only 12 covered bridges remain of the more than 50 originally built in Bucks County. Covered bridges are susceptible to weather, fire and neglect. Fortunately, the historical value of these bridges has been realized and many covered bridges have been protected, preserved and, in some cases, reconstructed.

Historic bridges, including covered bridges, are a valuable resource and should be treated as such. However, any rehabilitation or reconstruction of a historic bridge must be designed to balance historic preservation needs with the traffic and safety needs of the public. One mitigation measure, known as context-sensitive design, involves designing replacement bridges in accord with the original design, with particular attention paid to the materials, workmanship, appearance of the bridge and the approaches to the bridge. In addition, the new design takes into account the historic context of both the original bridge itself and of its surroundings and setting.

### ***Critical Corridors***

Critical corridors comprise roadways that provide essential links to communities in the county and provide for the movement of people and goods that are "critical" to the economic viability of the county and its citizens. These roadways in most instances provide long distance connections to areas within and outside the county and often serve a dual role of providing access to many of the nonresidential properties. They deserve a higher level of funding, maintenance and planning so that the flow of traffic can be maintained at an acceptable level. The following roadways within the county are

deemed critical corridors due to their importance in providing connectivity, adequate access, and carrying capacity for vehicular traffic and movement of goods and services. These corridors contain segments which experience peak hour delay due to traffic volumes exceeding capacity:

**Pennsylvania Routes** 1, 13, 113, 132, 213, 202, 232, 263, 309,  
313/663, 332, 413, 513, 532, 563, and 611

These roadways vary in their physical geometry, not only between each other but in many instances along the length of the roadway itself. Some roads may vary from 4 to 2 lanes over their length and have lane widths, shoulder widths and turning lanes that change intermittently. Each roadway's ability to safely accommodate both the current levels of traffic and the types of users is affected by these variations in the roadway geometry. Most of the corridors experience approximately 2.5 percent traffic growth per year despite existing capacity issues at specific intersections or roadway segments.

Roadway widening has been a traditional tool to increase the carrying capacity of roads that continue to experience growth. Due to the limitations in federal and state funding, however, roadway expansion cannot keep pace with the traffic volume growth rates that the county has experienced in the last 30 years. Moreover, a "wider and faster" approach to roadway construction does not ultimately solve the problems associated with congestion. Recent history has shown us that the continued creation of wider, faster roadways ultimately leads to a never ending cycle of land use changes and roadway capacity issues.

Given the roadway variations and funding limitations, a one-size-fits-all approach will not work in making blanket recommendations for these corridors. Rather, a corridor management program is essential to ensuring that these roadways function in the manner that serves both county residents and business establishments. Such a program would identify specific strategies to minimize congestion, identify and prioritize funding for improvements, encourage a wide range of vested users to participate in the planning process, identify where multimodal improvements are necessary or need to be extended, and establish the land use/transportation connections that are vital in protecting the future accessibility and carrying capacity of these roadways.

A management program for the critical corridors is important in that it can analyze each corridor in its entirety and break the roadway into logical roadway segments based on roadway type, i.e. lane width, number of lanes, congested intersections, rural versus urban contexts, and then develop and identify specific strategies which are logical for that segment. This would also consider the roadway users and the land use of the surrounding area. The analysis can determine existing and emerging congestion areas and make recommendations to prevent future congestion. These might involve land use changes or decisions or other techniques which might preclude actual widening. The roadway segment analysis can also prioritize community input based on the different needs of various communities and identify limitations for improvements due to environmental, financial or community support issues.

The recognition of the subcorridors for each of these critical corridors is also important for the specific techniques used to maintain the transportation system performance. Subcorridor levels provide logical termini where roadway lane widths, number of lanes or roadway functionality changes. Specific

improvements and recommendations can be targeted to accommodate all users at each subcorridor level.

The establishment of the critical corridors and the development of corridor management programs would allow the county to target future funding and maintenance to those facilities based on the specific needs of each roadway segment. Existing capacity problems, however, still remain that should be addressed by continued county support. The county will continue to build local consensus and support for ongoing improvement activities or supporting the future funding of phases such as design, right-of-way acquisition or funding.

The following are major long term improvements which are in the design or construction stage and will continue to require funding and commitment for their completion. These are projects supported by the county as part of an overall transportation plan. These projects represent the highest priority for local, county and regional support and should continue to be the focus to receive federal and state monies should increased funding become available. These projects support the critical corridor concept in that they are located on an identified corridor or they support increased access or mobility to an existing corridor.

### ***U.S. Route 1 Safety and Capacity Improvement Project***

Severe accidents on U.S. Route 1 have been caused by high traffic volumes and speeds. These problems are compounded by limited enforcement opportunities due roadway design issues which limit areas where speeders could be pulled over. The lack of shoulders also presents a safety hazard for motorists traveling along the corridor. The U.S. Route 1 Safety and Capacity Improvement Project is designed to alleviating the severe capacity and safety issues that exist along U.S. Route 1. Improvements to U.S. Route 1 from Pennsylvania Route 413 to the Philadelphia border are under design. These improvements include changes to ramp configurations and improvements to the bridges. The project is estimated to be \$220 million. This is an extremely important project which needs to continue to advance through the design process and requires dedicated federal funding. The county will continue to work with the local communities to address short term safety issues and support the overall corridor improvements and upgrades. The county will also continue to seek a dedicated funding source for this improvement.

### ***U.S. Route 13 Rehabilitation Project***

The U.S. Route 13 Rehabilitation Project is a context-sensitive improvement project that involves lane reductions, intersection improvements, pedestrian and bike improvements. The limits of the project are from Route 413 in Bristol Township to Levittown Parkway in Tullytown Borough. This project remains one the highest-ranked county priority projects for federal funding and encompasses an entire redesign of Route 13. This project is an excellent example of utilizing varying management techniques, as recommended under the critical corridor program. This project is a model for how roadways should be analyzed in relation to the users and the communities. The project is scheduled to go to construction in 2012 and is estimated to cost approximately \$24 million.

### *County Line Road Widening*

The widening of County Line Road is an important improvement project which has evolved from the overall corridor improvement plan adopted by the adjacent municipalities in 2001. Portions of the project are under construction in coordination with the U.S. 202 Parkway Project. Two additional segments are under final design and are in need of dedicated funding for construction. The widening of the corridor from the existing U.S. Route 202 (Butler Pike) to Pennsylvania Route 611 should continue to be a priority for the county. The corridor is envisioned as a 5-lane cross section which would provide two travel lanes in each section and a center turn lane to accommodate left turns at intersections and mid-block turns to adjacent land uses. The estimate for the segments under design is \$24 million.

### *Pennsylvania Route 313/663 Improvements*

The Pennsylvania Route 313/663 corridor was studied in its entirety in 1996, and a series of short and long term improvements were identified for the corridor. The most recent recommended improvement to receive funding is the widening of Route 313 from Curley Hill Road to Stump Road. The county and communities should continue to support this improvement and to foster the long term recommendations identified in the study. The widening project has received final design approval and is estimated to be \$12 million.

### *Oxford Valley Road Improvements*

The Oxford Valley Road Corridor has specific issues that warrant county support and funding priority. The first improvement involves the redesign and widening of the intersection of Oxford Valley and Business Route 1. This project has final design approval, but requires dedicated federal funding. The project's cost is approximately \$11 million. In addition, there is a need for a significant corridor improvement in the area of Cabot Boulevard. The movement of freight traffic from the CSX Morrisville Intermodal Facility involves a considerable amount of tractor trailers attempting to enter Cabot Boulevard from U.S. Route 1, via Oxford Valley Road. Compounding the problem in this area is the fact that there are a high number of retail establishments. Vehicles accessing these retail establishments present a conflict with the tractor trailers attempting to access the Intermodal Facility. These conflicts significantly affect capacity at the intersections along Oxford Valley Road, inhibiting regional goods movement. The improvement of the various intersections along Oxford Valley Road from Business Route 1 to the U.S. Route 1 ramps remains a high priority for funding and the county supports these improvements.

### *Pennsylvania Route 309 Improvements*

Pennsylvania Route 309 enters the county along County Line Road in Hilltown Township and traverses upper Bucks before exiting the county in Springfield Township. Route 309 has varying characteristics as it traverses the county. It enters the county as a five-lane section with a center turn lane and then it becomes a limited access facility through West Rockhill. It then provides access to the high density retail establishments in the Quakertown area before exiting the county as a five-lane facility. The segment in the Quakertown retail area experiences severe peak hour congestion and has some of the highest traffic volumes for a five-lane facility in the county.

Significant corridor-wide improvements are needed to accommodate existing and future projected traffic. A Joint Closed Loop Traffic Signal System is under final design in the Quakertown section of Route 309. The closed-loop traffic signal system will comprise 15 existing signalized intersections and one proposed signalized intersection along the Route 309 corridor and adjacent streets within Richland Township and Quakertown Borough. Construction is scheduled to occur in 2013 at a cost of \$2.8 million. In addition, to alleviate congestion at the Route 313/309/663 intersection, improvements to Pumping Station Road have also been proposed. This improvement will allow vehicles from the Lehigh Valley area to have better access to the Pennsylvania Turnpike Interchange located along Route 663. This project has undergone preliminary design, but further work on this project has been deferred until additional funding can be found.

Another important improvement related to the Route 309 corridor is the Sumneytown Pike/Route 309 Project. The purpose of the project is to provide a connection from Sumneytown Pike just north of the Pennsylvania Turnpike's Lansdale Interchange to Route 309. Phase I of this project is located solely within Montgomery County and is under construction. This phase does not include the Route 309 interchange portion of the project. The county supports Phase II of the project, which would include a new interchange along Route 309 in the Telford Borough area.

In addition, since the Route 309 corridor is a multimodal corridor, the county will continue to pursue the restoration of the Quakertown Passenger Rail service. The project remains within the FTA New Start Approval process and is estimated to cost \$150 million. This first phase of the project would restore passenger rail service from Lansdale Borough in Montgomery County to an area along Route 309 just south of Sellersville Borough (see the Public Transportation subsection for more detail).

### ***Transportation Improvement Program***

The focus of a transportation program should be on transportation-related impacts of local land uses and a long-range traffic improvement strategy. This may be accomplished by periodically monitoring and evaluating the conditions of the county's road system. Information collected through traffic counts, street maintenance, and accident reports is an important resource for determining future street improvement projects.

The Delaware Valley Regional Planning Commission (DVRPC) produces the DVRPC Transportation Improvement Program (TIP) for Bucks, Montgomery, Chester, Delaware and Philadelphia counties. The DVRPC and its member governments prepare a program of projects that responds to the needs of the region and that complies with federal and state policies. Most of the funding for transportation projects comes from federal funding (80 percent), through the federal transportation act which is authorized every six years, and from PaDOT (20 percent) through state funding.

The fiscal years 2011-2014 TIP contains nearly 400 projects, totaling almost \$3 billion for the phases to be advanced over the next four years, averaging \$725 million per year. Programmed funds include over \$1.6 billion for projects primarily addressing the highway system and \$1.3 billion of transit projects for various public transit providers in the region. The regional TIP is updated every two years, in coordination with PaDOT's Twelve Year Plan. The regional TIP lists all projects that intend to use



# Critical Corridors and Transportation Projects

— Critical Corridors

## Transportation Improvement Projects

- 1 Pennsylvania Turnpike/Interstate 95 Interchange Project
- 2 Pennsylvania Route 309 Improvements
  - A. Quakertown Passenger Rail Service Study
  - B. Sumneytown Pike/Route 309 Connector
  - C. Quakertown Joint Closed Loop Traffic Signal System
- 3 U.S. Route 1 Safety and Capacity Improvement Project
- 4 U.S. Route 202 Parkway (Under Construction)
- 5 U.S. Route 13 Rehabilitation Project
- 6 County Line Road Widening
  - A. Route 202 to Upper State Road (Under Construction)
  - B. Stump Road to Kulp Road
- 7 Pennsylvania Route 313/663 Improvements
- 8 Bristol Road Extension
- 9 Oxford Valley Road Improvements

— Major Roads \*

+++++ SEPTA Regional Rail

\* Once construction of the U.S. Route 202 Parkway is completed, existing U.S. Route 202 from U.S. Route 611 to Route 309 will no longer carry the U.S. Route 202 designation.

federal or state funds for their engineering, right of way costs or construction costs. There are not enough funds available every year to fulfill the TIP project requirements.

As of the 2011–2014 DVRPC TIP, there were fifty-six projects programmed for funding in Bucks County. Nearly half of these projects are bridge-related projects. The total funding dedicated to Bucks County projects in the TIP is \$199 million, but another \$1 billion will be necessary to complete these projects since some of these projects are not fully funded in the four-year period. Some of the larger, more critical projects on the TIP include the Route 13 Reconstruction Project and the Route 1 Bridge Reconstruction as described in the previous Critical Corridor discussion, and the Interstate 95/Pennsylvania Turnpike Interchange Project, the Project Route 202 Parkway, and the Bristol Road Extension described below.

### ***Pennsylvania Turnpike/Interstate 95 Interchange Project***

The Pennsylvania Turnpike/Interstate 95 Interchange Project is by far the largest infrastructure project in the county. The project includes widening of the Pennsylvania Turnpike to six lanes, the completion of a new bridge over the Delaware River and a new high speed connection of the Turnpike with Interstate 95. This project is a critical improvement that needs continued funding and is the highest priority for future funding needs. The project will improve mobility and access for both the county and the region and has continued to maintain community support. Phase I of the project includes all aspects of the entire project, except construction of the new bridge. It is currently in final design and is projected to cost over \$600 million.

### ***Route 202 Parkway***

The nine mile-long Route 202 Parkway is under construction between Route 63 (Welsh Road) in Montgomery Township and Route 611 in Doylestown Township. The goal of the project is to provide traffic relief on the existing Route 202 and other nearby roads. The Parkway is being built on a new alignment in a corridor situated between Upper State Road and Stump Road, passing through sections of Montgomery, Warrington and Doylestown townships.

The new roadway will be four-lanes wide between Route 63 (Welsh Road) and Route 463 (Horsham Road), and two lanes wide from Route 463 (Horsham Road) to the Route 611 Interchange. The roadway will widen to include left and right turn lanes at its signalized intersections. Parkway speed limit will be 40 mph, and it will be open to commercial vehicles.

A 12-foot wide shared use path with two-foot wide grass shoulders will run the entire length of the project to serve pedestrians, bicyclists and other non-motorized modes of transportation. Five trailhead parking facilities will be located adjacent to the Parkway at Knapp Road, Route 309, County Line Road, Bristol Road, and New Britain Road. Five-foot wide paved shoulders on each side of the Parkway will function as bicycle lanes. The road will open in 2012.

### ***Bristol Road Extension***

The Bristol Road Extension project involves the continuation of Bristol Road from its terminus at U.S. Route 202 to Park Avenue in New Britain Township as a two-lane roadway. The project involves the

relocation of the SEPTA Doylestown Rail Line crossing, improvements to the Doylestown Regional Rail Line which are intended to support higher travel speeds on the Doylestown Line, and the new roadway which is intended to alleviate congestion at the U.S. Route 202/152 intersection by allowing traffic to bypass Chalfont. The project is in the preliminary engineering stage and is being analyzed in the context of a regional land use study.

**Public Transit Projects**

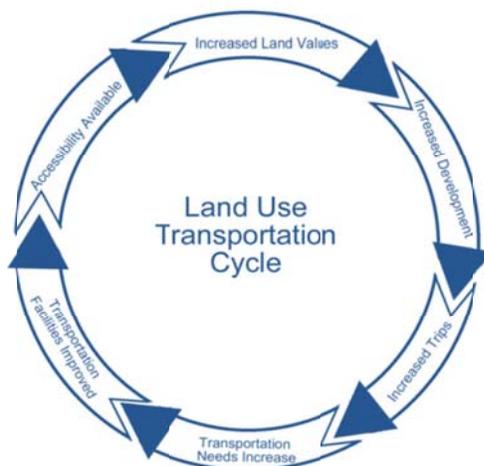
The TIP also provides funding for public transit projects. Projects specific to Bucks County found in the TIP include rail signal and catenary improvements to the Doylestown Line, West Trenton Line and Warminster Line. Also included in the TIP is the rehabilitation of the Levittown Train Station in Tullytown Borough.

PaDOT and the county’s municipalities cannot always solve congestion by building more, wider and faster roadways. History has shown that there will never be enough financial resources to supply the endless demand for roadway capacity in the county and region. Further, most agencies have realized that a “wider and faster” approach to road construction will not solve the region’s transportation problems. Other congestion management options must be considered to ensure that the county’s transportation network is not overburdened with traffic.

**Transportation-Land Use Connection and Planning**

The fundamental relationship between land use and transportation cannot be understated. Land use patterns and intensity influence the roadway network. Likewise, the roadway network can influence the land uses in a particular area. Just as new or expanded transportation systems create new access opportunities that attract new development, new development patterns create a need for additional transportation facilities. History tells us that land use and transportation patterns are linked in a continuing cycle, whereby transportation opportunities create an atmosphere for development which in turn generates additional transportation needs. The “Land Use-Transportation Cycle” is shown in Figure 20.

**Figure 20  
Land Use Transportation Cycle**



This continuing cycle has been the traditional route by which most suburban areas have developed. In order for this trend to be broken, this primary relationship between land use and transportation must be recognized, understood and exploited. This relationship should be used to create conditions in which new growth and new transportation systems and improvements can occur together in a logical manner.

Improving the linkage between land use and transportation planning is essential for the future of Bucks County. Inappropriate land uses coupled with inadequate transportation services create congestion and traffic impacts on both highways and local roads. They also cause worsening air quality conditions, decreased highway safety and reduced community access. Inefficient transportation access and unplanned land use patterns are also a significant hindrance to economic growth and productivity.

Each municipality has the ability to influence the future by taking a proactive stance towards integrating planning for land use and transportation facilities. The promotion of compact, mixed-use development may be one way municipalities can encourage less automobile-intensive uses. Each municipality must carefully consider the transportation implications of their planning decisions and coordinate these decisions with county, state and regional governments.

### *Smart Transportation*

The term Smart Transportation is used to describe a new method to roadway planning and design. In Smart Transportation, transportation investments are customized to fit the specific needs of each individual project. Different constraints, such as financial, community, land use, transportation, and environmental, are all factored in to determine the most appropriate solution. The optimal transportation solution evolves from a process in which a multi-disciplinary team, considering a wide range of solutions, works closely with the community. Smart Transportation incorporates the concept of Context Sensitive Solutions into the roadway development process.

The context sensitive solutions approach to transportation planning, design and implementation examines the extensive framework streets and roads play in enhancing communities and natural environments, considering urban, suburban or rural, scenic or historic contexts. A design team asks questions about the need and purpose of the transportation project, and addresses safety, mobility, and the preservation of scenic, aesthetic, historic, environmental, and other community values. Citizens are part of the design team, and support from stakeholders is received at the beginning of a project, rather than negotiating support as the project nears completion. Context sensitivity emphasizes the broad nature of solutions to transportation needs by focusing on enhancing the quality of life for transportation users, communities and the surrounding environment.

Roadway design standards established through Smart Transportation may be significantly different than those associated with the standard functional classification system. Smart Transportation develops design standards based upon how the roadway serves the community. The standard functional classification system sometimes places an entire highway into a certain class based on certain characteristics. These characteristics may include such things as the overall highway length, or trip volumes relative to other roadways in the urban area. Using these characteristics may lead to problems since its level of access and mobility may not be consistent with other roadways in that class.

Understanding the land use context provides guidance on the users of the road and how they will use it. It also provides the information needed to design the roadway and also helps determine what type of amenities may be required in the right-of-way. The land use context can determine the desired operating speed of a roadway. This “desired” speed is the speed at which vehicles should travel. For example, if pedestrian travel is desired in an area, the desired operating speed would be less than in an area where providing for optimum movement of vehicles is desired.

To address this issue, a roadway typology is used by Smart Transportation which better captures the role of the roadway within the community. If a segment of an arterial roadway has a relatively low speed, is important to community access, and has a lower average trip length, Smart Transportation policy dictates that the road not be over-designed as a large facility. In this way, Smart Transportation policies are more reactive to the needs of the community than focusing on moving as many cars as possible as fast as possible.

During the stakeholder meetings, participants noted that the connection between land use and transportation should be strengthened. The promotion of Smart Transportation techniques will help the county to address these concerns.

### *Access Management*

Bucks County has many arterial roadways that are designed for large volumes and high-speed traffic with restricted access to abutting properties. Controlling the access to these roadways allows them to perform their intended function. When access is not controlled, the number of conflict points with roadway traffic increases. This places serious demands on the roadway capacity, as well as making conditions unsafe for vehicles entering or exiting the highway. The conflict between safe and efficient movement of traffic and access to abutting properties has long been recognized as a limiting constraint in traffic operations and transportation systems management.

The approach recommended is to minimize the number of conflict points along these roads and to provide safe and efficient access to properties along roads. A conflict point is a place where two vehicles come together or their paths cross and one or both drivers must take evasive action to avoid collision.

Access management includes such techniques as shared driveways, providing access to secondary roadways, driveway spacing, planted median strips, and protected left turn lanes. Access management is both a land use and traffic issue. It calls for land use controls and incentives that are keyed to the development policies of the community and the capabilities of the transportation system so that there is a balance of accommodating new development with preserving traffic flow. Municipalities must also take into account the access requirements of businesses, as well as those vehicles traveling through their municipalities.

Based on field observations, several areas of the county are plagued by poor access conditions. The lack of well-designated driveways and unlimited access has led to unsatisfactory access along U.S. Route 13 in Lower Bucks County. Areas along Route 313, especially in Dublin Borough also experience high levels of congestion due to inadequate access management. Other corridors which could be improved

through the use of access management techniques include Street Road through Upper Southampton Township and Lower Southampton Township, Route 413 in Middletown Township and Route 202 through New Britain, Doylestown, Buckingham, and Solebury townships.

Each municipality can develop an Access Management Plan. This plan should include an analysis of current and projected land uses and their associated traffic conditions. The plan should include an implementation plan that establishes priorities and the responsible agencies for completing the roadway improvements or municipal ordinance amendments. PaDOT has recently developed model ordinance language for access management. PaDOT's Center for Program Development should be consulted during development of the plan. This plan should be adopted by the municipal elected officials and be included in the subdivision and land development review process.

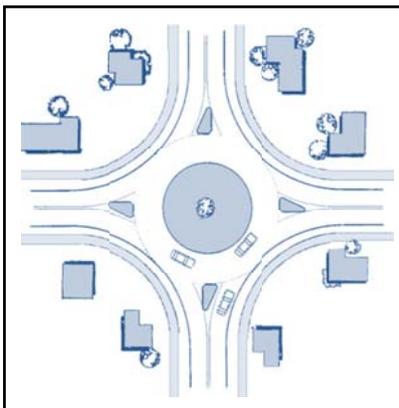
Several municipalities in the county have adopted access management ordinances. Some of these ordinances are corridor-specific, while others are a municipal-wide ordinance. For example, Milford Township provides Arterial Corridor Overlay Zoning requirements for specific corridors, while Plumstead Township applies access management to all arterials and major collectors in the township.

### *Traffic Calming*

Traffic calming measures are used to address speeding and high cut-through traffic volumes on neighborhood streets. These issues can create an atmosphere in which non-motorists are intimidated, or even endangered by motorized traffic. By addressing high speeds and cut-through volumes, traffic calming can increase both the real and perceived safety of pedestrians and bicyclists, and improve the quality of life within the neighborhood.

The role of physical measures in traffic calming is usually emphasized because these measures are self-policing, motorized vehicles will slow down in absence of a police presence. Some potential traffic calming measures include: speed humps, speed tables, chicanes, planted medians, roundabouts and curb extensions. These techniques should affect driver behavior and improve the safety of the street for all roadway users, including pedestrians and bicyclists, but they must be designed so they do not impede emergency access by police, fire, ambulance or rescue personnel.

**Figure 21**  
**Traffic Calming**



Each municipality should develop traffic calming policies specific to their neighborhoods. And while most traffic calming techniques are applied to existing residential neighborhoods, streets in new developments should also be designed to include these techniques when appropriate. Allowing for public participation during the designing of traffic calming facilities will help to ensure acceptance of these facilities.

Several municipalities have embraced traffic calming techniques. Richland Township has constructed a roundabout at the intersection of Station Road and Old Bethlehem Pike and Quakertown Borough has installed speed tables along Mill Street in the area of the borough park and swimming pool to slow vehicles at this pedestrian-intense area. Doylestown Borough has installed a variety of traffic calming techniques including planted medians, chicanes and speed tables to improve safety on various corridors in the borough.

### *Connectivity*

Connectivity refers to the ease of links and the density of connections in a road network. A well-connected road network has many short links, numerous intersections, and minimal dead-ends (i.e., cul-de-sacs). As road connectivity increases, travel distances decrease and route options increase. A road system with high connectivity allows more direct travel between destinations, which, in turn, makes the transportation system more accessible. In the past, road system design practices favored a poorly-connected hierarchical network, with numerous cul-de-sacs that connect to a few major arterials. This type of system increases the amount of travel required to reach destinations, concentrates traffic onto fewer roads, slows emergency response times, and tends to limit pedestrian and bicycling opportunities.

A well-connected road network allows ease of access by dispersing vehicles over more roads. A hierarchical road network strengthens land use accessibility and provides for higher traffic volumes and speeds on a few selected roads. Enhanced roadway connectivity through greater accessibility can provide a variety of benefits including increased route options, improved walkability and reduced vehicle travel.

Increased route options can reduce problems when a link is closed. It improves emergency response by allowing emergency vehicles more direct access, and reduces the risk that an area will become inaccessible if a particular part of the roadway is blocked by a traffic accident or other unforeseen circumstances. A highly-connected street system allows a fire station to serve about three times as much area as in an area with unconnected streets. It also increases the efficiency and safety of services such as garbage collection and street sweeping. These can result in substantial cost savings and service quality improvements.

Good levels of connectivity exist in most of the boroughs in the county. The grid pattern typically found in older boroughs leads to shorter travel distances and increased route options for travels and emergency responders. Many residential developments constructed during the 1980's and 1990's used a pattern of long, winding streets with very few intersections. In addition, the use of cul-de-sacs was very popular during this time because less through traffic can help create a feeling of community and provide a sense of security. Well-connected residential streets can also have these attributes if they are designed properly. A sense of community and security can be achieved through the provision of short block widths, "T"

intersections, narrow roadway widths and other traffic calming features which serve to control vehicle speeds and volumes.

Participants in the stakeholder meetings recognized the need for connectivity between communities. They felt that connectivity was essential to the movement of goods and people in the county.

### ***Trip Reduction***

Transportation Demand Management (TDM) is the general term used to describe any action that reduces single occupant vehicle trips on the roadway network during peak travel demand periods. The fundamental nature of TDM is that by transporting more people in fewer vehicles we can effectively reduce the demands on the transportation system and thereby make more efficient use of the system.

Decreasing the overall demand and stretching out the phasing of trips so that fewer trips are made during the morning and evening “rush-hour” peaks result in reduced traffic congestion. These efforts can also delay or eliminate the need for road widening or new construction. The term TDM includes alternatives to driving alone and the measures and techniques that promote the utilization of these alternate modes. The TDM programs are designed to:

- reduce the number of automobile trips;
- shorten trip lengths;
- switch the times of trips to less congested periods of the day; and
- encourage transit, carpooling, bicycling, and walking as alternatives to driving.

Transportation Demand Management programs make the transportation system more efficient and reduce pollution without adding major infrastructure. The most important TDM strategy is good land use planning that promotes compact, mixed-use, people-oriented development to supports walking, bicycling, and public transit. Future land-use planning decisions must continue to encourage non-auto travel and take greater steps to support alternate travel modes.

Commute trip reduction programs consist of employer-initiated actions that encourage employees to reduce the number and length of their drive-alone commute trips. Actions aimed at reducing commuting trips include incentives that encourage carpooling by providing reserved parking spaces for carpools and vanpools. Other incentives include subsidizing transit fares and providing secured bicycle storage and/or personal hygiene facilities for bicyclists. Employers may also allow employees to work a compressed work week schedule or telecommute, which shift trip times or reduce trip demand on the roadways.

### ***Telecommuting***

Telecommuters spend their workday at home using computers and other telecommunications equipment to perform their work-related duties. By performing their job responsibilities at home, telecommuters reduce traffic pressure on the roadways since they are not required to travel.

## Highway Transportation – Strategies and Actions

- Coordinate with DVRPC for capital highway improvements.
- Promote the completion of the I95-Pennsylvania Turnpike connection by working with PaDOT and the Turnpike Commission.
- Promote and support the redesign and ramp reconfiguration for U.S. Route 1 to enhance roadway safety and capacity.
- Examine and support roadway improvements within the context of the entire corridor and in keeping with the character of the functionality of each segment of the corridor.
- Support and promote the continuation of long term improvements for Pa Route 13, 313, County Line Road, Bristol Road, Oxford Valley Road and Pa Route 309.
- Support and promote improvements which enhance vehicular traffic flow and carrying capacity such as signal coordination and intersection improvements on corridors identified as Primary Arterial Corridors which include Pa Routes 1, 13, 113, 132, 213, 202, 232, 263, 309, 313/663, 332, 413, 513, 532, 563, and 611.
- Prepare a Critical Corridor Management Program.
- Support and Promote increased funding for maintenance, rehabilitation and reconstruction of infrastructure that provides access to port, freight rail and intermodal facilities.
- Give priority to maintaining and enhancing existing infrastructure and rehabilitation and reconstruction of bridges.
- Support the design of historic bridges undergoing rehabilitation or reconstruction with the understanding that the traffic and safety needs of the public should be balanced with historic preservation issues.
- Actively support PaDOT projects that are important to Bucks County by working with funding and approval agencies and advocating for our priorities.
- Review all proposals for new development patterns by examining the traffic and transportation impacts.
- Guide development into areas where existing roadway systems have capacity for future growth.
- Encourage the use of traffic calming techniques in residential developments to discourage speeding and high cut-through traffic volumes on neighborhood streets.
- Actively support access management planning efforts by municipalities.
- Promote well connected roadway networks to strengthen land use accessibility.
- Use management of traffic demands (Transportation Demand Management) strategies to ensure that new traffic demands can be met with existing or available resources.

## Public Transportation

Public transit plays an essential role in the county's transportation system. The Southeastern Pennsylvania Transportation Authority (SEPTA) and Transportation Management Association of Bucks County (TMA Bucks) provide fixed route bus service in the county. Carl R. Bieber Tourways, Trans-Bridge Lines, Susquehanna Trailways and Greyhound Lines Bus Company all provide regional bus service to destinations located outside of the county.

SEPTA provides public transportation service linking Philadelphia and the surrounding counties with an integrated network of over 200 bus and rail transit routes. SEPTA's Regional Rail Division operates seven electrified commuter rail routes to 150 stations in Pennsylvania, New Jersey and Delaware. SEPTA operates an extensive network of buses, trolleys and rapid transit trains in Center City Philadelphia, in addition to Regional Rail links to downtown employment centers, the University City area of West Philadelphia, and the Philadelphia International Airport.

Bucks County is served by four SEPTA Regional Rail routes which provide service to 15 rail stations. The **Warminster Line** provides rail passenger service from Warminster Township in the area of Ivyland Borough to Jenkintown and central Philadelphia and serves one station in the county. Overall, the Warminster line carried 14,004 passengers per day in 2007, with 2,056 of these boarding or leaving at the Warminster Train Station. Warminster station is the largest parking lot owned by SEPTA serving regional rail passengers. The 800-space parking lot is generally filled to capacity on weekdays. The lack of available parking could be impacting ridership at the station.

The **West Trenton Line** provides rail service from central Philadelphia through the townships of Lower Southampton, Bensalem, Middletown and Lower Makefield. The line continues through the borough of Yardley and ends in Mercer County, New Jersey. Stations located in the county along this line include Yardley, Woodbourne, Langhorne, Neshaminy Falls and Trevoise. In 2007, over 22,000 riders per day utilized this line, with slightly over 4,000 riders per day using the stations found within Bucks County. The Neshaminy Falls station contains 187 parking spaces and is routinely filled to capacity. Woodbourne station is the largest parking lot located along this line in Bucks County with 558 spaces. It is typically filled at 90 percent capacity. The stations of Yardley, Langhorne and Trevoise contain 142, 362 and 219 spaces respectively. They are typically running at 85 percent capacity on an average weekday.

The **Lansdale/Doylestown Line** provides rail service from central Philadelphia, through Lansdale in Montgomery County before ending in Doylestown Borough. Stations located in the county along this line include Chalfont, New Britain, Delaware Valley College and Doylestown. This line is the northernmost rail line in the county. Nearly 40,000 passengers per day use this line, which includes service to Thorndale. In 2007, 1,261 passengers boarded or left at stations within the county. No SEPTA parking is available at the Delaware Valley station and minimal parking (39 spaces) is available at New Britain station. Chalfont station contains 101 spaces and is routinely filled to capacity. Doylestown station is the largest parking facility along the line in Bucks County at 169 spaces and is usually filled at 75 percent capacity.

The southernmost line to serve Bucks County is the **Trenton Line**. This line starts in central Philadelphia and traverses the townships of Bensalem, Bristol and Falls before ending in Trenton, New Jersey. Stations located in the county along this line include Cornwell Heights, Eddington, Croydon, Bristol and Levittown. This line utilizes Amtrak's Northeast Corridor tracks. In 2007, 5,462 riders utilized SEPTA's Trenton Line via the stations found within the county, with 16,849 riders overall on the rail line including service to Chestnut Hill East.

The PaDOT-owned lot near the Cornwells Heights station is the largest park and ride lot in the county with 1,600 spaces. On a typical day, it is at 57 percent capacity, while the SEPTA owned lot near the station is at 74 percent capacity with 244 of the 329 spaces in use. The Levittown train station located in Tullytown Borough is the next largest parking facility in the county on this line with 382 available spaces. The station is running at near capacity, with 374 of the spaces in use on a typical day. The Bristol station parking lot is the most underused parking facility along the line in the county with only 144 of the available 294 spaces being used. The Croydon station has been improved and expanded to include 215 spaces, to accommodate parking demand at this location.

Intercity passenger rail services are provided to the county by Amtrak via the Cornwells Heights station in Bensalem Township. Amtrak provides commuter rail service along the Northeast Corridor. The Northeast Corridor is the busiest passenger rail line in the United States by ridership and service frequency. The route is fully electrified and serves a densely urbanized string of cities from Washington, D.C. to Boston, Massachusetts. It also has branches connecting Philadelphia with Harrisburg, Pennsylvania, and several other commuter destinations. The busiest passenger rail station in the United States is Pennsylvania Station in New York City, the central hub of the Northeast Corridor. Locally, the Cornwells Heights Station provided 5,860 boardings and alightings in 2009 for travelers using Amtrak service.

SEPTA also provides fixed route bus service to Bucks County through 14 bus routes located mainly in the lower portion of the county. Several routes serve the central portion of the county, but SEPTA's bus service is focused in the lower portion of the county due to the more concentrated populations that are required for efficient bus service. The northernmost bus route in the county serves Telford Borough. SEPTA utilizes Philadelphia Park, Neshaminy Mall and Oxford Valley Mall as transfer centers for their bus routes in the county. SEPTA works with the county and TMA Bucks to ensure that these bus routes are functioning efficiently. This continued coordination is necessary to the success of bus service in the county.

The Transportation Management Association (TMA) of Bucks County also provides fixed-route bus service to the county. The TMA's shuttle buses include the Bristol and Richboro-Warminster rushbus services. These shuttles provide transit services that offer a link between existing SEPTA services and suburban jobs. These services operate only during peak commuting hours as determined by the prevalent shift times at employment centers located along the bus route. The TMA continually assesses its bus routes to ensure that these buses run on the most efficient schedule.

The TMA routes are partially subsidized by the Job Access Reverse Commute Program (JARC) which is funded by the Federal Transit Administration. The purpose of the JARC program is to improve access to transportation services and to employment and employment-related activities for welfare recipients and eligible low-income individuals. The services transport residents in non-suburban areas to suburban employment opportunities.

Bucks County is also served by a variety of privately-owned transportation companies. These include taxi and bus lines. Private bus carriers operating in the county include Carl R. Bieber Tourways, Trans-Bridge Lines, Susquehanna Trailways and Greyhound Lines Bus Company. Bieber buses provide service from the Pennsylvania Turnpike park and ride lot in Milford Township to Reading, the Lehigh Valley and Philadelphia. Susquehanna Trailways buses provide service from the Lehigh Valley through Quakertown and Doylestown on its way to Philadelphia. Trans-Bridge Lines and Greyhound buses provide service from the Lehigh Valley through Quakertown, Doylestown and New Hope on their way to New York City.

Passenger safety, convenience and comfort are critical to the success of a well-functioning public transportation system. Providing a safe area for buses to pull over (i.e., bus turnouts) makes it possible for buses to have a safe haven from moving lanes of traffic while loading and unloading passengers. The provision of bus turnouts should be considered as new developments are constructed in areas of existing or future public transportation service. Bus shelters should also be constructed during the development process when deemed appropriate.

Most public transit services are concentrated in the lower portion of the county. The lower portion of the county is well-served by regional rail service, but the potential for increased ridership on rail lines is hampered by a lack of parking capacity at many of the existing train stations.

During the stakeholder meetings, participants stated that public transit needs to be improved and be more competitive with driving. Participants felt that people like the freedom of their personal vehicles but will be more likely to use public transportation if driving becomes cost prohibitive. Therefore, public transportation planning should continue to occur with the goal of making public transportation more appealing and competitive with driving. The county has supported SEPTA and the TMA and continues to work to modernize the operations and facilities.

### ***Quakertown Rail Restoration Project***

The Quakertown area of the county was previously served by the Bethlehem Rail Line which provided passenger rail service from the Lehigh Valley to the city of Philadelphia. The Bethlehem branch of the SEPTA Regional Rail service was discontinued in the early 1980's due to a variety of factors. The use of outdated rolling stock, poor rail bed conditions, and diesel locomotion which would be unable to utilize the center city commuter rail tunnel led to a steady decline in ridership. The commuter tunnel connected the once-separate Pennsylvania rail lines to the Reading rail lines, allowing commuter trains to travel through the city from one station to another. When this was completed, only electric trains could use the tunnel.

In 2000, the Bucks County Planning Commission completed a feasibility study of the potential reactivation of this rail line. The study concluded that reactivation of passenger service was feasible from a cost and ridership perspective. Based upon these results, the TMA began taking the steps necessary for reactivation. Their first step was to complete a business plan. This plan was completed in early 2006. This plan led to the production of an Alternative Analysis per the New Starts requirements of the Federal Transit Administration (FTA).

The Alternatives Analysis for the restoration of rail service in the Quakertown corridor was prepared for Bucks County, in cooperation with Montgomery County, the TMA, SEPTA, the Regional Improvement Consortium, and the Delaware Valley Regional Planning Commission (DVRPC).

The purpose of the Alternatives Analysis was to identify cost-effective and affordable means to strengthen mobility connections between upper Bucks and Montgomery Counties and key regional activity centers. These mobility improvements are necessary to support existing travel demand and to support the population, employment and commercial growth occurring in the upper Bucks County area. The Alternatives Analysis was completed in 2007 and is being revised to address SEPTA's comments and recent FTA rule changes.

### ***Newtown Branch***

Another unused rail line in the county is SEPTA's Newtown Branch. The Newtown Branch of the SEPTA right-of-way extends from the Fox Chase Station in the City of Philadelphia through Montgomery County to Newtown Borough. Service on this branch was discontinued in 1983. One of the primary reasons this line was deactivated was that this line relied on diesel locomotion which is unable to utilize the center city commuter rail.

In 2007, Bucks County commissioned a study of the corridor to determine if the use of Bus Rapid Transit would be appropriate for this corridor. Bus Rapid Transit (BRT) is a flexible, rubber-tired rapid-transit mode that combines stations, vehicles, and regular service schedules and that has operating flexibility and lower capital and operating costs than rail transit. Phase I of the study included an assessment of the existing conditions of the rail corridor; a determination of prospective study corridor conditions; a determination of appropriate BRT limits; a determination of the potential location of stations and park and ride locations; and the development of ridership demand forecasts for BRT service.

The Phase I results were not encouraging, and the potential for bus rapid transit service to the Newtown corridor did not appear to be feasible. Several reasons lead to this determination. As part of the study, the technical advisory committee, along with the consultant walked most of the line from Fox Chase to Newtown Township. The biggest obstacle to using the entire line is the West Trenton Regional Rail line. When service to Newtown was running, this crossing was "at-grade". However, this at-grade crossing has been removed and restoring this crossing will be extremely expensive. Any potential overpass in this area is also unlikely due to environmental constraints on both sides of the West Trenton Rail line. In addition, the projected ridership did not justify the costs associated with constructing the BRT system at this time.

Even though the results of the BRT study were not encouraging, Bucks County continues to support preserving this corridor as a future public transportation facility that is cost effective and provides benefits to the county and region.

### ***Transit Revitalization Investment District Act***

The Transit Revitalization Investment District (TRID) Act (Pennsylvania Act 238 of 2004) empowers municipalities, counties, and public transportation agencies to work cooperatively to establish TRIDs. TRIDs promote community revitalization by establishing districts that provide incentives for transit-oriented development and establishing mechanisms to capture the value added by development around transit stops. They also promote the creation of private–public partnerships to encourage redevelopment in and around the public transportation facilities.

TRIDs serve as the basis for requiring planning studies, comprehensive plan and zoning amendments that enable the establishment of transit-oriented development (TOD), a residential and commercial area designed to maximize access to public transportation, and often incorporates features to encourage transit ridership. A TOD should consist of moderate to high density housing along with complimentary public uses. These uses should include jobs, retail, services and professional office space, all concentrated in a mixed use development located along the regional rail system.

A typical transit-oriented development has the transit facility at its central core with accompanying residential, commercial, and employment uses within walking distance, which is typically within 2,000 feet. TODs emphasize a self-sustaining community and pedestrian oriented environment and reinforces the use of public transportation.

### ***Croydon Station Area***

The Croydon Station area in Bristol Township has the potential to be a prime example of a transit-oriented development. The right land uses exist, but pedestrian access is difficult. The retail and apartments are built conveniently along U.S. Route 13 directly across from the train station. Behind these buildings are neighborhoods with significant population density and an intact pedestrian environment.

Realizing Croydon’s potential as a transit center, Bristol Township completed the Croydon Transit Reinvestment District Study in 2009. This TRID study addressed the needs expressed by Bristol Township, key stakeholders, residents and businesses. A phased approach to the development of the TRID is proposed by the plan. This approach is supported by a market analysis and value capture evaluation of existing and envisioned redevelopment of the Croydon area.

Other areas in the county which could be redeveloped through transit oriented development include the Langhorne Station area in Middletown Township, Langhorne Manor Borough and Penndel Borough, Warminster Station in Warminster Township and Bristol Station in Bristol Borough.

### ***Transit and Rideshare Improvements***

There are many ways to improve public transit and rideshare services: providing additional routes, increased service, high occupancy vehicle priority, rider comfort improvements, lower and more convenient fares, improved user information, marketing programs, transit oriented development, improved security, and special services such as commuter express buses and special event shuttles.

Typically, five to ten percent of urban automobile trips will shift to high quality transit, and quality transit can promote additional travel reductions by stimulating more compact development. People who live in transit-oriented communities tend to drive 10-30 percent less than residents of automobile-oriented areas.

### **Public Transportation – Strategies and Actions**

- Coordinate with SEPTA in the planning and development of new and modernized transit service.
- Pursue funding for the Quakertown Rail Restoration Project.
- Preserve rail corridors to serve current and planned freight and passenger service.
- Promote the use of public transportation.
- Support and promote the concept of Transit Oriented Development for Croydon, Bristol, Langhorne and Warminster, and any other stations deemed appropriate.
- Promote the inclusion of public transit facilities (e.g., bus turnouts, shelters) within new developments, where appropriate.
- Continue to support the preservation of the Newtown Branch for public transportation, when deemed cost effective.

### **Pedestrians and Bicycling**

According to the 2001 National Household Travel Survey performed by the Federal Highway Administration, roughly 40 percent of all trips taken by car are less than 2 miles in length. By making some of these short trips on foot or by bicycle, rather than in a car, citizens can have a substantial impact on local traffic and congestion, as well as their physical health. Bicycle and pedestrian facilities are important but often overlooked transportation modes in Bucks County.

There are two main types of bike/pedestrian routes within Bucks County. These include sidewalks and facilities located along highway shoulders, and dedicated “off-road” bicycle/pedestrian trails. These trails can be located along roads or through parks and open space areas.

Significant systems of bike/hike paths have been established in parts of Bucks County, including Lower Makefield, Doylestown, and the Perkasio/Rockhill area. With PaDOT’s stronger emphasis on bicycling and pedestrian improvements as part of proposed highway projects, these facilities can be expanded and will make it easier for bicyclists and pedestrians to use roadways for transportation.

Improved facilities, such as sidewalks, crosswalks, paths and bicycle parking, as well as traffic calming, and streetscaping, will promote walking and biking. Promoting mixed land uses will provide more activities within walking distance.

### ***Pedestrians***

Mobility and access should be the focus of a well-defined pedestrian system. Being able to get from one place to another safely and conveniently as a pedestrian will often determine if someone decides to walk, bicycle, take transit, drive or undertake a trip at all. Incomplete links within the pedestrian system, lack of maintenance and poor upkeep, or dangerous conditions will discourage people from walking. People should be able to walk safely in Bucks County.

Providing a “walkable” environment is essential to an efficient ground transportation system. Every trip begins and ends with walking. Walking remains the most inexpensive form of transportation for all people. A walkable community provides the most affordable transportation system a community can plan, design, construct and maintain.

Several elements must be present in order to make walking can be on the level as the multimodal transportation system. First, the physical infrastructure for walking must be in place. When sidewalks are missing or obstructed or street crossings are difficult, these deficiencies can become an impediment to walking. Second, the pedestrian system must be interconnected. There must also be destinations within walking distance and an attractive and comfortable pedestrian environment that encourages people to walk.

Walking needs to be promoted as the mode of choice for short trips. Priority should be given to the completion of the pedestrian network that serves neighborhood shopping, schools, and parks. Emphasis should also be placed on completing the pedestrian network that serves transit centers, stations, and stops. Adequate crossing opportunities at transit stops should be provided.

Pedestrian safety and convenience can be increased by identifying and analyzing high pedestrian accident locations. From this identification process, physical improvements in areas of high pedestrian usage should be determined. These improvements may include traffic calming, signal improvements, and crossing improvements.

Through the provisions of their subdivision and land development ordinance, municipalities should ensure that new developments, both residential and nonresidential, are provided with sidewalks. Sidewalks provide alternative methods to make certain needed trips, in addition to their use for exercise and recreation.

It is important that sidewalks be provided in the higher density residential zoning districts, in the more rural areas where pedestrian use is anticipated, and in nonresidential areas where walking should be encouraged as an alternative to the use of the automobile. Sidewalks should be provided on both sides of existing and proposed streets.

Walkable communities put urban environments back on a scale for sustainability of resources (both natural and economic) and lead to more social interaction, physical fitness and diminished crime problems. Walkable communities are typically more liveable communities because of the options afforded to all ages and abilities to share in the community.

### ***Bicycling***

In addition to those who bicycle by choice, there are residents, including children and some workers, who must rely on bikes as a transportation necessity. When people choose to leave their cars at home and make their trips on bicycles, they reduce their use of gasoline, which reduces the volume of pollutants in the air. Other positive environmental impacts can be a reduction in neighborhood noise levels and improvements in local water quality, as fewer automobile-related discharges end up in the local rivers, streams, and lakes.

In order to give bicycle planning the attention it deserves, the Bucks County Commissioners created the Bucks County Bicycle Task Force. The task force, which was created in 2008, has been given the task of creating a bicycle plan for the county. Production of the Bicycle Plan was underway with the assistance of a private consultant during the development of this comprehensive plan.

The bicycle plan will identify and inventory existing bike conditions and define a circulation system that identifies both on- and off-road bicycle routes and improvements that will enhance bicycle activity within and between Bucks County and its neighboring counties. The plan provides recommendations to enhance education and bicycle safety outreach programs.

### ***Off Road Trails***

In many instances, trails will be used by both bicyclists and pedestrians. “Off-road” trails should be designed appropriately in accordance with tested standards. According to American Association of State Highway and Transportation Officials (AASHTO) standards, trails should be at least 10 feet wide (12 feet is preferable) and have 2 feet of clear space on either side of the trail. AASHTO also provides detailed information on horizontal alignment, curve radii, grade, structures, and other design elements affecting trail alignment which should be followed.

Trails immediately adjacent to roadways are generally discouraged. However, their safety can be improved if they are separated from the roadway by at least five feet or a 42 inch high solid barrier. Again, AASHTO provides excellent guidance on when and where this type of facility is appropriate. More information of off-road trail development can be found in the Parks, Recreation, and Open Space section of Part IV of this plan, as well as the *Bucks County Open Space and Greenways Plan (2011)*, which identifies an interconnected network of 27 greenways that provide open space and recreational opportunities, including off road trails. The plan identifies five different types of greenways corridors, many of which could host off-road trails for public recreation, wildlife viewing, lessons in history, and alternative transportation.

### ***Americans with Disabilities Act***

No matter where a pedestrian/bicycle facility is developed, they must meet the requirements of the Americans with Disabilities Act. Signed into law in 1990, the ADA requires that all new construction be accessible and usable to persons with disabilities. Alterations to existing facilities, within the limits of the project, must provide usability to the maximum extent feasible. These requirements will apply to all pedestrian and bicycling facilities.

Bucks County contains over 2,100 miles of bike trails, horse trails, hiking trails and sidewalks, with another 300 miles of trails are in various stages of development. These include smaller scale projects at the municipal level, as well as regional trails such as the East Coast Greenway.

### ***East Coast Greenway***

The East Coast Greenway is a trail system that spans nearly 3,000 miles as it winds its way between Canada and Key West, Florida. The goal of the project is to link all the major cities of the eastern seaboard in a continuous off-road trail system. In Pennsylvania, the East Coast Greenway enters Bucks County in Morrisville Borough from Trenton, New Jersey over the Calhoun Street Bridge. Currently, the trail uses existing roads in Morrisville Borough, Falls Township, Bristol Township and Bensalem Township as it passes through lower Bucks County. The trail continues into Philadelphia and Delaware County, and then crosses into the State of Delaware near Marcus Hook.

A nine-mile section of the East Coast Greenway in Falls and Bristol Townships is paved and ready to be used. However, two major obstructions and a few minor ones severely restrict its use. The Conrail railroad track embankment completely blocks the connection of two pieces of this 9-mile section in Falls Township. A second major obstruction exists where the East Coast Greenway crosses U.S. Route 13 in Tullytown Borough.

U.S. Route 13 is a limited access freeway that bisects the trail along the Delaware Canal. Trail users have been known to attempt to jump the guide rails and cross four lanes of traffic to continue on the path, creating unsafe conditions for both the trail user and motorists. To overcome this safety issue, the Pennsylvania Department of Conservation and Natural Resources (DCNR) has proposed two precast reinforced concrete box culverts to provide safe bike/pedestrian access beneath U.S. Route 13. Bucks County supports the efforts of the DCNR to alleviate these unsafe conditions for trail users.

### **Pedestrians and Bicycling – Strategies and Actions**

- Promote a balanced transportation system that includes safe facilities for bicycles and pedestrians to serve employees and people without cars, encouraging a greater role for them.
- Support the recommendations of the *Bucks County Bicycle Plan*.
- Support the development of the East Coast Greenway through lower Bucks County.
- Promote the idea that all roads, except expressways, should be safe for walkers and bicyclists.
- Promote “Smart Growth,” compact development, and mixed use development which are walkable and will reduce the demands on the transportation system.

- Assist municipalities in updating and applying their land use ordinances to require sidewalks, walking paths, and bicycle facilities as part of the development process.
- Work with the Bucks County Parks Department to connect and coordinate community paths and trails with trails within the county park system.
- Implement recommendations of the *Bucks County Open Space and Greenways Plan*.

### **Air Transport**

Air transportation performs a valuable function in Bucks County's economy by providing essential transportation services to individuals, organizations, businesses, and corporations. The airports in Bucks County are used for personal and recreational uses, corporate business travelers, and emergency medical transportation services.

According to public records, there are 25 private airports, 4 public airports, 19 private heliports and 1 public heliport in Bucks County. Multiple airports located in close proximity to the county accommodate travel for commercial, business, and general purposes.

Airport policies, regulations, and laws are provided by the Delaware Valley Regional Planning Commission (DVRPC), the Federal Aviation Administration (FAA), and the Pennsylvania Department of Transportation, Bureau of Aviation. DVRPC performs airport regional systems planning in the Philadelphia area and has contractual obligations with the FAA to do so. The Pennsylvania Department of Transportation, Bureau of Aviation, promotes, preserves, and develops airports in Pennsylvania by administering laws, regulations, and guidelines aimed at attaining those goals. The FAA is a federal agency responsible for regulating civilian aviation, promoting the development of aviation technology, and establishing programs to mitigate the environmental effects of aircraft and airports.

Similar to county governments, municipal governments do not have the authority to control operations at airports. However, municipalities do have the authority to control land uses and height of obstructions around airports through zoning ordinance regulations. Municipalities affected by airport hazard areas should pass zoning ordinances that control land uses and heights of obstructions around existing or planned airports. Municipalities can also establish policy regarding land uses around airports through land use plans and comprehensive plans.

The Bucks County Airport Authority was formed in 1961 by the county under the provisions of the Pennsylvania Municipal Authorities Act of 1945. The Authority was chartered for the purpose of acquiring, holding, constructing, improving, maintaining, and operating airports and all facilities necessary to maintain aviation services. The Authority provides these services for the airports of Doylestown, Quakertown and Van Sant.

**Doylestown Airport** is a general aviation public airport located in Buckingham Township. The airport has one paved 3,004 foot runway, full and connecting taxiways, hangars and tie-downs, maintenance hangar, and an administration building. Airplanes wishing to use the runway at Doylestown are limited

to a gross registered weight of less than 12,500 pounds. Maintenance and repair service, fuel, charter service, flight school, and aircraft rentals are available.

**Quakertown Airport** is a general aviation public airport located in Milford Township approximately 1 mile west of Quakertown along Route 663. The airport has one paved 3,200 foot runway with a full taxiway, hangars and tie-downs, air services facility, and a terminal building. Airplanes that use the runway at Quakertown are limited to a gross registered weight of less than 12,500 pounds. Maintenance and repair service, fuel, avionics, charter services, and flight instruction are also available.

**Van Sant Airport** is a county-owned grass runway airport located on Headquarters Road in Tincum Township. The airport is one of only two gliding airports in eastern Pennsylvania and is considered one of the top grass runway airports in the United States. Because Van Sant is a turf runway, there is no limitation on which planes may use the airport. The pilot in command must determine that the ground condition and runway length are suitable for the planned operation. Most aircraft that use this facility are under 3,500 pounds maximum take-off weight.

**Pennridge Airport** is a public general aviation airport located along Ridge Road in East Rockhill Township and Perkasio Borough. The airport is privately owned by Pennridge Development Enterprises, Inc. The paved runway extends 4,215 feet. Airplanes that use the runway at Pennridge are limited to a gross registered weight of less than 50,000 pounds. Although the daily operations are under 100 takeoffs/landings, it is the largest privately-owned airport between Philadelphia and Allentown.

**Philadelphia International Airport** is a commercial airport in Philadelphia, and is the largest airport in the Delaware Valley region. As of 2008, it was the 10<sup>th</sup> busiest airport in the world in terms of aircraft activity. Access to the airport from the county is provided via Interstate 95 or through SEPTA's Warminster Regional Rail line.

**Lehigh Valley International Airport** is a public airport in Lehigh County, Pennsylvania, located approximately 18 miles north of Quakertown. It is owned and operated by the Lehigh-Northampton Airport Authority. The airport is served primarily by regional airlines who feed passengers into a larger network of air traffic connecting points such as Philadelphia and Atlanta. The airfield supports over 100 based aircraft and provides over 140,000 flights annually.

**Trenton-Mercer Airport** is located in Mercer County, New Jersey, across the Delaware River from Bucks County. As one of only three commercial airports in New Jersey, Trenton-Mercer Airport averages approximately 100,000 take-offs and landings each year. Access to the airport from the county is provided via Interstate 95 or through SEPTA's West Trenton Regional Rail line. No commercial air carriers serve the airport.

Bucks County is fairly well-served by general aviation airports, but airport service has slowly been phased out at several former airports including Buehl Field Airport in Middletown Township and Warrington Airport in Warrington Township. Buehl Field Airport was a privately owned, single runway airport that was closed in 1998 and the land was developed into a senior housing development.

Warrington Airport contained one paved and one turf runway and was closed in 1991. A large housing development now occupies the lands of the former airport.

### ***Heliports***

Suburban heliports provide regional helicopter capacity and services. Helicopter operations can ferry corporate personnel and clients between business destinations and to other airports for commercial flight connections. Short access time to ground destination and avoiding the processing and ground access time from more distant commercial airports makes helicopter service attractive, efficient and economically feasible to a small segment of the aviation market. Helicopters can generate intense noise which must be managed effectively to avoid neighbor opposition.

Total RF Heliport is located in Bensalem Township. Highway access to the heliport is provided by U.S. Route 1, Interstate 276, and Route 132. Total RF Heliport is classified as a general service heliport by the Pennsylvania Bureau of Aviation. Two helicopters are based at the heliport.

### ***Economic Benefits of Airports***

Aviation represents only a minor portion of the transportation network in the county, but the portion it represents has considerable economic benefits. Airports can provide a positive economic impact to the community by providing the jobs and airport-generated dollars being spent in the community, which, in turn, enhances economic activity away from the airport itself.

Expenditures made by transient passengers who use the airport but are also a positive economic benefit. Location decisions by businesses can be positively affected by the presence of an airport. Protecting and preserving these assets is important to the success of the overall transportation network, the local economy, and the provision of emergency services.

### ***Air District Regulations***

Since certain types of development can reduce the size of the area available for landing, takeoff, and maneuvering of aircraft, it is important that appropriate safeguards be in effect to protect the utility of airports. It is also necessary to ensure the safety of the public from the hazards associated with airports. Providing these safeguards can be accomplished through suitable zoning techniques.

To assist municipalities in implementing proper zoning techniques in airport areas, PaDOT has developed the *Airport District Overlay Ordinance*. This ordinance protects surrounding area near the airport through the establishment of an Airport District Overlay. The purpose of this district is to establish specific “Airport Zones” around the airport site. Within these zones, the ordinance sets up building height limitations and permitted use restrictions. Providing these types of regulations through zoning allows the municipalities to maintain their existing zoning regulations with the additional protection afforded by the overlay district.

## Air Transportation – Strategies and Actions

- Assist the county’s municipalities in developing land use policies related to air transportation facilities. Make sure that all airports have the proper required airport hazard zoning in place.
- Support operations of airports through the promotion of compatible land uses to protect their function as a vital component of the region’s transportation system.
- Support the improvement of multi-modal access to the county’s airports.

## Goods Movement

Bucks County is an important regional hub for multiple modes of transportation, particularly for highway and rail goods movement and distribution. Sufficiently maintaining and augmenting the county’s existing transportation infrastructure is important to allow the county to play an important role in the region’s goods movement network.

The movement and distribution of goods can generate the negative effects of increased traffic congestion, increased wear and tear on the county’s infrastructure, and increased noise levels.

Freight generators and distributors (e.g., warehouses, ports, quarries, landfills and industrial parks) are located throughout Bucks County. A large majority of these facilities are located in the southeastern end of the county. The most notable example of a freight distributor in the county is the Keystone Industrial Port Complex located in Falls Township. Its sheer size and water, highway and rail connections make Bucks County one of the region’s most prominent industrial centers.

Measured by value or by tonnage, more freight moves over the highways than by any other mode. The county’s extensive transportation system is well suited for handling freight shipments. Three interstate highways traverse the county and offer local access through ten interchanges. Several rail freight lines are located in the county, including the CSX Trenton and Norfolk Southern Morrisville lines, and 5 local short lines. Freight service is also offered on three of SEPTA’s rail lines. Three port facilities located along the Delaware River are active in the county. Kinder-Morgan and GROWS are located in Falls Township and Riverside is located in Bristol Township. These port facilities specialize in bulk and break-bulk commodities such as metals, salt and project cargo.

Bucks County’s well-developed freight network provides tangible economic benefits to the county and the region. This network includes warehousing, water, roadways, rails and courier. During 2008, the total sales attributable to freight accounted for nearly \$800 million worth of goods in the county. This included \$8 million in water-related freight, \$15 million in rail-related freight, \$175 million courier freight, \$192 million in warehousing and \$408 million in roadway-related freight.

Freight is a planning consideration required by federal transportation legislation (SAFETEA-LU). The Delaware Valley Regional Planning Commission (DVRPC) has been conducting freight planning on a continuing, comprehensive, and coordinated basis since 1992. DVRPC’s Freight Planning Program is designed to assure the full incorporation of freight into the transportation planning process. This is

achieved through technical endeavors, committee work, and the treatment of freight in the DVRPC Long Range Plan and the DVRPC Transportation Improvement Program.

Bucks County's collective freight network establishes a genuine asset that produces well-paying jobs for county residents, critical tax ratables for municipalities and a critical anchor for current and future land development. This freight network must be protected and enhanced when feasible. Some specific improvements have been proposed that would enhance goods movement in Bucks County.

Participants in the comprehensive plan stakeholder meetings agreed that economic development success for the county is contingent upon the efficiency of the transportation system. The movement of goods is especially dependent upon the efficiency of the transportation system and must be considered as improvements to the system are contemplated.

### **Goods Movement – Strategies and Actions**

- Provide assistance to the county's municipalities in the development of sound economic development strategies compatible with efficient movement of goods.
- Encourage the location of new truck-generating or freight-generating facilities in proximity to highway interchanges and port facilities.
- Locate and buffer freight loading areas in a manner that minimizes impacts on adjacent uses and streets.
- Promote the inclusion of truck circulation plans as part of subdivision and land development plans.
- Provide efficient, cost-effective and safe movement of freight in and through the county.
- Maintain and enhance the county's competitive advantage in freight distribution through the efficient use of a flexible, continuous, multi-modal transportation network that offers competitive choices for freight movement.
- Protect and enhance public and private investments in the freight network.
- Work with PaDOT and DVRPC to fund capital improvements to freight movement facilities including:
  - Provide siding improvements to the Norfolk Southern Morrisville Line.
  - Provide additional trackage to the CSX Trenton Line.
  - Provide double stack clearance to the CSX Trenton Line.
  - Construct rail improvements to the Keystone Industrial Port Complex.
  - Construction of a third berth at Kinder Morgan Port Facility.
  - Widen Pennsylvania Turnpike from Mid-County interchange to Quakertown interchange.
  - Construction of Interstate 95/Pennsylvania Turnpike Interchange.
  - Reconstruction/widening of Scudders Falls Bridge (Interstate 95).

## Principle 8:

### **Promote Economic Opportunity, Housing Diversity, and Efficient Use of Land**

Efficient land use is essential to Bucks County's ability to continue to thrive in the future. It creates livable communities by sparing resources and providing a mix of land uses, a range of transportation options, a pedestrian-friendly environment, and a distinct sense of place, all of which cater to the population's social, economic, and physical basic needs. It is supported by a varied and affordable housing stock and sustainable, job-creating economic growth. Opportunities are given to living and working arrangements that meet the needs of older residents and attract a younger, educated workforce.

Bucks County has many valuable assets, including its quality of life, natural and historic resources, and a superior location. However, because of the county's rich amenities and high standard of living, its population continues to increase. Recent and past land development, unfortunately, has resulted in a pattern characterized by large-lot land consumption, urban infrastructure disinvestment, an overly uniform housing stock, and neighborhood disconnection. In addition, Bucks County's approach to economic development has been fragmented and has often failed to convey a single message.

In order to respond better to the county's future development, land use planning should be conducted in a regional context, examining infrastructure limitations, prioritizing the protection of natural resources, and adopting strategies which promote fair, livable, and connected communities. Economic development efforts reflect on community characteristics such as the natural and historic resources of the county, the location and capacity of infrastructure, and the availability and training of the workforce. In order to increase the variety of housing, create more jobs, and enhance business and income growth, partnerships are necessary between local governments to encourage area-wide economic development planning efforts.

Economic development is the process of improving a community's well-being through job creation, business growth, and income growth, as well as through improvements to the community that enhance quality of life and strengthen the economy.

Bucks County's position, near the center of the large metropolitan area of the northeastern United States, makes it well suited for business activities. Major highways, such as I-95, the Pennsylvania Turnpike, the northeast extension of the Pennsylvania Turnpike (I-476), and the Route 202 Parkway, to be completed in 2012, provide important access to and across Bucks County.

The county's diversity is evident in many ways: geography, development patterns, history and economy vary across the 60+ mile long county.

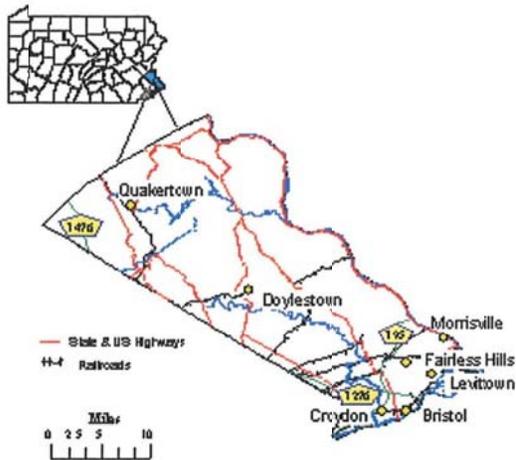
The Delaware River has played a big role in the history and development of Bucks County, beginning as the gateway to Pennsylvania during the 17<sup>th</sup> and much of the 18<sup>th</sup> centuries. The later development of the county has been affected by the river and by the natural growth of towns and ultimately suburbs. The Delaware River was the "highway" that served and connected industries during the post-industrial period. The county was transformed in the 1950s when U.S. Steel developed the Fairless Works on 2,000 acres of riverfront land in Falls Township. The Levittown and Fairless Hills developments in lower Bucks County provided homes for about 20,000 families, attracted to the area by the jobs at Fairless and in the shopping centers and other businesses that grew up around the steel mill. During this decade of the 1950s, the population of the county doubled, from 150,000 to 300,000 people.

The river communities above Yardley have not grown rapidly and retain the scenic and rural character that has attracted tourists and visitors for decades. The reputation of the county as a center of art, history, and culture is based on the quaint small towns and scenic geography of the riverfront communities, which retain this character. Washington Crossing, where General George Washington crossed the Delaware on Christmas night, 1776, is memorialized as a turning point in American history at Washington Crossing State Park.

Bucks County has attracted writers, actors, and artists for decades, providing a home or summer home for James Michener, Oscar Hammerstein, Margaret Mead, Moss Hart, S.J. Perelman, Pearl S. Buck, and many others who helped define Bucks County as a center for arts and culture. The cultural institutions continue to attract tourists and businesses.

Bucks County is defined more by its economic past than its present. The rise and fall of US Steel and the manufacturing establishments along the Delaware River and in lower Bucks County transformed and defined the county during the past 60 years. Services (office-type activities) have increased while manufacturing and farming have decreased. Today's economic picture is less uniform and less clear, characterized by smaller businesses throughout the county.

**Figure 22**  
**Bucks County Profile, September 2011**



Overview	
Land Area in Square Miles <sup>1</sup>	607.4
Persons per Square Mile <sup>2</sup>	1,030.6
Percent Urban <sup>1</sup>	90.1%
Percent Rural <sup>1</sup>	9.9%
<sup>1</sup> U.S. Bureau of the Census - 2000	
<sup>2</sup> U.S. Bureau of the Census - 2009 Estimate	



Center for Workforce Information & Analysis  
651 Boas Street  
Room 220  
Harrisburg, PA 17121-0001  
  
877-4WF-DATA  
[www.paworkstats.state.pa.us](http://www.paworkstats.state.pa.us)

Labor Force <sup>1</sup>	County	Pennsylvania
Civilian Labor Force	336,900	6,308,000
Employed	310,900	5,792,000
Unemployed	26,000	516,000
Unemployment Rate	7.7%	8.2%

<sup>1</sup> Preliminary August 2011 - Seasonally Adjusted

Major Employers <sup>1</sup>	Industry Sector
CENTRAL BUCKS SCHOOL DISTRICT	Educational Services
BUCKS COUNTY	Health Care and Social Assistance
ST MARY MEDICAL CENTER	Health Care and Social Assistance
HEALTHCARE SERVICES	Admin/Support, Waste Mgmt/Remediation Svcs
NORTHTEC LLC	Manufacturing
DOYLESTOWN HOSPITAL	Health Care and Social Assistance
GIANT FOOD STORES LLC	Retail Trade
WOODS SERVICES	Health Care and Social Assistance
WAL-MART ASSOCIATES INC	Retail Trade
GRAND VIEW HOSPITAL	Health Care and Social Assistance

<sup>1</sup> 3rd Quarter 2010 - Final

Employment and Wages by Industry Sector <sup>1</sup>					
	NAICS Industry Sector	Employer Units	Employment	County Wage	PA Wage
	Total , All Industries <sup>2</sup>	19,362	248,619	\$45,088	\$45,732
11	Agriculture, Forestry, Fishing and Hunting	72	399	\$28,312	\$28,341
21	Mining	16	199	\$51,326	\$68,328
22	Utilities	13	431	\$161,472	\$94,454
23	Construction	2,214	13,453	\$58,659	\$53,076
31-33	Manufacturing	1,123	26,822	\$57,788	\$53,662
42	Wholesale Trade	1,518	13,820	\$65,227	\$65,535
44-45	Retail Trade	2,309	36,240	\$28,235	\$24,972
48-49	Transportation and Warehousing	458	5,299	\$43,048	\$38,857
51	Information	252	5,409	\$64,445	\$63,553
52	Finance and Insurance	1,131	8,266	\$64,476	\$72,020
53	Real Estate and Rental and Leasing	567	2,975	\$46,952	\$46,494
54	Professional and Technical Services	2,371	14,179	\$71,277	\$77,575
55	Management of Companies and Enterprises	134	3,648	\$78,539	\$101,140
56	Admin/Support, Waste Mgmt/Remediation Svcs	1,224	15,517	\$34,727	\$31,113
61	Educational Services	241	4,266	\$39,285	\$48,404
62	Health Care and Social Assistance	2,198	39,097	\$41,771	\$42,516
71	Arts, Entertainment, and Recreation	260	5,160	\$19,283	\$28,034
72	Accommodation and Food Services	1,302	19,362	\$16,033	\$15,156
81	Other Services, except Public Administration	1,586	9,026	\$28,437	\$27,564
	Federal Government	71	1,328	\$56,719	\$64,532
	State Government	31	1,057	\$46,539	\$51,723
	Local Government	271	22,668	\$51,952	\$43,747

<sup>1</sup> 2010 Annual Average  
<sup>2</sup> County total includes Private, Federal, State and Local Government

Average Annual Wages by Major Occupational Group <sup>1</sup>			
SOC Code	Major Occupational Group	County Wage	PA Wage
00-0000	Total, All Occupations	\$43,810	\$42,040
11-0000	Management Occupations	\$109,720	\$99,810
13-0000	Business and Financial Operations Occupations	\$69,580	\$64,780
15-0000	Computer and Mathematical Occupations	\$76,220	\$73,090
17-0000	Architecture and Engineering Occupations	\$69,970	\$68,300
19-0000	Life, Physical, and Social Science Occupations	\$70,990	\$65,880
21-0000	Community and Social Services Occupations	\$38,750	\$38,780
23-0000	Legal Occupations	\$97,290	\$97,780
25-0000	Education, Training, and Library Occupations	\$47,670	\$52,000
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$47,780	\$45,470
29-0000	Healthcare Practitioners and Technical Occupations	\$70,960	\$65,120
31-0000	Healthcare Support Occupations	\$29,640	\$26,440
33-0000	Protective Service Occupations	\$50,170	\$41,480
35-0000	Food Preparation and Serving Related Occupations	\$22,540	\$21,160
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$28,370	\$25,690
39-0000	Personal Care and Service Occupations	\$24,560	\$23,810
41-0000	Sales and Related Occupations	\$41,870	\$36,210
43-0000	Office and Administrative Support Occupations	\$34,190	\$32,560
45-0000	Farming, Fishing, and Forestry Occupations	\$31,550	\$28,360
47-0000	Construction and Extraction Occupations	\$50,140	\$44,360
49-0000	Installation Maintenance, and Repair Occupations	\$43,990	\$41,170
51-0000	Production Occupations	\$38,090	\$34,380
53-0000	Transportation and Material Moving Occupations	\$32,830	\$31,940
55-0000	Military Specific Occupations	N/A	N/A

<sup>1</sup> May 2009 Occupational Employment Survey

Source: Center for Workforce Information and Analysis unless otherwise noted.

Bucks County has many advantages, including its quality of life, a valuable asset, and its location. Bucks County’s approach to economic development must be up to the challenge of competing and succeeding in a world economy.

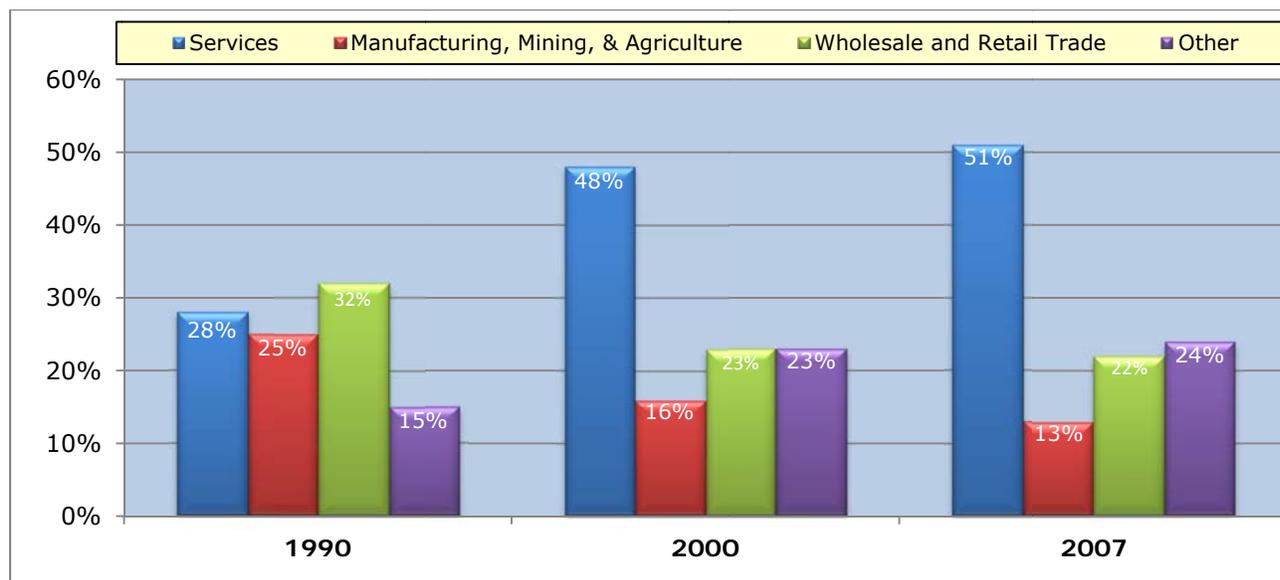
Economic development efforts need to reflect other community characteristics, such as protecting the rich natural and historic character of the county, the location and capacity of infrastructure, and the availability and training of the workforce.

**Economic Shifts**

The existing land use chapter indicates an increase in nonresidential usage (commercial, industrial, office), but the nature of those land uses has changed. The chart which follows shows the composition of economic activities in Bucks County from 1990 to 2007 and shows the number of business establishments in several categories. Services (office-type activities) have increased while manufacturing and farming have decreased. This pattern is repeated across the U.S. as economic shifts away from manufacturing have changed the profile of the business community. Between 2001 and 2007, Bucks County lost about 7,400 manufacturing jobs, or a decline of 19.1 percent. This was slightly better than Pennsylvania as a whole, which lost 20.1 percent of its manufacturing jobs during this same period. Perhaps due to the diverse economy, Bucks fared better than several neighboring counties where manufacturing losses exceeded 25 percent.

The manufacturing sector of the U.S. economy was at its peak in 1979 and has declined so that the number of jobs in manufacturing is at its lowest point since 1950. The failure of demand for manufactured goods to keep pace with productivity, along with competition from other countries where businesses face lower pay scales, contribute to a long-term decline in manufacturing jobs in the U.S. Bucks County is in a position of competing for a shrinking pool of manufacturing jobs.

**Figure 23  
Economic Shift, 1990, 2000, and 2007**



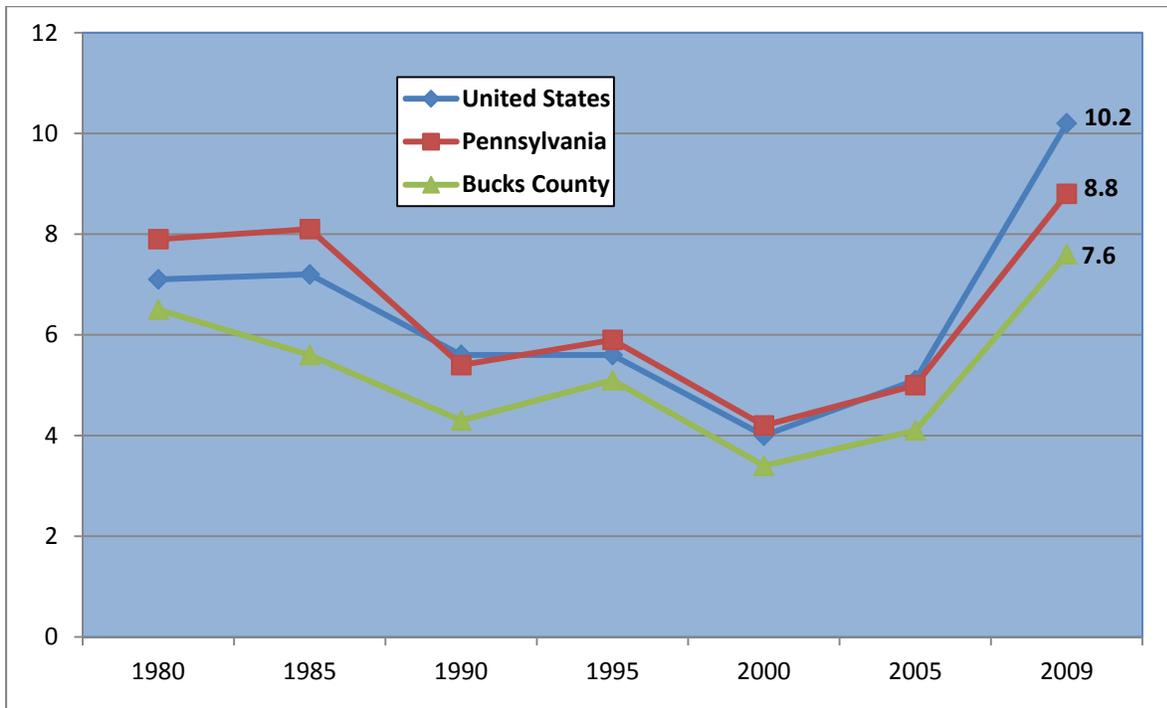
Bucks County gained employment in the economic sector called “health care and social assistance.” This category is the largest employment sector in Pennsylvania as well as in Bucks County. A gain of 6,500 jobs between 2001 and 2007 in Bucks made the county one of the leaders in the state. With a 21.7 percent jump in health care jobs, we outpaced neighboring counties by a significant amount. The publication, “Pennsylvania: Road to Growth, 2001-07 and Beyond,” published in February, 2009, by Penn State University, contains detailed information on the top ten industries in the Commonwealth and job gain or loss by county during this period.

Agriculture continues to play an important role in the Bucks County economy. Bucks County ranks seventh in the Commonwealth in total value of agricultural products sold and continues to lead most other counties in the production of nursery, greenhouse, sod, and horticultural products.

### Unemployment

Unemployment rates are tracked monthly in the Commonwealth of Pennsylvania. Figure 24 shows Bucks County’s unemployment rate along with the rates of the Commonwealth and the United States. Bucks County’s rate, while generally following the same trend as the rate in the state and the country, is consistently lower. Our diversified economy as well as our trained workforce may explain why we have fared better, even in difficult economic times, than most of the other counties in Pennsylvania.

**Figure 24**  
**Unemployment Rate, 1980–2009**



Source: PA Department of Labor & Industry Center for Workforce Information & Analysis

## **Structure of Economic Development Agencies in Bucks County**

A large number of economic development organizations – some government funded or sponsored, others privately funded, some narrowly focused, and other broad-based business organizations – play a role in the economic development of the county.

Bucks County economic development groups are engaged in a variety of activities and strategies, including:

1. Direct Business Strategies:
  - Land or building purchase and assembly
  - Creation of a business incubator
2. Direct Business Programs and Policies:
  - Financial incentives: grants, loans, revolving loan fund
  - Small business assistance: information, workshop
3. Indirect Business Development Strategies:
  - Infrastructure improvement – transportation, water, wastewater
  - Other public services, activities to improve quality of life
  - Planning and redevelopment studies
4. Indirect Business Programs and Policies:
  - Regulatory relief
  - Education and workforce development
  - Business recruitment and marketing
  - Regional cooperation

The largest economic development efforts in the County are operated by the Bucks County Economic Development Corporation, the Bucks County Redevelopment Authority, and the Bucks County Department of Community and Business Development.

### ***Bucks County Economic Development Corporation***

The Economic Development Corporation (EDC), was formed in 1958 by the Bucks County Commissioners as a private non-profit organization. The EDC provides financial assistance through low-interest loans for land, buildings, and equipment. The loan programs include several administered by the EDC as well as other loans available through state or federal programs which the EDC helps to bring to Bucks County businesses. The EDC is involved in several tax abatement programs through the state's Keystone Opportunity Zone program. Staff for the EDC operates the Industrial Development Authority (IDA), which provides tax-free financing for businesses. The IDA was created in 1968.

### ***Bucks County Redevelopment Authority***

The Redevelopment Authority (RDA), was formed in 1962 and oversees the Bucks County Enterprise Zone, brownfields redevelopment, provides loans to businesses through a revolving loan fund, and assists homeowners with financing for rehabilitation.

The Enterprise Zone of Bucks County encompasses portions of six municipalities in Bucks County: Bensalem Township, Bristol Township, Bristol Borough, Falls Township, Morrisville Borough, and Tullytown Borough. The Enterprise Zone’s five objectives are:

1. Provide technical and financial resources for small businesses and start-up businesses
2. Implement a Brownfields Revitalization program to reclaim or turn back to active use vacant or abandoned industrial property
3. Design and implement a marketing plan
4. Provide assistance to export businesses and support the long-term development of a deep water port at USX Fairless site
5. Create and maintain a comprehensive master plan for the Enterprise Zone area which takes into consideration quality of life, education and job training, infrastructure and transportation needs, zoning, natural resources and community development.

The Enterprise Zone Program places a priority on assistance to businesses involved in industrial, manufacturing, and export services.

### ***Bucks County Community and Business Development Department***

This is a department of the County of Bucks, supported by HUD funds, that deals primarily with the administration of the Community Development Block Grant Program. The Department provides no direct assistance to businesses, but it works with other groups on HUD loans for job creation, CDBG funding designed to spark economic development, and workshops and information referral for business owners. The department runs training programs and workshops to assist people with starting a business or expanding business opportunities. HUD revolving loan funds come through this department and are passed through to the RDA and the EDC for lending to various enterprises.

### ***Other Economic Development Organizations in Bucks County***

Many other groups and organizations in Bucks County operate to attract and support businesses, including: Chambers of Commerce; local economic development corporations and committees; community and business organizations; employment training organizations, such as CareerLink, the Bucks County Community College, and the Workforce Investment Board; TMA Bucks (the County Transportation Management Association); the Bucks County International Trade Council; and other non-profit organizations.

### **Regional Efforts to Promote the Philadelphia Regional Economy**

Bucks County is part of the larger regional economy, and the county cooperates with other regional groups. The Economy League of Greater Philadelphia seized the opportunity of the 2008 financial crisis to find out how the region can achieve “world class” status, by measuring how regions succeed and what makes them successful. The Philadelphia region has the 9<sup>th</sup> largest economy in the world – an impact greater than that of many nations - and is the 5<sup>th</sup> largest metropolitan area in the U.S.

The economy league identified factors that contribute to the strength of regional and local economies:

- Human Capital – Educational attainment, school quality, population
- Economy – Housing, income, innovation capital, labor demand, labor supply, and non-labor business costs
- Infrastructure – Health care, air and rail connections to other regions, and intra-regional transportation (public transportation, commute times, congestion)
- Governance – Fiscal, land use/zoning, and permits/regulations
- Quality of Life – Environmental quality, community engagement, crime rates, internet access, parks and recreation, and sustainability (open space preserved, liveability, walkability)

Select Greater Philadelphia is an economic development marketing organization dedicated to attracting companies to the Greater Philadelphia Region. The region consists of eleven counties in three states and is defined as “the heart of America’s East Coast business market.” The Greater Philadelphia region is becoming one of the nation’s top Life Science clusters and is the capital of the pharmaceutical industry. The region’s highly educated labor force (32 percent of persons 25+ years of age with a minimum Bachelor’s degree), strong life science enterprises, world-class universities, and affordable communities are emphasized in marketing efforts.

Bucks County’s assets mirror those of the region, with high marks for quality of life factors. Both the Economy League and Select Greater Philadelphia have identified characteristics necessary for a strong economy that are present in Bucks County. New enterprises that have come to Bucks County in recent years have selected the county based on workforce, lifestyle, and location.

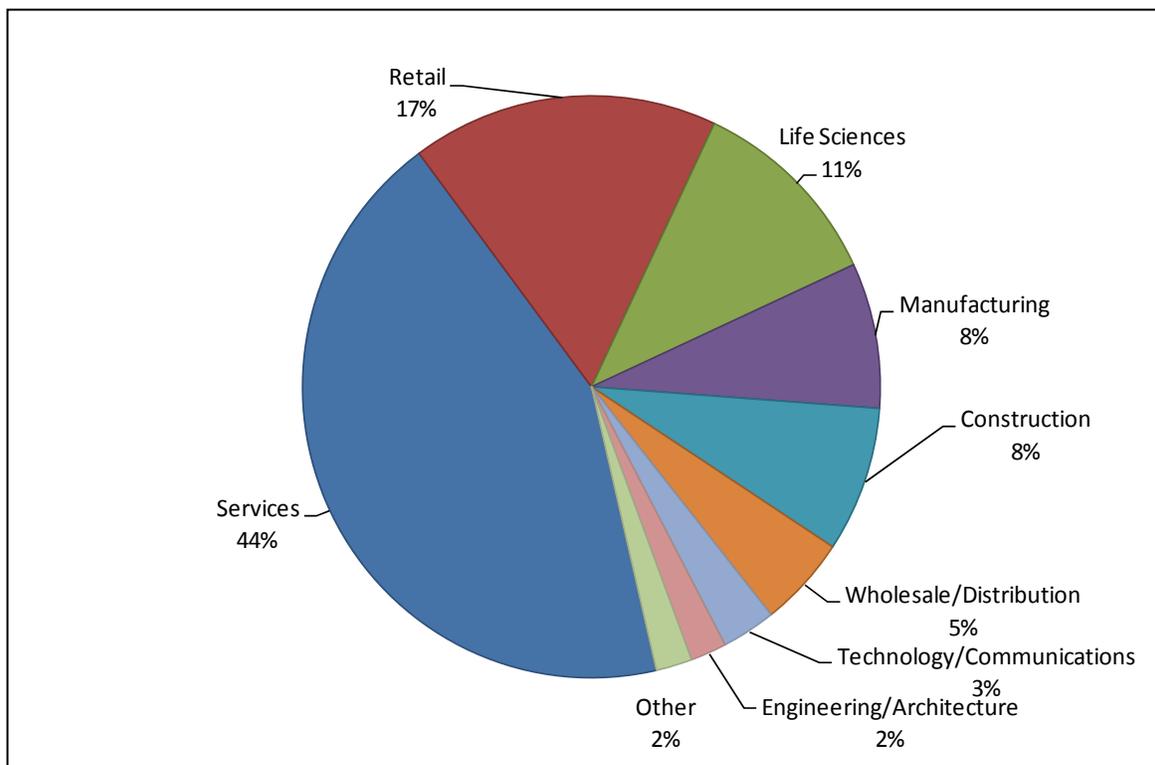
### **Bucks County Business Survey**

A survey of 28,000 Bucks County businesses was conducted in 2009. The detailed results of this survey can be found in the report of the Bucks County Economic Development Advisory Board, *Action Plan for Progress (December, 2009)*. The major findings can be summarized:

- Businesses from all parts of the county replied, with concentrations in lower Bucks (Bensalem, Middletown, Lower Makefield, and Falls); areas in Doylestown, Warminster, and Quakertown-Richland.
- More than half the businesses responding had been operating in their present location for more than 11 years, with nearly a third more than 21 years.
- Most businesses are small, with fewer than 50 employees. Less than 4 percent of businesses responding had more than 50 employees.
- Most businesses have not expanded their number of employees in the past three years and most do not expect to hire new employees in the near future.
- Bucks businesses chose their location in Bucks because of:
  - Location of Bucks County in the region

- Proximity to markets, suppliers, and complementary businesses
- Quality of life/community appeal for employees
- The business needs identified were:
  - Office or warehouse space
  - Parking
  - Modernization
- Very few businesses used any of the economic development organizations in existence to provide help to businesses.
- The top three changes that would assist businesses are:
  - Low-interest loans
  - Tax reform
  - Health care reform
- Comments included requests for one-stop shopping for business assistance, streamlined approval processes, workforce development, property tax reform, infrastructure development, and better marketing for Bucks businesses.
- The types of businesses that responded are detailed in Figure 25 below.

**Figure 25**  
**Response to 2009 Business Survey by Business Type**



This breakdown by business type parallels the profile of Bucks County residents and the types of industries in which they work. According to the latest Census information, the largest share of residents are employed in services (45.2 percent of all working residents of Bucks County were employed in the finance, real estate, and insurance sector). The next largest groups were employed in manufacturing and retail trade. These three groups accounted for 70 percent of all Bucks County employed residents.

The survey confirmed the importance of the quality of life in Bucks County, the importance of local government and their role in land use controls, and the confusion surrounding the various economic development programs and agencies.

### **Vision for Economic Vitality**

The *Action Plan for Progress (2009)* identified six goals and a vision of what Bucks County could look like if progress were made toward achieving these goals.

- Maintain diversity in the economy
- Maintain our high quality of life
- Create a good business climate
- Build and retain a skilled workforce
- Revitalize downtowns and main streets
- Reuse vacant and underutilized industrial and commercial sites

The Action Plan translated these goals into a vision which is specific to the future economic development of the county.

### **Vision 2030**

- Bucks County will be a center for innovation in key commerce sectors, maintaining our national reputation for balancing quality of life, preservation of the best of the past, and a focus on a future of economic prosperity through full, sustainable employment.
- Bucks County areas that have vacant or abandoned industrial sites will be repopulated with new businesses.
- Lower Bucks County will be the center for “green jobs” and green industries, as former industrial sites continue to attract new businesses.
- Low-intensity campus-type office and business park development will be established along key corridors: Route 13 in Lower Bucks and Route 663 in Upper Bucks.
- Boroughs have thriving downtown business districts that include a mix of retail, entertainment, service, and residential uses.
- Our biotechnology industry will be expanded in Doylestown area in connection with the Pennsylvania Biotechnology Center and Delaware Valley College.
- Bucks County provides an incubator for entrepreneurs who start small businesses here and are able to expand into stable businesses.

- More manufacturing and support businesses will be located at key interchanges in Bristol and Milford.
- Businesses will provide family-sustaining jobs and opportunities for employment at all income levels.
- Bucks County will not seek to become another King of Prussia, nor will we seek to encourage strip commercial development that would contribute to congestion or diminish the appeal of downtowns and Main Streets.
- Bucks County will have ended the “brain drain” and retained much of its younger educated workforce.

## **Strategies and Actions**

### **Coordinate Economic Development Functions and Agencies**

- Coordinate access to funding and financial support: investigate all available resources to provide economic incentives.
- Develop a unified message about Bucks County through consistent marketing, communications, and branding.
- Harness the strengths of existing agencies, enterprises and resources; present a consistent and compelling plan of action that all groups support.
- Create a mechanism to bring together the individuals, interests, and groups, including:
  - Businesses
  - Municipal governments
  - Marketing/communication
  - Finance
  - Education/workforce
  - Organizations providing direct services – EDC, RDA, County agencies, Chambers, etc.

### **Adopt and Institutionalize Guiding Principles for Economic Development**

- Target areas for development and areas for preservation: Guide development toward older suburbs, town centers, areas with existing buildings, brownfield sites, areas with existing infrastructure, transportation, and housing, and the Delaware riverfront.
- Identify the industry clusters that we want to nurture and attract. Knowledge-based businesses, green jobs, and biotechnology are key industries where Bucks has a foothold and where we can grow. Use existing industries as magnets for others. Anticipate the need for ancillary services to support industries.
- Continue all programs that enhance quality of life in Bucks County, including open space and environmental protection, fostering arts and culture, as well as institutions that promote the arts, and protecting quaint small towns.

**Use Existing Resources: non-profits, chambers, educational institutions, governments, planning commission**

- Engage all groups through better coordination and communication.
- Communicate guiding principles and message so there is a defined direction and better synergism and support.

**Help existing businesses by focusing on their needs and making information and assistance available. It is more effective and easier to retain and grow businesses than to attract new ones.**

- Focus on our existing business community.
- Continue outreach started with the business survey to find out what their needs are.
- Ensure that financial incentives and assistance are made available to businesses that want to stay and grow here.
- Explore the use of Local Economic Revitalization Tax Assistance Act (LERTA), tax-increment financing (TIF), transportation reinvestment district funding, and other programs that might benefit County businesses.

**Engage Municipal Partners in the Economic Development Mission**

All locations are not suitable or desirable for economic development. Desirable locations will depend on a number of factors. Determine which approaches are most suitable for different types of municipalities, considering:

- Character of the community
- Municipal goals – Need to balance competing interests of preserving natural heritage and encourage business enterprises; bedroom community or business center.
- Environmental issues
- Transportation availability
- Availability of vacant or underutilized parcels or buildings
- Water and wastewater infrastructure availability
- Recognize and work with municipalities, who have control over land use decisions and are the ultimate decision makers in zoning for different types of businesses and in exercising approvals of projects. Connect economic development goals with these processes:
  - Zoning and changes of zoning
  - Preservation programs
  - Infrastructure improvements
  - How they process applications for types of uses: conditional use, change of use, land development approval.
- Involve municipal officials in economic development goals by reaching out to them.
- Continue practice of having the Bucks County Planning Commission offer planning and zoning services to municipalities.

- Make information available on costs and benefits of different development patterns.
- Provide case studies on how other municipalities have handled development issues.
- Provide information on tax incentive programs – tax abatement requires local approval.

### **Workforce Development**

- Workforce needs must be coordinated with our economic development mission and advanced in concert with the activities of other groups. Planning to meet future job needs should be consistent with the industry clusters targeted by the County.



Housing is a basic human need; and where housing is built, how much of it, and what type, contributes greatly to the shape of a growing community. The physical condition of housing affects the quality of neighborhood life and public perception of local conditions. Cost of housing influences the social fabric of communities, and may completely shut some out of the private housing market. Abandoned housing reduces the tax base, cutting into the funding available to provide public services and facilities. Adequate housing is a prerequisite for the development and retention of an adequate labor force, which is essential for the expansion and attraction of business.

While much of the housing market (both supply and cost) is driven by private forces well beyond the control of the county, government policies and programs at all levels can have an impact, especially on housing needs not easily met by the marketplace. Federal policy allowing an income tax deduction for mortgage interest, for example, has historically aided homeownership. Funding programs and tax credits help support efforts by nonprofit and private developers to build or rehabilitate housing affordable to low- and moderate-income households, and those with special needs, or to shore up older neighborhoods. Timely planning can assess changes in the housing market and new housing arrangements created by demographic shifts. Land use regulation, as a result of this planning, and carried out by municipalities, can influence the location, type and cost of housing, particularly in growth communities.

### **Demographic and Socioeconomic Trends Affecting Housing**

Past trends in both housing and population growth provide clues to how these factors affect housing demand. Existing and future demands from population growth and household formation will influence continued housing growth in Bucks County through the year 2030.

Bucks County's location within the Philadelphia metropolitan area and the Northeast Corridor region extending from Boston, Massachusetts, to Washington, D.C., found it well poised to participate in the wave of suburbanization that took place in the United States after World War II. As shown in Table 37, the county housing stock and population registered their greatest percentage gains—88 and 113 percent respectively—from 1950 to 1960.

Much of this new development took place in lower Bucks County, including the construction of Levittown, at its completion in 1958, the largest planned community in the United States built by a single developer. Located near U.S. Steel's Fairless Works plant and other big industrial employers, it covered 5,500 acres, much of which had been farmland, and encompassed 17,311 single-family homes in four municipalities, plus schools, parks, shopping, and houses of worship.

**Table 37**  
**Change in Housing Units and Population, 1940–2010**

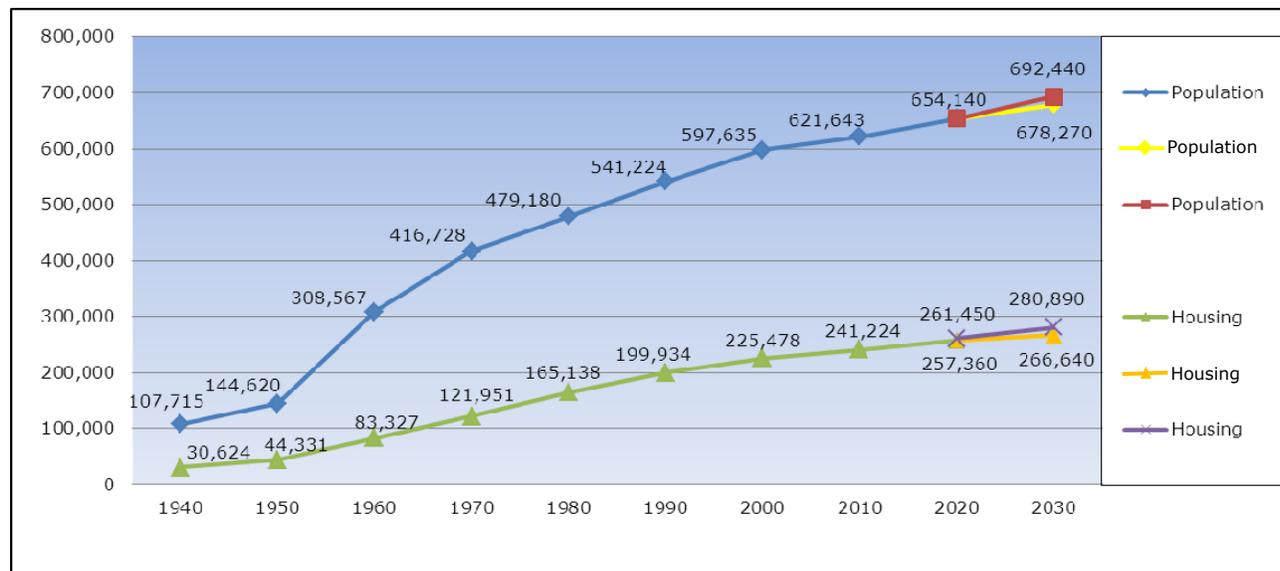
Year	Housing			Population		
	Total Units	Amount Change	Percent Change	Total Population	Amount Change	Percent Change
1940	30,624			107,715		
1950	44,331	13,707	44.8%	144,620	36,905	34.3%
1960	83,327	38,996	88.0%	308,567	163,947	113.4%
1970	121,951	38,624	46.4%	416,728	108,161	35.1%
1980	165,138	43,187	35.4%	479,180	62,452	15.0%
1990	199,959	34,821	21.1%	541,224	62,044	12.9%
2000	225,498	25,539	12.8%	597,635	56,411	10.4%
2010	241,991	16,493	7.3%	625,249	27,614	4.6%

Source: U.S. Census Bureau

While the percentage increase in housing began to taper after 1960, the number of new housing units built peaked at 43,187 units in 1980. Since then, with the consumption of tracts of land capable of accommodating large-scale residential development and several recessions, the overall pace of housing construction has slowed considerably from the peak years.

As Table 37 and Figure 26 demonstrate the rate of growth in the housing stock has far outpaced the rate of population gain, which is projected to continue for the next 20 years. Much of this disparity can be explained by certain demographic changes. The projections from 2010 to 2030 anticipate continuation of the prevailing trends, in either a slow-growth or high-growth scenario, depending on land use activity and socioeconomic factors, among others.

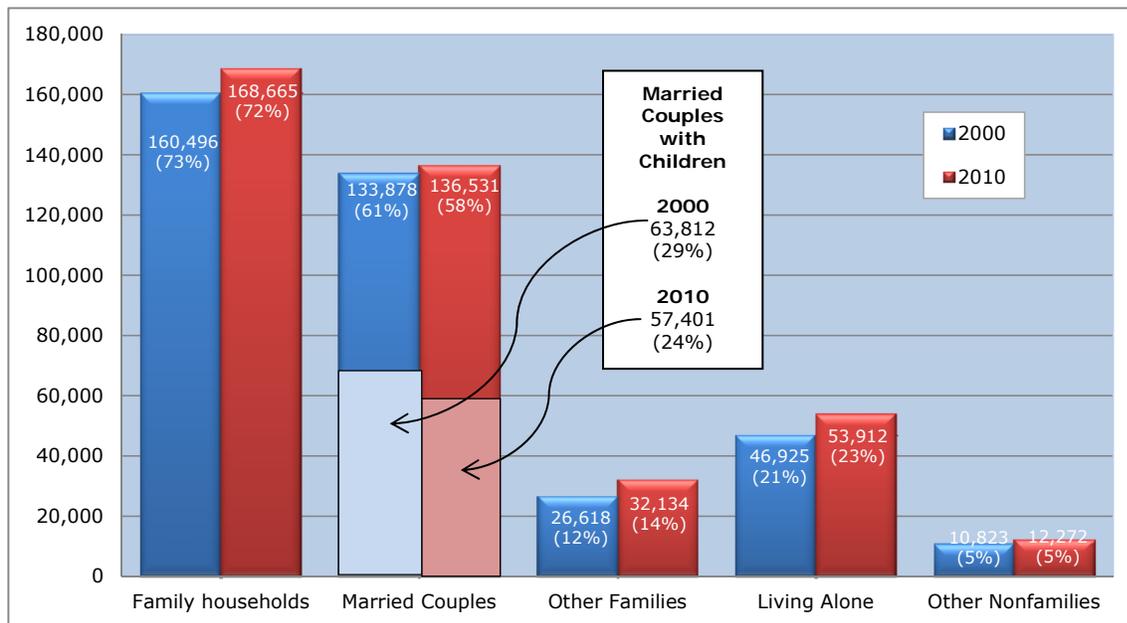
**Figure 26**  
**Population and Housing, 1940–2030**



Source: U.S. Census Bureau and Bucks County Planning Commission

The type, age and income of households influence housing choice, access and design. The bulk of households in the county, as illustrated in Figure 27, are families and couples, which suggests the county continues to retain and attract families with children. But from 2000 to 2010, the share of family households diminished, even as the share of families without children, singles and other less conventional household configurations increased. The loss (5 percent) was most evident for the traditional nuclear family form of married couples with children.

**Figure 27**  
**Household Types, 2000 and 2010**



Source: U.S. Census Bureau

While household size in the county has consistently been greater than that of the state and the nation, as detailed in Table 38, it has diminished overall. Social changes such as later marriage, lower birth rates, fewer couples deciding to have children, greater geographic mobility, higher divorce rates, rising consumer expectations, and longer life spans have resulted in smaller household sizes and more people living alone.

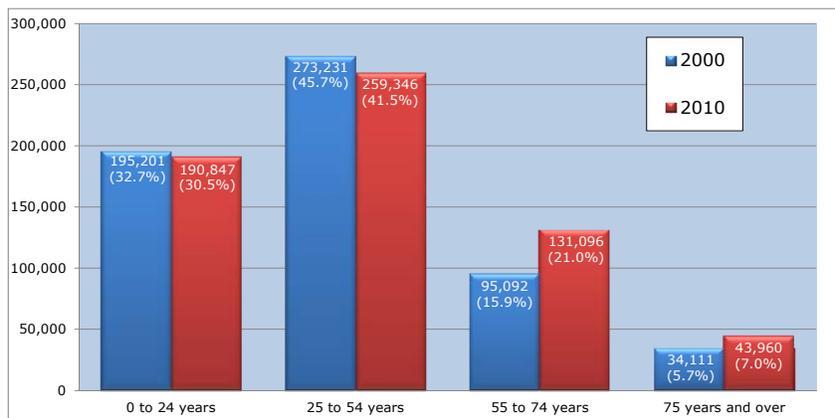
**Table 38**  
**County, State, and National Average Household Size, 1970–2010**

	1970	1980	1990	2000	2010
<b>Bucks County</b>	<b>3.50</b>	<b>3.00</b>	<b>2.80</b>	<b>2.69</b>	<b>2.63</b>
Pennsylvania	3.10	2.74	2.64	2.48	2.45
United States	3.14	2.76	2.63	2.59	2.43

Source: U.S. Census Bureau

Figure 28 illustrates the shifts in selected age cohorts from 2000 to 2010. The greatest drop in population occurred among adults in the prime homebuying and family-rearing years: 25 to 54. The greatest gains occurred among aging baby boomers and other “young elderly” in the 55 to 74 age group.

**Figure 28**  
**Age Distribution, 2000 and 2010**



Source: U.S. Census Bureau

The demographic shifts in age and household size broadly suggest growth in demand for smaller, affordable, physically accessible and easily maintained housing, a trend reinforced by economic issues and consumer taste, as noted later in this section. On the other hand, the county’s household size continues to skew larger than the national and state averages, a trend likely to support demand for conventional detached single-family housing.

Income levels in the suburban Philadelphia region are among the highest in the state. The median 2010 household income in Bucks County, at \$70,999, was somewhat less than two of its three suburban counterparts (Chester, Delaware and Montgomery counties), but far exceeded the Pennsylvania median of \$49,288.

The median income figure obscures some sharp variations in income level. Certain types of households, for example, singles, households composed of unrelated people and those headed by women, are far more likely to be have lower-than-median incomes.

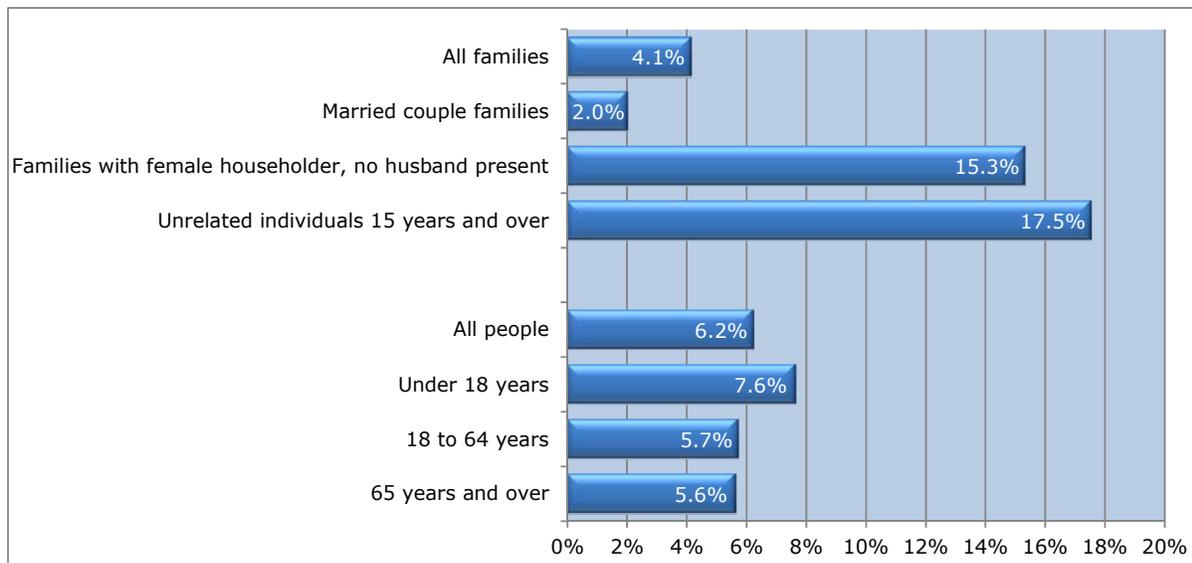
Families headed by women and people living alone are two of the groups that are disproportionately affected by housing costs. The number of female-householder and no-husband present families (single-

mother families) has grown dramatically, and so has the gap between their incomes and those of married-couple families.

The share of married-couple families raising their own children declined 10 percent between 2000 and 2010. Over the same time period, the number of single-parent families with their own children, the vast majority of them single mothers, increased by 11 percent. Typically, single-mother families have a significantly lower median family income than married-couple families.

Poverty rates by and age household type are shown in Figure 29. The overall poverty rate is low in Bucks County, 6.2 percent as of 2010. But the poverty rate climbed to more than 15 percent among households headed by women, and was higher non-family households composed of unrelated individuals. A far greater share of single-mother families lives in poverty, compared to married-couple or single-father families. Income well in excess of the poverty rate is required to adequately support housing and living costs for a family.

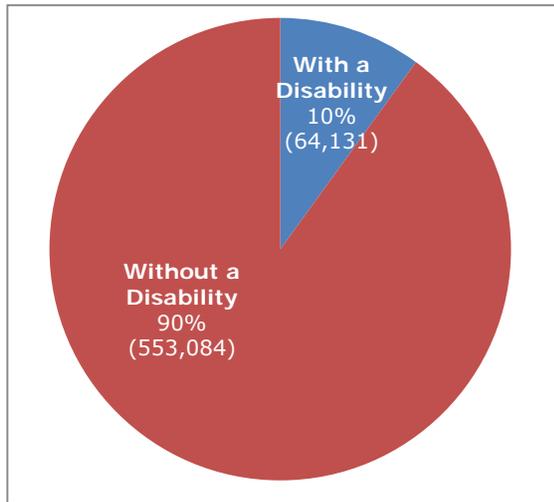
**Figure 29**  
**Poverty Rates, 2010**



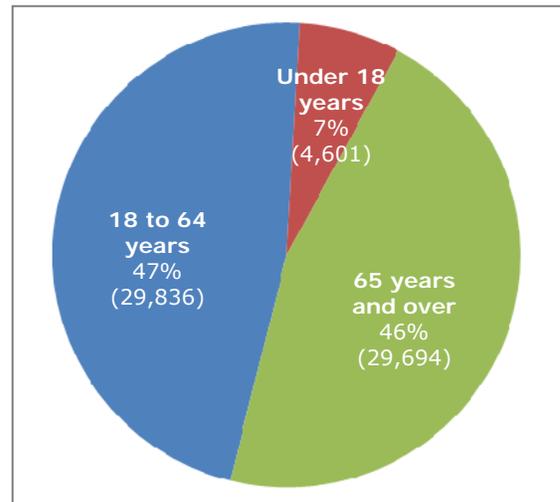
Source: American Community Survey, U.S. Census Bureau

Disability also can influence housing access, both in terms of cost and livability. Figures 30 and 31 illustrate the prevalence of disability in Bucks County. The share of the population with a disability was 10 percent in 2010. Of the disabled population, nearly half were adults between the ages of 18 to 64, another 46 percent were 65 and older, and the remaining 7 percent were children under age 18. The census data do not distinguish among disability types, which may include physical, cognitive and behavioral health.

**Figure 30**  
**Disability Status, 2009**



**Figure 31**  
**Disabled Persons by Age, 2009**



Source: American Community Survey, U.S. Census Bureau

Depending on the nature of disability, physical adaptation of housing or supportive services may be needed. The federal Fair Housing Act requires certain features of accessible design in new multifamily housing of four or more units. Pennsylvania court decisions have upheld consistency in zoning regulation between group homes for the disabled and other single-family housing.

Today’s demographic and socioeconomic conditions, along with consumer preference, are converging to create shifts in housing demand. Affordability, barrier-free access, and choice not only in residential design, location and size, but also in whether to buy or rent one’s home, will be key signs of a balanced housing market in the coming years.

**Housing Conditions**

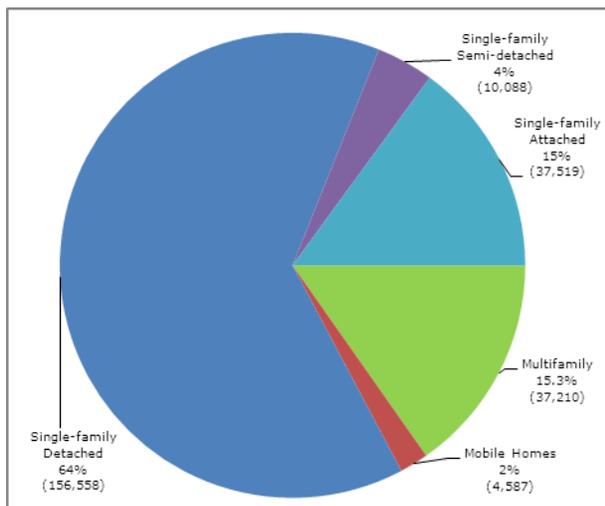
Factors such as type, age, location and condition of housing shape the dimensions of the housing stock. Detached single-family homes, townhouses or rowhouses, and apartments draw occupants of varying household sizes, incomes and life-cycle stage. Families often prefer housing that is located close to work and to friends and family, are in well-regarded public school districts, or near highways or mass transit that allow an easy commute. Age and physical condition of housing are key factors in determining the soundness and market desirability of neighborhoods.

**Housing Type**

Variety in housing types is necessary to house a population that is diverse in age and stage of life, household size, disability status and income. A balance of housing types close to employment centers, public transit and major roads promotes smart growth, a sound economy, and a sense of community. The Pennsylvania Municipalities Planning Code, Section 604(4), requires municipalities to zone for all housing types: single-family, two-family, multifamily in “various arrangements” and mobile homes.

The county’s overall housing stock is varied, although single-family housing predominates, accounting for nearly 64 percent of all units. The shares of single-family attached (townhouse-type) housing and multifamily housing (small and large apartment buildings) are about equal, at 15 percent or so. Figure 32 documents the distribution of housing types in Bucks County.

**Figure 32**  
**Housing Type, 2010**



Source: American Community Survey, U.S. Census Bureau

Most municipalities have a range of housing types, but there are often sharp differences between individual municipalities and regions of the county. The following tables list municipalities with the highest and lowest proportions and numbers of the three primary housing categories.

**Table 39**  
**Top 5 Municipalities by Total Number and Percentage of Single-family Detached Units, 2009**

NUMBER		
Municipality	Number	Percent
Bristol Township	16,207	74%
Middletown Township	11,791	67%
Northampton Township	11,060	78%
Bensalem Township	10,942	43%
Falls Township	8,827	65%

PERCENT		
Municipality	Percent	Number
Haycock Township	96%	722
Wrightstown Township	96%	979
Durham Township	94%	405
Springfield Township	92%	1,913
Nockamixon Township	91%	1,447

**Table 40**  
**Top 5 Municipalities by Total Number and Percentage of Single-family Attached Units, 2009**

NUMBER		
Municipality	Number	Percent
Bensalem Township	3,997	16%
Newtown Township	3,077	42%
Lower Makefield Township	2,189	19%
Northampton Township	2,084	15%
Bristol Borough	1,907	43%

PERCENT		
Municipality	Number	Percent
Bristol Borough	43%	1,907
Newtown Township	42%	3,077
Richlandtown Borough	41%	153
Quakertown Borough	34%	1,185
Sellersville Borough	31%	734

**Table 41**  
**Top 5 Municipalities by Total Number and Percentage**  
**of Multifamily (3+) Attached Units, 2009**

NUMBER			PERCENT		
Municipality	Number	Percent	Municipality	Number	Percent
Bensalem Township	7,420	29.0%	Dublin Borough	49%	346
Bristol Township	4,008	18.0%	Telford Borough	37%	303
Middletown Township	3,210	18.0%	Penndel Borough	36%	264
Warminster Township	3,206	24.0%	Doylestown Borough	36%	1,469
Falls Township	2,161	16.0%	Sellersville Borough	34%	827

Source: American Community Survey and U.S. Census Bureau (Tables 39 – 41)

In terms of absolute numbers, it is not surprising that the largest concentrations of various housing types, particularly single-family detached dwellings and apartments, which until relatively recently were the most typical housing forms, are found in the mature and populous municipalities of lower Bucks. At the same time, several of the county's smallest boroughs have high percentages, if not numbers, of apartment housing. This enhances housing choice.

Single-family attached housing may consist of rowhouses, which characterize older communities, or newer forms of townhouse and condominium-style housing. Townhouse-type attached housing is particularly prevalent in municipalities like Warwick, Lower Makefield and Newtown townships that have suburbanized rapidly since the 1960s. Small boroughs like Bristol and Quakertown contain high percentages of rowhouses.

Housing type diversity at the county level masks significant differences at the municipal level. Some municipalities, particularly in central Bucks or other areas of high housing costs, have few residential options that could be affordable to low-to-moderate income households, such as townhouses or apartments. This can be a drawback in terms of community socioeconomic, racial and ethnic diversity, access to good schools and a growing pool of suburban jobs.

### ***Tenure Type***

More than three-quarters of county residents are homeowners. Housing tenure types (ownership, rental) are shown in Table 42. The average renter household is smaller in size than the average homeowner household.

Census estimates for 2010 put the countywide percentage of owner-occupied housing at 77.1 percent. That compares to a national ownership rate of nearly two-thirds, and a statewide rate of 69.6 percent. Pennsylvania has one of the higher homeownership rates in the nation, and Bucks County has one of the highest homeownership rates in the state.

**Table 42**  
**Housing Tenure Type, 2010**

	Number	Percent
<b>Total occupied housing units</b>	234,849	
Owner-occupied	181,013	77.1%
Renter-occupied	53,836	22.9%
<b>Average size of homeowner household</b>	2.78	
<b>Average size of renter household</b>	2.11	

Source: U.S. Census Bureau

Homeownership is viewed as one sign of neighborhood stability and household affluence, and is more characteristic of suburban communities than cities. Homeownership is also characteristic of younger, larger families with children. There are suggestions, both nationally and locally, that homeownership as the “American Dream” may be undergoing some re-evaluation, but clearly it remains the tenure type of choice within the county, for reasons allied to historical, social and economic factors.

### **Physical Conditions**

Physical condition is an important benchmark for evaluating the health of the housing stock and the neighborhoods in which it is located. Characteristics like age, vacancy rates, and quality measures provide a snapshot of housing conditions, in place of or along with direct inspection.

Table 43 shows the distribution of housing age in Bucks County. Older housing typically demands greater investment in maintenance and rehabilitation to keep it livable.

**Table 43**  
**Housing Age, 2010**

Year Built	Number	Percent
2005 or later	8,546	3.5%
2000 to 2004	13,594	5.5%
1990 to 1999	32,897	13.4%
1980 to 1989	35,663	14.5%
1970 to 1979	48,357	19.7%
1960 to 1969	32,304	13.1%
1950 to 1959	43,110	17.5%
1940 to 1949	8,761	3.6%
1939 or earlier	22,730	9.2%
<b>Total</b>	<b>241,911</b>	<b>100%</b>

Source: American Community Survey, U.S. Census Bureau

Concentrations of older housing are often found in cities, boroughs, and mature “inner” or “first” suburbs. Such neighborhoods may be occupied by lower-income families who find maintenance costs a

hardship. On the other hand, as is true in many parts of Bucks County, older homes in historic neighborhoods may be among the most desirable and costly addresses.

Zoning and subdivision ordinances should provide adequately for infill construction and visually compatible restoration and replacement of structures in older, perhaps historic, neighborhoods that are experiencing disinvestment, vacancy, physical deterioration or other signs of decline. These are neighborhoods in which community development programs of housing rehabilitation and redevelopment, possibly pairing public-sector and private participation, may leverage reinvestment by residents and stem further deterioration. Older homes are often a good source of entry-level, relatively affordable housing.

In addition to physical repair and age, vacancy rates and quality measures are two supplementary ways of assessing the livability of housing. High vacancy rates may indicate abandonment and neighborhood blight. High levels of overcrowding or lack of bathroom plumbing, for example, also characterize substandard housing.

As Table 44 shows vacancy rates for both owner-occupied and rental housing as of 2010 were low; the vacancy rate of owner-occupied housing at 1 percent was extremely low. A vacancy rate of about 5 percent is considered normal to allow for market activity. The low vacancy rate in owned housing confirms that the local market is not experiencing widespread abandonment or disinvestment, as is true of locales hardest hit by contraction in the housing market. The higher rental vacancy rate may suggest rental rates beyond reach of a broad segment of potential renters.

**Table 44  
Housing Occupancy, 2010**

	Number	Percent
<b>Total housing units</b>	245,956	
Occupied	234,849	95.5%
Vacant	11,107	4.5%
<b>Homeowner vacancy rate</b>	1.1%	
<b>Rental vacancy rate</b>	7.4%	

*Source: U.S. Census Bureau*

Housing quality is measured by the lack of plumbing, kitchen facilities, or telephone service, plus occupancy per room (a common standard for housing overcrowding is occupancy by more than one person per room). The incidence of each of these livability markers in Bucks County housing was negligible, under 1 percent. Housing vacancy rates and basic livability markers indicate the countywide housing stock is largely in good shape.

## Housing Trends and Challenges

Multiple factors combine to influence housing market trends. Demographics, economics, land use regulation and consumer preferences are among the factors that influence the production and sale of housing. An aging population, a diminishing supply of easily developable land, changes in mortgage finance, economic recession, and consumer tastes of upcoming generations are combining to influence the local housing market in new ways.

### *Geographic Patterns of Housing Growth*

A recent trend apparent in residential development proposals reviewed by the county has been a decline in the number of residential units proposed, along with a continued drift toward multifamily or attached housing, often geared toward the aging. As Table 45 shows, the number of total residential units proposed decreased by nearly 64 percent in the second half of the last decade compared to the first half. The sharp downturn in the national economy in 2008 has had reverberating affects on the local housing market, causing housing starts to remain historically low.

Table 45 also shows that the combined number of proposed attached and multifamily dwelling between 2001 and 2005 was slightly more than the number of proposed single-family detached units. Between 2006 and 2010, the combine number of proposed attached and multifamily dwelling was more than double that of proposed single-family detached units. More than half of the attached and multifamily units proposed between 2001 and 2010 were associated with proposed age-restricted developments.

**Table 45**  
**Proposed Residential Development by Region, 2001–2010**

Region	Proposed Residential Development, 2001 To 2005					
	Single-Family Detached	Semi-Detached	Attached	Multi-Family	Mobile Homes	Total
Upper Bucks Region	4,272	51	1,314	1,220	0	6,857
Central Bucks Region	4,294	75	1,887	3,478	261	9,995
Lower Bucks Region	1,739	99	643	1,873	0	4,354
<b>Bucks County</b>	<b>10,305</b>	<b>225</b>	<b>3,844</b>	<b>6,571</b>	<b>261</b>	<b>21,206</b>

Region	Proposed Residential Development, 2006 to 2010					
	Single-Family Detached	Semi-Detached	Attached	Multi-Family	Mobile Homes	Total
Upper Bucks Region	814	54	69	798	21	1,756
Central Bucks Region	1,014	76	778	832	0	2,700
Lower Bucks Region	554	22	1,424	1,236	0	3,236
<b>Bucks County</b>	<b>2,382</b>	<b>152</b>	<b>2,271</b>	<b>2,866</b>	<b>21</b>	<b>7,692</b>

A slowing pace of new residential starts has been accompanied by a marked shift in its direction toward lower Bucks. As shown in Table 4 above, proposed residential development during the first half of the past decade was concentrated in central Bucks. Much of this development was proposed on sizable greenfields in Plumstead and Warrington townships and as redevelopment of the naval air warfare center in Warminster Township. The number of proposed housing units in upper Bucks, concentrated mainly on greenfields in Bedminster, Milford, and Richland townships, also exceeded that in the lower part of the county. Yet during the second half of the last decade, proposed residential development was concentrated in mature, larger communities of lower Bucks, including Bensalem, Lower Makefield, and Middletown townships, as infill development or redevelopment of abandoned or underutilized sites.

Single-family detached housing was the predominant proposed housing type in upper Bucks between 2001 and 2005 while the combined number of proposed attached and multifamily exceeded proposed single-family detached housing in the central and lower part of the county during this same period. In the second half of the last decade, proposed single-family detached housing in upper Bucks was surpassed by the combined number of proposed attached and multifamily. Proposed development in both central and lower Bucks continued to be dominated by attached and multifamily, though central Bucks, in particular, still recorded a significant share of proposals for detached single-family homes.

### ***Market Preferences***

Uncertain economic conditions may impede the completion or pace of proposed development discussed above, but the bulk and location of proposals are indicative of future growth patterns. Builders, researchers, real estate agents and others confirm such changes in the housing market. The downturn in the economy has diminished consumers' appetite for large, single-family homes that are expensive to buy and maintain, and has reduced sources of development financing.

Younger singles and families, by choice or necessity, are living in rental housing or with parents. The millennials, or Generation Y, children of the baby-boomers, will likely not be able to buy housing until later in life, and have different lifestyles and tastes than their parents. Broadly identified trends resulting from this scenario include heightened demand for rental housing and other alternatives to detached single-family homes. Generation Y would prefer living in an urban setting or a suburban area that contains shopping, dining, and transit in close proximity. Many urban areas are experiencing a resurgence fueled not only by young adults but also by empty-nester baby-boomers.

The focus on residential alternatives translates into design and locational options that might include smaller, "greener" less costly housing, transit-oriented development, walkable neighborhoods and live/work units that provide flexibility for artists, entrepreneurs, business start-ups and semi-retirees. This kind of housing shortens commuting times and helps revitalize neighborhoods. The large boomer cohort will continue to propel interest in age-restricted housing and the use of universal design: environments, buildings and products that are usable by everyone, at all stages of life, without need for adaptation.

## Density

Density is one way of looking at the nature of housing development that is taking place, its consistency with zoning patterns, and the kind of development it is promoting. Net density, the number of housing units per residentially zoned acre, is considered a more accurate benchmark than gross density, the number of housing units per acre for the entire municipality.

A very low density of one unit per 2 acres, for example, would be characteristic of appropriate, rural-type development in an area lacking infrastructure, while it would suggest sprawl development in a designated development area zoned for village or suburban-type housing. A density of 8 or more units per acre, in the Philadelphia region, is categorized as a high density typical of cities, boroughs, mature suburbs, other older or fully developed areas, transit-oriented development, multi-family development, or other places where significant density exists or is desired. Density of 1 to 2 units per acre is considered low density, and density of 2 to 8 units per acre is considered medium density.

Concentrations of mid- to high-density development located where suitable infrastructure is in place or planned contribute to community and regional balance. They play an important role in sparing open space and minimizing sprawl, and in supporting public transit, jobs growth, and housing choice.

Table 46 illustrates change in the net housing density in the county from 1970 to 2009, by community type: boroughs, mature suburbs, growth municipalities and rural ones. The net density in the county in 2009 ranged from 0.49 units per acre in rural areas to 5.49 units per acre in boroughs. These densities are modest. The Delaware Valley Regional Planning Commission rates Bucks County as a medium low-density county.

**Table 46**  
**Housing Density (dwelling units per acre), 1970–2009**

Year	Rural Area	Upper Bucks Emerging Suburb	Central Bucks Emerging Suburb	Lower Bucks Emerging Suburb	Mature Suburbs	Boroughs
1970	0.44	0.46	0.62	1.75	2.90	3.76
1980	0.37	0.54	0.88	2.54	4.04	4.90
1990	0.47	0.72	1.26	2.96	4.61	5.43
2009	0.49	0.84	1.51	3.03	4.77	5.49

Densities have increased nominally in rural areas of the county in the past 40 years, and more so in growth and mature communities, suggesting that development district concept is being applied at the municipal level. Still, if development pressure on rural areas and resulting sprawl is to be contained as population continues to rise, significant increases to the modest density rates may be needed in older and growing communities. Also, interest in compact developments with a mix of uses and housing types is increasing. Density is central to the success of these types of developments, making them more walkable and vibrant.

***Age-restricted Housing***

Active-adult, or “55-plus” housing, market-rate age-restricted developments designed for independent living and keyed to the mushrooming population of aging baby boomers, have proliferated throughout the county in recent years. The number of built or proposed units, as of 2010, numbered nearly 8,000, compared to a total existing housing stock of roughly 242,000.

Active-adult housing in the county has taken the form of small- to mid-size communities, mainly owner-occupied rather than rental, and often with on-site recreation and social facilities. These types of developments have been marketed as an alternative to ownership of large single-family homes, providing maintenance-free living close to family and friends. They have also been represented to municipalities as developments that place little or no stress on infrastructure and services, particularly on schools, because of the lack of school-age children. This argument has been used to persuade municipalities to increase the permitted density and unit types in areas of municipalities not originally intended for intense development and having few of the services that will be eventually needed and wanted by older adults as they age in place.

Age-restricted housing, then, should be situated near major roads and community facilities, and incorporate the same design standards applied to similar styles of general occupancy housing. The growing numbers of such housing, together with reported, if isolated, instances of sales and financing problems, suggest that market saturation may have been reached. There are increasing numbers of older people who are unable or unwilling to sell their homes in a down market and move on to 55-plus communities. At least one municipality has been approached to consider rescinding the age-restriction to increase the number of potential buyers for existing age-restricted homes.

Municipalities should proceed with caution in zoning for and approving new age-restricted development or responding to requests to eliminate the age restriction for existing 55-plus communities. In the right location, certain existing age-restricted housing consisting of smaller, lower-cost units could ultimately transition to serve as an attractive and affordable market segment to first-time and one-income buyers, including young singles, couples, and small families, as well as empty-nesters and other singles.

In addition, not all seniors seek to relocate to retirement communities or resorts. Municipalities should prepare for the growing number of seniors who want to age in their own homes. A study by the AARP, the nationwide senior advocacy organization, indicates that 88 percent of those aged 65 and older and 83.5 percent of baby-boomers want to stay in their homes as long as they can. Homes that are designed to allow seniors age in place will be increasingly desirable.

Growth in the aging population, paired with a diminished job market, favors the formation of more multigenerational households, as family and non-family households share living quarters for reasons of elder care, child care, or economic necessity. Local ordinances can provide for accessory apartments, modular elder cottages, and conversions, among the housing types that provide space and privacy for extended families, and are usually reversible should they no longer be needed.

Assisted living, sometimes known in Pennsylvania as personal care homes, and continuing care retirement communities (CCRCs), or life care, are specialized forms of senior housing, targeted to the “older” elderly. Assisted living arrangements, which are regulated by the state Department of Public Welfare, provides support in daily activities. CCRCs, which began to take shape 10 to 20 years ago, are regulated by the State Department of Insurance, and combine multiple levels of institutional and non-institutional housing types: independent living, assisted living and nursing home. Unlike active-adult housing, assisted living and life care arrangements typically involve fee-for-service or financial contracts, rather than outright sale or rental of living quarters.

As Bucks County continues to develop, the number of large land tracts suitable for retirement or assisted living communities are becoming scarcer. Like active-adult housing, CCRCs and assisted living communities are best located near shopping, medical centers and other community facilities and health care. Though these housing types may themselves incorporate such facilities, living arrangements for the elderly should have good access to services they may lack, and be a part of the wider community. Zoning and development standards for CCRCs, assisted living and nursing homes should also be flexible enough to allow mixed uses and new forms of facilities, particularly those that favor small-scale village-type and homelike designs.

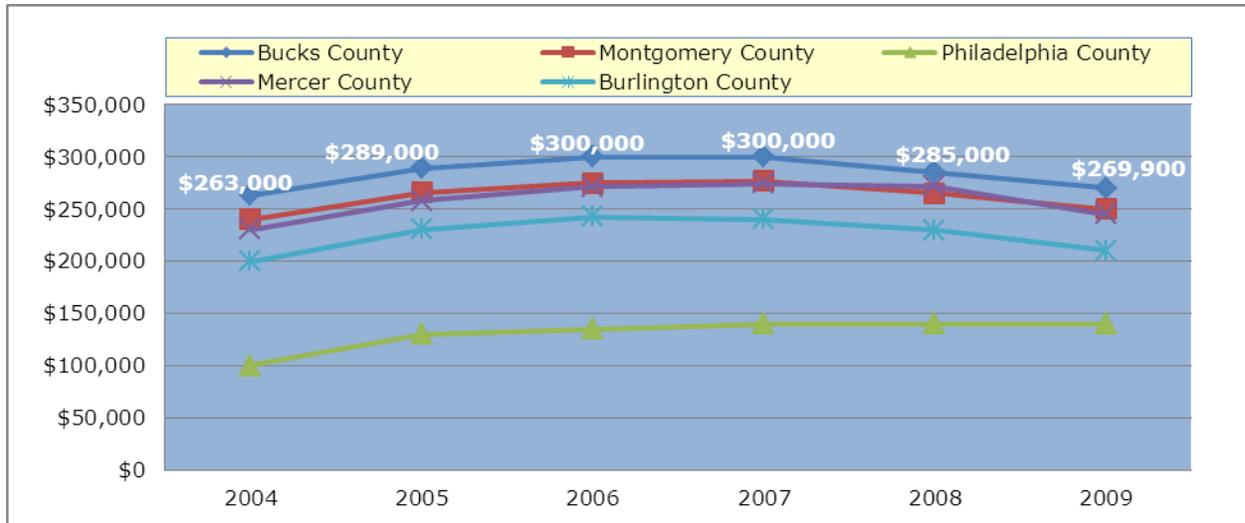
In addition, the rapid increase in the aging population has spurred creation of innovative supplementary services directed toward helping people age in place. Examples include home assistance services and on-demand transportation service offered by nonprofit or for-profit providers, adult day care centers, or “village” shared service arrangements, which may involve intergenerational service trading within a set geographic area.

### **Housing Prices, Costs, and Affordability**

The county’s housing stock has largely maintained value in the face of recession and upheaval in credit markets. Figure 33 traces changes in median sales price from 2005 to 2010 for selected metropolitan-region counties tracked by the regional TREND real estate listing service. Prices now are close to what they were in mid-decade, after peaking in 2006-2007.

In regional context, the local housing market has shown stability and resilience. The median sales price of housing in Bucks County, \$282,500 in 2010, had declined about 10 percent from a peak of \$300,000 from 2006 to 2007, and was the highest of the five counties in the region.

**Figure 33**  
**Median Sale Prices**  
**Bucks, Montgomery, Philadelphia, Mercer, and Burlington Counties**  
**2004–2009**



Source: Trend Real Estate

**Distressed Sales**

Nevertheless, Bucks County has not completely escaped the toll of the national financial crisis that began in 2006. The total number of housing sales has dropped and the share of short sales and foreclosures, markers of housing market distress and homeowner affordability problems, have risen and are comparable to, or may even exceed, others in the region. Table 47 shows data on housing prices, short sales and foreclosures in the region for the 2nd quarter of 2011.

**Table 47**  
**Housing Prices and Foreclosures, 1<sup>st</sup> Quarter 2010**

	Housing Units Sold	Median Sales Price	Short Sale	Foreclosure
<b>Bucks County</b>	<b>934</b>	<b>\$270,000</b>	<b>8.50%</b>	<b>6.90%</b>
Montgomery County	1,269	\$255,000	3.90%	8.10%
Mercer County	530	\$224,000	8.70%	12.30%
Burlington County	700	\$206,000	10.40%	11.10%
Philadelphia County	2,288	\$130,000	3.10%	4.50%

Source: Delaware Valley Regional Planning Commission

The rates of short sales (sales that do not yield enough to cover outstanding mortgage debt) and foreclosures in the county both exceeded 10 percent in mid-2011, and are among the highest in the five-county region. Statistics assembled by the Delaware Valley Regional Planning Commission show Bucks County foreclosures concentrated in the lower and uppermost municipalities of the county, with rates highest in Bristol borough and township, and Morrisville and Quakertown boroughs.

### **Rents**

Rental housing in Bucks County is costly, creating a shortfall of units affordable to those in lower income brackets. The median monthly rent in Bucks County, \$1,036 in 2010, was the highest of six adjoining Pennsylvania and New Jersey counties, and exceeded state and national medians as well. Median rent figures are in Table 48.

**Table 48**  
**Median Monthly Rent for U.S., Pennsylvania,**  
**and Select Metro-Area Counties, 2010**

<b>Bucks County</b>	<b>\$1,036</b>
Delaware County	\$930
Lehigh County	\$839
Montgomery County	\$1,057
Northampton County	\$873
Mercer County (NJ)	\$1,082
Pennsylvania	\$763
United States	\$855

*Source: American Community Survey, U.S. Census Bureau*

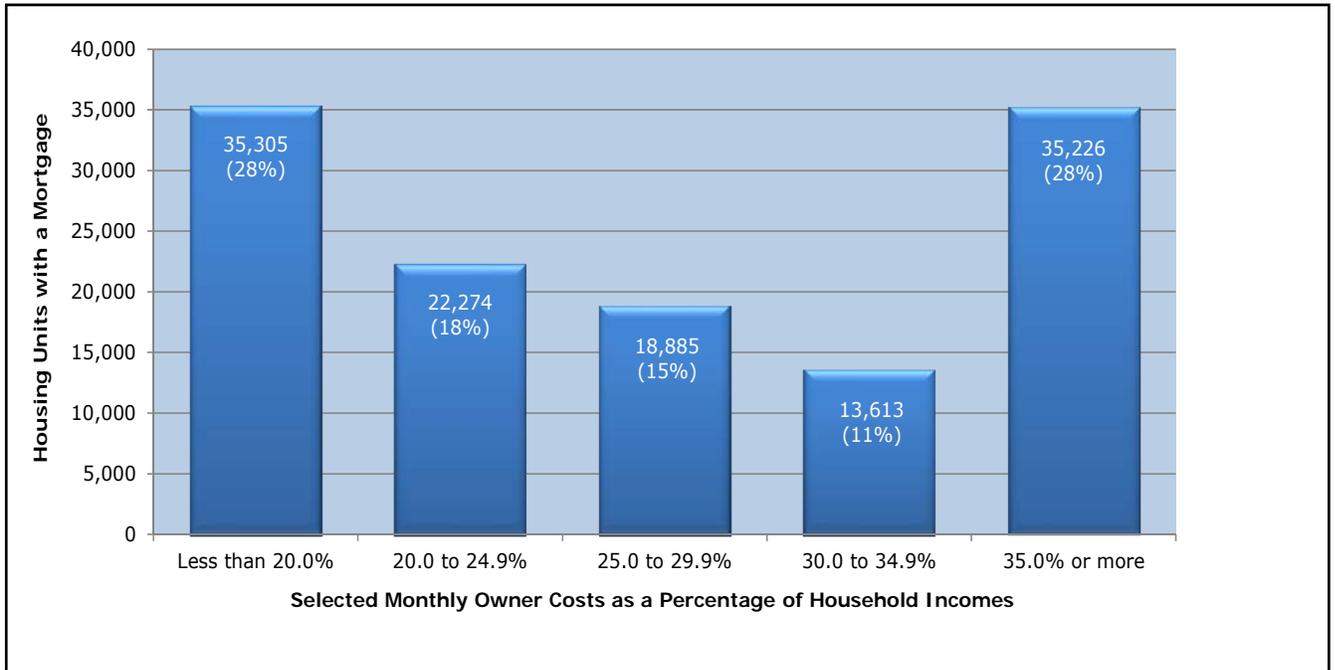
### **Affordability**

When housing values and rents are high, lack of affordability, known as cost burden, becomes a problem for a share of the population whose income doesn't keep pace. Results of the comprehensive plan survey show that the share of respondents citing "the high cost of housing" as one of the features they least liked about Bucks County housing totaled more than 43 percent. But among the youngest group of respondents, those younger than 25, the figure reached a high of just over 60 percent.

At the extreme end, housing costs that outstrip household financial resources can impede economic growth, by hampering the ability of businesses to hire and retain workers. They also heavily affect those just entering the housing market, and may push out young people, thus contributing to "brain drain" of young, educated singles and families.

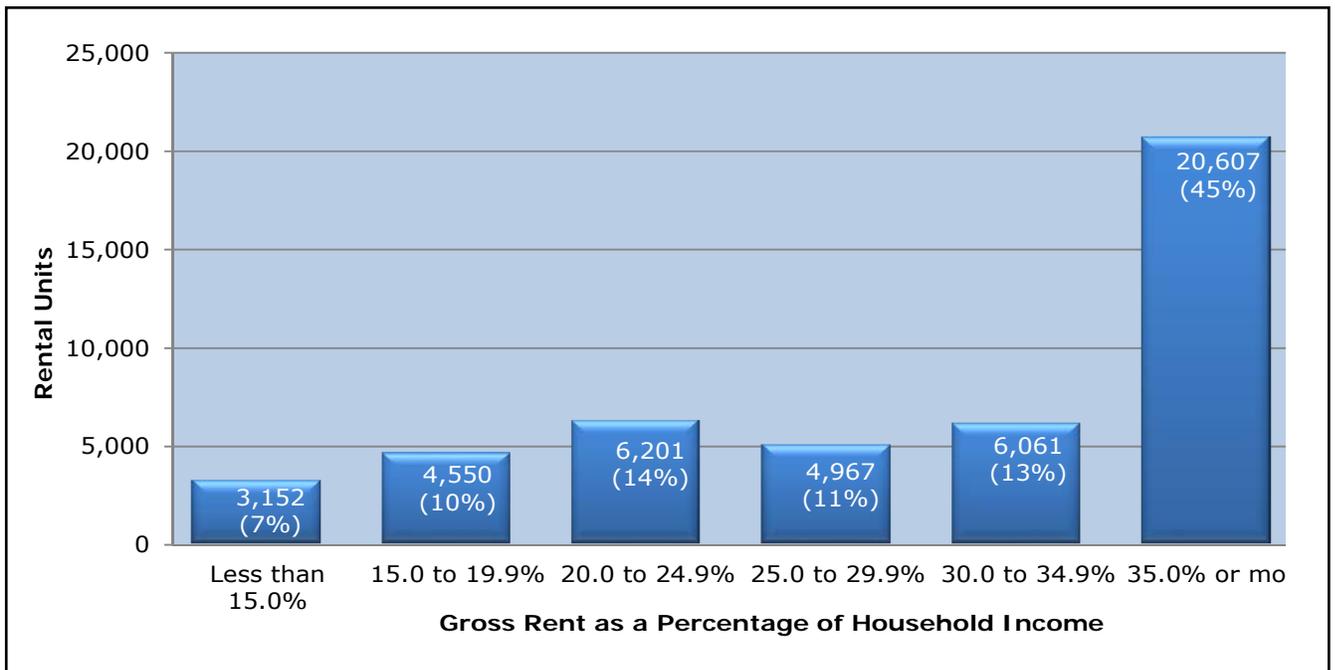
Figures 34 and 35 depict the incidence of cost burden for homeowners and renters, as of 2009. Cost burden exists when a household spends more than 30 percent of gross income for rent or mortgage payments. Severe cost burden consists of housing costs of 35 percent or more of income.

**Figure 34**  
**Owner-Occupied Housing Cost Burden, 2009**



Source: American Community Survey, U.S. Census Bureau

**Figure 35**  
**Rental Housing Cost Burden, 2010**



Source: American Community Survey, U.S. Census Bureau

The rate of cost burden is higher among renters, with half experiencing some form of cost burden, and 42 percent severely cost burdened. Among homeowners, the cost burden rate totaled 38 percent, with 27 percent severely cost burdened.

A recent study by the Federal Reserve Bank of Philadelphia documented continuing erosion of the supply of rental housing available and affordable to the region's lowest-income families. Table 49 shows that the decline in affordable rental units in Bucks County at the lowest end of the income spectrum was the steepest in the region, and that the availability of rental housing for low-to-moderate-income families is among the tightest in the region.

**Table 49**  
**Affordable and Available Rental Housing Units**  
**in 2005-2006 and Changes from 2000**

	Affordable/Available Units per 100 Renter Households					
	2005-06			Change from 2000		
	0-30% AMI *	0-50% AMI	0-80% AMI	0-30% AMI	0-50% AMI	0-80% AMI
Pennsylvania	43	84	110	-6	-2	2
<b>Bucks</b>	<b>25</b>	<b>56</b>	<b>104</b>	<b>-12</b>	<b>0</b>	<b>6</b>
Chester	33	59	101	-6	-5	1
Delaware	21	72	112	-9	3	8
Montgomery	27	51	106	-5	-11	6
4-county suburban region	25	60	106	-2	4	9
Philadelphia	43	89	114	-2	4	9

\*AMI – Average Monthly Income

Source: Federal Reserve Bank of Philadelphia

## Housing and Land Use

Communities often struggle to provide planning and zoning that fosters the kind of housing their residents need, want, and can afford. Although housing prices are primarily driven by the market, the provision of more affordable units can be influenced by municipal land use policies and regulations. Thoughtful development standards and design foster balanced growth and are responsive to market forces. Ordinances and codes that regulate residential use and development should be revised periodically not only to acknowledge changes in land use, consumer taste and development industry trends, but to provide for the housing variety required under the Pennsylvania Municipalities Planning Code.

General zoning and subdivision standards control use, location and the nature and scale of residential development and related improvements. Standards for housing type, lot size, height, setbacks, impervious surface, and other dimension and design features have to do not only with visual appearance, land use, and growth management, but with affordability and access to jobs and educational opportunity.

Many municipalities in the county continue to focus preferentially on single-family housing in their land use planning and zoning ordinances. This ignores the “new normal” being wrought by economic and demographic change, and threatens to make basic shelter unattainable for many.

Ownership of single-family housing is not the only residential form that contributes to a livable community. The concepts of community and neighborhood, for many, encompass social and economic diversity of residents, and a mix of housing with shopping, restaurants, offices, schools and cultural establishments. Variety of housing types, paired with preservation and restoration of older residential and mixed-use neighborhoods, makes for a balanced housing stock and market.

Communities composed entirely of large single-family houses on large parcels of land are physically and economically unsustainable in the long run. There is evidence of increased market demand for multifamily and townhouse units, generated by underserved renters and first-time and one-income buyers—including young singles, couples, and small families—as well as empty-nesters and other singles who need or are seeking affordable, lower-cost units. Neighborhood rehabilitation, apartments above ground-floor retail shops and infill construction in older communities maintains and adds this type of housing.

One way to combat the often unwarranted and entrenched bias against housing other than detached, large-lot singles is to ensure the best possible design and character, so that townhouses, apartments, cluster housing and other housing forms fit better into neighborhoods. They need to be attractive, sensible, and welcoming, as well as affordable.

For example, today’s modular housing, assembled on site from prefabricated components, is generally as durable and attractive as housing built on site, and less costly. Small-lot single-family housing arranged in a cluster formation not only spares natural resources and land, but helps contain costs. Respondents to the comprehensive plan survey ranked construction of a variety of housing types, and of small-lot singles, as the two most preferred housing policies in the county.

Municipalities need to consider how new living arrangements fit with existing regulations and what changes may be needed. Specialized regulations, including zoning districts or use provisions, allow for particular types of development that may be suited to certain demographic groups, sites, or development goals, such as redevelopment, growth management, compatibility with adjoining neighborhoods, historic preservation, affordability, and mixed use. Examples include:

- transit-oriented development, traditional neighborhood development, provision for live/work housing, home occupations, and other zoning provisions that favor mixed use, redevelopment, infill development, walkability, transit connectivity, and/or historic preservation;
- planned residential development to promote coordinated development of larger sites;
- residential conversions, to aid in historic preservation and expand housing choice;
- active-adult housing, used judiciously to retain the growing number of older residents who may wish to downsize while staying in their home communities;

- accessory apartments and elder suites, to provide independent living choices to seniors and others who may want to live near family and friends, but don't need direct support services;
- various types of multifamily and attached housing and mobile homes, to provide lower-cost rental and ownership options as an alternative to detached single-family housing; and
- group homes, assisted living, retirement homes and nursing facilities for those with special needs.

### ***Codes***

The Commonwealth has adopted the Uniform Construction Code as the statewide standard for housing construction and rehabilitation. The code uniformity promotes cost efficiency, safety and consistency of outcomes in new development and repair work.

Enforcement at the municipal level of property maintenance and health codes is another way to maintain sound condition of housing stock and neighborhoods. In addition to permit inspections for property additions or new construction, a number of municipalities require inspection of major systems (e.g., roofs, plumbing, electrical, HVAC) when a residential property of any type changes occupancy, as a proactive way of protecting housing quality. Maintaining properties at code standards, or bringing them into compliance if necessary, is a key component of neighborhood preservation or neighborhood revitalization.

### **Housing Programs, Organizations, and Administration**

Public and private agencies play a major role in creating housing opportunities for those who cannot buy or rent market-rate housing without assistance. These agencies rely heavily on public-sector funding programs in order to produce housing within financial reach of lower-income and special-needs households.

The Bucks County Community and Business Development Office is the county's lead agency for housing and related community development activities. It coordinates federally funded and other programs designed to produce and maintain affordable housing, and make related neighborhood improvements. The office is also responsible for monitoring fair housing practices throughout the county to ensure that discrimination does not impede housing choice.

The four-year Consolidated Plan prepared by the community development office is a comprehensive planning document that identifies the sources and guides the uses of community development and housing funds, both public and private, in Bucks County. It includes an action plan that is updated annually.

### ***Special-Purpose Housing Programs***

Programs administered by the county community development office include the Community Development Block Grant (CDBG) program of the U.S. Department of Housing and Urban Development (HUD), the HOME program, also funded by HUD, and the county Housing Trust Fund. This funding is used to support a range of community development agencies and activities countywide.

A high share of this funding is typically spent in the older, more urbanized communities concentrated in lower Bucks and secondarily in upper Bucks, which may have greater physical rehabilitation and redevelopment needs.

Bucks County’s CDBG grant totaled nearly \$2.15 million in fiscal year 2011. A minor share of the grant is usually dedicated directly to housing, typically for improvements at group homes and lower-income apartment housing, housing counseling to avert foreclosures, and homeless shelter operations.

The HOME program is the primary source of direct assistance for many affordable housing activities, including construction, acquisition, rehabilitation, operations, and rental assistance. The county’s anticipated 2012 HOME grant was about \$1.1 million.

The county Housing Trust Fund is capitalized through deed recording fees. This money, amounting to \$500,000 in 2011, provides down payment assistance for first-time homebuyers, housing counseling and housing rehabilitation, among other activities.

The county community development office also administers special-purpose housing grants from HUD. Grant funds for such programs totaled \$1.68 million from 2010 to 2013, for emergency shelters, supportive housing for individuals and families with special needs, and rapid re-housing of youths aging out of foster care, ex-offenders, and others at risk of homelessness.

There is an active network of nonprofit housing and service providers in the county. They coordinate their efforts through the Bucks County Continuum of Care. Nonprofit organizations create and manage special-needs and general-purpose affordable housing and provide related support services. Allied public agencies, such as Bucks County Children and Youth and the county’s Mental Health/Developmental Programs departments also provide direct services and coordination.

Table 50 lists the number and types of special-purpose housing run by nonprofit organizations. This housing, totaling 582 units at scattered sites throughout the county, encompasses emergency shelter for the homeless and transitional and permanent supported housing for those with disabilities or otherwise at-risk.

**Table 50  
Special-Purpose Housing, 2010**

Housing Type	Number of Units
Emergency shelter	103
Transitional	435
Permanent supportive	44
<b>Total</b>	<b>582</b>

*Source: Bucks County Office of Community and Business Development*

In addition, the number of general-occupancy affordable housing units created and operated by nonprofit organizations is estimated at about 2,800. That figure does not include public housing and Section 8 vouchers, as discussed below. Most, but not all, of the general-purpose affordable housing is rental housing, and much of it is designated for the elderly.

The Bucks County Continuum of Care conducts an annual point-in-time count of the homeless. The number of homeless persons recorded on January 26, 2011 was 505.

Most homeless households were sheltered. Shelters operated by nonprofit providers are concentrated near population centers in Lower Bucks County, with a few smaller facilities in upper Bucks. Families with children account for a growing number of the homeless, according to service providers. Recent changes in the HUD criteria for homelessness are expected to result in a greater number of homeless individuals and families.

Faith-based volunteer agencies have taken a lead role in expanding shelter capacity during the winter months by providing temporary shelter in houses of worship. As this plan was being prepared, the local chapter of the American Red Cross announced that it was preparing to stop operating its homeless shelter in Levittown, the largest shelter in the county; county officials and other members of the housing community were in the process of enlisting another provider to take over the shelter.

### ***Public Housing and Section 8***

The Bucks County Redevelopment Authority conducts rehabilitation of owner-occupied housing using HOME and Housing Trust Fund monies. The Bucks County Housing Authority operates 1,189 public housing units in 10 developments, all but one located in the lower or upper reaches of the county, and administers the Section 8 voucher program, which provides rental assistance to 3,100 lower-income households throughout the county. Section 8 payments to landlords bridge the difference between market-rate rents and what voucher holders can pay without becoming financially overburdened.

The bulk of public housing is in senior citizens' buildings; senior housing totals 1,006 units compared to 193 units of family housing. Demand for public housing is high, with waiting lists for all housing types. The list for Section 8 housing assistance vouchers is currently closed, with a backlog of about 2,700 applications.

### ***Assisted Housing Program Standards***

There are rent and income standards for housing assistance programs that involve federal or other public funds to produce affordable, accessible housing targeted to special-needs and lower-income households. Table 51 lists annual income standards by household size for the metropolitan region to which Bucks County belongs.

Most such housing is designated for very-low to low-income households, a category that encompasses, for example, an income of up to \$40,200 for a family of four. Some programs that develop for-sale

housing are more likely to target moderate-income families who otherwise wouldn't be able to become homeowners.

**Table 51**  
**Housing Program Income Standards, 2011**  
**Standards for Philadelphia, Camden, Wilmington, PA-NJ-DE-MD Metro-Area**

Household Size	Very low-income (30% of median)	Low-income (50% of median)	Moderate-income (80% of median)	Median Income
1 Person	\$16,900	\$28,150	\$44,950	\$56,300
2 Persons	\$19,300	\$32,200	\$51,400	\$64,400
3 Persons	\$21,700	\$36,200	\$57,800	\$72,400
4 Persons	\$24,100	\$40,200	\$64,200	\$80,400
5 Persons	\$26,050	\$43,450	\$69,350	\$86,900
6 persons	\$28,000	\$46,650	\$74,500	\$93,300
7 Persons	\$29,900	\$49,850	\$79,650	\$99,700
8 Persons	\$31,850	\$53,100	\$84,750	\$106,200

Source: U.S. Department of Housing and Urban Development

HUD-determined monthly fair market rent (FMR) values for Bucks County, as well as sample income levels needed to afford them, are in Table 52. The Section 8 voucher program provides rental assistance to lower-income households, by paying the owners of rental properties the difference between FMR and 30 percent of the renters' household income. Other forms of assisted rental housing use subsidies to write down rental costs to 30 percent of income for lower-income occupants.

**Table 52**  
**Monthly Rent Limits for Housing Programs, 2011**

Fair Market Rent	UNIT TYPE			
	Efficiency	1 BR	2 BR	3 BR
\$803	\$915	\$1,095	\$1,339	\$1,615
<b>Annual HH income needed to afford 2 BR market-rate unit = \$43,800</b>				
Annual HH income of low-income 4-person HH (50% of median) = \$40,200				
Annual HH income of very-low-income 4-person HH (30% of median) = \$24,100				
Annual HH income of low-income 3-person HH (50% of median) = \$36,200				
Annual HH income of very-low-income 3-person HH (50% of median) = \$21,700				
Monthly housing (rent+utility, mortgage) costs in excess of 30% of HH income = shelter cost burden				

Source: U.S. Department of Housing and Urban Development

The Continuum of Care, the countywide housing coordinating body composed of public and private agencies active in providing affordable and special-purpose housing and allied services, has been reorganized to broaden the shared responsibilities of member agencies, to enhance two-way communication with county government, and to sharpen its effectiveness in alleviating homelessness and securing funding. The coalition should play a key role in partnering with Bucks County Community

and Business Development, and other county agencies, to coordinate housing and community development planning, programming, and spending.

## **Strategies and Actions**

### **Planning and Land Use**

- Encourage municipalities to incorporate housing into comprehensive planning, providing technical assistance where feasible.
- Encourage municipalities to review and revise zoning and subdivision ordinances as necessary to promote Smart Growth objectives, providing technical assistance where feasible. Fair share standards, availability of infrastructure, proximity to workplaces and community facilities, preservation of natural resources and open space, design and scale, and neighborhood redevelopment needs are among factors to be considered.
- Encourage municipalities to review and revise zoning and subdivision ordinances as necessary to promote housing choice, providing technical assistance where feasible. Affordability, fair housing standards, disability rights, appropriate location, need for support services and variety of housing types are among factors to be considered. Rental housing and other alternatives to single-family attached housing, infill development, traditional neighborhood development, cluster development, residential conversions, accessory apartments, age-restricted housing, live-work units, mixed-use options and quasi-institutional residential uses should be afforded particular consideration.
- Support public and private efforts to rehabilitate and maintain housing stock, including disability-adaptive improvements, rehabilitation of owner-occupied and rental properties, code enforcement, and historic preservation.

### **Housing Programs, Organization, and Administration**

- Continue a leading role in Continuum of Care activities, including coordination of homeless planning, housing and allied support service project development, operations and funding.
- Coordinate federal housing and community development program planning and funding with countywide land use and growth management planning, and redevelopment initiatives.
- Coordinate federal housing and community development program planning and funding with housing and related support service and neighborhood improvement projects initiated by private and public agencies.
- Provide organizational and financial support to nonprofit agencies and other developers and managers of special-needs, supportive, and general-purpose affordable housing.
- Create a countywide plan to maximize housing opportunities.
- Provide public information and education on housing issues.



Throughout Bucks County, public officials and residents have strived to create communities that are sensitive and responsive to our environment, economy, and society. When land is managed properly, jobs are created, and neighborhoods are respected, people can rightly feel good about their efforts to plan for and protect their community.

Future Land Use provides a blueprint for planning and development in Bucks County. It establishes where we are by evaluating trends and conditions and provides a plan to get where we want to go. By designating appropriate places for development to occur, municipalities can plan for and coordinate infrastructure systems, including roads, public transit facilities, trails, sewage disposal systems, water supply systems, and public utilities. Providing a plan for future land use also enables officials to direct development to those areas with infrastructure capabilities while protecting and preserving those areas with sensitive natural resources and agricultural land.

### **The Costs of Sprawl**

Planning for growth and development in Bucks County has been mixed in its successes and failures. On a local level, success stories are common: historic buildings are preserved, intersections are made safer, and new compact and walkable communities are developed. Municipal growth management policies have done much to temper the pace of residential development, generally concentrating it in areas of existing and planned infrastructure. Yet despite local efforts, it is clear that the problems caused by sprawl development continue.

Sprawl development is characterized by development that is single-use, low-density, and auto-dependent. It has been the dominant pattern of development in Bucks County since the 1940s, which began the rapid growth and suburbanization of the county with developments such as Fairless Hills and Levittown.

Sprawl has been costly to our county and quality of life. It has been the primary cause of a range of connected regional problems that have been, for the most part, beyond the control of local planning and development review. Among sprawl's most costly effects:

- a significant loss of farmland and natural resources
- urban disinvestment
- costly infrastructure development
- physically and socially disconnected neighborhoods
- a reliance on fossil fuels
- an increased vulnerability to climate change

### **Loss of Farmland and Natural Resources**

Sprawl development has been most damaging to our agricultural and natural heritage. Over the past 50 years, Bucks County has lost close to 80 percent of its farmland acreage. In 1960 there were 4,069 farms totaling 394,880 acres in the county. In 2007, there were only 934 farms totaling 75,883 acres remaining. Bucks County has also lost 32 species due to habitat loss, mostly in the Coastal Plain.

Increases in impervious surfaces due to our patterns of development have also led to increased flooding, impaired water quality, eroded streambanks, and reduced groundwater recharge, further damaging our natural heritage and degrading our quality of life.

### **Urban Disinvestment**

Urban disinvestment results from the loss of residents from older, built-out communities. As residents leave, business investment and tax revenues decline. Those who stay must pay for a larger proportion of physical infrastructure that is declining due to age.

Bucks County has not been immune to the problem of urban disinvestment. Communities with the highest tax rates are concentrated in lower Bucks County, which underwent rapid growth following World War II and reached a mature development stage by the 1970s. The top five municipalities with net migration gains between 1990 and 2000 are Lower Makefield, Buckingham, Warwick, Plumstead, and Warrington townships. The top five municipalities with net migration losses during the same period are Bristol, Warminster, Bensalem, Falls, and Lower Southampton townships; each of these municipalities is characterized by mature development and infrastructure.

### **Travel Costs**

A common complaint about sprawl development is that it increases traffic congestion and time spent in the car. This complaint is not unfounded. The costs of travel are increasing: driving times continue to increase, midday travel has increased dramatically, and a significant percentage of non-work travel now occurs during peak hours. The average household has seen a doubling in annual gasoline expenditures since 2001; in 2001, we averaged 6.2 cents per mile of vehicle travel, but now we are paying nearly 14 cents per mile travelled.

Between 1977 and 2007, United States vehicle miles traveled (VMT), grew by 110 percent, even though the U.S. population grew by only 37 percent. Between 1996 and 2007, Bucks County VMT grew by 19.9 percent, even though Bucks County population only grew by 7.2 percent during same period.

VMT is closely linked with road accidents and congestion. As vehicle miles traveled increase, so do the risk of accidents and the related costs of injuries and increased travel times.

### **Infrastructure Development**

Numerous studies have shown an auto-dependent development pattern to increase the cost of infrastructure spending. Infrastructure spending is a critically important factor in developing a plan for future land use in Bucks County. Infrastructure in the United States is currently underfunded. States and municipalities are approaching infrastructure improvements by either not funding infrastructure at all or not fully funding infrastructure, and by not repairing or replacing most types of infrastructure.

Between 2010 and 2035, a \$36 billion funding deficit is projected for highway and transit infrastructure for the Pennsylvania side of the Delaware. In Bucks County alone, 89 projects have been placed on the 2009-2012 Transportation Improvement Program list, at a total cost of over \$1.3 billion.

## Disconnected Neighborhoods

One of the primary features of sprawl development is how reliant it makes people on their cars to get where they need to go. Single-family homes on large lots create sprawling neighborhoods where you don't always know your neighbors. The elderly, the young, and the poor are isolated and have fewer and more costly transportation options in sprawling neighborhoods.

Many public health officials believe that sprawl development has also been costly to our community health. Consider:

- More than one-half of all Americans (affecting all demographic groups) are overweight or obese (30.5 percent).
- Childhood obesity has more than tripled in the past 30 years. The prevalence of obesity among children age 6 to 11 years increased from 6.5 percent in 1980 to 19.6 percent in 2008. The prevalence of obesity among adolescents age 12 to 19 years increased from 5.0 percent to 18.1 percent.
- Motor vehicle travel has become safer over time, but motor vehicle crashes are still the leading cause of death for people age 1 to 34.

As we have become more reliant on personal vehicles for travel, our health and vitality have suffered.

## Energy and Environment

Sprawl development has also affected how we use our energy supplies. Our largest source of energy is petroleum, which is tied closely to consumption in the transportation sector. Over the years the availability of relatively-cheap oil has allowed for the rapid suburbanization of the United States and led to explosive growth in consumption.

But securing those oil supplies has been very costly to our nation. Between 1976 and 2007, it has been estimated that the cost of deploying aircraft carriers in the Persian Gulf is over \$7 trillion. Among the top 5 petroleum importers to the United States are Venezuela, Nigeria, and Saudi Arabia, countries whose policies have not always aligned with the United States.

Drilling our way out of the problem is unlikely to solve the problem, as domestic petroleum production peaked in the early 1970s and has declined annually since. During this same period consumption has increased significantly.

Looming over tighter energy supplies is the problem of global climate change. Climate scientists have reached consensus that greenhouse gas emissions have contributed to the warming of our planet, which could potentially have dire consequences for our future standard of living and the environmental systems we depend on. Significant to climate change is the fact that our transportation system alone accounts for one-third of the United State's greenhouse gas emissions and over one-half of these emissions are from personal vehicle use.

## Choices

Even for those skeptical of the science of climate change, the trends discussed above are discouraging, and in some cases, alarming. Issues of food supply, public health, energy security and supply, infrastructure spending, and fairness in our investment priorities all play into how we envision our county growing and developing. We must choose a way to not only continue our high quality of life, but enable us to live and work in a more sustainable way. That choice is Smart Growth.

## What is Smart Growth?

Smart Growth is a response to the modern, car-dependent pattern of development. It is a coordinated, holistic policy of Sustainable Development<sup>21</sup> in the context of land use planning, addressing the long-term viability of regional growth patterns and the underlying costs involved. Smart Growth recognizes the importance of land use policy and planning beyond just “stopping sprawl,” and most significantly, the transportation-land use connection.

Smart Growth is not different from a traditional growth management strategy in that one of its goals is to preserve important natural resources and farmland. Such a strategy seeks to reduce rapid land consumption patterns through zoning, infrastructure planning, and open space preservation. However, growth management pays less attention to the quality of growth taking place in developed areas and fails to address the root causes of sprawl.

Smart Growth emphasizes a bottom-up, integrated approach to planning, rather than a focus on trying to address the individual consequences of sprawl. Transportation investments are customized to fit the context and needs of a project. Water resources are planned for using an integrated strategy, focusing on the factors of supply, stormwater management, zoning, wastewater disposal, and open space preservation. Land use planning is done in a regional context, recognizing the limits imposed by infrastructure capabilities and costs, the importance of protecting resources for future generations, the desire to develop fairer and more livable communities, and the need to provide long-term, meaningful economic growth.

## What Does Smart Growth Look Like?

Smart Growth is generally characterized by the following key features:

### ***Compact, Efficient Development***

Smart Growth demands that land be developed in a compact and efficient manner. Compact and efficient development maximizes the use of land resources by reducing setbacks and lot sizes and encouraging multiple-story buildings.

Compact and efficient development increases the efficiency of public transit, infrastructure, and household energy use. Compact growth allows more efficient provision of public services such as

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<sup>21</sup> See Chapter I Plan Foundations for a detailed discussion of Sustainable Development and how the concept is fundamental to the Vision, Principles, and strategies and actions of this comprehensive plan.

schools, police, fire, and emergency services. Public services can be centralized and the costs of staffing, facilities, and equipment can be reduced.

Studies have shown that compact development offers numerous energy and cost savings:

- Residential units in more compact cities use 20 percent less energy for heating and cooling than in sprawling cities. On a per capita basis, residents use 20 to 50 percent less water and a reduced water demand reduces demand for electricity required for conveyance.
- Living in a dense, walkable area can reduce transportation costs as much as 37 percent. Public transportation reduces VMT by 102.2 billion miles, saves 4.2 billion gallons of gasoline, and reduces the nation's carbon emissions by 37 million metric tons annually.
- Road costs for sprawling development can be as much as 25 percent higher than compact places. Single-family dwellings in urban areas cost one-third less in water and sewer services than those in sprawling areas; multifamily dwellings in urban areas cost two-thirds less.

Bucks County's villages and boroughs are great examples of compact and efficient development. Although lot sizes are small, land is efficiently developed, and central areas contain multiple-story buildings. Such a development pattern encourages a sufficient density of population to efficiently deploy public services, allow public transit, and lower infrastructure and energy costs.

### ***A Development Focus on Existing Communities***

With a Smart Growth development strategy, new growth and infill development is encouraged toward existing infrastructure, neighborhoods, and public services, rather than expanding into undeveloped areas. Development is focused on community revitalization, the rehabilitation of brownfields, and adaptive reuse of older buildings. As part of this Comprehensive Plan's resident survey, when residents were asked their opinion of the best economic policy moving forward, the top two choices were: 1) revitalizing existing commercial areas and downtowns and 2) revitalizing older industrial areas and vacant sites.

The Development District is a planning tool Bucks County municipalities have successfully used to channel growth to appropriate areas of the county. First promoted in 1970 by the Bucks County Planning Commission document, *The Urban Fringe: Techniques for Guiding the Development of Bucks County*, planning, zoning, and logical infrastructure development has enabled municipalities to concentrate development closer to services and away from farmland and natural resources. Map 18 shows development constructed within municipalities' development areas between 1990 and 2009.

However, Development District planning is sometimes undermined by water and sewerage facilities built by private developers and authorities outside designated development areas. Many municipalities do not have complete control of the development of water and sewer infrastructure, and when such infrastructure is constructed outside of development areas, this can cause leapfrog development into areas that municipalities would like to keep rural or target for preservation.

Further, the Development District tool has been used many times in a way that assumes that growth will inevitably continue to expand outward and does not fully support alternatives to driving. Developments are designed in a way a car is required to be the primary choice in transportation. Off-street parking is required in abundance and accommodating the movement of vehicles is paramount. As a result, car-dependent, sprawling development patterns continue in developed areas of Bucks County, giving incentive to many residents to repeat the cycle of sprawl by moving farther outward and away from the problems of sprawl development.

One clear indicator of this failure to provide support to alternatives to driving is housing densities in various developed areas of Bucks County, which suggest insufficient densities to support public transit.

**Table 53**  
**Housing Density (dwelling units per acre), 1970–2009**

	Rural Area	Upper Bucks Emerging Suburbs	Central Bucks Emerging Suburbs	Lower Bucks Emerging Suburbs	Mature Suburbs	Boroughs
1970	0.44	0.46	0.51	1.30	2.90	3.76
1980	0.37	0.54	0.69	1.85	4.04	4.90
1990	0.47	0.72	1.05	2.30	4.61	5.43
2009	0.49	0.84	1.35	2.39	4.77	5.49

Studies have cited 7 dwellings per acre as the minimum to support bus service and about 9 dwellings per acre to support rail. At best, our boroughs have a density of about 5.5 dwellings per acre.

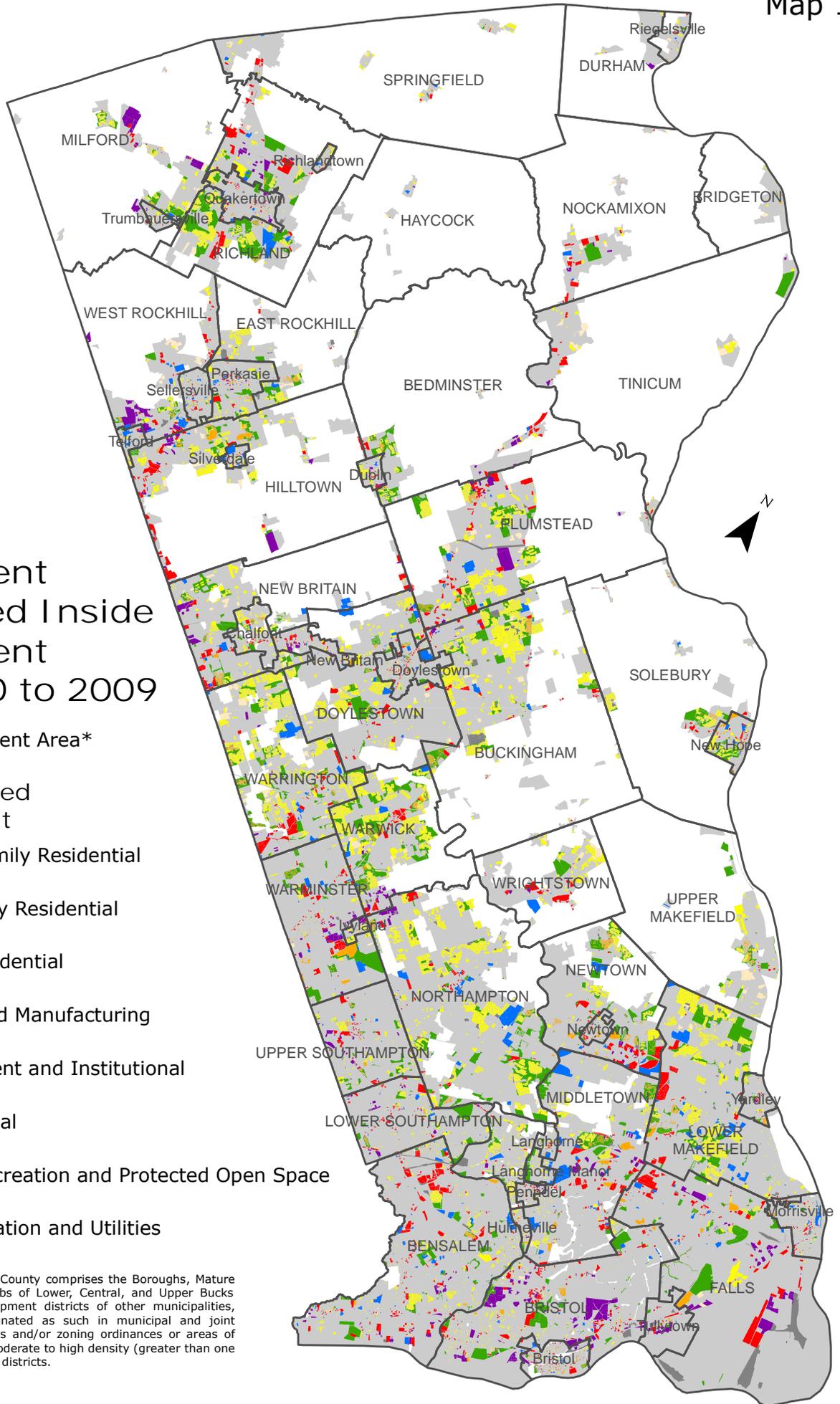
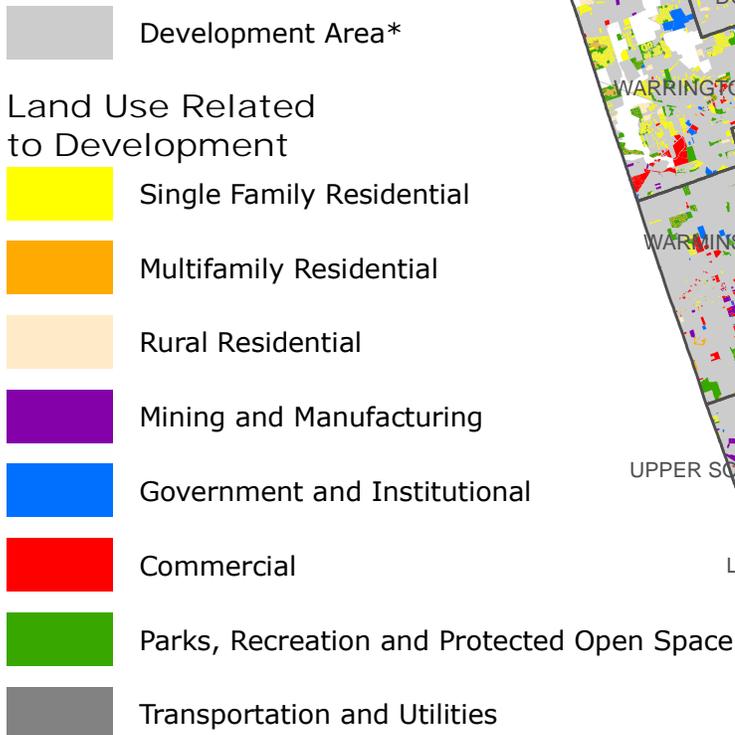
Higher densities in designated development areas can benefit communities in other ways:

- Higher-density development puts less stress on public services. Studies have shown that higher-density developments generate fewer school children per dwelling and cost less in providing public services, such as police and fire protection, schools, libraries, and trash removal.
- Higher-density development generates less traffic per dwelling than low-density development and can lower vehicle miles travelled by 38 percent.
- Higher-density development can serve all income groups, such as younger families just getting a start or older empty-nesters, looking for the service and entertainment opportunities that compact, mixed-use areas can offer.

***Transportation Options***

Land use and transportation planning is integrated to accommodate the automobile while providing increased transportation choices, such as mass transit, bicycles, and walking. Solutions to transportation needs are focused on enhancing the quality of life for transportation users, the community, and the surrounding environment.

# Development Constructed Inside Development Area, 1990 to 2009



\* The Development Area of the County comprises the Boroughs, Mature Suburbs and Emerging Suburbs of Lower, Central, and Upper Bucks municipalities and the development districts of other municipalities, which consist of areas designated as such in municipal and joint municipal comprehensive plans and/or zoning ordinances or areas of municipalities correlating to moderate to high density (greater than one dwelling unit per acre) zoning districts.

All forms of transportation are reliable, efficient and user-friendly, allowing full access by all segments of the population to housing, employment, education, and human and community services. A sprawling environment discriminates against the elderly, the young, and the poor. Compact, walkable areas improve access to jobs and services for those without a car because walking is the lowest cost form of personal transportation.

When residents were asked what they like least about Bucks County, as part of this Comprehensive Plan's resident survey, traffic congestion topped the list, and limited public transportation and not being able to walk were the fifth and sixth most popular responses; traffic congestion was the most popular response. Stakeholders attending the spring 2011 meetings emphasized the need to provide more non-motorized connections between neighborhoods and other community resources. These survey responses and stakeholder comments suggest that Bucks County residents recognize the limitations of the county's pattern of development and desire more alternatives to driving.

### ***Walkable Neighborhoods***

In a Smart Growth development strategy, land is developed or redeveloped specifically with the pedestrian in mind. Communities are designed in such a way that residents can walk to places that are important to them, such as schools, churches, public services, play sites, shopping and work. Services are located within an appropriate walking range of mixed uses and housing options.

Walkable communities are well known to Bucks County residents. Since the founding of the county's first communities, its villages and residential neighborhoods have been distinctly walkable. Communities such as Quakertown, Doylestown Borough, Newtown Borough, and Bristol Borough are among the county's most walkable. Studies have shown that walkable neighborhoods are less susceptible to price changes in the real estate market and are less costly to a family's transportation budget.

### ***A Mix of Uses***

By placing complementary land uses in close proximity to one another, alternatives to driving, such as walking or biking, become viable. Mixed-use development is development that incorporates residential, commercial, and institutional uses. Modern development typically provides a single use on a single parcel. Mixed-use development lessens impacts by promoting walking and minimizing the need for parking and provides a more diverse and sizable population and commercial base for supporting viable public transit. Mixed-use development also helps to establish a community identity by providing a contrast to the predominant single-use zoning.

A classic example of mixed use is the traditional storefront with apartments above. Apartment residents are able to make use of services offered by local commercial establishments without getting into a car.

### ***A Range of Housing Opportunities***

A range of housing options, such as houses of various sizes, townhouses, condominiums, granny flats, or affordable homes for low-income families, allow people to live, work, and eventually retire in the same community. Stakeholders attending the spring 2011 meetings emphasized the importance of neighborhoods, the need to provide a greater diversity of housing, and the desire to place employment

areas and housing in closer proximity so that residents spend less time commuting to and from their jobs.

Recent national surveys have shown that a growing number of people desire more flexibility in their housing choices. Demand has been shown for:

- Smaller, greener, and less costly housing.
- Walkable, infill, and transit-oriented housing.
- Rental housing and other alternatives to single-family detached homes.
- Universal design and other accessibility features to promote aging in place.
- Live-work units that revitalize downtowns and provide flexibility for artists, entrepreneurs, start-ups, and semi-retirees.

All of these housing options are in keeping with the principles of Smart Growth.

### ***Distinctive Communities with a Strong Sense of Place***

A sense of place results when the design of development protects and incorporates the distinctive character of a community and the particular place in which the development is located. Geography, natural features, climate, culture, historical resources, and ecology each contribute to the distinctive character of a region.

Communities with a sense of place are valued in a way that communities without a sense of place are not. Residents with strong ties to their local culture, history, and geography and the people of an area are much less likely to leave.

Bucks Countians are fiercely proud of their local roots and the unique features of their communities. When residents were asked what they like best about Bucks County as part of this Comprehensive Plan's resident survey, the top three responses were: farmland, rural character, and natural beauty; park and recreation facilities; and cultural and historic sites.

### ***Protection of Resources***

The protection of open space and natural areas both in and surrounding localities is an important characteristic of Smart Growth. Open space preservation supports Smart Growth goals by bolstering local economies, preserving critical environmental areas and natural heritage, improving our communities' quality of life, and guiding new growth into existing communities.

Resources to be protected include important community spaces, habitat for plants and animals, recreational opportunities, farmland, places of natural beauty, and water resources.

A recent Delaware Valley Regional Planning Commission/Greenspace Alliance study estimates that southeastern Pennsylvania's open space network adds \$240 million in annual property and tax revenues, due to the increased value of homes within a one-mile radius of open space. The study also estimates

open space in this region generates \$566 million in annual expenditures, 6,900 jobs, \$299 million in annual salaries, and \$30 million in annual state and local taxes.

### ***Community Collaboration/Public Process***

Appropriate citizen participation ensures that planning outcomes are equitable and based on collective decision-making. Community involvement provides the necessary “buy-in” among citizens for new initiatives and educates the public about the choices officials face when making decisions.

However, planning processes must involve comprehensive strategies that engage meaningful citizen participation and find common ground for decision-making. Convenient, well-advertised meetings and other forums were provided to allow citizens to feel included in the process.

### ***Transparent, Predictable, Cost-Effective Rules for Development***

A clear vision of what is desired by the community can translate into plans that are implemented with little controversy. Depending on the scale of the initiative, such a vision can take the form of comprehensive plans, neighborhood and area plans, or illustrated development guides.

Plans must be supplemented with clear design and construction standards and review processes. Transparent and predictable rules and processes serve to minimize misunderstandings and save developers both time and money. Communities should demand quality projects from developers but must also ensure a fair and timely process for project completion.

### **How Can We Make Smart Growth Happen Here?**

It isn’t enough for individual municipalities to implement the principles of Smart Growth on their own. Residents, municipal officials, and developers need a way of understanding how their community fits into the larger puzzle and what types of Smart Growth planning activities and initiatives they should be considering. Cross-border cooperation and coordination is critical because development impacts are regional. Cooperation does not diminish the role of individual municipalities to control local planning and make land use decisions.

Future Land Use planning offers a way of implementing Smart Growth locally, but with a county perspective. The following section, Future Land Use, will provide a definitive framework for coordinating and implementing local and regional planning, preservation, and development initiatives.

### ***Future Land Use***

The Future Land Use Plan map provides a framework for embodying the principles of Smart Growth in Bucks County and serves as a visual guide for implementing these principles. While the map is conceptual in nature, it is intended to provide a county-wide vision that can assist municipalities with implementing Smart Growth at the local level. The following discussion explains how the map was developed, how the map should be used and provides a description of the nine future land use categories and examples of land use that are anticipated. A table is also provided specifically describing smart growth strategies and actions for the identified future land use categories.

### ***Development of Future Land Use Map***

The Future Land Use map was developed using a process that was meant to be both methodical and objective. To that end the future land use map was developed by analyzing data from the county's Geographic Information System (GIS) including existing land use characteristics, natural resources, water and sewer infrastructure, and transportation infrastructure. Also taken into account were population and development trends, the various plans developed by the county, and the local planning and zoning of each Bucks County municipality.

In a step-by-step process, using the county's GIS data, layers were overlaid onto a map beginning with the existing land use data. The existing land use mapping was the most important factor in determining the boundaries of future land use since already developed lands will most likely remain in the same type of land use over the course of the planning period of this comprehensive plan. Nine future land use categories were identified in this process by analyzing the available data and incorporating the concepts of Smart Growth that are at the core of this plan.

### ***How to Use Future Land Use Map***

The Future Land Use map is meant to assist in the coordination and implementation of local and regional planning efforts. County and local officials should use the map as a guide to land use planning decisions such as rezoning and comprehensive planning. The future land use plan is not a site-specific land use plan, but is a generalized view of the types of land use that should be encouraged in the designated areas. Municipal officials should continue to take into account local planning and zoning and current conditions when implementing the vision set forth in the comprehensive plan.

A primary planning activity associated with the development of the map was an analysis of whether the areas of the county intended for more intense residential development would have sufficient capacity to absorb projected residential development. Appendix C Development Area Analysis contains a detailed analysis of both the potential demand and capacity for residential development to the year 2030. The analysis indicates that the overall development area of the county has sufficient developable land to absorb all residential development, including multifamily housing, projected up to 2030. The Development Area includes all Boroughs (whether designated as Town Centers or Secondary Centers), the Mature Suburban Areas, the Employment Areas of Bensalem, Bristol, Falls, Lower Makefield, Lower Southampton, Middletown, and Warminster townships, the Emerging Suburban Areas, and certain Secondary Centers. They coincide with areas of municipalities designated as such in municipal and joint municipal comprehensive plans and/or zoning ordinances or areas of municipalities which are intended to accommodate moderate to high density development.

In accordance with the Pennsylvania Municipalities Planning Code (MPC), the *Bucks County Comprehensive Plan*, along with the relevant municipal planning documents, will serve as the basis for the Bucks County Planning Commission's recommendations for its reviews of proposed development and sewage facilities.

### *Town Centers*

The Town Centers are comprised of the boroughs in the county that have historically served as regional centers, providing goods, services, and jobs for people throughout county. Each of these centers has a unique history, character, and sense of place. Town Centers comprise the boroughs of Bristol, Doylestown, Morrisville, Newtown, Quakertown, Perkasie, and Sellersville.

Town Centers are typified by a mix of higher-density residential uses, including multifamily buildings, twins, townhouses, and single-family detached homes on small lots. Town Centers will often have different housing types within the same neighborhood; however, in general, higher density residences, such as multifamily buildings and mixed-use residential buildings, will be located near or adjacent to core commercial areas and medium-density residential uses, such as townhouses and twins, will be located in districts outside of core areas.

Retail commercial land uses make up the core area of Town Centers and many times contain mixed-use buildings, with stores located at street level and apartments located on the second and third stories. Town Centers permit the efficient circulation of both motor vehicles and pedestrians, with the commercial core being much more pedestrian-oriented and human-scaled than a typical suburban center. Often these centers have a fine grain mix of office uses, cultural and entertainment uses, retail services, and public services.

A full range of infrastructure is available, including public water and sewerage. SEPTA regional rail service is available to many of the town centers. Regional and local public services, including hospitals, schools, social services, and libraries, are located within the Town Center or nearby.

The Town Centers are vital areas for development and redevelopment and will figure prominently in the implementation of the smart growth principles set forth in the Comprehensive Plan. Development and redevelopment within the Town Centers should continue to reinforce the key features of Smart Growth, including compact and efficient development, a mixture of uses, a variety of transportation options, walkable neighborhoods, distinctive communities with a strong sense of place, and a range of housing opportunities.

#### **Landmark Towns**

Landmark Towns of Bucks County is a regional revitalization initiative of four boroughs along the Delaware Canal and River—Bristol, Morrisville, New Hope and Yardley—that have traditional downtown business districts. The Landmark Towns project is designed to help these small towns breathe renewed economic life into their business districts, while preserving and enhancing the industrial and cultural heritage they share. All of these boroughs have exhibited the will and interest to improve their quality of life, preserve historic resources, and enhance economic conditions.

Since early 2006, representatives from each community have worked with the Delaware and Lehigh National Heritage Corridor, Inc., to develop and implement a regional revitalization strategy following the National Trust for Historic Preservation Four Point Main Street approach for downtown revitalization and the Pennsylvania State Heritage Park Program. This cooperative effort allows resources to be shared that would otherwise be unavailable to these small communities.

The Landmark Towns initiative is a complementary regional planning effort that reflects the Future Land Use plan and map of the *Bucks County Comprehensive Plan*.

### *Secondary Town Centers*

Secondary Town Centers are similar to Town Centers but do not have the full range of public services, infrastructure, or the mix or intensity of uses found in Town Centers. Secondary Town Centers include boroughs not identified as Town Centers and certain villages that serve as nodes of commercial activity along key transportation routes. Secondary Town Centers function as focal points for smaller market areas. The boroughs of Dublin, Hulmeville, Ivyland, Langhorne, Langhorne Manor, New Britain, Penn del, Richlandtown, Riegelsville, Silverdale, Telford, Trumbauersville, Tullytown, and Yardley have been identified as Secondary Town Centers, as well as the villages of Croydon, Jamison, Richboro, and Southampton.

Many Secondary Town Centers lack the physical integrity of older structures that is found in most Town Centers. That is, the core area was never fully developed or maintained at the densities necessary to support the level of activity and infrastructure investment (such as public transit) that is present in Town Centers. While most Secondary Town Centers contain (or once contained) elements of traditional towns (e.g., walkable neighborhoods and downtowns), over the years commercial areas have been developed into land uses that are much more auto-oriented, such as gas stations, fast-food restaurants, or strip shopping centers. Other Secondary Town Centers, like Hulmeville, Langhorne, Langhorne Manor, Penn del, Tullytown, and Yardley, have essentially been swallowed up by suburban and exurban development to a point that their distinct identity has been compromised.

Nonresidential uses in Secondary Town Centers include office, commercial, and some institutional uses. Some mixed-use buildings are found in commercial core areas. Single-family attached and detached dwellings are prevalent, with some multifamily dwellings located adjacent to the core area. Older residential areas are laid out in a traditional style with a gridlike street pattern, smaller lots, and shorter setbacks. Newer homes are developed in a suburban style with curvilinear streets, culs-de-sac, bigger lots, and larger setbacks.

Secondary Town Centers are oriented primarily to automobile circulation. Pedestrian access to and within commercial areas is sporadic, with areas of incomplete sidewalks or unsafe pedestrian conditions. Public services are found in the area but are at a smaller scale and are more likely to be local branches of institutional uses (e.g., post offices or libraries).

Given the key location of Secondary Town Centers and that there are services and available infrastructure, these areas will, just like the Town Centers, serve as focal points for revitalization in accordance with Smart Growth principles. Development techniques, such as Transit Oriented Development and Traditional Neighborhood Developments, will be especially important in the Secondary Town Center areas.

### *Mature Suburban Areas*

Mature Suburban Areas are medium density areas with mostly single-family residential development. Located in the lower end of the county, these communities were planned and developed during the period immediately following World War II. Mature suburban areas are mostly built-out and have had limited population growth in the last 30 years and, in some cases, a loss of population. Despite the

stagnation in population growth Mature Suburban Areas remain very important to the county because of the large number of residents and the extent of infrastructure and public services within these areas.

Infrastructure is highly developed within the Mature Suburban Areas, including highways, public transit, utilities, and public services. However, given the age of much of the infrastructure and other factors there are problems of maintenance that are becoming increasingly evident. Aging infrastructure includes not only roads, water, stormwater and sewer systems, but public services, such as schools as well. Public transit, while available, is not efficient due to lower densities. Infrastructure issues are exacerbated due to the fact that the communities are more spread out than Town Centers or Secondary Centers and thus require greater expense for maintenance and repair.

Because these areas are close to build-out and have a limited amount of vacant land, redevelopment and revitalization of underutilized land will be the primary driver of growth. Redevelopment and revitalization opportunities are scattered throughout the Mature Suburban Area, such as Transit Oriented Development near existing transit centers. The Delaware River waterfront is one concentrated area of potential redevelopment and will be important to redevelopment efforts in the region.

The long-term survival and success of the communities within the Mature Suburban Areas will be tied to both repairing and enhancing infrastructure, redevelopment and revitalization of underutilized lands, and effective neighborhood planning to avoid the potential problems of decline and disinvestment in residential areas.

**Bucks County Waterfront Revitalization Plan**

The *Bucks County Waterfront Revitalization Plan* was completed in 2005 and provides a vision for the entire Lower Bucks County Delaware Waterfront. The plan encompasses portions of Bensalem, Bristol, and Falls townships and Bristol, Morrisville and Tullytown Boroughs. Officials from the aforementioned municipalities and Bucks County and the Redevelopment Authority of Bucks County participated in the development of the plan. Within the plan are six primary opportunity areas which are key areas that are re-considered priority and catalytic redevelopment and enhancement projects for each municipality. The plan describes each Opportunity Area and provides a vision for future land use:

- The plan envisions the Bensalem Township Opportunity Area as a waterfront development of mixed-use residential development located between State Road and the waterfront. Mixed-use office and commercial units would be built along State Road and a marina would be a focal point of the development.
- The Bristol Township Opportunity Area is comprised of land owned by the Dow Chemical Company and would involve the development of high-quality space for office, flex, commercial, and residential development along the waterfront. Public open space would be provided along the river.
- The Bristol Borough Opportunity Area focuses on improving access to the Borough from the river and enhancing the borough's built environment to capture additional economic development and visitation. Efforts would include adaptive re-use, redevelopment, and revitalization on Mill Street, adaptive re-use of the Grundy Mill Complex and nearby structures, and continued redevelopment in the Riverfront North area.
- The Tullytown Borough Opportunity Area's redevelopment would focus on adaptive reuse of existing structures along Main Street that would include a mix of residential, office and retail uses. Also envisioned is additional low-density residential development on the south side of Main Street. Improvements to the waterfront at Franklin Cove would include a public park and marina and natural corridor restoration to Martins Creek.
- The Falls Township/Morrisville Borough Opportunity Area envisions the development of a new SEPTA station in the borough along with a complimentary transit-oriented development and redevelopment of the Delaware River shoreline in both the township and borough to include public water access and mixed-use development.

### *Emerging Suburban Areas*

Emerging Suburban Areas are those areas with both planned and available public infrastructure and services intended for future development by municipalities. These areas were identified by mapping the development districts established by municipalities through their comprehensive planning and zoning efforts. The boundaries of the Emerging Suburban Areas are also areas within the county with significant population gains over the last 20 years.

Within the county these areas are the most susceptible to change due to the potential for population increases and the availability of public infrastructure. It is in these areas that that the mixed use, Smart Growth development types should be implemented. For example, the location of new public facilities should be steered towards underutilized sites (e.g., brownfields and grayfields), new development should be compact and built where existing infrastructure is adequate, and all development should be designed with the pedestrian in mind. Future development may include residential, nonresidential, and a mixed uses as part of planned developments.

### *Employment Areas*

Employment Areas are areas where primarily nonresidential growth (commercial, industrial, and office development) has and will continue to occur along, or in close proximity to, arterial corridors having access to the regional transportation network (i.e., rail, interstate highways, and ports). These areas are often characterized by single use and land intensive development.

Within Employment Areas both residential and nonresidential development is expected and appropriate. The introduction of medium- to high-density residential uses within mixed-use developments is desirable in order to better link jobs and housing. To this end, live-work opportunities within mixed-use development should be encouraged. Nonresidential development should be undertaken in a planned and coordinated way. The creation of “campus-type” office, business and industrial parks with unified building design is desirable in these areas. Commercial development should be undertaken with an emphasis on access control, streetscape appearance, pedestrian travel and safety.

### *Rural Centers*

Rural Centers are the commercial villages in the county that are adjacent to or within areas that have been identified as Rural Resource or Natural Resource/Conservation Areas. Anchor, Buckingham Village, Furlong, Lahaska, Ottsville, Pipersville, Plumsteadville, Springtown, and Washington’s Crossing have been identified as Rural Centers. These centers serve even smaller market areas than the Secondary Town Centers and are typically located on arterial roads. Rural centers have a concentration of commercial uses but have fewer, if any, public services and less infrastructure than a Secondary Town Center. These centers have a land use pattern that is more auto-dependent than both Town Centers and Secondary Centers and typically lack sidewalks. Gas stations, convenience stores, and strip shopping centers are commonly found in Rural Centers. However, Rural Centers maintain some integrity as a village, with many older buildings set close to the road.

New development and infill development should continue with village-style development that is compact and pedestrian-oriented. Especially important in Rural Centers is the concept of traffic calming

on the higher order roads that pass through the Rural Centers in order to foster a more pedestrian-friendly community. Development and redevelopment within these centers should be focused toward serving local needs rather than regional needs.

### ***Rural Resource Area***

Rural Resource Areas primarily contain rural residential and agricultural uses, but may include limited residential and nonresidential uses. Rural Resource Areas include active farms, significant agricultural soils, and other natural resource areas of economic value (e.g., mineral and timber areas). These areas were identified by mapping agricultural land uses, agricultural soils of statewide importance, woodlands, quarries, and rural residential land use (i.e., single-family residential uses on lots greater than 5 acres). The Rural Resource Areas are located outside of the Emerging Suburban Areas and Town Centers, Secondary Town Centers, and Rural Centers. Infrastructure is not fully developed in these areas and is not expected to expand into these areas, making significant development unlikely.

Care should be taken to preserve the rural character of these areas, as they are an important part of what makes Bucks County a desirable place to live and visit. To achieve this purpose the preservation of farmland should be targeted in this area through both the traditional means of preservation (e.g., land trust organizations or the Bucks County Agricultural Land Preservation Program) and through municipal Transfer of Development Rights programs. The pattern of low density residential uses should be continued but with incentives for the development of conservation style housing where appropriate.

### ***Natural Resource/Conservation Areas***

Natural Resource/Conservation Areas include areas of greenway corridors, recreation areas, and conservation landscapes identified in the Natural Areas Inventory of Bucks County, 2011. These features are essential to the image of the county and its quality of life. Indeed, as part of the Bucks County Comprehensive Plan survey, Bucks County residents identified preserving open space, resource areas and agricultural lands as their third and fourth most important issues.

Natural Resource/Conservation Areas serve as an overlay to all other future land use areas, emphasizing their importance in future land use planning. These areas remain largely undeveloped due to the presence of protected natural resources. The Natural Resource/Conservation Areas may also include underlying Rural Resource Areas which will continue to be used as agricultural, forestry, mineral extraction, rural residential uses, and, to a lesser extent, nonresidential use.

The greenway corridors included in the Natural Resource/Conservation Areas are those identified in the *Bucks County Open Space and Greenways Plan* (2011) and follow the higher order streams, creeks, and rivers of the county. The recreation areas included are state, local, and county lands that are used for a variety of recreation purposes.

The conservation landscapes portion of the Natural Resource/Conservation Areas encompasses large portions of some upper Bucks municipalities, so it should be understood that some land use other than conservation use will take place in these areas. The Atlantic Coastal Plain conservation landscape as depicted in the 2011 Natural Areas Inventory encompasses a large portion of the Lower Bucks area in

order to capture the many small, but important coastal resources found throughout this region. Because depicting this entire conservation landscape on the Future Land Use map would obscure significant areas of important future land use, it is not shown as part of the Natural Resource/Conservation Areas. Included on the map, however, are sites of significant natural value in the Atlantic Coastal Plan Landscape that were identified as priorities in the *1999 Natural Areas Inventory*.

### ***Unique Land Uses***

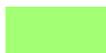
Unique Land Uses are those uses which have countywide significance, including airports, quarries, and landfills. These uses serve important needs within the county but often come with undesirable impacts on the immediate area. In the event that one of these uses ceases operation, redevelopment of the site should be undertaken in keeping with the character of the area. Unique Land Uses are too small to be shown on the Future land use Plan map and will be assumed to continue in their current use.

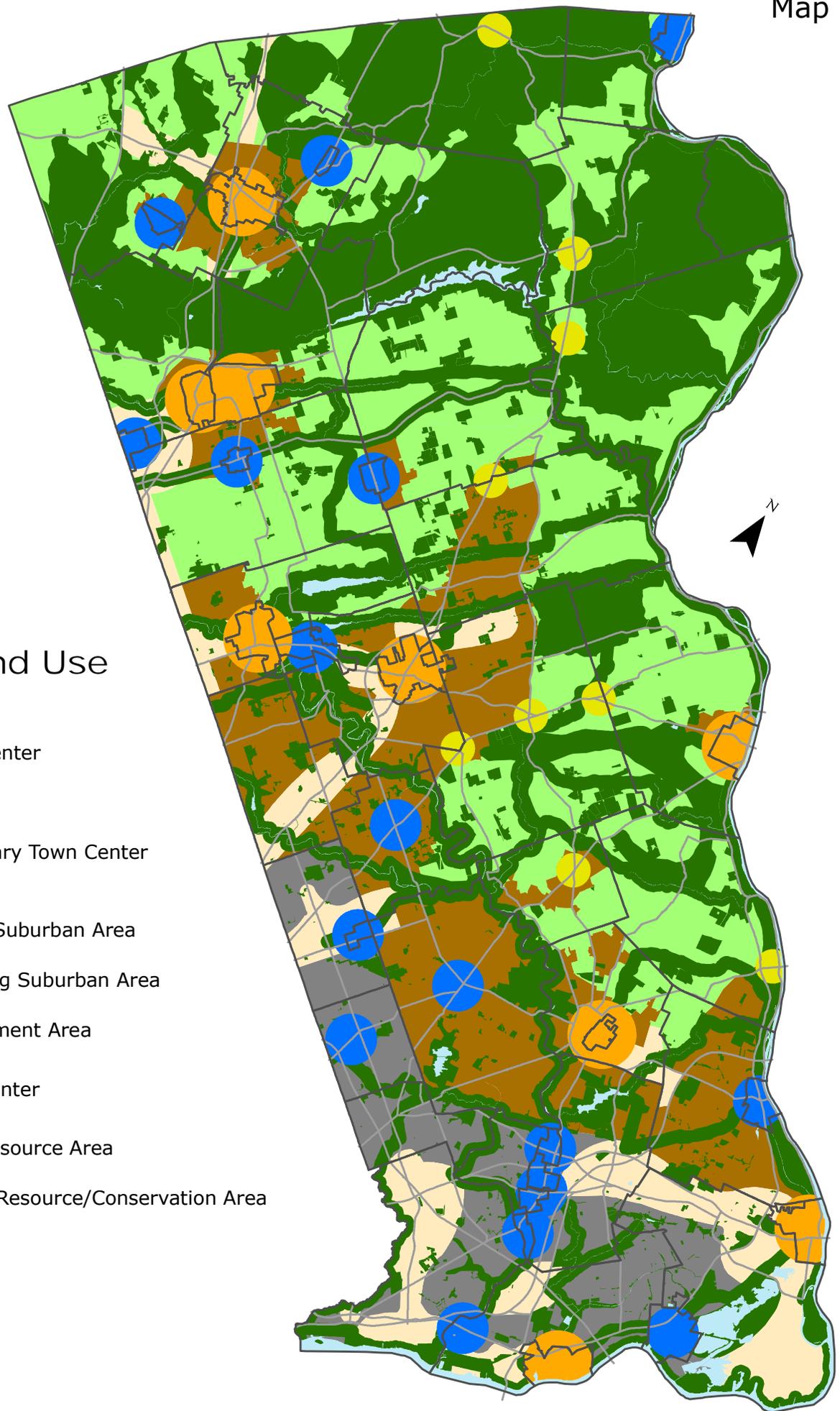
## **Strategies and Actions**

### **Planning for Smart Growth**

The following table lists strategies and actions by Smart Growth principle for the Future Land Use categories identified on the Future Land Use map. Each strategy and action recommended for an area or areas of implementation is shown by using a check mark. While by no means is this list exhaustive, it is intended to complement the Future Land Use categories shown on the map and described above to detail the type and characteristics of development and preservation that are necessary to fully implement Smart Growth as a land use planning strategy.

### Future Land Use

-  Town Center
-  Secondary Town Center
-  Mature Suburban Area
-  Emerging Suburban Area
-  Employment Area
-  Rural Center
-  Rural Resource Area
-  Natural Resource/Conservation Area



Strategy/Action	Area of Implementation								
	TC	STC	RC	EA	MSA	ESA	RRA	NRA	BC
<b>Compact, Efficient Development</b>									
Ensure development intensities are matched to the appropriate development area. Higher density development should be located in town center and secondary areas. Medium density development should be located in suburban and employment areas. Low-density development should be permitted in all other areas.									✓
Review zoning ordinance minimum lot sizes and setbacks for all land uses. Reduce lot sizes and setbacks to allow greater efficiency of land use where appropriate.									✓
Reduce off-street parking; use parking management strategies to make efficient use of parking supply. Limit the impact of off-street parking areas by providing screening and planted islands and by placing parking lots to the rear and sides of buildings.	✓	✓	✓	✓	✓	✓			
<b>A Development Focus on Existing Communities</b>									
Concentrate development into designated development areas where existing roadways, sewerage systems, and water supply systems have sufficient capacity to serve future growth.	✓	✓		✓	✓	✓			
Develop a list of key infill and redevelopment sites, including brownfields, greyfields, and underutilized land, and prioritize for development and redevelopment.	✓	✓		✓	✓				
Build public facilities (such as schools, municipal buildings, and civic buildings) on brownfield, greyfield, or other underutilized sites instead of greenfield sites.	✓	✓			✓	✓			
Develop Transferable Development Rights (TDR) programs to preserve farmland and natural areas in outlying areas and concentrate development in developed areas.						✓	✓	✓	
<b>A Mix of Uses</b>									
Provide for a mix of commercial, civic, and high-density residential uses. Ensure commercial and residential uses are permitted to be integrated into the same building.	✓	✓		✓	✓	✓			
Explore opportunities for mixed-use traditional neighborhood developments and live-work units at key infill sites.	✓	✓		✓	✓	✓			

TC – Town Center  
 STC – Secondary Center  
 RC – Rural Center

EA – Employment Area  
 MSA – Mature Suburban Area  
 ESA – Emerging Suburban Area

RRA – Rural Resource Area  
 NRA – Natural Resource Area

BC – All areas of Bucks County

Strategy/Action	Area of Implementation								
	TC	STC	RC	EA	MSA	ESA	RRA	NRA	BC
<b>Transportation Options</b>									
Create new transit centers at appropriate areas by supporting Transit Oriented Development (TOD) and Transit Revitalization Investment Districts (TRID). Ensure a sufficient density of walkable residential area is provided for.	✓	✓		✓	✓	✓			
<b>Walkable Neighborhoods</b>									
Plan for the pedestrian first:									
<ul style="list-style-type: none"> <li>Concentrate community services near homes, jobs, and transit (through zoning and public facilities planning) such as grocery stores, community and education facilities, child care, health clinics, job centers, places of worship, police and fire stations, and parks.</li> </ul>	✓	✓		✓	✓	✓			
<ul style="list-style-type: none"> <li>Provide a sufficient density of housing and employment (and intensity of activities) at key locations to support transit and walking. Ensure lot size, setback, and building height requirements allow a continuous fabric of buildings and amenities.</li> </ul>	✓	✓	✓	✓	✓	✓			
<ul style="list-style-type: none"> <li>Ensure developments are designed to encourage pedestrian travel and safety. Provide pedestrian amenities such as street trees, crosswalks, signage, bike racks, and street furniture. Provide a connected and continuous network among residential areas, parks, schools, and civic and commercial districts.</li> </ul>	✓	✓	✓	✓	✓	✓			
<ul style="list-style-type: none"> <li>Provide buildings with a street and sidewalk orientation, with front facades facing public space but not parking areas.</li> </ul>									✓
<ul style="list-style-type: none"> <li>Develop a pedestrian master plan to provide the community with the basic elements of a safe and convenient pedestrian circulation system.</li> </ul>	✓	✓	✓		✓	✓			
<ul style="list-style-type: none"> <li>Develop ordinances and funding streams to repair and construct sidewalks. Enforce sidewalk requirements of the subdivision and land development ordinance.</li> </ul>	✓	✓	✓	✓	✓	✓			
<b>A Range of Housing Opportunities</b>									
Review and revise zoning and subdivision ordinances as necessary to promote housing choice. Consider factors such as affordability, fair housing standards, disability rights, appropriate location, need for support services and the provision of housing types.									✓

TC – Town Center

EA – Employment Area

RRA – Rural Resource Area

BC – All areas of Bucks County

STC – Secondary Center

MSA – Mature Suburban Area

NRA – Natural Resource Area

RC – Rural Center

ESA – Emerging Suburban Area

Strategy/Action	Area of Implementation								
	TC	STC	RC	EA	MSA	ESA	RRA	NRA	BC
<b>Distinctive Communities with a Strong Sense of Place</b>									
Protect and enhance the historic character and physical integrity of the community by preserving older buildings through historic preservation activities.	✓	✓	✓		✓	✓	✓	✓	
Participate in "Main Street" planning activities by providing streetscape improvements to the downtown, encouraging good store design, and developing economic development, organization, and promotion activities.	✓	✓							
Develop neighborhood plans to target opportunities to improve the quality of life in specific, identifiable areas of the community.	✓	✓			✓				
Provide an illustrated development guide or ordinance for key development and redevelopment areas and include clear, community-based development objectives.	✓	✓		✓	✓	✓			
Engage in corridor planning activities. Coordinate the appearance of signage, landscaping, and streetscaping. Concentrate commercial zoning into nodes instead of strips to permit more efficient vehicular and pedestrian circulation patterns.				✓	✓	✓			
<b>Protection of Resources</b>									
Recognize agriculture as a legitimate land use. Provide agricultural zoning in farmland areas to limit the development of important agricultural soils. Preserve contiguous farmland to assure that agriculture remains a viable and permanent land use.						✓	✓	✓	
Protect sensitive natural resources by enforcing natural resource protection standards and stormwater best management practices.									✓
Encourage the use of low-impact development techniques, and conservation design.							✓	✓	
Secure parkland along key stream corridors including the Delaware River and Neshaminy Creek to provide recreational opportunities including trails and water access.									✓
Preserve open space and greenway corridors in accordance with local plans, but in the context of the regional open space network.									✓
Encourage planning, site design, and building construction practices that promote energy conservation.									✓

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Strategy/Action	Area of Implementation								
	TC	STC	RC	EA	MSA	ESA	RRA	NRA	BC
<b>Community Collaboration/Public Process</b>									
Ensure municipal comprehensive plan is in keeping with the recommendations and land use policy of the county and surrounding municipalities. Perform a self-audit to ensure local policy implements smart growth policies in appropriate areas.									✓
Participate in multi-municipal planning efforts with neighboring municipalities to achieve consistent and effective smart growth planning and resource protection.									✓
Implement the recommendations and program objectives of important revitalization efforts, including the Bucks County Waterfront Revitalization Plan and Landmark Towns of Bucks County.	✓	✓		✓	✓				
Develop concrete quantitative and qualitative descriptions that can be used to identify development of regional significance and impact that meet the general definition established by the State (any land use that, because of its character, magnitude, or location will have substantial effect upon the health, safety, or welfare of the citizens in more than one municipality).									✓
Review and comment on development proposals in a municipality that would have significant impacts on other municipalities or State or regional resources or facilities and assess remedies to mitigate the impacts.									✓
Review and comment on development proposals in other Counties that would have significant impacts on Bucks County's resources or facilities and assess remedies to mitigate the impacts.									✓
<b>Transparent, Predictable, Cost-Effective Rules for Development</b>									
Ensure development review and approval process is open and timely. Encourage pre-application meetings between the applicant and municipal officials, site inspections, and the submission of sketch plans. To encourage this process, agree not to change the zoning ordinance to adversely affect the density permitted on the site for a specified period of time.									✓

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# PLAN IMPLEMENTATION

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Comprehensive planning sets the stage for smart growth and sustainable development. Without plan implementation, the most thoughtful planning will not reach its full potential, falling short of achieving the plan’s vision and principles set by community leaders and citizens. For this reason, plan implementation—the activities taken to carry out the strategies and actions expressed in this comprehensive plan—is a component of plan development. The four implementation components of this plan include: role of stakeholders, priorities for actions, plan monitoring, and supplemental products.

### **Role of Stakeholders**

Stakeholders in this planning process include public sector (elected and appointed officials), development community, private/nonprofit organizations, and the general public. Each stakeholder has responsibility for decisions and actions, and all stakeholders need to work together to achieve the sustainability and prosperity for Bucks County.

#### ***Public Sector***

The public sector includes agencies and organizations at all levels of government (federal, state, county, and local) including county and local planning commissions and boards as well as regional planning agencies (Delaware Valley Regional Planning Commission). Federal and state governments set policies and priorities and establish mandates that affect the county. Federal agencies include Environmental Protection Agency (EPA), U.S. Army Corps of Engineers, Department of Housing and Urban Development (HUD), and state agencies include Department of Environmental Protection (PaDEP), Department of Community and Economic Development (DCED), Department of Conservation and Natural Resources (DCNR). Other public sector stakeholders include water and sewer authorities, school districts, and special-purpose boards and commissions.

County planning commissions serve as advisory bodies in Pennsylvania, providing comments on proposed developments, on local plans and ordinances, and planning assistance to local governments. The Bucks County Planning Commission (BCPC) will continue providing assistance to local governments in planning and zoning issues and will work with stakeholders to guide its successful implementation.

Municipalities are empowered by the Pennsylvania Municipalities Planning Code to make land use and zoning decisions, directly affecting the built environment and livability of communities. Municipalities can influence land use and development by utilizing planning tools (up-to-date comprehensive plan, ordinances, and other regulations that are consistent with the comprehensive plan) and trained decision-makers (elected or appointed officials) who carefully consider and understand the impacts of land use decisions.

#### ***Development Community***

Developers, architects, landscape architects, realtors, financial institutions, and others that are involved in development from the private sector comprise the development community stakeholders. Much of the built environment in Bucks County is the product of incremental decisions made at individual sites

over many years. Private enterprise drives this system, but it is shaped by local government land use controls, such as zoning, as well as a complex mix of policies at other levels of government.

### ***Private/Nonprofits Organizations***

Philanthropic organizations, civic organizations, community-based nonprofits, advocacy groups, and some types of membership organizations can play a contributory role in this plan's implementation. They make recommendations, advocate for legislative changes, and push the public sector toward better decision-making. Nongovernmental groups are active at a variety of levels, from those that cover the entire region to those that focus their efforts in a single community or neighborhood.

### ***General Public***

Residents and business owners can take localized actions, form coalitions, or provide broad-based support for elected officials implementing the vision and principles emphasized in this plan. These individuals can affect the success of this plan through personal and household decisions that affect the level of involvement in their own community, water and energy use, or personal transportation and food choices. Business decisions can have even larger repercussions on the environment and transportation.

### **Priorities for Action**

Each component of this plan puts forth strategies and actions designed to put into action this plan's Principles, with the ultimate goal of realizing the plan vision. Implementation in a planning context is putting it all together to carry out the recommendations of a comprehensive plan.

New initiatives and good ideas—which could make a real difference—can go to waste unless there is a common-sense understanding of their importance and buy-in from stakeholders. To provide a starting point, the strategies and actions of this plan were distilled into a simple list of priorities, which are both easy to understand and publicize. The priorities for actions are divided into two short lists—top overall plan actions, which include all stakeholders as actors and facilitators, and top county actions, which include the county as the main actor or facilitator.

### ***Top Overall Plan Actions***

Throughout the components of this plan, there are many common ideas and recommendations—the need to preserve resources, to make smarter infrastructure investment choices, and to increase economic opportunity. The following list of top plan actions embodies the policies of smart growth, resource preservation, and sound economic development planning to provide a simple, yet clear direction for Bucks County. There are no single answers or perfect solutions to reaching long-term goals. These actions strive to meet multiple goals while minimizing competing objectives.

### ***Reduce Our Vehicle Miles Traveled***

(Guiding Principles—Enhance Transportation Mobility; Promote Energy Conservation and Efficiency; Promote Economic Opportunity; Housing Diversity; and Efficient Land Use)

Vehicle Miles Traveled (VMT) is the total number of miles driven by all vehicles within a given time period and geographic area. VMT is influenced by factors such as population, age distribution, the

number of vehicles per household, and the distances people have to travel to get to work, school, or shopping. Increases in vehicle miles traveled means greater reliance on fossil fuels, increased traffic congestion, greater wear on transportation infrastructure, increased air pollution and greenhouse gas emissions, and sprawling development patterns. To account for increases in population, it is helpful to measure VMT per capita to provide a fair comparison for different time periods or geographic areas.

To effectively reduce VMT per capita, we must continue our efforts to integrate land use and transportation planning. We should design transportation improvements in the context of the project area and design for all users of the system, including bicyclists and pedestrians. Transit investments are as important as investments in road and highway infrastructure. Sufficient densities at key transportation nodes are necessary to implement transit-oriented development, mixed-use development, and traditional neighborhood development, and to achieve viable transit and a good pedestrian circulation system.

### ***Expand Our Open Space Preservation Efforts***

(Guiding Principles—Protect Natural, Historic, and Scenic Resources; Preserve and Expand Parks, Open Space, and Farmland; Mitigate Hazards to Life and Property)

No other public policy has captured the hearts and minds of Bucks County residents more than open space preservation. Local, county, and state preservation funding has successfully preserved more than 22,000 acres of farmland, parkland, and natural resource areas. Open space preservation has done more than preserve the county’s agricultural, natural, and scenic heritage. It has been an effective tool in slowing sprawl development and has provided economic benefits to our communities. The county is four years into its second 10-year open space preservation program, both supported overwhelmingly by Bucks County voters. The county is committed to continuing preservation of farmland, parkland, and natural areas in accordance with the guiding principles of the open space and agricultural land preservation programs.

Looking forward, we should expand on our successful efforts by connecting existing preserved open space properties with newly preserved land and developing multi-municipal greenway and trail networks that would serve both recreational development and natural resource protection efforts. The preservation of agricultural, historical, and scenic resources should also remain top preservation priorities; many resources remain unprotected and will be lost forever should we not continue to act on our opportunities.

### ***Promote Comprehensive Water Resources Management and Planning***

(Guiding Principles—Protect Water Resources and Reduce Waste; Protect Natural, Historic, and Scenic Resources; Mitigate Hazards to Life and Property)

Water is used every day for a large number of tasks including recreation, drinking water, waste disposal, and food production.

To help meet the future demand for water, county water resources planning should address water quantity, water quality and ecological issues and consider all water resources including groundwater,

surface water, wastewater, and stormwater. An integrated approach requires management of water resources in a way that ensures long-term sustainable availability for present and future generations. Comprehensive water resources planning ties together the issues, plans, studies, and regulations relative to water and relates water resources to land use, growth, environmental resources, utility expansion, health, and safety.

### *Increase Housing Opportunities in Development Areas*

(Guiding Principles—Promote Economic Opportunity, Housing Diversity, and Efficient Land Use)

Preserving our heritage must not come at the expense of providing quality housing opportunities for those looking to move within or make a new start in Bucks County. When properly designed and located, new housing contributes to the local economy, provides greater density necessary for efficient transportation, keeps housing prices stable, allows people to live closer to employment opportunities, and increases the efficiency of public services and infrastructure.

To increase such opportunities, we need to strengthen our efforts to place mixed use development, multifamily housing options, redevelopment, infill development, and transit connectivity in designated development areas. We must consider housing types that meet the needs of the older generation, including active-adult housing, retirement homes, long-term care facilities, and accessory apartments, to retain the growing number of older residents who may wish to downsize in their home communities. By locating housing in areas of jobs, transit, and services, residents gain greater mobility and access to their needs, making housing more affordable and viable.

### *Create Walkable Communities*

(Guiding Principles—Promote Economic Opportunity, Housing Diversity, and Efficient Land Use; Enhance Transportation Mobility; Preserve and Expand Parks, Open Space, and Farmland; Provide Adequate Community Facilities)

Walkability is an important component of liveable communities. Some of the most desirable neighborhoods and communities in Bucks County are also the most walkable, defined by narrow, tree-lined streets, sidewalk cafes, parks, and comfortable, well-built housing. Walkable neighborhoods are less susceptible to price changes in the real estate market and are less costly to a family's transportation budget. Walkability means mobility and connectivity for the old, the young, the poor and anyone who doesn't want to deal with the hassle and cost of owning a car.

We need to continue to improve the county's walkability by planning for the pedestrian rather than just the motor vehicle. Complementary uses should be located near each other, and a sufficient density of housing and employment should be permitted to support transit and walking. Communities should eliminate barriers to walking by making streets safer, ensuring connectivity between adjacent uses, and reducing unnecessary setbacks and lot size requirements. Our schools and important community institutions should be located within walking distance of residential neighborhoods. We should also continue our efforts to create new connections between communities by developing new trail connections and acquiring easements for greenway corridors.

### ***Expand Business and Job Opportunities***

(Guiding Principles—Promote Economic Opportunity, Housing Diversity, and Efficient Land Use; Preserve Agricultural Farmland; Protect Natural, Historic, and Scenic Resources)

Economic Development is the process of improving the community’s well-being through job creation, business and income growth, as well as through enhancements to the community that improve quality of life and strengthen the economy.

The current and future success of the county is dependent on finding the right balance of economic growth with the other traditionally strong aspects of life in the county. These include: quality schools and colleges, open space for recreation and sprawl mitigation, farming heritage, cultural venues, high quality housing stock, mix of housing, and the proximity of other centers of employment.

Bucks County has many advantages, including its quality of life, educated labor force, and location, that make it a good place for business growth. Competing in a world economy for businesses and jobs requires the engagement of many partners—public and private, regional and local—who can work together to attract new businesses and to encourage expansion of businesses already here.

Economic development needs to reflect community characteristics, such as protecting the rich natural and historic character of the county, the location and capacity of infrastructure, and the availability and housing of the workforce. It is one of the important building blocks of the comprehensive plan, connected to other priorities for implementation because the economic future depends on other plan components: focusing growth in areas with good transportation and infrastructure; attracting young people to Bucks County with a diverse housing market and good communities; and preserving the character of the county and its resources. The guiding principles for economic development are:

- Target areas for development and areas for preservation. Guide development toward older suburbs, town centers, areas with existing buildings, brownfield sites, areas with existing infrastructure, transportation, and housing, and the Delaware riverfront.
- Target industry clusters we want to nurture and attract. Knowledge-based businesses, green jobs, and biotechnology are key industries where Bucks has a foothold and can grow. Use existing industries as magnets for others. Anticipate the need for ancillary services to support industries.
- Continue all programs that enhance quality of life in Bucks County, including open space and environmental protection, fostering arts and culture, and protecting quaint small towns.

### ***Top County Actions***

Several plan strategies and actions fall within the jurisdiction of Bucks County government for implementation. These county actions were compiled and grouped into three categories: county plans/studies, municipal planning assistance, and model ordinance development (as shown in the boxes below). While these actions have been categorized, neither the individual listings nor the category listings are in order of priority. Time and resources may dictate if and when individual actions are undertaken in the future.

## PLAN IMPLEMENTATION

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The following is a listing of potential plans, studies, or reports that may be produced either by the county independently or with the county's assistance in cooperation with other organizations and/or agencies.

### **County Plans/Studies**

- Key Industries Study (important industries the County should nurture and attract)
- Critical Transportation Corridor Management Plan
- Infill and Redevelopment Site Assessment
- Economic Development Study
- Countywide Stormwater Management Plan
- Drought Protection and Emergency Water Supply Plan
- Housing Opportunities Study
- Regional Agricultural Areas Preservation Assessment
- Agricultural and Farm Support Services Inventory
- Historic Preservation Resources Inventory
- Organic Waste Management Study (diversion & alternative use)
- County Branding and Marketing Study
- County Space Needs Assessment
- Developments of Regional Significance and Impact Assessment

The county will continue its ongoing actions to assist local communities with their planning efforts, including funding options, project management, and project consultation. The county will work with communities to fulfill their specific planning and zoning needs upon request. The types of plans and products that the county could provide assistance include the following:

### **Municipal Planning Assistance**

- Municipal and Joint Comprehensive Plan, Zoning Ordinance, and Subdivision and Land Development Ordinance Updates
- Water Resources Planning
- Jobs and Business Growth Study
- Downtown/"Main Street" Plans (strategies for streetscape improvements, good store design, and economic development, organization, and promotion activities)
- Corridor Plans (strategies to address transportation issues and coordinate signage, landscaping, and streetscaping)
- Illustrated Development Guides/Standards for Key Development and Redevelopment Areas
- Access Management and Traffic Calming Plans
- Municipal Park & Recreation and Open Space Plans
- Source Water Protection Plans
- Wastewater Facility (Act 537) Plan Updates
- Neighborhood Plans (targeting opportunities to improve the quality of life)
- Greenway Corridor Feasibility Plans
- Transfer of Development Rights Programs
- Groundwater Studies
- Pedestrian and Bicycle Master Plans
- Critical Facilities/Infrastructure Action Plans (strategies to reduce potential damage and loss of function)
- Critical Habitat Studies (strategies to increase habitat connectivity, reduce habitat fragmentation, and enhanced habitat islands)
- Scenic Resource Studies (establishing specific criteria)
- Recycling Assessments (strategies for increasing recycling)

The county can provide additional guidance to municipalities by preparing model ordinance language for specific planning standards and criteria. Bucks County Planning Commission has prepared model ordinances on various planning topics including: village planning; natural resource protection standards; traffic impact studies; swimming pools; on-lot disposal systems management; and cellular telecommunication facilities. The types of ordinance language that the county could develop beyond those already provided include:

**Model Ordinance Development**

- Mixed-Use Traditional Neighborhood Developments and Live-Work Unit Standards
- Transit Oriented Development Design Standards
- Agricultural Use Standards (provisions for farm operation, agricultural soil, and support services retention and expansion; agritainment/agritourism and other accessory businesses and uses, and accessory energy facilities and associated design, sign and buffer standards)
- Greenway Corridor Standards
- Trail and Open Space Link Criteria
- Scenic Roads and Vistas Criteria
- Waste Management, Minimization, and Recycling Ordinance

**Plan Monitoring**

Monitoring and evaluating the progress in achieving this plan’s visions and principles is needed to ensure its success and to allow for adjustments in response to economic, social, or regional changes. The plan includes the following monitoring activities.

***Community Indicators***

Community indicators or ‘measures of success,’ provide information about past and current trends by providing quantifiable and measurable information about the county. Indicators can provide insight into the overall direction of a community, its population and economy, built and natural environment, transportation and civic involvement. Indicators can be used to determine how effective a plan or policy has been at promoting sustainability and smart growth, at linking the economy, environment and society goals. Indicators can be used with benchmarks and targets to evaluate performance and track progress.

Measuring progress is important to determining the effectiveness of any plan by seeking feedback on progress being made in meeting the plan’s goals and promoting its policies. Using informational tools to monitor progress provides an opportunity for feedback and for adjustments to strategies or actions. An indicator is a measurement that assists in demonstrating movement toward or away from a plan’s vision and principles; it is understandable and relevant. Benchmarks establish a “starting point”—the state of an indicator as of a particular point in time (for example, the year 2011). A target is a quantifiable outcome that provides a framework for measuring progress. Targets should be ambitious yet obtainable.

Identification of proposed indicators and targets helps to measure progress toward the 2030 vision and principles of this plan. Following the adoption of this plan, key indicators, benchmarks, and

targets will be used by the county to monitor the implementation of the plan and help prioritize future efforts.

Categories of indicators will align with plan principles: land use, natural resources, socioeconomic, housing, economic, historic and scenic, transportation, hazard mitigation, community facilities and services, and growth management.

To illustrate how indicators, benchmarks, and targets will be applied to Bucks County, samples figures are provided below. The timeline for a target date should not exceed ten years from the benchmark date, so that process of measuring progress and making adjustments to the target figures is more manageable. Community indicators can be monitored annually in the form of a report card as described in the following section.

<b>Sample Bucks County Indicators</b>	
<b><i>Indicator A</i></b>	County agricultural easements (Bucks County Agri cultural Land Preservation Program)
<b><i>Benchmark</i></b>	12,494 acres preserved in 2011
<b><i>Target</i></b>	Add 700 acres per year or an additional 6,300 acres by 2020 (19,100 total acres)
<b><i>Indicator B</i></b>	County-owned and operated multiuse paths
<b><i>Benchmark</i></b>	10.3 linear miles in 2011
<b><i>Target</i></b>	Increase 75 percent or 7.7 linear miles by 2020 (18 total linear miles)

Progress toward reaching these targets may not be the sole responsibility of the county and will, in many circumstances, require federal or state participation as well as countywide stakeholder collaboration among municipalities, residents, businesses and other affected parties.

***Annual Report Card***

Following the establishment of the county’s community indicators, annual monitoring will be conducted to determine their effectiveness. This monitoring activity, in the form of an annual report card, will be useful in reviewing progress that has been made in achieving targets over the course of the year. An evaluation of the indicators and targets may also reveal a need for change. For instance, if a target is too conservative or ambitious, it may need to be adjusted (up or down) to reflect a more obtainable figure. Following the adoption of this plan and establishment of community indicators, an annual report card highlighting progress made toward plan indicators will be conducted.

***Smart Growth Scorecards***

The use of smart growth scorecards has been gaining traction throughout the country as an effective way to evaluate the policies and regulations that determine a community’s development patterns and to promote dialogue among decision-makers, developers, and citizens. Following the adoption of this plan, scorecards can be prepared for use by communities in the county. The county can assist

municipalities with research and development of customized scorecards to satisfy their specific context and needs.

Municipal-level scorecards can assist communities with evaluating current regulations established through their ordinances and determine how they influence the pattern of growth and development. These scorecards help communities view current development pattern through a smart growth lens—measuring the effectiveness of their development policies over time.

Project-specific scorecards can help determine if proposed development projects are generally consistent with a community’s established smart growth policies such as compactness, connectivity/accessibility, and walkability. These scorecards can also be used to gauge whether the types of places that a community desires can be built within the parameters of current regulations.

Municipal-level scorecards are not intended to rate or compare one community to another. Each community may use this information differently. Some communities may be satisfied with the current development pattern, and the land use policies that influence that pattern, while others may not. Since one size does not fit all, smart growth policies should be based on the values, priorities, and available resources within each community. On the other hand, project-specific scorecards are intended to rate projects according to a structured standard, which allows for an effective project comparison.

Depending upon local policies, issues, and the desired level of detail, scorecards can be tailored to match a community’s needs. The following sample municipal-level and project-specific issue categories are from scorecards of various communities throughout the country.

<b>Sample Municipal-Level Scorecard</b>	
Compact Centers	Sound Water Policy
Mix of Compatible Uses	Fiscal Analysis
Redevelop Sites and Buildings	Business Diversity
Transportation Options	Range of Housing Options
Critical Environmental Areas	Housing Affordability
Farmland and Open Space	Infrastructure and Services
Strong Sense of Place	Public Involvement
Respect Community Character	Coordinate Public Investment
Walkable Communities	Regional Cooperation
<b>Sample Project-Specific Scorecard</b>	
Near Existing Development/Infrastructure	Range of Housing Options
Density and Compactness	Mixed Use
Site Optimization and Compactness	Connectivity/Accessibility
Community Character and Design	Architectural Aesthetics
Safeguards the Environment	Streetscapes
Protects Farmland and Open Space	Civic Space
Choices for Getting Around	Service Provision
Walkable and Transit-Friendly	Enhances Tax Base
Promotes Design for Livability	
<i>Source: U.S. Environmental Protection Agency website.</i>	

Once a scorecard has been established, it can be evaluated against adopted policies or existing projects. The results can be analyzed, ensuring that the scorecard is balanced and serves its intended purpose. Results of the municipal-level scorecard will reveal the broad picture of the community, while the project-specific scorecards will show how a development rates in satisfying its community-based growth and development policies.

### ***Interim Assessment Report***

An Interim Assessment Report will be prepared every five years to identify the progress of plan implementation as well as changes that may have occurred that are important to the planning process. Monitoring the progress of the recommended strategies and actions will function as a barometer on the success of the plan. Accounting for new developments or changes will ensure that the plan remains dynamic and ‘in sync’ with forces that influential to the plan’s outcome. The Interim Assessment Report may include the following:

#### **Sample Contents—Interim Assessment Report**

- Significant actions and accomplishments since the last report, including the status of implementation schedule for recommended strategies and actions in the plan,
- Obstacles or problems in the implementation of the plan (e.g., stakeholder role changes, funding cuts, priority shifts),
- Recommendations to improve or enhance the effectiveness of plan implementation (e.g., adjustments to strategies and actions, programs, and procedures) that could be developed for the upcoming 5-year period.

### **Supplemental Products**

Other documents, summaries, and studies will be needed as part of the county’s ongoing planning process following the adoption of this plan.

### ***Web-Based Document***

A web-based version of this plan will be produced that can be easily accessed and navigated. It will contain a narrative similar to the hardcopy version but with the focus of being reader-friendly, such as including tabs and linkages to major plan topics and individual plan components. Providing hyperlinks within the narrative could provide cross-referencing to internal county resources (e.g., *Bucks County Land Use Plans—Tools and Techniques and Courses of Action*, *Bucks County Continuum*, *Municipal Demographic Profile*), as well as external sources (websites).

**Planning Practice Studies**

Planning concepts are in practice by various communities in Bucks County, but with varying degrees of success. Examples of current planning concepts that are employed in the county include the following:

- Local Planning Concepts**
- Transfer of Development Rights (TDRs)
  - Traditional Neighborhood Developments (TNDs)
  - Mixed Use Developments
  - Brownfield/Greyfield Developments
  - Town Centers
  - Conservation by Design
  - Village Planning
  - Low Impact Development (LID)
  - Transit-Oriented Development (TOD)

Based upon observations and lessons learned over time, it is necessary to make adjustments to the way a planning concept has been established or how it is applied. The preparation of a study can examine issues such as: the location and application of a planning concept, why it has or has not been effective, and what may be needed to make it work better. To be more responsive to factors and circumstances that may be unique to the community or setting, periodic evaluations may result in changes to specific policies or regulations while laying a foundation for updating model ordinance language.



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## **APPENDICES**

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Appendix A. Survey Results

Appendix B. Stakeholder Meetings Summary

Appendix C. Development District Analysis

## **I. INTRODUCTION**

As part of the process of updating the county comprehensive plan, a survey was conducted to gather feedback from Bucks County residents that would help in shaping direction for the plan. The survey was open to Bucks County residents and was accessed in two ways. It was available online through the Bucks County Planning Commission webpage and available as a paper copy to submit by mail.

The planning commission used the online survey tool, Zoomerang, to facilitate the online submissions. The county has a subscription to this website and has had success with using the service with other county-wide surveys administered in the past. Around 2000 paper copies of the survey were distributed throughout the county. They were sent to senior centers, libraries, colleges and universities, chambers of commerce, and YMCAs. Additional copies were distributed at the Bucks County Grange Fair and the Household Hazardous Waste collection sites. Emails promoting the survey with a link to the survey site were also sent to municipal offices, county agencies, the county's school district employees, and state representatives and paper copies of the survey followed in the mail.

The survey ran from July 2, 2010 through September 17, 2010. During that time, the county received 1,746 surveys, 1,454 through the website and 292 by mail. Due to the method of distribution, the survey cannot be considered a statistically random sample. It can though serve as a tool to examine the opinions of county residents about the major planning issues facing the county.

The survey is comprised of nine questions. The first three questions ask for information that would characterize the respondent and allow for cross referencing with the remaining six questions. The first three questions pertain to the respondent's place of residency expressed as a zip code, age of the respondent, and the role the respondent may play in the community. The next three questions on the survey allow respondents to express what they like the most and least about Bucks County and what they believe are the most pressing issues facing the county. The seventh question allows respondents to indicate the adequacy of community services where they live, such as emergency services, water and sewer service, and trash collection. The final two questions ask respondents to express their views on what economic and housing policies should be pursued by the county.

## **II. ALL RESIDENTS**

Of the 1,746 surveys returned to the county, 1,699 were from Bucks County residents. The survey analysis was completed only on the responses received from residents of Bucks County.

### **A. SUMMARY OF FINDINGS**

The following provides a summary of questions 4 through 9.

#### **Question 4: What do you like most about Bucks County?**

Farmland and rural character, park and recreation facilities, and cultural and historic sites are what respondents like best about Bucks County. Bucks County is valued most for its fabric of open land and cultural and recreation amenities. Preserving these resources for future generations is clearly on the minds of Bucks County residents.

**Question 5: What do you like least about Bucks County?**

The top three responses for what respondents like least about Bucks County are traffic congestion, high taxes, and the loss of farmland/rural character in the county. These three issues are common complaints in areas of sprawling development. The results point to the need for communities to plan and manage future growth in a way which prevents suburban sprawl from continuing.

**Question 6: What do you believe are the most important issues facing Bucks County?**

Respondents believe controlling traffic congestion, managing growth and development and open space/farmland preservation are the most important issues facing Bucks County. The responses support the priorities the county has made over the years in dealing with development pressure. They also indicate, however, the need for more focused efforts on improving the quality of existing and new development.

**Question 7: Are the following services adequate where you live?**

For each of the services provided, at least 90 percent of respondents believe they are adequate. This is an encouraging sign that municipalities and the county are addressing much of the service needs of residents. The three services which respondents selected as inadequate are stormwater management, public water, and public sewer, pointing to the need for good development practices and suitable planning by service providers.

**Question 8: What economic policies should be pursued in Bucks County?**

Respondents selected revitalizing existing areas such as commercial areas, downtowns, industrial areas and vacant/abandoned sites as more important to pursue than encouraging new construction of office parks, industrial parks, shopping centers, and entertainment complexes. Clearly, the public recognizes the need to focus on infill development and redevelopment in existing areas, such as brownfields and greyfields, rather than development of greenfields.

**Question 9: What types of housing policies should be pursued in Bucks County?**

The two policies respondents selected as the most important to pursue are allowing for construction of development with a variety of housing types and allowing construction of single-family subdivisions on small lots with preserved common open space. Allowing for low-density large lot development is the third most preferred policy.

Clearly, the respondents support efforts to provide opportunities for a diversity of housing options, which may meet the wide range of demand of future homeowners and renters. People also appear to want the ideal, single-family dwelling, but are looking for development patterns that aren't as consumptive (e.g., smaller lots with open space).

Even though respondents chose to encourage a variety of housing types, it does not appear they favor high density development as the selection stating, "Allowing for construction of high density multi-family apartments or townhouses with preserved land" is the second to least preferred policy.

The respondents, however, may not necessarily be against density, just single-use density. They want to see a variety of housing types, which is more indicative of a community. They don't want to see multifamily buildings with open space, which puts to mind a type of housing that is cut off from the rest of the community and a potential source of problems. Respondents are least in favor of subsidizing housing to make it more affordable.

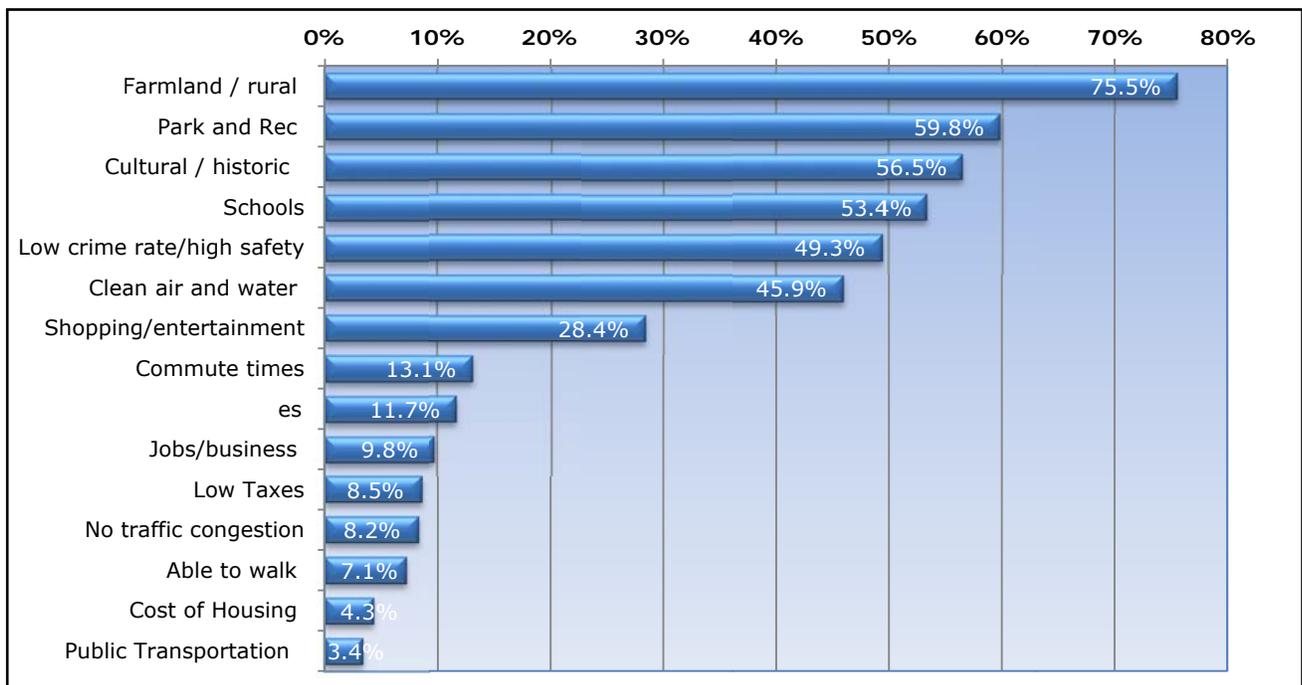
**B. ACTUAL RESULTS**

**Question 4. What do you like most about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents that selected the category as one of their top five choices).

Farmland, rural character	75.46%
Park and recreation facilities	59.80%
Cultural and historic sites	56.50%
Quality of schools	53.38%
Low crime rate/high safety	49.32%
Clean air and water	45.91%
Variety of shopping/entertainment	28.43%
Short commuting times to work	13.13%
Variety of housing choices	11.71%
Jobs/business opportunities	9.77%
Low taxes	8.48%
No traffic congestion	8.18%
Able to walk to work/shop/recreation	7.12%
Cost of housing	4.30%
Public transportation	3.35%

**Figure A-1**  
**Survey responses to what residents like most about Bucks County.**

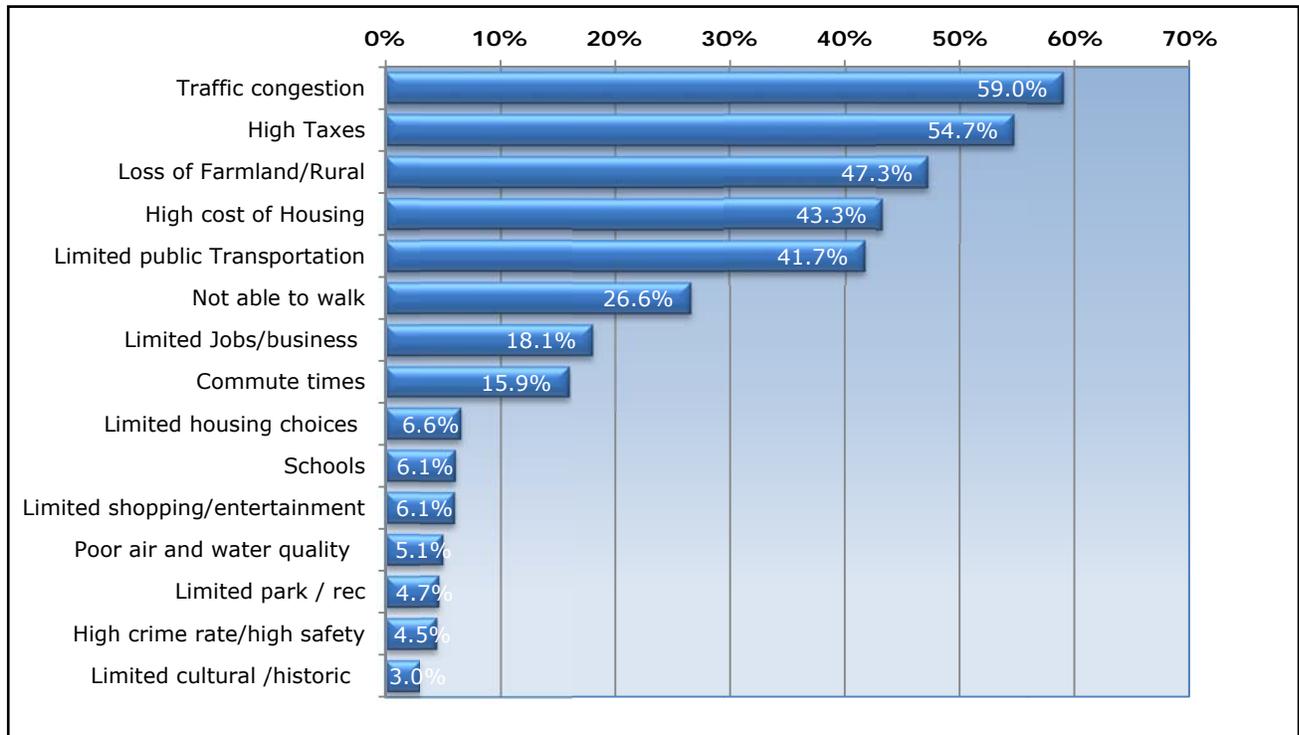


**Question 5. What do you like least about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents that selected the category as one of their top five choices )

Traffic congestion	58.98%
High taxes	54.68%
Loss of farmland, rural character	47.26%
High cost of housing	43.32%
Limited public transportation	41.67%
Not able to walk to work/shop/recreation	26.55%
Limited Jobs/business	18.07%
Long commuting times to work	15.89%
Limited housing choices	6.59%
Quality of schools	6.12%
Limited shopping/entertainment	6.06%
Poor air and water quality	5.06%
Limited park and recreation facilities	4.71%
High crime rate/high safety	4.53%
Limited cultural and historic amenities	3.00%

**Figure A-2**  
**Survey responses to what residents like least about Bucks County**

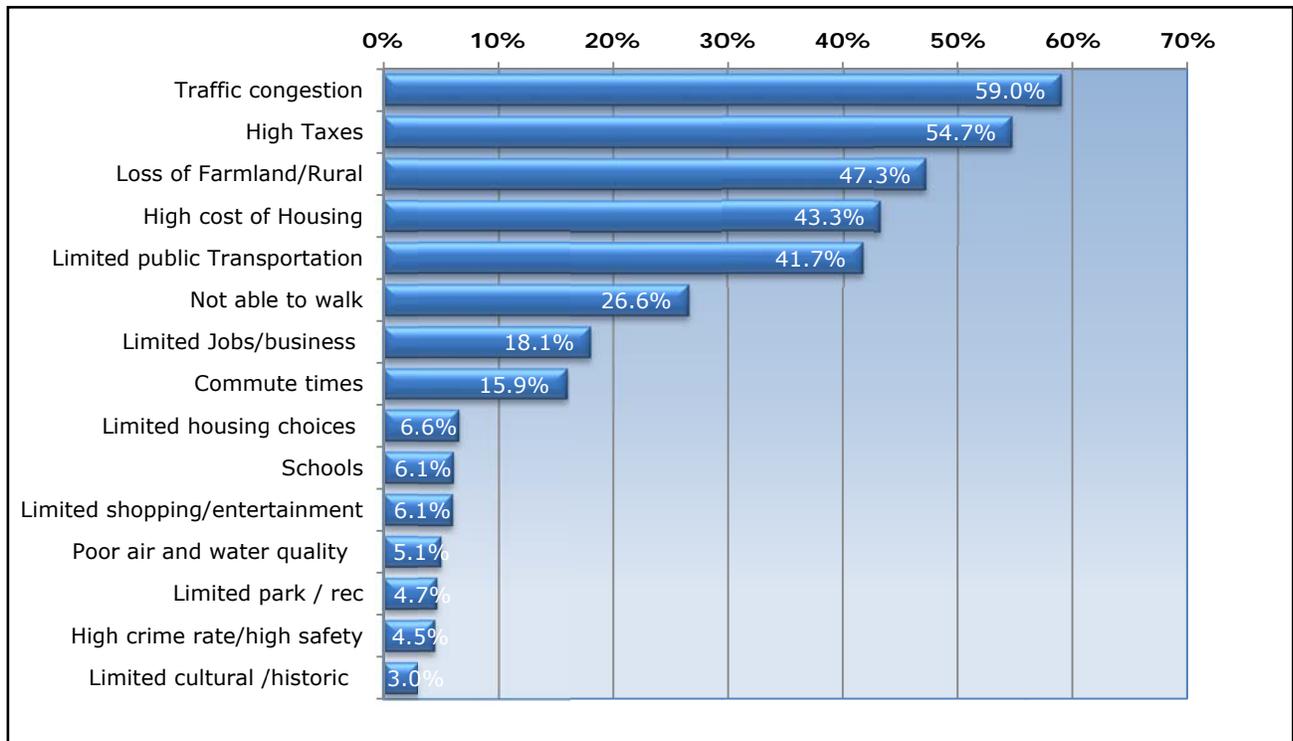


**Question 5. What do you like least about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents that selected the category as one of their top five choices )

Traffic congestion	58.98%
High taxes	54.68%
Loss of farmland, rural character	47.26%
High cost of housing	43.32%
Limited public transportation	41.67%
Not able to walk to work/shop/recreation	26.55%
Limited Jobs/business	18.07%
Long commuting times to work	15.89%
Limited housing choices	6.59%
Quality of schools	6.12%
Limited shopping/entertainment	6.06%
Poor air and water quality	5.06%
Limited park and recreation facilities	4.71%
High crime rate/high safety	4.53%
Limited cultural and historic amenities	3.00%

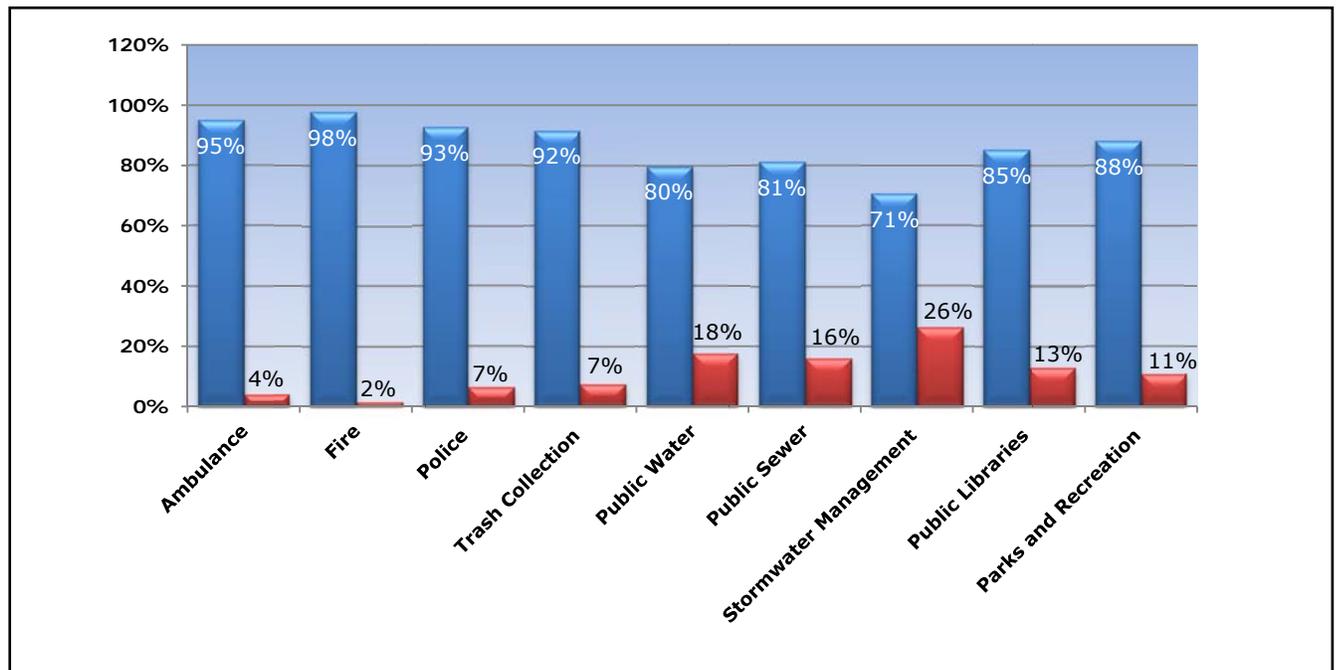
**Figure A-2**  
**Survey responses to what residents like least about Bucks County**



**Question 7. Are the following services adequate where you live?**

	Yes	No
Ambulance	95%	4%
Fire	98%	2%
Police	93%	7%
Trash collection	92%	7%
Public water	80%	18%
Public sewer	81%	16%
Stormwater management	71%	26%
Public libraries	85%	13%
Parks and recreation	88%	11%

**Figure A-4**  
Survey responses on how residents rate local services.



**Question 8. What economic policies should be pursued in Bucks County?**

(Respondents were asked to rank the policies from 1 to 4, with 1 being the most important. The numbers below represent the average response.)

Economic Policy	Average
Revitalize existing commercial areas and downtowns	1.6
Revitalize older industrial areas and vacant/abandoned sites	1.7
Encourage construction of new office and industrial parks	3.0
Build new shopping centers and entertainment complexes	3.3

**Question 9. What housing policies should be pursued in Bucks County?**

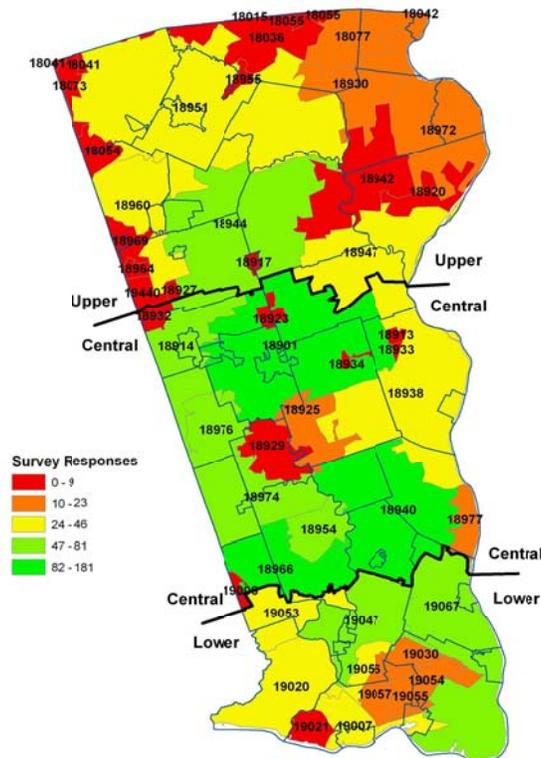
(Respondents were asked to rank the policies from 1 to 6, with 1 being the most important. The numbers below represent the average response.)

Housing Policy	Average
Allow for construction of development with a variety of housing types	2.5
Allow for construction of single family subdivisions on small lots with preserved common open space	2.6
Allow for low-density large lot developments	3.1
Allow for all forms of housing in all municipalities	3.5
Allow for construction of high density multifamily apartments of townhouses with preserved common open space	3.9
Subsidize housing to make it more affordable	4.2

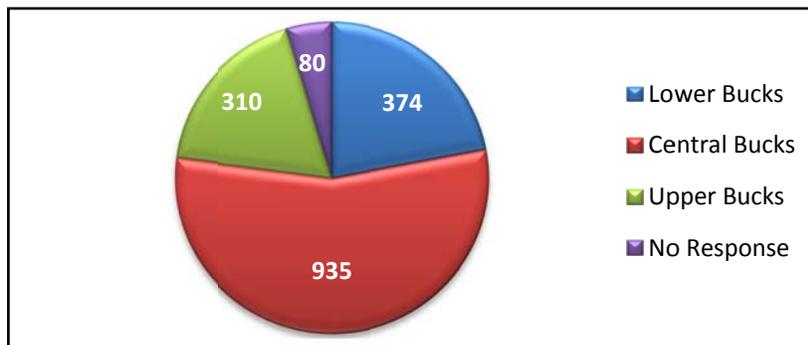
**III. GEOGRAPHIC AREA**

In order to compare the responses from different regions of the county, surveys were tabulated for three geographic areas, lower Bucks, central Bucks and upper Bucks. The location of the respondent was determined through the zip codes provided in question 1 of the survey. Figure 5 shows the distribution of the zip codes into three geographic areas and Figure 6 demonstrates the total number of respondents in each region.

**Figure A-5  
Distribution of Survey Responses by Zip Code.**



**Figure A-6**  
**Number of respondents in the three geographic locations.**



Most of the respondents live in central Bucks (55 percent), followed by lower Bucks (22 percent), upper Bucks has the least number of residents respond (18 percent). Fewer than 5 percent did not indicate a zip code and these responses were not included in the analysis.

**A. SUMMARY of FINDINGS**

**Highlights:**

In upper and central Bucks, farmland and rural character is what they like the best, while park and recreation facilities is the top choice in lower Bucks. Traffic congestion and high taxes are what all regions of the county like least. The most important issues facing the county in all regions are traffic congestion, managing growth, and preserving open space and farmland. An overwhelming majority selected all services in all areas as adequate. Stormwater management is the service considered the most inadequate, but at a low percentage. Each region would prefer to pursue the revitalization of existing areas than encourage new construction. Each region prefers a variety of housing types and single-family lot developments with preserved open space. None of the three regions want to subsidize housing.

**Question 4: What do you like most about Bucks County?**

No matter which region of the county a respondent is from, they strongly favor the county’s farmland and rural character. In upper and central Bucks, it is the most popular choice. It is the second highest choice in lower Bucks. The reason for this may be because there is less farmland in lower Bucks than in the other regions of the county. Over 90 percent of those in upper Bucks selected farmland and rural character as what they like most about Bucks County and clean air and water ranked second. Those respondents from central Bucks selected the quality of schools as the second highest ranked choice, 20 percent higher than upper and lower Bucks. The respondents in lower Bucks ranked the county’s park and recreation facilities as the most preferred choice. The respondents from lower Bucks differed in opinions from the rest of the county for two other choices. They selected a variety of shopping and entertainment 20 percent higher than those from upper and central Bucks and only 33 percent in lower Bucks selected Bucks County low crime rate, while 50 percent of respondents in the other two regions selected this choice.

**Question 5: What do you like least about Bucks County?**

Traffic congestion received the highest percentage of responses and high taxes received the next highest, as what people liked the least in central and lower Bucks. In upper Bucks, it was the opposite, high taxes was the most popular, while traffic congestion was second. This may be because traffic congestion is not as much of a problem in the upper, more rural, regions of the county. Central Bucks selected losing farmland and rural character as the third highest most popular choice, while the third most popular choice in lower Bucks is the high cost of housing.

**Question 6: What do you believe are the most important issues facing Bucks County?**

Controlling traffic congestion, managing new growth and development, and open space and farmland preservation are what respondents from all regions of the county believe are the most important issues facing the county. Natural resource protection also received high percentage of responses, over 10 percent in upper and central Bucks than lower Bucks. Although it did not receive a majority of responses, revitalizing urban centers received 15 percent more responses in lower Bucks than the other regions of the county, highlighting lower Bucks urban characteristics and the need to renovate aging areas.

**Question 7: Are the following services adequate?**

The majority of respondents find the services provided in all regions of the county as adequate. The only variation is, respondents from upper Bucks selected public water, public sewer, and stormwater management as adequate, but 15 percent less than the other services. This is possibly a reflection of the lack of public infrastructure for water, sewer and stormwater in the upper Bucks region. Stormwater management received the highest percentage in all three regions of the county, as the service considered most inadequate. However, the percentage of those choosing this is not high, 26 percent of respondents in central and lower Bucks and 32 percent of respondents in upper Bucks chose this selection. In upper and central Bucks, the next most popular selection considered inadequate are public water and public sewer, while public libraries and parks and recreation is second most selected response in lower Bucks.

**Question 8: What economic policies should be pursued in Bucks County?**

Respondents from all three regions of the county are in agreement and think revitalizing existing areas is more important than encouraging new construction. Respondents in upper and central Bucks, ranked revitalizing commercial areas higher than industrial areas, while respondents in lower Bucks ranked revitalizing industrial areas above revitalizing commercial areas. This is probably because lower Bucks has a higher concentration of industrial development than other regions of the county.

**Question 9: What types of housing policies should be pursued in Bucks County?**

Respondents from all three regions of the county think allowing for construction of development with a variety of housing types and allowing construction of single family subdivisions on small lots with preserved common open space are the most important policies for the county to pursue. Respondents from upper Bucks and central Bucks, favor low-density large lot development more than those from lower Bucks. Those from lower Bucks are slightly more in favor of allowing for all forms of housing types and high density multi-family apartments and townhouses than the rest of the county. These

responses seem to be reflective of the types of housing found in the respective regions. All three region of the county do not think subsidizing housing is a policy that should be pursued in the county.

**B. ACTUAL RESULTS**

**Question 4: What do you like most about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents from each region that selected the category as one of their top five choices.)

	Upper	Central	Lower
Clean air and water	56.4%	46.1%	37.4%
Farmland, rural character	90.9%	76.6%	62.3%
Cultural and historic sites	54.1%	57.3%	55.6%
Park and recreation facilities	54.5%	59.4%	64.4%
Jobs/business opportunities	10.6%	7.9%	12.5%
Variety of shopping/entertainment	19.6%	24.0%	45.4%
Quality of schools	39.0%	64.3%	41.4%
Variety of housing choices	5.4%	11.2%	18.1%
Cost of Housing	5.4%	2.8%	6.9%
Public Transportation	0.6%	2.4%	7.4%
No traffic congestion	18.3%	6.3%	5.3%
Short commuting times to work	7.1%	14.4%	15.7%
Able to walk to work/shop/recreation	2.2%	8.3%	7.7%
Low crime rate/high safety	50.3%	56.1%	33.1%
Low Taxes	10.3%	8.6%	6.9%

**Question 5: What do you like least about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents in each region that selected the category as one of their top five choices).

	Upper	Central	Lower
Poor air and water quality	3.55%	4.28%	7.49%
Loss of farmland, rural character	43.87%	49.52%	44.92%
Limited cultural and	2.90%	2.03%	5.08%
Limited park and recreation facilities	5.16%	5.13%	3.74%
Limited jobs/business	19.03%	14.97%	24.60%
Limited shopping/entertainment	9.03%	5.56%	4.81%
Quality of schools	5.48%	3.32%	13.10%
Limited housing choices	5.81%	6.31%	7.22%
High cost of housing	43.55%	43.10%	45.72%
Limited public transportation	43.55%	43.74%	36.36%
Traffic congestion	47.10%	62.78%	60.43%
Long commuting times to work	18.39%	16.79%	11.76%
Not able to walk to work/shop/recreation	21.94%	27.06%	30.21%
High crime rate/high safety	2.26%	1.82%	12.30%
High taxes	60.00%	51.87%	59.36%

**Question 6: What do you believe are the most important issues facing Bucks County?**  
 (Respondents were asked to select up to five. The numbers below represent the percentage of respondents in each region that selected the category as one of their top five choices)

	Upper	Central	Lower
Open space/farmland preservation	57.74%	58.61%	42.78%
Providing parks and recreation opportunities	13.23%	16.04%	12.57%
Historic resource protection	21.94%	23.96%	21.66%
Natural resource protection	53.87%	50.91%	40.64%
Controlling traffic congestion	55.16%	68.77%	63.37%
Providing more transportation	37.74%	41.50%	41.44%
Housing needs and affordability	21.94%	19.47%	29.14%
Employment opportunities	28.39%	21.18%	33.69%
Managing new growth and development	58.06%	64.49%	46.79%
Revitalizing urban centers	21.94%	18.72%	36.90%
Improving community services	21.61%	13.58%	18.45%
Cooperative planning between local	23.55%	25.35%	26.47%
Public safety and security	13.55%	15.51%	22.99%

**Question 7: Are the following services adequate?**

Service	Upper		Central		Lower	
	Yes	No	Yes	No	Yes	No
Ambulance	94%	6%	96%	4%	95%	3%
Fire	98%	2%	99%	1%	96%	3%
Police	83%	16%	97%	3%	90%	9%
Trash collection	89%	10%	94%	6%	89%	9%
Public water	63%	32%	82%	18%	90%	8%
Public Sewer	65%	30%	83%	16%	90%	7%
Stormwater management	65%	32%	73%	26%	68%	26%
Public libraries	81%	15%	87%	13%	85%	13%
Parks and recreation	88%	11%	90%	10%	84%	14%

**Question 8. What economic policies should be pursued in Bucks County?**

(Respondents were asked to rank the policies from 1 to 4, with 1 being the most important. The numbers below represent the average response.)

Economic Policy	Average		
	Upper	Central	Lower
Revitalize existing commercial areas and downtowns	1.5	1.6	1.6
Revitalize older industrial areas and vacant/abandoned sites	1.7	1.8	1.5
Encourage construction of new office and industrial parks	3.0	3.1	2.8
Build new shopping centers and entertainment complexes	3.5	3.3	3.2

**Question 9. What housing policies should be pursued in Bucks County?**

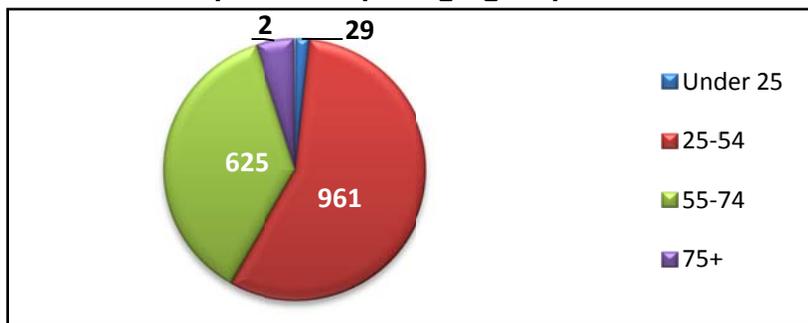
(Respondents were asked to rank the policies from 1 to 6, with 1 being the most important. The numbers below represent the average response.)

Housing Policy	Average		
	Upper	Central	Lower
Allow for construction of development with a variety of housing types	2.7	2.6	2.3
Allow for construction of single family subdivision on small lots with preserved land	2.7	2.6	2.4
Allow for construction of high density multifamily apartments or townhouses w/preserved land	4.1	4.0	3.6
Allow for low-density large lot developments	2.7	3.1	3.3
Allow for all forms of housing in all municipalities	3.5	3.7	3.0
Subsidize housing to make it more affordable	4.3	4.5	3.8

**IV. AGE GROUP**

This section compares the responses of the different age groups to see if age is a determination on how things are viewed in the county. The respondents were asked in question 2 to select one of the following age groups in the survey, Under 25, 25-54, 55-74, or 75+. The following figure represents the number of responses received for each age group.

**Figure A-7**  
**Number of respondents per age group**



An unequal number of surveys were received from each age group. The majority, 56.5 percent of respondents were 25-54. Thirty seven percent were 55-74. Only 1.7 percent of the respondents are Under 25, and only 4.8 percent of the respondents were over 75.

**A. SUMMARY OF FINDINGS**

**Highlights:**

All age groups like county farmland and rural character best. Those under 25 dislike the high cost of housing the most. Those over 75 like high taxes the least, while those 25-74 chose traffic congestion as what they like least. Controlling traffic congestion is the most important issue for all age groups. An overwhelming majority find services in the county as adequate. Stormwater management is the service considered the most inadequate, except among those under 25 who chose public libraries. All age groups prefer revitalizing existing areas instead of building new construction. Each age group prefers a

variety of housing types and single family subdivisions with preserved open space the most. No age group wants to subsidize housing.

**Question 4: What do you like most about Bucks County?**

No matter the age of the respondent, all concur that Bucks County farmland and rural character is the selection liked best. Park and recreation facilities and cultural and historic sites also ranked very high among all age groups. The younger respondents (Under 25, 25-54) chose the quality of schools as the second most popular response, close to 20 percent higher than those over 55. The percentages varied on a number of selections from those respondents over 75 from the rest of the age groups. Those over 75 chose clean air and water as the second most popular response as what they like most and 15 percent more respondents selected a variety of shopping and entertainment than the other age group.

**Question 5: What do you like least about Bucks County?**

Traffic congestion is the most popular or second most popular choice for each group on what they like least in the county. The older the respondent, the higher the percentage of respondents selected high taxes as what they like least. Over 50 percent of respondents selected high taxes from ages 25-74 and over 70 percent of those over 75 selected this response, while only 27 percent of those are under 25 chose high taxes. Those under 25 tend to be at lower income level and are less likely to own property and may be paying fewer taxes, therefore are not as affected by taxes as older residents. The trend is the opposite for the high cost of housing. The younger the respondent, the higher percentage selected the cost of housing as what they like least. The high cost of housing is the most popular response for those under 25. Again this is probably a reflection of their lower income level. Those under 25 differed in their response in two other selections. Respondents under 25 selected loss of farmland at least 25 percent less than the older age groups while they selected limited jobs and business opportunities at least 25 percent more than those in the older age groups. The concern over the availability of jobs and business opportunities by young adults reflects the trend the county has experienced of younger persons leaving the region (the “brain drain”) to find employment that matches their education and skills.

**Question 6: What do you believe are the most important issues facing Bucks County?**

All respondents in each age group chose controlling traffic congestion as the most important issue facing the county. High percentages were received among all age groups for open space and farmland preservation as well. Those respondents who are 25-74 selected managing new growth as the second most popular response, at least 15 percent higher than those under 25 or over 75. One interesting trend seen for two of the categories is the older the respondent, a lesser percentage selected providing more transportation, while a higher percentage selected cooperation among local governments.

**Question 7: Are the following services adequate?**

An overwhelming majority of respondents in all age groups find the services provided adequate. Less respondents over 75 selected public sewer, public water and stormwater management as adequate. Those over 25 selected stormwater management as the most inadequate service, while those under 25 chose public libraries as the least adequate service.

**Question 8: What economic policies should be pursued in Bucks County?**

The respondents under 75 rank the economic policies in the same order, preferring first to revitalize existing commercial areas and downtowns, then revitalizing older industrial areas and vacant abandoned sites, then encouraging construction of new office and industrial parks, and finally building new shopping centers and entertainment complexes is the least favored economic policy. The preferences of respondents over 75 vary slightly. The difference to the above order of preference is those over 75 prefer to revitalize industrial areas before revitalizing existing commercial and downtown areas.

**Question 9: What types of housing policies should be pursued in Bucks County?**

The two policies all age groups ranked as the most important to pursue are allowing for construction of development with a variety of housing types and allowing construction of single-family subdivisions on small lots with preserved common open space. Allowing for low-density large lot development is the third most preferred policy. The least two preferred policies are allowing for construction of high density multifamily apartments or townhouses with preserved land and subsidizing housing.

**B. ACTUAL RESULTS**

**Question 4. What do you like most about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents in each age group that selected the category as one of their top five choices)

	Under 25	25-54	55-74	75+
Clean air and water	48.3%	41.8%	50.6%	58.5%
Farmland, rural character	69.0%	76.1%	75.2%	74.4%
Cultural and historic sites	58.6%	53.4%	61.8%	53.7%
Park and recreation facilities	58.6%	59.6%	60.6%	57.3%
Jobs/business opportunities	13.8%	10.8%	8.8%	3.7%
Variety of shopping/entertainment	31.0%	24.8%	31.7%	46.3%
Quality of schools	58.6%	62.4%	41.4%	37.8%
Variety of housing choices	6.9%	9.4%	15.5%	12.2%
Cost of housing	3.5%	4.8%	3.7%	3.7%
Public	6.9%	2.8%	3.2%	9.8%
No traffic congestion	0.0%	8.0%	8.3%	12.2%
Short commuting times to work	10.3%	14.3%	12.5%	6.1%
Able to walk to work/shop/recreation	10.3%	7.8%	5.9%	7.3%
Low crime rate/high safety	44.8%	50.8%	49.1%	36.6%
Low taxes	10.3%	9.2%	8.0%	3.7%

**Question 5. What do you like least about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents in each age group that selected the category as one of their top five choices)

	Under 25	25-54	55-74	75+
Poor air and water quality	3.5%	5.0%	5.3%	4.9%
Loss of farmland, rural character	20.7%	45.3%	51.5%	48.8%
Limited cultural and historic sites	3.5%	3.2%	2.6%	3.7%
Limited park and recreation facilities	3.5%	5.8%	3.2%	3.7%
Limited jobs/business	44.8%	18.3%	16.6%	17.1%
Limited shopping/entertainment	17.2%	6.4%	4.8%	8.5%
Quality of schools	10.3%	6.0%	5.9%	7.3%
Limited housing choices	6.9%	6.1%	7.4%	6.1%
High cost of housing	62.1%	45.1%	41.3%	32.9%
Limited public transportation	51.7%	39.9%	45.6%	30.5%
Traffic congestion	58.6%	58.2%	61.6%	50.0%
Long commuting times to work	20.7%	19.0%	12.5%	3.7%
Not able to walk to work/shop/recreation	27.6%	28.5%	24.2%	22.0%
High crime rate/high safety	6.9%	4.2%	4.3%	9.8%
High taxes	27.6%	51.8%	58.4%	70.7%

**Question 6. What are the most important issues facing Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents in each age group that selected the category as one of their top five choices)

	Under 25	25-54	55-74	75+
Open space/farmland preservation	55.2%	54.7%	54.7%	56.1%
Providing parks and recreation opportunities	24.1%	16.3%	12.0%	11.0%
Historic resource protection	17.2%	21.6%	24.8%	31.7%
Natural resource protection	37.9%	47.7%	53.3%	43.9%
Controlling traffic congestion	58.6%	65.4%	64.6%	56.1%
Providing more transportation	48.3%	41.9%	40.0%	24.4%
Housing needs and affordability	24.1%	23.3%	21.4%	11.0%
Employment opportunities	37.9%	25.7%	25.1%	25.6%
Managing new growth and development	37.9%	59.0%	60.0%	43.9%
Revitalizing urban centers	24.1%	24.1%	21.9%	17.1%
Improving community services	17.2%	17.4%	14.6%	23.2%
Cooperative planning between local	13.8%	22.5%	29.0%	35.4%
Public safety and security	31.0%	15.6%	16.2%	24.4%

**Question 7. Are the following services adequate?**

Service	Under 25		25-54		55-74		75+	
	Yes	No	Yes	No	Yes	No	Yes	No
Ambulance	93%	7%	96%	4%	95%	4%	90%	5%
Fire	97%	3%	98%	2%	98%	1%	98%	1%
Police	90%	10%	93%	7%	92%	7%	94%	4%
Trash collection	97%	3%	92%	8%	92%	7%	91%	5%
Public water	83%	14%	81%	18%	78%	18%	72%	16%
Public Sewer	90%	7%	84%	15%	78%	18%	73%	12%
Stormwater management	83%	17%	72%	26%	69%	27%	56%	27%
Public libraries	79%	21%	87%	12%	83%	15%	82%	9%
Parks and recreation	83%	17%	88%	12%	89%	9%	82%	9%

**Question 8. What economic policies should be pursued in Bucks County?**

(Respondents were asked to rank the policies from 1 to 4, with 1 being the most important. The numbers below represent the average response.)

Economic Policy	Under 25	25-54	55-74	75+
Revitalize existing commercial areas and downtowns	1.5	1.6	1.5	1.5
Revitalize older industrial areas and vacant/abandoned sites	2.1	1.7	1.7	1.4
Encourage construction of new office and industrial parks	3.1	3.1	2.9	2.3
Build new shopping centers and entertainment complexes	3.2	3.3	3.3	2.7

**Question 9. What housing policies should be pursued in Bucks County?**

(Respondents were asked to rank the policies from 1 to 6, with 1 being the most important. The numbers below represent the average response.)

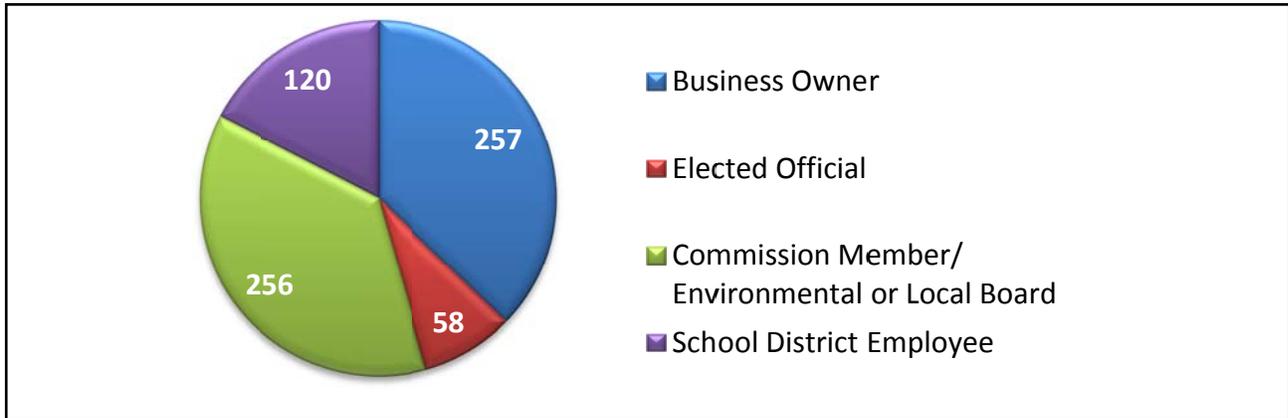
Housing Policy	Average			
	Under 25	25-54	55-74	75+
Allow for construction of development with a variety of housing types	2.8	2.6	2.4	2.1
Allow for construction of single family subdivisions on small lots with preserved common open space	2.8	2.7	2.5	1.8
Allow for construction of high density multifamily apartments of townhouses with preserved common open space	4.0	4.0	3.8	2.8
Allow for low-density large lot developments	3.2	3.1	3.2	2.2
Allow for all forms of housing in all municipalities	3.4	3.5	3.5	2.5
Subsidize housing to make it more affordable	3.9	4.3	4.3	3.5

**V. Residents' Role in the Community**

Survey respondents were asked in question 3 to check one of 9 classifications demonstrating what role the respondent may play in the community as it relates to the purpose of the county comprehensive plan. The categories were business owner, elected official, members of a local or county advisory board, planning commission member, school district employee, developer/builder, farmer, student, or other. It was decided to cross reference and compare the responses of six of these groups; business owner, elected official, school district employee, and those respondents who marked they were members of a

local or county advisory board, a planning commission member, or an environmental/conservation non-profit board member were grouped together as once category. These groups were chosen for the cross referencing because they had the highest number of respondents who answered yes to these classifications. The following figure demonstrates the number of respondents in each classification cross referenced.

**Figure A-8**  
**Number of respondents in each resident classification cross referenced.**



**A. SUMMARY of FINDINGS**

**Highlights:**

Bucks County farmland and rural character is what all groups liked best. Traffic congestion is what all groups like least, except business owners, who chose high taxes. All chose traffic congestion and managing growth and development as the most important issues the county has to face. The majority of services are considered adequate by all groups. The service considered the most inadequate is stormwater management. Each group would prefer to pursue the revitalization of existing areas than encourage new construction. Each group prefers a variety of housing types and single-family lot developments with preserved open space. Subsidizing housing is the least preferred policy among all groups.

**Question 4: What do you like most about Bucks County?**

All respondents from each of the four classifications like Bucks County farmland and rural character best. The second and third most popular response for elected officials and board/commission member is either cultural and historic sites or park or recreation facilities. School district employees selected both cultural and historic sites and the quality of schools as the second most popular response as what they liked the most about the county. The second most popular response for business owners was low crime rate/high safety.

**Question 5: What do you like least about Bucks County?**

Traffic congestion, high taxes and loss of farmland were the top three most popular responses among school district employees, elected officials, and board/commission members for what they like least about the county. School district employees equally ranked the high cost of housing as their third most popular response. High taxes and traffic congestion were the least liked characteristics of the county by business owners.

**Question 6: What do you believe are the most important issues facing Bucks County?**

Controlling traffic congestion and managing new growth and development were the top two most popular choices for all four groups. The next two most popular responses were for open space and farmland preservation and natural resource protection.

**Question 7: Are the following services adequate?**

The majority of respondents selected the services as adequate in all four groups. A slightly smaller percentage of elected officials and board/commission members selected public water, public sewer, and stormwater management as adequate.

Across all four groups, stormwater management received the highest number of respondents, ranging from 25 percent to 33 percent, as not being an adequate service. The next service selected as most inadequate are a mix of public water, public sewer, and public libraries. Libraries are the second most popular response among elected officials as an inadequate service.

**Question 8: What economic policies should be pursued in Bucks County?**

All four groups ranked the economic policies in the same fashion as has been reported previously. They prefer first to revitalize existing commercial areas and downtowns, then revitalize older industrial areas and vacant abandoned sites. The next most important policy after the above is to encourage construction of new office and industrial parks, and finally building new shopping centers and entertainment complexes is the least favored economic policy.

**Question 9: What types of housing policies should be pursued in Bucks County?**

Respondents from all groups think allowing for construction of development with a variety of housing types and allowing construction of single family subdivisions on small lots with preserved common open space are the most important policies for the county to pursue in regards to housing. Allowing for low-density large lot development is also favored among school district employees, elected officials, and business owners. This type of housing however, is ranked second to least important among board and commission members. All groups agree that subsidizing housing is the least important housing policy to pursue.

**B. ACTUAL RESULTS**

**Question 4: What do you like most about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents that selected the category as one of their top five choices for each residents' role.)

	School District Employee	Elected Official	Business Owner	Board Commission Environment
Clean air and water	40.83%	48.28%	46.30%	52.73%
Farmland, rural character	71.67%	81.03%	78.60%	79.69%
Cultural and historic sites	66.67%	58.62%	53.70%	65.23%
Park and recreation facilities	58.33%	62.07%	52.92%	52.96%
Jobs/business opportunities	9.17%	13.79%	14.01%	14.45%
Variety of shopping/entertainment	30.83%	25.86%	24.90%	24.61%
Quality of schools	66.67%	43.10%	49.03%	52.34%
Variety of housing choices	10.83%	5.17%	12.06%	10.16%
Cost of housing	4.17%	1.72%	3.11%	3.13%
Public transportation	3.33%	5.17%	2.33%	4.30%
No traffic congestion	6.67%	12.07%	10.12%	8.20%
Short commuting times to work	21.67%	12.07%	15.18%	9.38%
Able to walk to work/shop/recreation	8.33%	10.34%	7.00%	10.55%
Low crime rate/high safety	38.33%	50.00%	55.25%	48.83%
Low taxes	4.17%	13.79%	11.67%	10.16%

**Question 5. What do you like least about Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents that selected the category as one of their top five choices for each residents' role.)

	School District Employee	Elected Official	Business Owner	Board Commission Environment
Poor air and water quality	5.00%	1.72%	6.23%	5.47%
Loss of farmland, rural character	45.83%	44.83%	49.03%	53.13%
Limited cultural and	0.83%	0.00%	3.11%	4.30%
Limited park and recreation facilities	5.83%	0.00%	8.56%	7.42%
Limited jobs/business	10.83%	15.52%	18.29%	16.80%
Limited shopping/entertainment	6.67%	3.45%	6.23%	6.25%
Quality of schools	2.50%	3.45%	7.39%	4.30%
Limited housing choices	5.00%	1.72%	4.67%	8.59%
High cost of housing	45.83%	32.76%	41.63%	39.06%
Limited public transportation	43.33%	36.21%	38.91%	49.61%
Traffic congestion	60.00%	60.34%	59.53%	58.98%
Long commuting times to work	14.17%	20.69%	10.51%	14.06%
Not able to walk to work/shop/recreation	29.17%	27.59%	24.12%	24.22%
High crime rate/high safety	2.50%	5.17%	3.11%	6.25%
High taxes	50.83%	53.45%	60.31%	49.61%

**APPENDIX A: SURVEY RESULTS**

**Question 6: What do you believe are the most important issues facing Bucks County?**

(Respondents were asked to select up to five. The numbers below represent the percentage of respondents that selected the category as one of their top five choices for each residents’ role.)

	<b>School District Employee</b>	<b>Elected Official</b>	<b>Business Owner</b>	<b>Board Commission Environment</b>
Open space/farmland preservation	55.83%	53.45%	57.59%	50.78%
Providing parks and recreation opportunities	17.50%	10.34%	17.51%	19.53%
Historic resource protection	17.50%	36.21%	25.68%	26.17%
Natural resource protection	48.33%	48.28%	49.03%	56.64%
Controlling traffic congestion	73.33%	63.79%	65.76%	62.89%
Providing more transportation	46.67%	34.48%	40.08%	41.80%
Housing needs and affordability	23.33%	8.62%	19.07%	19.14%
Employment opportunities	21.67%	24.14%	28.02%	23.05%
Managing new growth and development	55.83%	67.24%	64.98%	63.67%
Revitalizing urban centers	22.50%	36.21%	23.35%	26.17%
Improving community services	11.67%	17.24%	13.23%	18.36%
Cooperative planning between local	24.17%	31.03%	24.12%	37.11%
Public safety and security	10.83%	20.69%	16.73%	12.89%

**Question 7: Are the following services adequate?**

<b>Service</b>	<b>School District Employee</b>		<b>Elected Official</b>		<b>Business Owner</b>		<b>Board Commission Environment</b>	
	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
Ambulance	98%	3%	90%	9%	94%	6%	96%	3%
Fire	98%	0%	98%	2%	97%	3%	98%	2%
Police	93%	8%	91%	9%	94%	6%	93%	6%
Trash collection	94%	6%	100%	0%	91%	9%	91%	8%
Public water	83%	16%	84%	12%	77%	21%	80%	18%
Public Sewer	84%	14%	81%	16%	77%	22%	77%	20%
Stormwater management	73%	25%	72%	26%	67%	33%	66%	33%
Public libraries	93%	7%	76%	22%	84%	15%	82%	18%
Parks and recreation	88%	12%	91%	9%	86%	14%	86%	14%

**Question 8. What economic policies should be pursued in Bucks County?**

(Respondents were asked to rank the policies from 1 to 4, with 1 being the most important. The numbers below represent the average response.)

<b>Economic Policy</b>	<b>Average School District Employee</b>	<b>Elected Official</b>	<b>Business Owner</b>	<b>Board Commission Environment</b>
Revitalize existing commercial areas and downtowns	1.1	1.5	1.5	1.5
Revitalize older industrial areas and vacant/abandoned sites	1.8	1.7	1.7	1.7
Encourage construction of new office and industrial parks	3.1	2.8	3.0	2.8
Build new shopping centers and entertainment complexes	3.3	3.3	3.4	3.3

**Question 9. What housing policies should be pursued in Bucks County?**

(Respondents were asked to rank the policies from 1 to 6, with 1 being the most important. The numbers below represent the average response.)

<b>Housing Policy</b>	<b>Average School District Employee</b>	<b>Elected Official</b>	<b>Business Owner</b>	<b>Board Commission Environment</b>
Allow for construction of development with a variety of housing types	2.4	2.3	2.4	2.5
Allow for construction of single family subdivision on small lots with preserved land	2.5	2.5	2.7	2.6
Allow for construction of high density multifamily apartments or townhouses w/preserved land	4.0	3.8	4.1	3.6
Allow for low-density large lot developments	3.2	2.8	2.7	3.8
Allow for all forms of housing in all municipalities	3.5	3.4	3.5	3.4
Subsidize housing to make it more affordable	4.4	4.3	4.5	4.6



## **SUMMARY OF COMMENTS FROM STAKEHOLDER MEETINGS**

**April 28, 2011**

7:00 P.M. to 9:00 P.M.  
BC Community College  
275 Swamp Road  
Newtown, PA 18940

**May 3, 2011**

7:00 P.M. to 9:00 P.M.  
Quakertown Free Library  
401 W. Mill Street  
Quakertown, PA 18951

**May 10, 2011**

7:00 P.M. to 9:00 P.M.  
Levittown Free Library  
7311 New Falls Road  
Levittown, PA 19055-1006

**APPENDIX B: STAKEHOLDER MEETINGS SUMMARY**

The Bucks County Planning Commission (BCPC) staff conducted three Stakeholder meetings on April 28th, May 3rd, and May 10th. Municipal officials, staff, and representatives were invited to attend the April meeting. County residents, community organizations, special interest groups, and county and regional agencies were invited to attend the two May meetings. The three meetings were conducted to:

- Present and seek consensus on *Bucks County Comprehensive Plan* vision, principles and strategic actions from these Stakeholders.
- Uncover issues or concerns that need to be addressed in the Plan and hear what may require modification or enhancement.

At each meeting attendees were asked to fill out a survey regarding the content and format of the plan’s Vision Statement. Meeting attendees were also organized into groups where specific comprehensive plan topics were discussed openly between BCPC staff and participants.

The following presents the results of the Vision Statement survey and a summary of common concerns, issues, and recommendations from the participants in each of the group discussions at the three Stakeholder meetings. This insight and input helped shape the emphasis, direction, and recommended strategies of the *Bucks County Comprehensive Plan* update.

**Vision Statement Survey Results**

Accurate Reflection	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total	
Yes	1	1	1	1	1	1	1			1	1	1	1	1	1	1	1					1	1	17
No			1					1	1									1	1	1				6
<b>Major Comments</b>																								
Provide Better Transportation in Some Places												Housing/Transportation/Access for Frail Aged/MH/MR												
Location specific (regions)												Brownfield Development w/Municipal Usage												
More emphasis on Economic Development												Energy, Climate and Economic Issues dominate												

Format	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total	
Paragraph	1*	1	1	1					1	1		1			1	1*	1					1*	1*	12
Bullet					1	1	1				1		1	1			1	1	1	1				10
Include Photos	1						1	1			1		1	1	1	1						1	1	10
Other								1																1

\*1 was assigned because the survey response only indicated that the vision needed to include photos, which then assumes that the original paragraph format is okay.

Length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total	
About Right			1	1	1	1	1		1		1	1	1	1	1	1		1	1	1	1			16
Too Long	1	1						1															1	4
Not thorough										1							1							2

Motivating	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total							
Yes				1	1				1	1	1	1	1	1	1	1	1							11						
No								1																1						
<b>Not specified, but comments</b>																														
Shorten	1	1																no response	no response			no response		2						
Location diversity			1																											1
Quantifiable benchmarks						1																								1
Need punch, sense of action							1																							1
Closing stronger w/ reminder of purpose																												1		1
Remind people why they moved here																												1		1

# GROUP 1



Natural Resources  
Historic and Scenic Resources  
Parks/Recreation  
Agricultural and Open Space Preservation  
Energy Conservation and Efficiency

## Natural Resources

- Stakeholders agreed that creative zoning such as cluster development should be utilized to protect natural resources. The county should play an active role in providing assistance to municipalities regarding these land development strategies.
- Stakeholders agreed that there should be greater focus on the land/water interface protection especially regarding drinking water supply.
- There was consensus that all groups should foster greenways and corridors for habitat protection.
- There should be a balance between property rights and natural resource protection. The county should reach out to the general public regarding the benefits of natural resource protection.
- Make GIS tools available to municipalities to analyze success of and help project need for future protection efforts.

## Historic and Scenic Resources

- Stakeholders expressed concern that there are no scenic regulation provisions or oversight. Scenic overlay districts should be used as a tool to preserve features and efforts should be coordinated with open space planning. The county should assist with this process.
- Lack of education and funding are issues of concern. Many residents don't know what surrounding townships are doing. Resources are important to the county's agrarian character, economy, and tourism. The county should work with municipalities on efforts to identify historic resources and promote the value of these resources to communities.
- Adaptive reuse is important but difficult to implement due to the state building code. Zoning could potentially make it easier. Incentives should be used to provide greater flexibility to protect barns and other historic features.
- There should be a focus on types of resources (e.g., think historic buildings/barns tours), and municipalities and agencies should coordinate efforts to inventory and promote these features and resources. A resource guide to bundle and market resources together (tourist bureau) should be created.
- Stakeholders expressed concern that there is a lack of connectivity between scenic and historic resources and parks and recreational areas. The focus should be to link historic and cultural resources to greenways/park systems/trails and sidewalks. Bike transportation and trails should also be promoted and encouraged.

## Parks/Recreation

- Municipalities in the lower portion of the county are grappling with the issue of limited access to parks and the Delaware River due to their communities being industrialized and built-up. Municipal officials and stakeholders would like to see greater efforts made regarding riverfront planning.

- Protection measures cannot be regionalized and efforts must take into consideration community needs and goals. Some park/recreational uses are inappropriate at some locations (e.g., no emergency services in close proximity). There should be better communication among county departments, EMS, land trusts and environmental groups to determine what constitutes an appropriate use.
- County should develop a better way to advertise open space and parks and recreational opportunities in the county. Some parks are under-utilized due to their location, limited access and limited advertisement.
- A fragmented government structure impedes protection efforts. Trust for public land partnerships (and the like) will help with referendum funding and future initiatives. Preservation of open space should address the economic value of protecting these lands.
- The county should inform communities of the costs of flooding from lessons learned and should also foster relationships with stakeholders.

### **Agricultural and Open Space Preservation**

- Need to assess overall return on investment by developing a tool that the County and municipalities can use to analyze and evaluate the effectiveness of preservation programs (e.g., acreage, habitat preserved).
- Stakeholders agreed that there is a significant need to address the loss of farms and the farming community in the county. It is imperative that other uses can be created and permitted, such as Community Supported Agriculture (CSAs), farm-based business, agritourism and agritainment.
- Municipal officials and stakeholders expressed concerns regarding limited opportunity for utilization of agricultural preservation funding. Many properties do not meet the acreage requirements for open space programs (50 acres minimum) and/or do not meet the soil requirements (e.g., prime agricultural). The program should be revamped to permit funding set aside for smaller farms, and farms having varied soil types.
- Stakeholders agreed that the county and local easement programs have been very effective for land preservation. Since historic and scenic resources are often overlooked for funding, there may be an opportunity to expand the County's program to include funding for these resources in future bond referendums.
- There is growing concern related to the increased number of horse farms in the county. Many horse stables and riding clubs are located in small areas, resulting in water quality and soil erosion issues. Oversight and management is difficult to implement so education is important.

### **Energy Conservation and Efficiency**

- Stakeholders unanimously agreed that the county should have a point person to address energy conservation/efficiency/Leadership in Energy Conservation and Efficiency (LEED) building issues, questions and requirements, who is able to provide recommendations, cite examples and

case studies and assist with the development of model ordinance language. The county should also provide technical assistance.

- The initial cost to construct green projects typically prohibits implementation of many LEED projects. The county needs to educate municipalities and residents and provide clear evidence of short-term/long-term cost savings for implementing “green” projects.
- County should show fiscal responsibility and lead by example (i.e., pilot programs, LEED certification).
- The Uniform Construction Code was recently amended. Stakeholders agreed that the county should be versed in the new code and should be able to provide ways to address municipal concerns, which would include providing ways to address greenhouse gas emissions.

## GROUP 2



Hazard Mitigation  
Community Facilities  
Solid Waste  
Water Supply  
Wastewater  
Stormwater

## Hazard Mitigation

- Stakeholders felt strongly that development in floodplains should not occur and that in the cases of repetitive losses, the property should be purchased and the land dedicated back to the county and/or municipalities for open space purposes.
- Specific to flooding, stakeholders felt a large area of concern is that many of the stormwater management facilities in the county are old and outdated and don't function properly. Based on this, stakeholders felt these issues need to be addressed, but acknowledged there is no funding available.
- Stakeholders agreed that county taking over the 911 system was working effectively, but that there are still some areas in the county without adequate telecommunications facilities, posing a safety risk.

## Community Facilities

- There was broad based support among stakeholders for the consolidation of some services such as police services, road services, and waste hauling to help reduce the costs associated with each municipality having to have dedicated equipment and personnel. However, there was also recognition that this wasn't practical in all areas of the county and that the consolidation of some services such as school districts, was also not practical.
- Specific to libraries, there was general consensus that the county should take a greater role in the funding of libraries as the role of libraries continue to evolve with many of them serving as community centers, not just libraries.
- Stakeholders agreed that the recruitment and retention of emergency services personnel was a challenge.

## Solid Waste

- Stakeholders were divided on the concept of having one waste hauler for a community. There was recognition of the benefits of having one hauler, such as reductions in congestion on the roads and fewer vehicle miles driven due to fewer companies/haulers servicing an area. Some municipal officials felt that they didn't have the resources needed to deal with complaints and billing issues.
- Stakeholders expressed a clear preference for single stream recycling, more yard waste drop-off facilities, more disposal options at the household hazardous waste collection events, and composting. While recognizing the benefits of the recycling of building products, stakeholders indicated that there is no real demand for this.

## Water Supply

- Stakeholders agreed that the protection of groundwater resources was important and that encouraging activities that promote groundwater recharge was needed. Municipalities should also require that development can demonstrate a sustainable water supply.

- There was consensus that the establishment of riparian buffers along stream corridors was needed to assist in the protection of water supply sources and that the county and municipalities should work with local organizations to help restore and establish these buffers.

Stakeholders felt that more needs to be done by the State to address the Marcellus shale/fracking issues to help protect water supplies

### **Wastewater**

- There was broad-based support for discouraging the use of stream-discharge wastewater systems and instead, encouraging the use of land disposal systems that promote groundwater recharge.
- Stakeholders felt that the lack of pumping over time is the primary cause of failing on-lot systems (e.g. septic systems) and that inspections and requiring pumping every 3 years were needed to prevent on-lot sewage disposal system failures.

### **Stormwater**

- Stakeholders expressed a need for regulations to require stormwater runoff infiltration to recharge groundwater and want to see natural areas utilized for infiltration.
- Municipal officials don't want residents doing their own stormwater management because they are afraid of an influx of neighbor complaints and they don't have the capacity to deal with the calls they currently receive.
- Stakeholders agreed that there is a need for increased regional stormwater management in order to help address the impact on Lower Bucks from development activity occurring in Central and Upper Bucks.
- There was a clear interest in having more education on stormwater management involving partnerships between the county and engineering firms.



# GROUP 3



Transportation  
Economic Opportunities  
Housing  
Land Use

## Transportation

- Stakeholders felt transportation funding is one of the most important issues; alternative funding sources should be investigated and funds managed more efficiently.
- Stakeholders felt that transportation planning for capacity has to be more proactive and not reactive.
- Participants stated that public transit needs to be improved and be more competitive with driving. Participants felt that people like the freedom of their personal vehicles but will be more likely to use public transportation if driving becomes cost prohibitive.
- Stakeholders believe that economic development success is contingent upon the efficiency of the transportation system.
- Participants felt that the connection between transportation and land use planning should be strengthened since the efficacy of each are interrelated. The connection affects both movement of goods and people. Connectivity should be created between communities.

## Economic Opportunities

- Participants emphasized that future economic development initiatives need to focus on existing urban areas, including downtowns, with adequate infrastructure capabilities.
- Stakeholders felt that job creation and helping to ensure affordable housing for the workforce are important components to economic development.
- Stakeholders felt there was insufficient financial incentives and coordination of resources to revitalize existing areas.
- Some participants were concerned that not enough economic development planning has been given to maintaining and expanding the county's manufacturing, research and development, and technology base.

## Housing

- Participants felt that the county lacked the diversity in housing choice and affordability, including a lack of rental options.
- The location and types of housing as it stands today offer little in the opportunity to age in place or live near employment opportunities. Many participants offered that a greater mix of land uses should be provided to help solve this problem.
- There is also a concern that age-restricted housing will not fill the housing needs of future residents—older residents may not want to live in these types of communities and younger residents may not have enough housing opportunities.
- Finally, some participants suggested a need to make certain housing types, including townhouses and apartments more attractive so that there is greater acceptance of these housing types from the broader community.

## Land Use

- As with the economic development discussion, stakeholders desired future development efforts to be focused on revitalization and redevelopment of existing developed areas rather than the development of green spaces.
- When talking about residential areas, participants often referred to the importance of neighborhoods and the need to provide more non-motorized connections between them and other community resources.
- Participants emphasized mixed-use development with access to goods, services, recreational amenities, and entertainment. Again, participants emphasized the need to provide a better link between jobs and housing.
- Some participants felt the need for more cooperation among communities and county coordination, vision, and guidance.



## Overall Housing Capacity

An analysis of both the potential demand and capacity for residential development indicates that overall the Development Area of the county (see Map C1), made up of the Boroughs and Mature Suburban and Emerging Suburban lower Bucks and central Bucks municipalities<sup>1</sup>, and the development districts<sup>2</sup> of the remaining municipalities, has a sufficient capacity to absorb all the residential development projected by 2020 and 2030 (both high and low housing projections) and have a remaining capacity for 606 units. If the historic distribution of residential construction inside and outside the development area is considered, the development area has sufficient capacity to absorb all the residential development projected by 2020 and 2030 (both high and low housing projections) and have a remaining capacity for 6,336 units.

The capacity of the Boroughs and Mature Suburban and Emerging Suburban lower Bucks municipalities is assumed to be provided by redevelopment and infill development. Capacity of the development district of the remaining municipalities is based on the development potential of developable land<sup>3</sup> calculated by multiplying the net buildable site area<sup>4</sup> of these lands by the highest density permitted for the municipal zoning district in which the land is located in. This is a conservative method of calculating capacity given that many municipalities base density on gross site area or base site area (excludes existing rights-of-way and easements).

On an individual municipal level, the development districts of only two municipalities would not have sufficient capacity to accommodate the total 2020 low projected individual municipal housing growth and three municipalities would have insufficient capacity for the total 2020 high projections. The numbers increase for 2030 with 7 and 10 municipalities having insufficient capacity to accommodate the low and high housing projections, respectively.

While the Development Area is intended to accommodate much of the projected housing development, realistically, some projected housing development will occur outside the Development Area. In an effort to more accurately reflect the historic distribution of residential construction, the share of projected development outside the Development Area is assumed to be the rate found for housing constructed in the last 10+ years<sup>5</sup> or that recorded in recent municipal and joint municipal comprehensive plans. During this period, approximately 61.7 percent of new residential development occurred within the development districts of the upper Bucks municipalities and 66.9 percent in central Bucks municipalities.

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<sup>1</sup> Mature and Emerging Suburban lower Bucks municipalities – Bensalem, Bristol, Falls, Lower Makefield, Lower Southampton, and Middletown townships.

Mature and Emerging Suburban central Bucks municipalities – Northampton, Warrington, Warminster, and Upper Southampton townships.

<sup>2</sup> Development Districts consist of areas of municipalities designated as such in municipal and joint municipal comprehensive plans and/or zoning ordinances or areas of municipalities correlating to moderate to high density (greater than 1 dwelling unit per acre) zoning districts.

<sup>3</sup> Potentially developable land includes rural residential, agricultural, and vacant land uses with no conservation easements or deed restrictions related to protected open space. For planning purposes, one dwelling unit is subtracted from the dwelling unit capacity of each rural residential parcel to reflect the existence of the current dwelling unit.

<sup>4</sup> Net buildable site area is the area of a parcel that remains after subtracting the area of natural resources required to be protected based on the minimum Natural Resource Protection standards recommended by Bucks County and 15 percent of parcels over four acres to account for new rights-of-way and easements and extension of utilities.

<sup>5</sup> The historic development period for certain municipalities with significantly low amounts of development was extended to 15 years.

The historic distribution of development in the development district of certain individual municipalities, particularly those in rural portions of the county, many with significant natural resources, is far less than these regional percentages.

Given the regional and municipal historic trend of development inside versus outside the Development Area, the Development Areas of all the individual municipalities are considered sufficient to provide their fair share of the county low and high 2020 housing projection. All but two municipalities have sufficient development area to accommodate their share of the low 2030 housing projection when considering the regional and municipal historic trend of development inside versus outside the Development Area. That number increases to five for the high 2030 housing projection.

Current planning conventions suggest that a fair share/development area analysis be conducted every five years to ensure there is adequate capacity for housing development commensurate to the current pace of development. Thus, while the Development Area currently appears to be sufficient to meet the overall housing demand for 2020 and 2030 housing, municipal officials should analyze the Development Area of their respective municipalities in five years to determine if the pace of development would exceed the housing capacity currently provided.

### **Multifamily Housing Capacity**

Similar to overall housing, analyses of the capacity for multifamily housing indicates that the areas zoned for such development in the county, much of which is congruent with the Development Area, is sufficient to provide for a fair share of multifamily housing<sup>6</sup> to 2030. Two analyses were conducted that relate to the fair share principles established in the *Surrick*<sup>7</sup> court case and subsequent case law.

The first analysis involves a comparison of the actual and potential amount of multifamily housing that can be provided in municipalities to the amount projected for the county based the current percentage of multifamily housing for the Bucks County as a whole.<sup>8</sup> For this analysis, the multifamily capacity of the Boroughs and Mature Suburban and Exurban Lower Bucks municipalities based on the county percentage is assumed to be provided by redevelopment and infill development. Capacity of the remaining municipalities is based on the development potential of developable land calculated by multiplying the net buildable site area of these lands by the highest density permitted for multifamily housing in the municipal zoning district in which the land is located in.

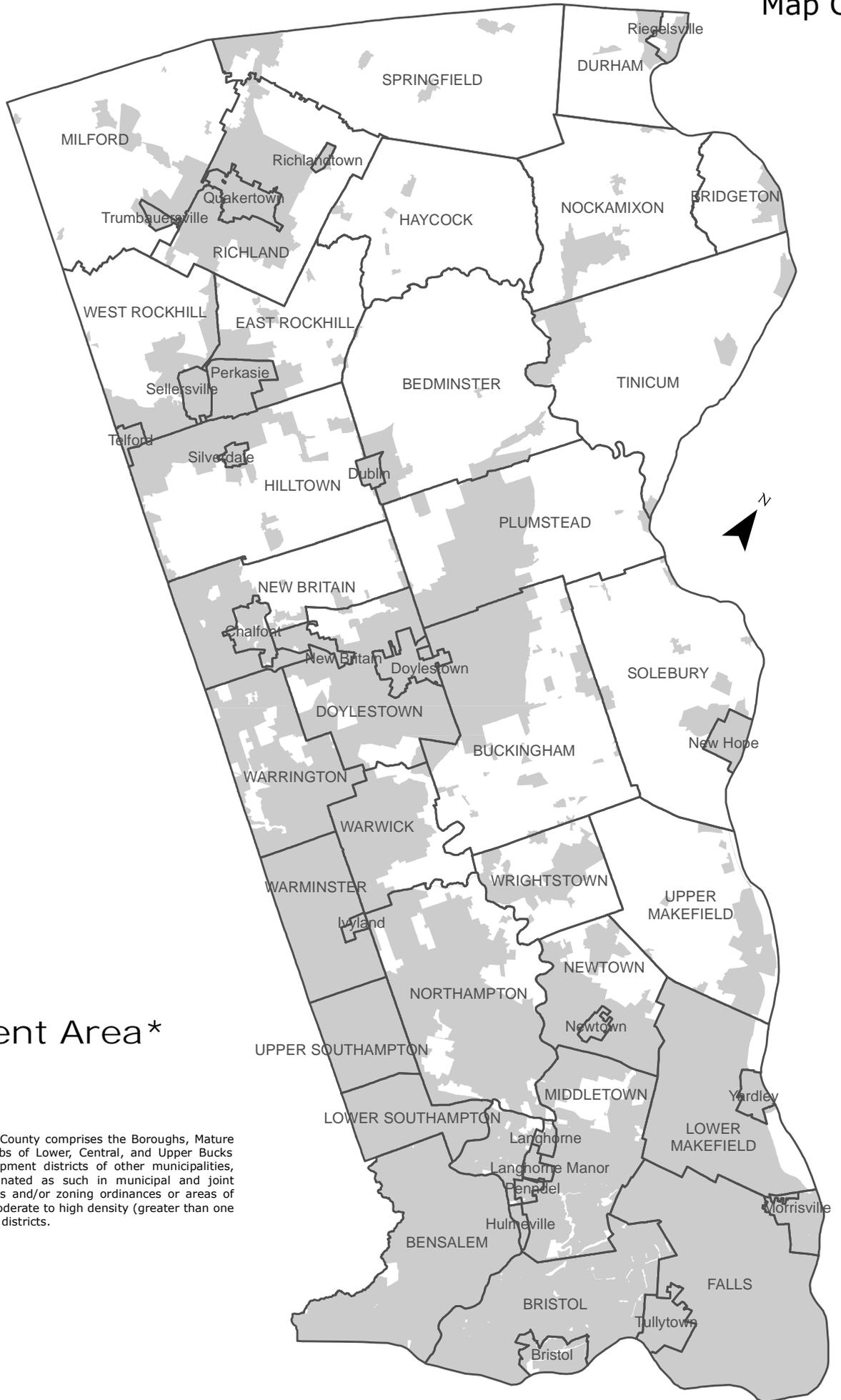
Based upon this analysis, the sum total of multifamily housing that could be provided from municipalities would exceed the low and high 2020 and low 2030 projected multifamily housing for the county as a whole. The high 2030 county multifamily housing projection exceeds the sum total of multifamily housing that could be provided from municipalities by only 317 units. On an individual municipal level, however, 9 municipalities have a capacity for multifamily units that is below the county percentage for the low 2020 multifamily projection and 10 municipalities have a capacity for multifamily

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<sup>6</sup> Multifamily housing units include attached unit structures (e.g., townhouses) or 3 or more unit structures (e.g., apartment buildings, multiplexes), but excludes 2 unit structures (e.g., twins, duplexes).

<sup>7</sup> *Surrick v. ZHB of Upper Providence Twp.*, 476 Pa. 182, 382 A.2d 15 (1977)

<sup>8</sup> The overall percentage of multifamily units for Bucks County is 30.8 percent, based upon the 2000 U.S. Census.



## Development Area\*

\* The Development Area of the County comprises the Boroughs, Mature Suburbs and Emerging Suburbs of Lower, Central, and Upper Bucks municipalities and the development districts of other municipalities, which consist of areas designated as such in municipal and joint municipal comprehensive plans and/or zoning ordinances or areas of municipalities correlating to moderate to high density (greater than one dwelling unit per acre) zoning districts.

units that is below the county percentage for the high 2020 multifamily projection. The number increases to 10 and 13 municipalities that have a capacity for multifamily units that is below the county percentage for the low and high 2030 multifamily projection, respectively. An important note is that many of these communities are not subject to significant growth pressures. Because of their rural characteristics, abundance of significant natural resources, distance from growth centers, and lack of infrastructure and services, individually these municipalities are not likely to be considered in the path of development.

The second method to determine multifamily fair share involves an evaluation of the percentage of land area zoned for multifamily use within a municipality to assess whether it is disproportionately small in relation to land available in the municipality. After evaluating land zoned for multifamily uses, it appears that many municipalities provide significant multifamily opportunities. More than 29 municipalities have 10 percent or more of their acreage in zoning districts that allow for multifamily uses. Another 18 municipalities have between 5 and 10 percent of the land area available for multifamily housing. Only 7 municipalities have less than 5 percent in of their acreage zoned for multifamily use. Although the Courts have not established a particular threshold for the minimum percentage of land that needs to be zoned for multifamily use in a municipality, specific percentages of land designated for multifamily development have been upheld by the Courts on a community-by-community basis, depending upon whether or not a municipality is in a logical area for growth or experiencing growth pressure.<sup>9</sup> All of the municipalities with significantly low percentages of multifamily zoning are either in rural areas not likely to be considered in the path of development due to existing conditions and context or are boroughs or mature suburbs having limited potential for infill and redevelopment and/or remaining undeveloped areas contain significant natural resources.

As part of the 5-year overall development area analysis, municipal officials along with the municipal solicitors should review applicable case law to determine if and how the municipality should be providing for a fuller range of housing types including apartments and townhouses, particularly in light of the county's sustainability and smart growth initiatives.

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<sup>9</sup> *Cambridge Land Company v. Marshall Township*, 560 A.2d 253 (Pa. Commonwealth, 1989). The township provided apartment use on 2.75 percent of its total land area and 1 percent of the land set aside for this use was undeveloped. Based on additional factors, such as low growth pressure, the court upheld the ordinance.

*Appeal of M.A. Kravitz Co. Inc.*, 460 A.2d 1075 (Pa. 1983). Wrightstown Township provided for multifamily use on 0.6 percent of its total land area. Based upon additional factors, including that the community was not a logical area for growth, the court upheld the township's ordinance.

*Hostetter v. Londonderry Township*, 437 A.2d 806 (Pa. Commonwealth, 1981). The township zoned 2.6 percent of its total land area for multifamily use. Based upon potential units under permitted densities and the context of minimal development pressure, the court sustained the ordinance.

*Willistown Township v. Chesterdale Farms, Inc.* 341 A.2d 466 (1975). The township provided for apartments on 0.7 percent of its total land area. The court ruled that this was a token amount and therefore exclusionary.